AMENDED EIS/EA REPORT
CHAPTER 1: INTRODUCTION
VERSION 3

CANADIAN MALARTIC CORPORATION

APPENDIX 1.IV

Responses to Information Requests on the Draft EIS/EA Submission

January 2018
Project No. 1656263
Hammond Reef Gold Project

Golder Associates

Canadian Environmental Assessment Agency

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-1

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS/EA report describes the proponent of the project; however, there is no mention of the key personnel, contractors, and/or subcontractors responsible for preparing the report.

Potential Environmental Effects

None

Proposed Action

Provide the name and roles of the key personnel involved in preparing the draft EIS/EA Report.

Reference to EIS

Section 1.2, Page1-4

Response

Section 1.2.2 provides Osisko's corporate management structure. For clarity, the following has been added: The EIS/EA Report is the responsibility of the Director of Sustainable Development, and was prepared with the help of the EIS/EA Team. This team included Osisko staff and Osisko's environmental consultant, Golder Associates.

INFORMATION REQUEST – CEAA-3

Source: Canadian Environmental Assessment Agency

Summary of Comment

The environmental effects assessment is not clear in identifying or characterizing the impact, mitigation measures, whether there is a residual effect and the significance of the residual effect.

Potential Environmental Effects

The layout of the environmental effects assessment for each environmental component need to be explained in a consistent manner to fully understand the environmental effects of the project.

Proposed Action

The environmental effects assessment should be revised in a consistent manner to follow the general steps of the impact assessment.

Reference to EIS

Chapter 6

Response

The Environmental Impacts Assessment Matrices (Tables 6-55 to 6-57) have identified the impact, mitigation measures, residual effect and significance of the residual effect for each phase and Project activity. These tables have been updated to reflect the comments received from CEAA as per the examples provided by the agency throughout the comment period.

INFORMATION REQUEST – CEAA-4

Source: Canadian Environmental Assessment Agency

Summary of Comment

In section 6.2.3, several tables are presented to assess each project activity against specific assessment measures.

Potential Environmental Effects

Although Tables 6-49 to 6-51 describe the project interaction, assessment conclusion and mitigation, it would be helpful to provide an overview of the interactions between the project activities and the environmental and socio-economic components for greater clarity.

Proposed Action

Provide an interaction matrix describing the interaction of VECs with project components for a visual summary.

Reference to EIS

Section 6.2.3

Response

The Draft EIS/EA Report included project interaction tables in three locations: Table 6-52 (Table 6-49 in the Final EIS/EA Report) provides a project interaction table for the socio-economic VECs. The aquatic environment VECs interactions table is provided in Appendix 3.1 of the Aquatic Environment TSD and the terrestrial environment VECs interactions tables are provided in Section 3.2 of the Terrestrial Ecology TSD.

INFORMATION REQUEST – CEAA-5

Source: Canadian Environmental Assessment Agency

Summary of Comment

Residual environmental effects are not clearly described in the draft EIS/EA Report. Tables 6-49 to 6-51 identify the environmental component, project interactions, measures of the effect, conclusion, mitigation and the significance; however, it is not clear how the conclusion on significance of effect was reached.

Potential Environmental Effects

It is important to clearly state the residual effect in order to determine the significance of the adverse residual effect.

Proposed Action

Revise the columns in Tables 6-49 to 6-51 to show the assessment in the following order: 1) Activity; 2) VEC affected; 3) Potential Effect; 4) Proposed Mitigation; 5) Residual Environmental Effect; 6) Predicted degree of impact after Mitigation (using the criteria in Tables 6-49 to 6-51, i.e. extent, duration, frequency, reversibility, magnitude); 7) Significance of Residual effect.

Reference to EIS

Tables 6-49 to 6-51

Response

The tables have been revised to reflect the columns requested above. For clarity, the tables are now found in a new section within Chapter 6 entitled “Residual Effects Assessment”.

INFORMATION REQUEST – CEAA-6

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS indicate results of feedback surveys on the land use in the study area (i.e. hunting, fishing and harvesting). It is not clear which study area was used in the survey.

Potential Environmental Effects

The spatial boundary of the assessment according to the VECs is important in assessing environmental effects from the project.

Proposed Action

Clarify what study area was used in the surveys.

Reference to EIS

Section 7.1.2.8, Pg.7-11; Pg.7-13; Pg.7-15

Response

The Local Study Area (LSA) is defined as the area likely to be affected by the direct environmental effects of the Project. For land and resource use, the local study area corresponds to the LSAs selected for aquatic and terrestrial biology (Figure 4-3), which represent the primary linkages between direct Project-related effects and potential effects on land and resource use. Effects on land and resource use are primarily a result of: (1) restricted access to the land directly impacted by the Project – the Project "footprint" – or (2) indirect effects as a result of effects on the aquatic or terrestrial environments.

The Aboriginal Heritage Resources and Traditional Land Use effects on Aboriginal communities from the Project identified and assessed in this TSD are assumed to occur primarily within the LSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-7

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS states, "Borrow Pits are subject to a separate permitting process and are therefore not further included in the assessment." The rationale for not including the impact of taking aggregates from the borrow pits on the environment is not clear.

Potential Environmental Effects

The environmental effects assessment should include all activities, proposed by the proponent that may have an impact on the environment.

Proposed Action

Provide an assessment of the borrow pits on the environment and mitigation measures to reduce any impacts on the environment.

Reference to EIS

Lake Water Quality TSD, Section 1.3.4, Pg. 4

Response

OHRG currently holds permits under the Aggregate Resources Act for 3 existing aggregate pits in the vicinity of the Project, and these aggregate pits would remain in use. OHRG has also identified other prospective sources to address some of the additional aggregate requirements. In due course, they may apply for permits for one or more of these prospective sites; however no decision has yet been made in this regard. Depending on commercial considerations, (i.e. haul distance, purchase costs, royalties, etc.), OHRG may address additional requirements by either purchasing aggregate from commercial sources or by crushing waste rock on site.

OHRG holds Category 9 permits on the existing aggregate pits, which means that the pits are located on Crown land and they are not to be operated closer than 1.5 m above the established water table. It is expected that any new aggregate pits would also be permitted under Category 9. No aggregate can be extracted from below the water table, and any runoff from rainfall can be contained within the pit area where it will infiltrate. Good practice measures, such as leaving a high point on the access road, will be followed to prevent any runoff leaving the sites of any of the aggregate pits. For this reason, the aggregate pits are not expected to have any impacts on lake water quality.

INFORMATION REQUEST – CEAA-8

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS states, "In the early stages of construction, existing site access roads will be upgraded and new access roads will be constructed, where required. Access roads will also be required for Borrow Sites and the sites will be opened to provide access to construction materials." It is not clear where these new access roads will be constructed.

Potential Environmental Effects

The scope of the project shall include all components of the project as proposed by the Proponent. If the construction of the new access roads is being proposed by the proponent, the environmental effects of the new access roads should be included.

Proposed Action

Clarify if Osisko is proposing the construction of new access roads and if so, provide an assessment of the new access roads required for the borrow pits.

Reference to EIS

Section 5.1.1, Pg. 5-7

Response

OHRG currently holds permits for aggregate pits in the vicinity of the Project, and these aggregate pits would remain in use. Access roads to these pits already exist. When they are no longer required, the pits and their access roads will be rehabilitated according to the requirements of the Aggregate Resources Act.

OHRG has also identified other prospective sources to address some of the additional aggregate requirements. In due course, they may apply for additional Category 9 permits for one or more of these prospective sites; however no decision has yet been made in this regard. New access roads would likely be required in connection with any of these possible new aggregate pits.

Depending on commercial considerations, (i.e. haul distance, purchase costs, royalties, etc.), OHRG may address additional requirements by either purchasing aggregate from commercial sources or by crushing waste rock (providing testing indicates that it is acceptable from a geochemical standpoint). No new access roads would be required in this case.

INFORMATION REQUEST – CEAA-9

Source: Canadian Environmental Assessment Agency

Summary of Comment

The alternative means in table 4-1 are listed for each project component; however, only one alternative means is listed for the Fiber Optic Line. It is not clear whether there is only one feasible alternative for the fiber optic line or if there are other alternative means for this project component that is not listed.

Potential Environmental Effects

Alternative means of carrying out the project is a factor to be considered in the federal EA. It is important to have clarity on the alternative means in order to properly assess options.

Proposed Action

Clarify whether there are other alternative means for the fiber optic line.

Reference to EIS

Table 4-1, Pg. 4-5

Response

The only alternative considered for the fibre optic line was to share the alignment and support structures as the transmission line. By doing this, additional terrestrial impact is avoided and installations costs are minimized. Therefore the Fibre Optic Line was removed from Table 4-1.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-10

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS states, "...the on-site worker accommodation camp, was selected as the preferred alternative." However, it is later explained in the draft EIS that this alternative allows for opportunities for both workers wishing to live in Town and workers preferring a shift rotation, allowing them to reside in the Regional Study Area. The preferred alternative is not clearly explained as Alternative 1 is described differently in the alternative assessment conclusion.

Potential Environmental Effects

Alternative means of carrying out the project is a factor to be considered in the federal EA. It is important to have clarity on the alternative means in order to properly assess options.

Proposed Action

Clearly describe Alternative 1.

Reference to EIS

Section 4.2.9, Pg. 4-22

Response

Two alternatives were assessed for worker accommodation. Alternative 1 is to build an on-site worker accommodation camp, and Alternative 2 is to house workers in Town. Alternative 1 was selected and an on-site worker accommodation camp will be constructed. In an effort to remain flexible and allow for maximum benefits to the Town, Osisko will also provide opportunities for workers wishing to live in Town, commuting daily by bus or personal vehicle, however Alternative 2, which includes only off-site accommodation and not allowing workers to live on site, has been deemed unfeasible.

INFORMATION REQUEST – CEAA-11

Source: Canadian Environmental Assessment Agency

Summary of Comment

Table 4-2 includes a summary of preferred alternative means of carrying out the project. Not only does it include the preferred alternatives discussed in previous sections but it also includes a few of the single feasible alternatives (i.e. Low-grade ore stockpiling siting, organic and solid waste management)

Potential Environmental Effects

None

Proposed Action

Correct table 4-2 if it should include all alternatives or only the project components that had alternative means assessed.

Reference to EIS

Table 4-2, Pg. 4-23

Response

Removed single feasible alternatives from table including; low grade ore stockpile siting, auxiliary transmission line, organic and solid waste management and fibre optic line.

INFORMATION REQUEST – CEAA-12

Source: Canadian Environmental Assessment Agency

Summary of Comment

As the environmental effects of the alternatives means are described, it is not apparent how any of the potentially adverse environmental impacts of the alternative means could impact potential or established Aboriginal or Treaty rights.

Potential Environmental Effects

It is a requirement of section 7.3 of the EIS Guidelines.

Proposed Action

Describe any potentially adverse environmental impacts of the technically and economically feasible alternatives on potential or established Aboriginal or Treaty rights or reference where the information can be found.

Reference to EIS

Section 4.0

Response

The social evaluation considered potential effects to Aboriginal rights through cultural heritage, services and infrastructure, land use, local resources and potential benefits to the local population and economy.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-13

Source: Canadian Environmental Assessment Agency

Summary of Comment

The closure Plan TSD states that “After closure, the inactive tailings beaches are expected to be susceptible to erosion by surface runoff, and exposed tailings surfaces could also generate off-site migration of dust. The closure measures are designed to physically stabilize the tailings surfaces to prevent erosion and dust generation." It is not clear how the closure measures will prevent erosion and dust. It is not apparent how impacts from tailings dust will be mitigated during operations.

Potential Environmental Effects

As the concern was raised by an Aboriginal group, it is important that it be addressed.

Proposed Action

Provide impact assessment of air quality from wind erosion from tailings during operations and indicate mitigation measures for potential impact of tailings dust impacts on the air quality.

Reference to EIS

Closure Plan TSD s4.2, p13

Response

Fugitive dust throughout the project, including during the Closure Phase, will be managed through the implementation of a comprehensive fugitive dust Best Management Practices Plan (BMPP), which will include practices for managing wind erosion from tailings during Operations and re-vegetation during Closure as described in Section 4.2 of the Conceptual Closure and Rehabilitation Plan TSD. Some typical steps to be included in the BMPP for managing dust generation from the tailings areas are ensuring a minimum moisture content of the tailings to keep the area wet and/or installing wind screens. Wet or moist tailings would have little in the way of dust generation potential. As stated in the Conceptual Closure and Rehabilitation Plan TSD, the “closure measures are designed to physically stabilize the tailings surfaces to prevent erosion and dust generation.” The types of closure measures include covering and vegetating these areas, which would eliminate the dust generation.

The combination of the closure plan activities and the implementation of the BMPP, which includes facility engagement and accountability, will ensure that the potential emissions from tailings are an insignificant source. Therefore, they have been excluded from the assessment as a potential source of particulate matter. This is standard practice and follows the guidance in Section 7.4 of the Ontario Ministry of the Environment “Procedure for Preparing an Emission Summary and Dispersion Modelling Report” document dated March 2009.

Once the final design of the Osisko project is confirmed, a comprehensive site-specific BMPP, as described in Section 3.3 of the Atmospheric Environment TSD, will be created for the site which will include specific objectives to control fugitive emissions from tailings.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-14

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS states that "it is not possible to realistically assess potential effects on fish without site specific data on peak particle velocity values since this depends on the nature of the rock and the transmissivity." It is not clear why the nature of the rock and the transmissivity cannot be modeled to predict the effects of blasting. As blasting of the open pit progresses closer to the edge of the Upper Marmion Reservoir, there is a greater potential for vibration effects on fish and fish habitat in the Upper Marmion Reservoir.

Potential Environmental Effects

The effects should be predicted in order to identify its significance to fish in the Upper Marmion Reservoir. Mitigation measures should also be identified.

Proposed Action

Explain the rationale for not being able to predict the effects of blasting on fish.

Reference to EIS

Pg. 6-18 and Section 6.2.2.1.2, Pg. 6-107

Response

The blasting report can be found in the Section 5.0 Vibrations of the Atmospheric Environment TSD. The DFO guideline and impact thresholds were prepared for the purpose of measuring potential impacts to fish and fish spawning areas from in-water blasting and, as a result are not directly applicable to assessing the potential effects of on-land blasting. As a result, an adaptive management approach is recommended to measure and mitigate any effects of blasting on fish and fish spawning shoals. This would involve undertaking a series of test blasts to measure whether the in-water thresholds are exceeded, if they are, either to adjust the characteristics of the blast or install in-water mitigation measures, such as a bubble current, to remediate any impacts. As stated in Section 5.3.2 of the Atmospheric Environment TSD, any one, or combination, of the following in-design mitigation measures would reduce the maximum charge weight per delay:

1) Reducing the borehole diameter with a corresponding reduction in the drill pattern.

2) Introducing decked charges within each borehole.

3) Reducing the borehole length (depth) by reducing the bench height.

For example, a reduction in the borehole diameter from 270 mm to 251 mm would reduce the explosive weight per hole by approximately 14%. Decking of the explosive column, could further reduce the maximum explosive weight per hole by an additional amount. The amount of reduction is dependent on the decking configuration. Additional decking, or reductions in the bench height, as identified above, could achieve further reductions in maximum explosive weights per hole.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-15

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS states, " During the construction phase, flows in watercourses and lake water levels are expected to be altered from baseline conditions by changes in land cover, runoff diversion, runoff interception, lake dewatering, water taking and effluent discharge" and “Four MSA waterbodies will be completely in-filled …and are not discussed further in this section." It is not clear why the activities involved with in-filling the four MSA waterbodies are not assessed. What are the effects of dewatering lakes on the Upper Marmion Reservoir?

Potential Environmental Effects

Although the greatest potential for hydrological change may occur during operations, it is important to understand the potential effects of hydrologic change during all phases of the project, including the construction phase. Concerns with water quantity has been expressed by Aboriginal groups and the public, thus, it is important to characterize the potential effects of lake dewatering into Upper Marmion Reservoir and to understand how other water bodies will be destroyed.

Proposed Action

Specify which water bodies need to be dewatered during the construction phase and assess the potential effects of dewatering the specific waterbodies on the Upper Marmion Reservoir and surrounding waterbodies.

Reference to EIS

Section 6.1.3.1.3, page 6-33

Response

The effects of loss of water bodies in the MSA were assessed in Section 6.2.2, Aquatic Ecology. The section included a list of water bodies that will be affected.

The sentence “Four MSA waterbodies will be completely in-filled...and are not discussed further in this section." has been changed to “Four MSA water bodies are completely contained within the Project footprint and will be lost. They are discussed further in Section 6.2.2, Aquatic Ecology."

INFORMATION REQUEST – CEAA-16

Source: Canadian Environmental Assessment Agency

Summary of Comment

It is not clear whether the waterbody identified as Unnamed Lake 1 (API#13), which is to be used as the Mine Water Emergency Spill Pond is to be the Process Plant Collection Pond. It is not clear what activities are involved in the construction of the Process Plant Collection Pond and the potential effects related to these activities. Although the greatest potential for hydrological change may occur during operations, it is important to understand the potential effects of hydrologic change during all phases of the project, including the construction phase.

Potential Environmental Effects

Concerns with water quantity has been expressed by Aboriginal groups and the public, thus, it is important to characterize the potential effects of lake dewatering into Upper Marmion Reservoir and to understand how other water bodies will be destroyed.

Proposed Action

Clarify whether the Mine Water Emergency Spill Pond is the same as the Process Plant Collection Pond. If so, please use consistent language throughout the report to avoid confusion. Describe the activities involved with the construction of the Process Plant Collection Pond and assess the impacts it may have on receiving waterbody.

Reference to EIS

Section 6.1.3.1.3, Page 6-33

Response

Yes, the mine water emergency spill pond is a cell within the PPCP. As stated in Chapter 5, Section 5.2.7: The PPCP will be divided into two separate cells. Surface water runoff collected from various site components, including stockpiles and the TMF will be captured in a one cell (i.e., runoff cell), and will be used as reclaim water in the mill or sent to the ETP for treatment and environmental discharge. The other cell of the PPCP will allow for passive containment in the event of a spill (i.e., emergency spill cell) from a process plant vessel failure (e.g., leach tank or tailings thickener).

Water balance modeling has calculated that the volume of water that will accumulate in the PPCP from the various site runoff collection systems during the Environmental Design Storm (EDS – 24 hour 100 year storm) is approximately 350,000 m^3. The capacity of the spill cell is about 100,000 m^3 and the runoff cell is about 300,000 m^3.

The perimeter containment and interior dykes will consist of a rock fill embankment with side slopes of 1.5H:1V. Low permeability containment will be provided by a geomembrane liner in the emergency spill pond. An emergency spillway will be provided on the PPCP in order to discharge excess flows into the west pit.

INFORMATION REQUEST – CEAA-17

Source: Canadian Environmental Assessment Agency

Summary of Comment

The effects of habitat loss and alteration are described with a token reference to the habitat compensation plan. It is not clear how the loss of fish habitat will be mitigated.

Potential Environmental Effects

Fish habitat compensation under the Fisheries Act is considered mitigation under the Canadian Environmental Assessment Act. Thus it is important that a description of how the loss will be offset is included in the draft EIS.

Proposed Action

Provide a description of the conceptual habitat compensation measures in the body of the main draft EIS and include a reference to where the more detailed plan can be found.

Reference to EIS

Section 6.2.2.1.1, page 6-104

Response

A No Net Loss Plan or Habitat Offset Plan is provided in the Aquatic TSD, which describes in detail how the aquatic habitat losses from the project will be offset. The following provides a summary of the habitat losses and proposed offsets for both the MMER listed waterbodies and the Section 35 offsets.

Habitat Losses

Using the Habitat Accounting Model developed for the project, habitat losses were as follows:

- Total Habitat losses: approximately 34,000 Habitat Units;
- Habitat Losses requiring MMER listing (approximately 22 000 HUs):
  - Losses associated with the Waste Rock Management Facility: 5 features representing 1,977 HUs
  - Losses associated with the Tailings Management Facility: 10 features representing 20,211 HUs
- Habitat Losses requiring Section 35 Fisheries Act Authorization: 7 features representing 11,989 HUs.

MMER Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (API#2) that supports northern pike and there are the lower reaches of two headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake and API#8).

The following habitat offset projects are proposed to address these MMER Listed losses (totaling 24,000 HUs):

- A floodplain area at the mouth of Sawbill Creek;

- An area at the mouth of API#1;
- Snail Bay.

Each of these projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in "mounds" throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake

Section 35 Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (Mitta Lake) that is considered to have potential as a baitfish resource and there are the lower reaches of several headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake).

The following habitat offset projects are proposed to address these Section 35 listed losses (totaling approximately 12,000 HUs):

- Stocking of several headwater waterbodies that are currently fishless;
- The upper part of Trap Bay;
- An area at the mouth of Lumby Creek;
- Microhabitat features adjacent to an area of filling of a portion of the drawdown zone of Upper Marmion Lake; and
- Microhabitat features associated with the construction of the minewater discharge.

Several fishless ponds will be stocked with fish from Mitta Lake and API#2 to create a potential baitfish resource and also to preserve a remnant fish community representative of Mitta Lake, which will preserve an opportunity to restock these fish in the flooded pits post closure. The Trap Bay and Lumby Creek projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in "mounds" throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake. The Microhabitat features will include installation of partially submerged logs and felled cedar trees, rocky shoals and other features that will provide shallow water cover for fish species in Upper Marmion Lake.

It is possible that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the

habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m^2. While this is not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application. Feasibility of cutting a channel, pit stability and public safety concerns under the Mining Act (O. Reg 240/00) would however need to be addressed. This is not currently considered as part of closure and would be addressed at an appropriate time prior to final closure.

These habitat offsets were discussed in several meetings with DFO/MNR following submission of the EA and on May 29, 2013, DFO stated that “This should be enough direction as to what habitat gains will be created to offset the losses for the EIS phase”.

INFORMATION REQUEST – CEAA-18

Source: Canadian Environmental Assessment Agency

Summary of Comment

Table 7-11 Concordance Table does not have a link to the actually issues related to the topic. This makes it difficult to know whether the concern was actually addressed.

Potential Environmental Effects

EIS Guidelines section 8.3 requires that information on each issue be included in a Table of Concordance which in turn shall clearly indicate which section of the EIS includes a discussion of the issue.

Proposed Action

Describe the issue in greater detail in the concordance table.

Reference to EIS

Table 7-11, Page 7-51

Response

Aboriginal concerns are detailed in Section 7.3 of Chapter 7 Public and Aboriginal Consultation and the corresponding Appendix 7-V Record of Consultation – Aboriginal. Two key tables within these documents provide a record of key issues raised by Aboriginal communities and outline both where within the EIS/EA Report the issue is fully addressed as well as communication activities that took place to specifically discuss and follow up on key issues. These tables have been updated to include activities that took place up to October 15, 2013 and revised for clarity based on comments received from the Government Review Team.

One example Key Issue raised by an Aboriginal Community is provided below. The community is Naicatchewenin First Nation and the Key Issue is Water Quality. Table 7-14 in Chapter 7 is intended as a summary which is then further expanded in Appendix 7-V through both a table, and detailed documentation of each communication activity.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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Example line from Aboriginal Community Concern Concordance Table in Chapter 7

Community	Key Issues Raised	Follow Up Communications	Section Issue Addressed in EIS/EA Report
Naicatchewenin First Nation	Water quality	Presentation to Fort Frances Chiefs Secretariat Community visit including poster sharing water quality results Community news brief sharing water quality results	Chapter 5 Project Description Section 5.2.7 Water Management System Chapter 6 Effects Assessment Section 6.1.3: Water Quantity and Quality Chapter 8 Environmental Management Planning Section 8.2.2.4 Water Quality

Example line from Comment Response Table in Appendix 7-V

Date	Type	Purpose	Aboriginal Group	Key Issues Raised	Community Concern	Response	Follow Up	Documents
2/22/2012	Email	Comments on Terms of Reference	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Thank you for sharing your concerns. These issues will be addressed in the EIS/EA Report, although we hope to be able to provide additional information in the interim.	Share information about water quality and water management practices.	• 2012-02-22 Naicatchewenin First Nation.pdf
6/18/2012	Presentation at monthly Chiefs meeting	To present and discuss the baseline data and results; To present the revised project layout; To provide responses to outstanding concerns To provide an update on the Traditional Use Study (TUS)	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Most of the water will be reclaimed from the tailings. A polishing pond will clean tailings water. Before water is released to the Marmion Reservoir, it will be tested to make sure it meets standards. The effluent discharge point will be tested to make sure it meets standards. The effluent discharge point will be in an area with good mixing characteristics. The effluent discharge point will avoid areas that have important fish habitats.	Community visit Community news brief	• 2012-06-18 FFCS Notes and Presentation.pdf

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Date	Type	Purpose	Aboriginal Group	Key Issues Raised	Community Concern	Response	Follow Up	Documents
11/6/2012	Community visit	To provide an overview of Project alternatives and collect information about community land use	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Community members were provided information about planned water management systems and the potential effects to water quality from the OHRG project through the use of posters and a Project overview video.	Community news brief	• Naicatchewenin Open House Meeting Notes.pdf
30/8/2013	Community news brief	To share the results of the environmental assessment in plain language form	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	A summary of water quality work and planned water management strategies was provided in plain language form to the band office for community information. Some of the water management strategies Osisko will be implementing to ensure water quality is not affected negatively include: • Avoiding effluent discharge near walleye spawning areas. • Use of a buffer zone between the pit and Marmion Reservoir. • Treatment of suspended solids if necessary. • Capture of seepage around the Tailings Management Facility, the Waste Rock stockpile and the ore stockpiles. • Water quality monitoring at site and in Marmion Reservoir.	Quarterly meetings with Environmental Resource Sharing Committee	2013-08-30 Sharing the Results of the Water Quality Assessment – Community News Brief.pdf

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INFORMATION REQUEST – CEAA-19

Source: Canadian Environmental Assessment Agency

Summary of Comment

The scope of the cumulative effects assessment identifies three existing projects or activities and one foreseeable project that may interact with the Hammond Reef Gold Mine Project. It is not clear how only four projects or activities were determined to have a possible interaction with the proposed project. Potential cumulative effects can also occur with other existing ongoing activities such as recreational and commercial, fishing, hunting and trapping and forestry activities under the Crossroute and Sapawe Forest Management Plans.

Potential Environmental Effects

Scoping for the cumulative effects assessment is critical in focusing the assessment to the residual effects from the environmental assessment. It is important to assess whether these activities, in combination with the proposed project, can result in overexploitation of the resources in Upper Marmion Reservoir as well as surrounding areas.

Proposed Action

Revise the cumulative effects assessment to include an analysis of the potential environmental effects of the project with the existing ongoing activities of fishing, hunting and trapping as well as forestry activities under the Crossroute and Sapawe Forest Management Plans.

Reference to EIS

Section 6.8.1, Pg. 6-179

Response

Impacts on existing activities such as hunting, fishing and trapping have been assessed directly in the impact assessment section. The activities identified in the comment are not considered to be cumulative effects, but rather components that could be directly affected by the Project.

Additional future projects including the Treasury Metals proposed Goliath Gold Project; the Bending Lake Iron Group proposed Josephine Cone Project, the planned Rentech Wood Pellet Production Facility and the planned Resolute Forest Products Sawmill have been added to the revised cumulative effects assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-20

Source: Canadian Environmental Assessment Agency

Summary of Comment

The scope of cumulative effects is incomplete as it lacks the identification of appropriate regional issues of concern, VECs, spatial or temporal boundaries and other actions and potential impacts due to actions or possible effects.

Potential Environmental Effects

Scoping for the cumulative effects assessment is critical in focusing the assessment to the residual effects from the environmental assessment. This assists in determining if the action under review has the potential to contribute to any cumulative effects. It will also clarify how conclusions were made about the cumulative effects.

Proposed Action

Identify and justify the environmental components that will constitute the focus of the cumulative effects assessment. In addition identify and justify the spatial and temporal boundaries for the cumulative effects assessment for each VEC selected.

Reference to EIS

Section 6.8.1, Pg. 6-179

Response

The cumulative effects section has been revised. The following projects have been added:

- Planned wood processing facilities, including the Resolute Forest Products Sawmill near Atikokan and the Rentech Wood Pellet Production Facility in Atikokan (formerly known as the Atikokan Renewable Fuels Mill);
- The former Atiko-Sapawe Gold Mine near Atikokan;
- Bending Lake Iron Group proposed Josephine Cone Iron Mine project near Ignace, Ontario; and
- Treasury Metals proposed Goliath Gold Project near Dryden, Ontario.

However, the effects of the Project are limited to the mine footprint area and a small area of Upper Marmion Reservoir around the Project. All projects considered in the cumulative effects assessment are located outside of the area in which effects from the Project are predicted, therefore, there is little value in conducting a detailed assessment against all VECs.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-21

Source: Canadian Environmental Assessment Agency

Summary of Comment

Section 11 provides sufficient information on the predicted economic and social benefits of the project. However, specific details on how the EA process for the proposed project provided a benefit to Canadians is lacking. For example, there is no reference or details on the environmental benefits created as a result of the project going through the EA process, etc.

Potential Environmental Effects

It is important to describe the benefits to Canadians from an environmental perspective as a means to validate the effectiveness of the environmental assessment process.

Proposed Action

Describe how the EA process for the proposed project provided a benefit to Canadians, considering the following factors: maximized environmental benefits; contribution of the EA to support sustainable development; aboriginal consultation and public participation; technological innovations; and increases in scientific knowledge.

Reference to EIS

S11

Response

The environmental assessment process contributed to the sustainable development of the region by providing a structured planning process whereby OHRG considered potential environmental effects of the Project and designed mitigation and management strategies to minimize these effects. The consideration and assessment of potential cumulative effects in the region assured that natural resource development is carried out in a sustainable manner.

The environmental assessment provided for Aboriginal consultation, government and public participation in the Project. Consultation for the Project was carried out at key milestones directly linked to the environmental assessment process. Public comments received as part of the EIS/EA consultation process were directly considered throughout the EIS/EA Report finalization process.

In the two weeks following the submission of the Draft EIS/EA report, during the public comment period, presentations were held with the public (in the Town of Atikokan), Aboriginal groups (the Fort Frances Chiefs Secretariat, LDMLFN and the MNO) and the government review team to provide a fulsome overview of the information contained in the report. Comments on the Draft EIS/EA Report were received from Aboriginal, public and government, totalling more than 700 comments. Responses were prepared for each comment that was received and draft responses were presented to stakeholders by topic and interest group. Chapter 7 details Project Public Consultation and Aboriginal Engagement and provides a full summary of activities, including meeting notes and information materials. A summary of the meetings that took place is as follows:

Public

A Community News Brief has been published on a biweekly basis since 2011. Topics of discussion include EA conclusions, EIS/EA Report revisions and Project plans.

Several written comments were received from the public including the Ontario Federation of Anglers and Hunters, the Atikokan Sportsmen's Club, a local tourist outfitter and a local lease holder. Many letters of support were received from the public including from the Atikokan Economic Development Committee, the Town of Atikokan, local municipalities and several local community members.

A Community Open House was held in Atikokan in April. Forty people attended and provided their support and feedback.

Meetings were held with a bait fish harvester, a group of local tourism outfitters, the OFAH and the Sportsmen's Club to present draft responses to comments received on Draft EIS/EA Report. Discussions were positive and resulted in the commitment to invest in capacity funding for tourism promotion and conduct environmental effects monitoring including additional fish tissue sampling should the Project go forward. Formal written responses have also been provided to these groups.

Government

Meetings with regulatory agencies took place on an ongoing basis throughout the public comment period. The topics of these discussions include the following key points:

- No Net Loss Planning
- Environmental Monitoring
- Water Quality Modelling
- Mine Waste Alternatives
- Groundwater Management
- Closure Planning

Agencies were provided draft responses to their comments and discussions took place regarding required revisions to finalize the EIS/EA Report.

Aboriginal

Written comments were received from the Métis Nation of Ontario, Seine River First Nation and Lac de Mille Lacs First Nation. The majority of written comments related to water quality, aquatic health and Aboriginal rights.

OHRG visited each First Nations community and shared the conclusions presented in the EIS/EA Report. Copies of Community News Brief publications are also provided to each Band Office.

OHRG held meetings with First Nations and Métis to discuss their comments and provide draft responses. A formal written response has been provided to LDMLFN and will be provided to SRFN. Negotiations with MNO are ongoing and OHRG anticipates positive outcome towards a formal partnership agreement in the short term.

Summary of New Work

Some additional work has been undertaken based on the comments received from public, Aboriginal and government on the Draft EIS/EA Report. This work includes new and ongoing field studies, new design and modelling calculations, desktop studies, publication of new reports and revisions to existing reports. The summary of new work undertaken as a result of stakeholder feedback includes:

- Environmental Field Studies
  - Bat surveys
  - Water quality sampling
  - Water level and flows collection
  - Climate data collection
- Environmental Monitoring Plan
  - Revised to clearly meet guidelines
  - Expanded to include more detail and commitments
- Water Quality Modelling
  - Additional definition of mixing zone
  - Conceptual design of effluent diffuser
- Mine Waste Alternatives
  - Alternatives TSD revised substantially to reflect the requirements of the regulatory agencies
- Closure Planning
  - Provided a draft of the Certified Closure Plan to MNDM for review and feedback
  - Ongoing discussions about reclamation details
  - Developed a closure planning memorandum, which provides a brief description of the alternatives that were considered for each element of mine closure as well as the rationale that was used to select the preferred alternative
  - Developed a pit flooding model memorandum summarizing modifications made to the spreadsheet model subsequent to the submittal of the EIS/EA, which resulted in a revised pit filling duration

This active and ongoing participation of the Aboriginal, public and government in the project planning process is a significant benefit to Canadians that is provided by the EA Process. OHRG's commitment towards ongoing engagement with Aboriginal communities and the public through information sharing and formation of committees is directly tied to the environmental assessment process, and our commitments are outlined in Chapter 9 of the EIS/EA Report.

Finally, the environmental assessment provided increased scientific knowledge in the area. The baseline studies conducted by Osisko included two to three years of information collection on the physical and biological environment in the local and regional study areas. This information has been published and is publically available. Osisko also contributed to the collection of traditional land use by First Nations and Métis in the area through either capacity funding or direct participation in information collection.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-24

Source: Canadian Environmental Assessment Agency

Summary of Comment

Under section 16(2) of the former Canadian Environmental Assessment Agency, a follow-up program is a requirement. Within the draft EIS/EA Report the follow-up program is described as the Environmental Management Plan. The schedule for the finalization and implementation of the follow-up program is not clear.

Potential Environmental Effects

It is a requirement of section 13.2.1 of the EIS Guidelines. A schedule will provide greater certainty in planning for the design and implementation of the follow-up program.

Proposed Action

Provide a schedule for the finalization and implementation of the follow-up program.

Reference to EIS

Section 8.1.2.4, page 8-3

Response

The following schedule showing follow up plan throughout the Project phases has been added to Section 8.0 of the EIS/EA report.

Q3 2013 – Submit Final EIS/EA Report

Q1 2014 – Form Atikokan-OHRG Consultation Committee

Q2 2014 – Consult on Monitoring Plans

Q3 2014 – Finalize Construction Monitoring Plans

Q4 2014 – Receive EIS/EA Approval

Q1 2015 – Begin Project Construction

Q1 2016 – Finalize Operations Monitoring Plans

Q1 2027 – Finalize Closure Monitoring Plan

The above schedule depends on the outcome of the Feasibility Study due to be completed in 2014, at which point is will be decided whether the Project will proceed as scheduled. If the Project is delayed, then the implementation of the follow-up programs will be similarly delayed.

INFORMATION REQUEST – CEAA-25

Source: Canadian Environmental Assessment Agency

Summary of Comment

Tables 8-2 and 8-6 contain a column that describes the "Monitoring Objective and/or Plan". For some components, the objective of the monitoring activity is not clear.

Potential Environmental Effects

It is important that the objective is clear for each monitoring activity in order to be able to report on the results and whether the monitoring activity was able to fulfill the objective.

Proposed Action

Provide the objective for each monitoring activity for each component in Tables 8-2 and 8-6.

Reference to EIS

Tables 8-2 and 8-6

Response

Table 8-6 is now Table 8-8 in the Final EIS/EA Report.

Tables 8-2 and 8-8 have been revised to clarify monitoring objectives.

INFORMATION REQUEST – CEAA-26

Source: Canadian Environmental Assessment Agency

Summary of Comment

The monitoring activity for soil and terrain consists of a periodic review of embankment stability, pit slopes and general site erosion. The duration of this monitoring activity is not clear.

Potential Environmental Effects

The follow-up program shall include a schedule indicating the frequency and duration of effects monitoring.

Proposed Action

Provide the duration of the monitoring activity for soil and terrain.

Reference to EIS

Table 8-2

Response

During operations, embankment stability and pit slopes would be continuously monitored. The reference to general site erosion above is assumed to refer to the stormwater management system, which would be inspected after each significant rainfall event. Specific details of monitoring and inspections during operations will be provided in the OMS manual that will be developed for the site

The physical stability monitoring that will be carried out during closure and post-closure is described in Chapter 5 of the Conceptual Closure and Rehabilitation Plan. The frequency of inspections is summarized in Table 5-1 in that document, which is appended below for convenience.

Chapter 8 has been revised to include the duration of monitoring activities.

Attachments

Table 5-1 from CCRP

Table 5-1: Hammond Reef Physical Stability Monitoring Frequency at Closure

Monitored Item	Closure	
	Years 1-5	**After Year 5**
Tailings Management Facility		
General facility inspections	Annually	Annually
Tailings dam inspections – (by site personnel)	Monthly	Annually
Tailings dam inspections – (by geotechnical engineer)	Annually[1]	Annually[1]
Water levels, pipelines, pumping systems	Daily if pumping; monthly if discharging water by gravity flow [2]	Annually (where pumping is not required) [2]
Spillway / Drainage Channel	Monthly[3]	Monthly[3]
Open Pit Stability and Water Levels	Annually	Every 5 years
Stockpiles	Annually	Every 5 years
Processing Facility Area Re-graded Slopes	Annually	Every 5 Years
Reporting	Annually	As per inspection

Notes:

1. Frequency of the dam inspection refers to an inspection by a qualified geotechnical engineer.
2. Inspection after closure only refers to the TMF Reclaim Pond levels and seepage collection ditches
3. Monthly during the ice-free season plus once prior to the spring freshet

INFORMATION REQUEST – CEAA-27

Source: Canadian Environmental Assessment Agency

Summary of Comment

The monitoring programs considerations for the atmospheric environment are presented in Table 8-3 for the operations phase. The monitoring program should also be conducted in the construction phase of the project to verify the assumption that emissions during the operations phase bound those during all other phases.

Potential Environmental Effects

This will assist in the verification of the assessment predictions on air quality.

Proposed Action

Revise the duration of the monitoring program for the atmospheric environment to include the construction phase.

Reference to EIS

Section 8.2.2.1, page 8-12

Response

Ambient air monitoring is not typically conducted during a construction phase of a Project unless the construction activity has a specific hazard (i.e., a remediation program or very close neighbors). Neither of these conditions apply at the Hammond Reef site.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-28

Source: Canadian Environmental Assessment Agency

Summary of Comment

The objectives of the hydrology monitoring program are well laid out in section 8.2.2.2; however, the duration of the monitoring program is not clear.

Potential Environmental Effects

The follow-up program shall include a schedule indicating the frequency and duration of effects monitoring.

Proposed Action

Provide the duration of the monitoring activity for hydrology.

Reference to EIS

EIS/EA Report, Version 1, Chapter 8 – Environmental and Social Management Planning, Section 8.2.2.2, pages 8-13 to 8-14

Response

Existing flow and lake water level monitoring stations that are currently operating will continue to be operated throughout the period prior to the construction phase and thereafter throughout the four phases of the Project (construction, operations, closure and post-closure). Monitoring at relocated and new stations will commence prior to the start of the construction phase, to establish existing conditions, and will continue throughout the four phases of the Project. (Hydrology TSD, Version 1, Section 8.2.1, 3rd paragraph on page 187).

At the recording stations, data logging devices will record water levels at half hourly intervals. Rating curves will be developed and maintained for these stations by collecting manual readings of water levels and direct flow measurements seasonally to broadly cover the range of hydrological conditions. (Hydrology TSD, Version 1, Section 8.2.1, 2nd paragraph on page 187).

At the non-recording stations, manual readings of water levels and direct flow measurements will be collected seasonally to broadly cover the range of hydrological conditions.

In addition to the above, flow volumes will be metered on a daily or weekly basis at key locations in the Project's water management system (EIS/EA Report, Version 1, Chapter 8, Table 8-4 on page 8-13) and data logging devices will be installed in the TMF reclaim pond and the Mine Water Emergency Spill Pond to record water levels at hourly intervals. Metering and data logging devices will be established in individual components of the water management system, prior to their commissioning and use, and the data will be collected during the four phases of the Project as applicable. (Hydrology TSD, Version 1, Section 8.2.1, 4th paragraph on page 187, and Table 8-2, 1st and 2nd paragraphs on page 188).

Chapter 8 has been updated and revised to include additional information on the duration of monitoring programs.

INFORMATION REQUEST – CEAA-29

Source: Canadian Environmental Assessment Agency

Summary of Comment

The frequency and methodology for the monitoring program are laid out in section 8.2.2.3 for groundwater but the objectives and duration of effects monitoring is not clear.

Potential Environmental Effects

The follow-up program shall include a schedule indicating the frequency and duration of effects monitoring and discussion of the objectives the monitoring activity is fulfilling.

Proposed Action

Provide the objective and duration of the monitoring program for groundwater.

Reference to EIS

Section 8.2.2.3, page 8-14

Response

Chapter 8 has been clarified to include the following objectives for the groundwater monitoring program:

- Confirmation of water level predictions;
- Confirmation of water quality predictions; and
- Confirmation of design assumptions.

The method, frequency and duration of the groundwater monitoring program are also provided in Chapter 8 as per the table below.

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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Potential Effect	Parameter	Location(s)	Method	Frequency	Duration
Changes to Groundwater Levels	Groundwater Elevation	Downgradient from the Mine, Stockpiles, WRMF and Water Management Systems	Manual depth to water measurements at all locations and continuous monitoring using data logging pressure transducer at select locations	Quarterly for manual depth to water measurements. Continuous for locations with data logging pressure transducers	Construction phase Operations phase
		Between the open pits and Upper Marmion Reservoir			
		Downgradient from the TMF near the shoreline of Lizard Lake and Upper Marmion Reservoir	Manual depth to water measurements	Bi-annual	
		Downgradient from the Accommodation Camp's septic system near the shoreline of Upper Marmion Reservoir			
		Near surface water monitoring stations		Quarterly	
Changes to Groundwater Quality	Water Quality Parameters	Downgradient from the Mine, Stockpiles, WRMF and Water Management Systems	Grab samples Laboratory analysis	Bi-annual	
		Between the open pits and Upper Marmion Reservoir			
		Downgradient from the TMF near the shoreline of Lizard Lake and Upper Marmion Reservoir			
		Downgradient from the Accommodation Camp's septic system near the shoreline of Upper Marmion Reservoir and the chemical/fuel storage and maintenance facilities.			

INFORMATION REQUEST – CEAA-30

Source: Canadian Environmental Assessment Agency

Summary of Comment

The frequency and duration of the monitoring program for water quality is described; however, the objective of the monitoring program is not clear.

Potential Environmental Effects

It is important that the objective is clear for each monitoring activity in order to be able to report on the results and whether the monitoring activity was able to fulfill the objective.

Proposed Action

Provide the objective of the monitoring program for water quality.

Reference to EIS

Section 8.2.2.4, page 8-15

Response

The objectives of the water quality program are provided in Chapter 8 and are as follows:

- Confirmation of predictions for general parameters including nutrients, cyanide and metals;
- Management of on-site water quality through monitoring of internal stations; and
- Ensure regulatory compliance at off site stations included discharge points.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-31

Source: Canadian Environmental Assessment Agency

Summary of Comment

The objective of the monitoring plan for geochemistry is described but the duration of the monitoring activity is not clear.

Potential Environmental Effects

The follow-up program shall include a schedule indicating the frequency and duration of effects monitoring.

Proposed Action

Provide the duration of the monitoring activity for geochemistry.

Reference to EIS

Section 8.2.2.5, page 8-16

Response

The objectives of the geochemistry program are provided in Chapter 8 and are as follows:

- Confirmation of predicted geochemical characteristics;
- Confirmation that oxidation and acid mine drainage is not occurring; and
- Collection of further geochemical characterization information for consideration in the Certified Closure Plan.

A geochemistry monitoring plan will be developed and implemented by OHRG to confirm the characteristics of the materials mined, placed or otherwise used in construction.

The plan will include confirmation samples at a rate that considers the mine schedule, existing geochemical data, and follows appropriate guidance documents such as MEND (2009) or INAP (2012) as is required under O.Reg 240/00 under the Mining Act of Ontario. Samples will be analyzed using appropriate test methods for assessment of ARD/metal leaching potential, to confirm that the samples fall within the range identified, tested and described in the Geochemistry, Geology and Soils TSD. The results of analysis of geochemical characterization samples will be evaluated as part of on-going management of the Project Site. Since the development of a geochemical sampling program is contingent upon development of a detailed mine plan, the details of the program will be developed when a mine plan has been completed in the detailed design phase of the Project.

INFORMATION REQUEST – CEAA-32

Source: Canadian Environmental Assessment Agency

Summary of Comment

The objective and method are described for the terrestrial ecology monitoring program; however the frequency of the monitoring activity is not clear.

Potential Environmental Effects

The follow-up program shall include a schedule indicating the frequency and duration of effects monitoring.

Proposed Action

Provide the frequency of the monitoring activity for the following residual effects: loss of habitat and the risk of injury/mortality to SAR and other wildlife in Table 8-7.

Reference to EIS

Table 8-7

Response

Chapter 8 has been clarified to include the following objectives for the terrestrial biology monitoring program:

- Ensure successful colonization of native plants in regenerating areas;
- Ensure effectiveness of mitigation measures;
- Protect active nests;
- Protect bird populations;
- Improve the waste management program;
- Evaluate the effectiveness of the wildlife management plan; and
- Evaluate the effectiveness of bat habitat compensation measures.

The method, frequency and duration of the terrestrial biology monitoring program are also provided in Chapter 8 as per the table below.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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<table>
<tr><th>Potential Effect</th><th>Indicator</th><th>Location</th><th>Method</th><th>Frequency</th><th>Duration</th></tr>
<tr><td>Loss and/or Alteration of Vegetation</td><td>Composition and diversity of plant communities in LSA</td><td>Disturbed areas within the mine site and access roads that have been left to regenerate.</td><td>Visual assessment of areas undergoing natural regeneration by an ecologist.</td><td>Periodically at each site
Approximately every 2 years after natural re-vegetation begins</td><td>Operations phase
Until native vegetation communities become established.</td></tr>
<tr><td rowspan="3">Displacement of wildlife
Change in habitat availability and suitability</td><td rowspan="4">Presence and persistence of wildlife species in the LSA</td><td>Locations to be selected based on ongoing mine activity</td><td>Breeding bird point counts</td><td rowspan="2">Annually</td><td rowspan="4">Construction phase
Operations phase
Closure phase or as required by relevant permits</td></tr>
<tr><td>Locations of installed bat compensation measures</td><td>Bat acoustic monitoring using stationary devices and visual assessments</td></tr>
<tr><td rowspan="3">Areas adjacent to the mine site and within the LSA</td><td>Review of secondary source data from MNR</td><td>As records are updated and available</td></tr>
<tr><td rowspan="2">Wildlife Injury
Wildlife Mortality</td><td>Recording of visual observations in a Wildlife Log</td><td rowspan="2">On-going</td></tr>
<tr><td>Reporting of wildlife mortalities by workers</td></tr>
</table>

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – CEAA-33

Source: Canadian Environmental Assessment Agency

Summary of Comment

There is an incorrect reference made in section 6.8.3.1. The draft EIS states, "as noted in section 6.1.3.5, water quality discharging from the Hammond Reef mine during mine operations is not expected to exceed guidelines..." Section 6.1.3.5 cannot be found in the report.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Correct the reference made on Page 6-180.

Reference to EIS

Section 6.8.3.1, Page 6-180

Response

The correct reference is Section 6.1.5.2.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-34

Source: Canadian Environmental Assessment Agency

Summary of Comment

Reference to the former Canadian Environmental Assessment Act is incorrect. This correction needs to be made for accuracy as the process requirements follow the provisions of the former act.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Replace 1994 to the following reference (S.C. 1992, c. 37)

Reference to EIS

Section 1.10.1.1, Page 1-22

Response

Reference updated to (S.C. 1992, c. 37)

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-35

Source: Canadian Environmental Assessment Agency

Summary of Comment

The Alternatives Assessment Workshop was not held on November 11, 2012.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Please indicate that it was an alternative assessment workshop for mine waste under the Metal Mining Effluent Regulations and correct the date to November 20, 2013.

Reference to EIS

Section 1.10.1.1, Page 1-26

Response

The correct date is November 20, 2012. The reference has been updated.

INFORMATION REQUEST – CEAA-36

Source: Canadian Environmental Assessment Agency

Summary of Comment

The sentence "Taking into account the feedback received, the federal Minister of the Environment will make a decision on the EIS/EA Report" is partially incorrect. For accuracy, the sentence should be revised to inform the public of the correct steps at the end of the process. Reference to the correct document that the Minister will take into account is important as well.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Please replace sentence with the following, "After this comment period, the Minister of the Environment will take into consideration the Comprehensive Study Report along with comments received and make public the environmental assessment decision statement."

Reference to EIS

Section 1.10.5, Page 1-30

Response

Text updated to: After this comment period, the Minister of the Environment will take into consideration the Comprehensive Study Report along with comments received and make public the environmental assessment decision statement.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-37

Source: Canadian Environmental Assessment Agency

Summary of Comment

The sentence "...Minister of the Environments will make their decisions on the EIS/EA Report" is partially correct. For accuracy, the sentence should be revised to inform the public of the correct steps at the end of the process. Reference to the correct document that the Minister will take into account is important as well.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Please revise sentence to the following, "...will each make their decisions on the environmental assessment."

Reference to EIS

Section 1.10.6, Page 1-31

Response

Text updated to: Following the public review period of the Comprehensive Study Report, and the final Ministry evaluation period, the federal and provincial Ministers of the Environment will each make their decisions on the environmental assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-38

Source: Canadian Environmental Assessment Agency

Summary of Comment

The sentence starting with "Following the approval of the EIS/EA Report..." is incorrect. The EIS/EA Report does not receive approval under the federal EA process. The EIS/EA Report is used to make a decision on whether the project is likely to cause significant adverse environmental effects. The language also implies that the project will be approved which is solely the decision of the Ministers of Environment.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Please revise sentence to the following, "If the Ministers make a positive decision on the environmental assessment,"

Reference to EIS

Section 1.10.6, Page 1-31

Response

Text updated to: If the Ministers make a positive decision on the environmental assessment, the federal authorities may exercise their regulatory authority within the timelines agreed to in the MPMO Project Agreement (assumed to be three months). Provincial permitting approvals would likely follow in a similar timeframe.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – CEAA-39

Source: Canadian Environmental Assessment Agency

Summary of Comment

The draft EIS lists the other ministries and government offices that have been involved in consultation, including review of preliminary baseline studies and OHRG's environmental assessment approach. Health Canada was also involved in the review of baseline studies but was not included in the list.

Potential Environmental Effects

For greater accuracy.

Proposed Action

Include Health Canada in the list of government offices involved in review.

Reference to EIS

Section 7.2.1, Page 7-23

Response

Section 7.2.1 has been revised to include Health Canada, as detailed below:

Provincial and federal government agencies have been working together to provide a streamlined consultation process where possible. Key contacts for the environmental assessment from provincial and federal governments have been identified as:

- Ministry of Northern Development Mines.
- Ministry of Environment - Environmental Assessment and Approvals Branch.
- Canadian Environmental Assessment Agency.

Other ministries and government offices that have been involved in consultation, including review of preliminary baseline studies and OHRG's environmental assessment approach, include:

- Aboriginal Affairs and Northern Development Canada.
- Department of Fisheries and Oceans.
- Environment Canada.
- Health Canada
- Major Projects Management Office.
- Ministry of Labour.
- Ministry of Natural Resources.
- Ministry of Tourism and Culture.

- Ministry of Transportation.
- Natural Resources Canada.
- Transport Canada.

INFORMATION REQUEST – CEAA-40

Source: Canadian Environmental Assessment Agency

Summary of Comment

Table 7-6 provides a summary of presentations to the Fort Frances Chiefs Secretariat as well as the regulatory milestone related to the presentation. The February 11, 2011 presentation indicates that it was presented during the commencement of the federal environmental assessment however, the federal EA did not formally commence until July 28, 2011.

Potential Environmental Effects

For greater accuracy.

Proposed Action

The regulatory milestone during the February 11, 2011 presentation more accurately represents the draft project description phase of the federal process.

Reference to EIS

Table 7-6, Page 7-39

Response

This table reference has changed in the Final EIS/EA Report; it is now Table 7-9.

The table has been revised as shown below.

Table 7-9: Summary of FFCS Presentations Prior to EA Terms of Reference Submission

Date	Topics of Discussion	Regulatory Milestone
February 11, 2011	Project Overview Environmental Assessment Process	Federal Project Description
April 19, 2011	Project Description Alternative Methods Baseline Study Approach	Commencement of Draft Terms of Reference
October 17, 2011	Project Update Aboriginal Consultation Plan Terms of Reference Process	Commencement of Draft Terms of Reference
February 2, 2012	Project Update Responses to Concerns Resource Sharing Agreement	Submission of Terms of Reference
March 19 2012	Traditional Use Study Proposal	Traditional Use Study
June 18, 2012	Presentation of Baseline Results Responses to Concerns	Commencement of Provincial Environmental Assessment
September 17, 2012	Traditional Use Study Results Project Alternatives	Commencement of Provincial Environmental Assessment
December 3, 2012	Closure Planning Avoidance and Mitigation	Commencement of Closure Planning

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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Date	Topics of Discussion	Regulatory Milestone
February 21, 2013	Results of the assessment Potential effects Mitigation measures Commitments	Submission of Draft EIS/EA Report
April 15, 2013	Aquatic Health Aboriginal Consultation	Submission of Draft EIS/EA Report
August 19,2013	Comments on EIS/EA Report EA Process RSA Committees	Submission of Draft EIS/EA Report
Planned	Results of the assessment Potential effects Mitigation measures Commitments	Submission of Final EIS/EA Report
Planned	Detailed Closure Planning	Submission of Closure Plan
Planned	Mitta Lake Fish Relocation Planning	Prior to Construction

INFORMATION REQUEST – CEAA-41

Source: Canadian Environmental Assessment Agency

Summary of Comment

With respect to references to the status of Métis rights, the Draft EIS/EA Report refers several times to a "rights-bearing Métis community" in the region.

Potential Environmental Effects

None

Proposed Action

Rather than refer to a "rights bearing Métis community" it is common practice within the federal Government to refer to there being a "potential rights bearing Métis community" as the Métis in this region have not established their rights through the Courts (as was the case in the Sault St. Marie region with the Powley case). Some alternative ways of wording this phrase include:

According to the Métis Nation of Ontario, the Project lies within the traditional territory of a rights-bearing Métis community.

The Project lies within a provincially recognized Métis traditional harvesting area. According to the Métis Nation of Ontario, there is a rights-bearing Métis community in the area.

Reference to EIS

Section 7.3.2.3 Pg.7-35

Response

Text updated to: The Project lies within the traditional territory of a potential rights-bearing Métis community.

Department of Fisheries and Oceans

INFORMATION REQUEST – DFO-1

Source: Department of Fisheries and Oceans

Summary of Comment

Extending the toe of the slope below the high water level has not been accounted for in the No Net Loss Plan (NNLP).

Potential Environmental Effects

Extending the toe of the slope below the high water level has the potential to impact fish habitat.

Proposed Action

Include the extension of the toe of the slope below the high water level into the NNLP.

Reference to EIS

Page 5-8, last paragraph

Response

This habitat loss has been included in the habitat losses described in Table 3.5 of the Aquatic TSD report.

The NNLP has been revised and includes this habitat loss.

INFORMATION REQUEST – DFO-2

Source: Department of Fisheries and Oceans

Summary of Comment

The freshwater intake should have a fish screen following the advice proved in DFO's Freshwater Intake End-of-Pipe Fish Screen Guideline (March 1995).

Potential Environmental Effects

It is a mitigation measure effective in protecting fish.

Proposed Action

The fish screen for the freshwater intake should be identified in the report as a mitigation measure. The proponent should also commit to the implementation of this mitigation measure.

Reference to EIS

Page 5-35, 5.2.7 Water management system, 2nd paragraph

Response

The freshwater intakes for the workforce accommodations and for the minewater intake will be screened to prevent entrainment of small-bodied fish in accordance with the DFO operational statement for screening of intakes. This will be included in the detailed design phase of the project.

INFORMATION REQUEST – DFO-3

Source: Department of Fisheries and Oceans

Summary of Comment

Not provided

Potential Environmental Effects

It is a mitigation measure effective in protecting fish.

Proposed Action

Identify appropriate mitigation measures such as 'bubble curtains' to reduce the shock wave from blasting through the water.

Reference to EIS

Page 6-19, 3rd paragraph

Response

The blasting report can be found in the Air/Atmosphere TSD. The DFO guideline and impact thresholds were prepared for the purpose of measuring potential impacts to fish and fish spawning areas from inwater blasting and, as a result are not directly applicable to assessing the potential effects of on-land blasting. As a result, an adaptive management approach is recommended to measure and mitigate any effects of blasting on fish and fish spawning shoals. This would involve undertaking a series of test blasts to measure whether the inwater thresholds are exceeded, if they are, either to adjust the characteristics of the blast so that the thresholds are not exceeded (for example, by reducing the hole diameter or decking the blasts) or install in-water mitigation measures, such as a bubble current, to mitigate any impacts. In addition, the locations of the spawning areas of valued fisheries can be identified to more accurately determine if impacts could occur.

INFORMATION REQUEST – DFO-4

Source: Department of Fisheries and Oceans

Summary of Comment

Not provided

Potential Environmental Effects

Not provided

Proposed Action

Will the upgrading of the existing crossings and constructing the new crossings address any fish passage issues?

Reference to EIS

Page 6-14, 4th paragraph

Response

Section 3.8.4 of the Aquatic TSD contains the following:

Stream Crossings: a total of 15 stream crossings for the proposed access road (Hardtack/Sawbill) will be required, of which 14 are considered to impact fish habitat. For each of these, compensation for the lost habitat associated with culvert installation will be provided, using one of the following approaches:

- Installation of an open bottomed culvert to preserve aquatic habitat.
- Remediate existing barriers in the stream being crossed to provide access by fish to more habitat area (equal to or greater than the area of habitat occupied by the culvert).
- Undertake a channel restoration associated with the culvert installation to increase stream area (by increasing channel length and/or width) and offset the habitat lost to the culvert.

The draft No Net Loss Plan/Habitat Offset plan will contain details for each crossing highlighting how habitat losses will be mitigated and/or offset.

Stream crossing effects on fish are also discussed in Section 6.2.2.1 (EIS Chapter 6) and in Table 6-48.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-5

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

Confirm that Table 6-48 will form the basis of the NNLP.

Reference to EIS

Page 6-101

Response

Revised Section 6.2.2.1 to state: The direct loss of habitat through the destruction of existing surface water features within the Project footprint are summarized in Table 6-48 (the locations of the API's are shown on Figure 6-7). These habitat losses have been discussed with federal and provincial regulators, assigned specific values and will form the basis of the No Net Loss Plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-6

Source: Department of Fisheries and Oceans

Summary of Comment

It mentions that "some effect on walleye habitat may occur during construction of stream crossings where walleye habitat has been identified".

Potential Environmental Effects

NA.

Proposed Action

Clarify which stream crossings are at a location where walleye habitat has been identified.

Reference to EIS

Page 6-104, Effects of habitat loss and alteration, 5th paragraph

Response

The crossing at API#62 is upstream of a known walleye spawning area. The mitigation for this crossing is provided in the draft No Net Loss Plan/Habitat Offset Plan.

As well, Section 3.8.4 of the Aquatic TSD contains the following mitigation measures:

Stream Crossings: a total of 15 stream crossings for the proposed access road (Hardtack/Sawbill) will be required, of which 14 are considered to impact fish habitat. For each of these, compensation for the lost habitat associated with culvert installation will be provided, using one of the following approaches:

- Installation of an open bottomed culvert to preserve aquatic habitat;
- Remediate existing barriers in the stream being crossed to provide access by fish to more habitat area (equal to or greater than the area of habitat occupied by the culvert); and
- Undertake a channel restoration associated with the culvert installation to increase stream area (by increasing channel length and/or width) and offset the habitat lost to the culvert.

The draft No Net Loss Plan/Habitat Offset plan will contain details for each crossing highlighting how habitat losses will be mitigated and/or offset.

INFORMATION REQUEST – DFO-7

Source: Department of Fisheries and Oceans

Summary of Comment

The freshwater intake should have a fish screen following the advice proved in DFO's Freshwater Intake End-of-Pipe Fish Screen Guideline (March 1995).

Potential Environmental Effects

It is a mitigation measure effective in protecting fish.

Proposed Action

The fish screen for the freshwater intake in Sawbill Bay should be identified in the report as a mitigation measure. The proponent should also commit to the implementation of this mitigation measure.

Reference to EIS

Page 6-106, 3rd paragraph

Response

The freshwater intakes for the workforce accommodations and for the minewater intake will be screened to prevent entrainment of small-bodied fish in accordance with the DFO operational statement for screening of intakes. This will be included in the detailed design phase of the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-8

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

Why is there no plan to actively establish aquatic communities in the pits?

Reference to EIS

Page 6-110, 6.2.2.1.3., Closure and Post-Closure Phases, 5th paragraph

Response

The pits at closure will be steep-sided (the existing benching from the operations phase will remain), with limited potential for development of littoral areas fish habitat. For the current mining plan, the area of appropriate depth would be about 1,250 m^2 (which is the approximate area of the proposed connecting channel between the flooded pits). It is anticipated that this shallow area would naturally develop into wetland habitat over the long term, through colonization by emergent/submergent aquatic plants, facilitated by dispersion of seed/plant sources into the flooded pits by wind, surface runoff, avifauna, etc.

It is possible that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m^2. While this is not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application. Feasibility of cutting a channel, pit stability and public safety concerns under the Mining Act (O. Reg 240/00) would however need to be addressed. This is not currently considered as part of closure and would be addressed at an appropriate time prior to final closure.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-9

Source: Department of Fisheries and Oceans

Summary of Comment

The draft EIS/EA report states “effects on aquatic habitat will be progressively reversed”. The meaning of this sentence is not clear. Will the effects be reversed by the actions of the proponent or will happen naturally?

Potential Environmental Effects

None

Proposed Action

Clarify and explain in more detail the state that effects on aquatic habitat will be progressively reversed.

Reference to EIS

Page 6-131, Table 6-51, Aquatic Biota

Response

The statement about progressive reversal of effects to aquatic habitat is linked to the closure of the waste rock stock pile, tailings management facility and open pits as it relates to hydrology and hydrogeology. During the closure/post-closure phases, runoff and seepage from the waste rock stockpile and tailings management facility will be released to the environment once water quality is deemed to be suitable for discharge. This will reverse some effects on aquatic habitat that has resulted from decreased flows due to loss of watershed. Pumping from the open pits will cease and groundwater levels will begin to rise. As discussed in the revised Conceptual Closure and Rehabilitation Plan, it is expected that it will take approximately 218 years for pit water levels to rise to an elevation of 420.0 metres above sea level (masl), the proposed spill over elevation from the pits to the environment. Groundwater levels in the vicinity of the pit will rise progressively along with pit water levels and approach pre-mining elevations over much of the area that experienced changes during operations. Once water quality is deemed to be of suitable quality it will be released. Once full, the flooded pits are expected to provide some habitat for fish although presently plans to modify the pit to increase the amount of suitable habitat is not accounted for as an offset to fish habitat loss in the NNLP.

The estimated pit flooding duration has changed since the submittal of the EIS/EA. The rationale for this change and details of the pit flooding model have been summarized in a technical memorandum and are included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

INFORMATION REQUEST – DFO-10

Source: Department of Fisheries and Oceans

Summary of Comment

The impacts to fish passage at water crossings are not apparent. It is expected that MNR's Environmental Guidelines for Access Roads and Water Crossings would be part of the compliance requirements for road construction.

Potential Environmental Effects

None

Proposed Action

Provide an assessment of the impacts to fish passage at the water crossings.

Reference to EIS

Page 8-19, Table 8-6, Aquatic Ecology, Road construction

Response

Table 8-6 is now Table 8-8 in the Final EIS/EA Report.

Reference has been added to the MNR Environmental Guidelines for Access Roads and Water Crossings document in Table 8-8.

As well, Section 3.8.4 of the Aquatic TSD noted that the following mitigation measures will be used to minimize impacts of stream crossing construction:

Stream Crossings: a total of 15 stream crossings for the proposed access road (Hardtack/Sawbill) will be required, of which 14 are considered to impact fish habitat. For each of these, compensation for the lost habitat associated with culvert installation will be provided, using one of the following approaches:

- Installation of an open bottomed culvert to preserve aquatic habitat.
- Remediate existing barriers in the stream being crossed to provide access by fish to more habitat area (equal to or greater than the area of habitat occupied by the culvert).
- Undertake a channel restoration associated with the culvert installation to increase stream area (by increasing channel length and/or width) and offset the habitat lost to the culvert.

The No Net Loss Plan/Habitat Offset plan contains details for each crossing highlighting how habitat losses will be mitigated and/or offset.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-11

Source: Department of Fisheries and Oceans

Summary of Comment

It should be stated that two NNL Plans will be developed rather than speculating on what will be changed in the Fisheries Act since public consultation has included the development of NNL Plans as mitigation for fish habitat destruction.

Potential Environmental Effects

This is to allow for assessment of the adequacy of habitat compensation under separate regulatory processes: specifically, pursuant to s.27(1) of the Metal Mining Effluent Regulations, a plan to compensate for lost habitat is required, as is adequate security for carrying out the compensation plan prior to waste being disposed of in a scheduled tailings impoundment area; with respect to habitat impacts associated with other mine components, habitat compensation and adequate security for carrying out the compensation plan is required in support of an authorization under section 35 of the Fisheries Act.

Proposed Action

Indicate that in developing NNL Plans, habitat compensation to address losses from the scheduling of water bodies for tailings and waste rock disposal will be presented separately from habitat compensation for other project-related losses due to physical habitat alteration, disruption or destruction of habitat.

Reference to EIS

Page 8-23, 1st and 2nd paragraphs

Response

Removed discussion of change to Fisheries Act under section 8.2.3.2.1. Updated text to state:

In the final NNLP, habitat compensation to address losses from the scheduling of water bodies for tailings and waste rock disposal (to address requirements of the MMER Schedule 2) will be presented separately from habitat compensation for other project-related losses due to physical HADD under Section 35 of the Fisheries Act.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-12

Source: Department of Fisheries and Oceans

Summary of Comment

The preparation of the fish habitat compensation plan has more to do with receiving a Fisheries Act Authorization issued by DFO rather than to be considered as part of the EA.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Page 8-23, Section 8.2.3.2.2

Response

Deleted "the preparation of a fish habitat compensation plan for consideration as part of the EA" from Section 8.2.3.2.2.

INFORMATION REQUEST – DFO-14

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

Include the following document to the list of references: MNR. 1990. Environmental Guidelines for Access Roads and Water Crossings.

Reference to EIS

Page 13-6

Response

The following reference has been added to Chapter 13: References. MNR. 1990. Environmental Guidelines for Access Roads and Water Crossings.

INFORMATION REQUEST – DFO-15

Source: Department of Fisheries and Oceans

Summary of Comment

Do the rocks that will be submerged as the open pits flood (take up to 78 years) have any potential to create fish habitat?

Potential Environmental Effects

Not provided

Proposed Action

Describe the potential for the rocks that will be submerged as the open pits flood (take up to 78 years), to create fish habitat.

Reference to EIS

Conceptual Closure and Rehabilitation Plan (Version 1), Page 14, 4.3 waste Rock Stockpile, 2nd sentence

Response

The estimated pit flooding duration has changed since the submittal of the EIS/EA. The revised pit filling duration is about 218 years. The rationale for this change and details of the pit flooding model have been summarized in a technical memorandum and are included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

At this time the flooded pits are not considered part of habitat gains accounted for to offset the habitat losses in the No Net Loss Plan/Habitat Offset Plan, however, adjustments to the configuration of the lifts and the characteristics of the connecting channel between the pits are proposed that would create a “littoral bench” in shallow water that would provide conditions to support wetlands and fish habitat. The area of this littoral bench is approximately 21,000 m^2 and is discussed in the No Net Loss/Habitat Offset Plan.

Rocks remaining along the upper benches at closure will remain into post-closure and will provide habitat.

INFORMATION REQUEST – DFO-16

Source: Department of Fisheries and Oceans

Summary of Comment

Not provided

Potential Environmental Effects

Not provided

Proposed Action

Provide information on whether the rock cut channel connecting the east and west pits and connecting the west pit to the Upper Marmion reservoir have any fish habitat features (natural channel design) built in.

Reference to EIS

Conceptual Closure and Rehabilitation Plan (Version 1), Page 16, 4.6 Open Pits, 3rd paragraph

Response

It is possible that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat). While this is not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application. Feasibility of cutting a channel, pit stability and public safety concerns under the Mining Act (O.Reg 240/00) would however need to be addressed. This is not currently considered as part of closure and would be addressed at an appropriate time prior to final closure.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-17

Source: Department of Fisheries and Oceans

Summary of Comment

It states that the lake resulting from the flooding of the open pits will not be developed as aquatic habitat.

Potential Environmental Effects

None

Proposed Action

Describe the rationale for not considering the lake resulting from the open pits as aquatic habitat. If it can be created as aquatic habitat, include a discussion on how.

Reference to EIS

Conceptual Closure and Rehabilitation Plan (Version 1), Page 24, 5.3.1 Aquatic Monitoring Program, last sentence

Response

For the post-closure period of the project, the pits will gradually fill with surface runoff from the MSA, groundwater and direct precipitation over a period of approximately 218 years. In the short term, it is anticipated that the quality of the runoff (which includes runoff from the TMF and WRMF) will not meet SSWQOs. During this early phase of filling, the pits will not be considered as aquatic habitat, as they continue to serve as part of the mine closure and rehabilitation process. Over time, the quality of the runoff from the TMF and WRMF is predicted to improve to the point where it will meet SSWQOs, at which time, it will be allowed to discharge directly to the environment. The pits will continue to fill with precipitation, groundwater and some local runoff. As the pits continue to fill, permanent stratification will occur and the deeper waters will become isolated from the upper waters. It is predicted that by the time that the pits overflow into Sawbill Bay (in approximately 218 years), water quality in the pits will meet SSWQOs. If in the long term pit water quality does not meet SSQWOs, further treatment of the discharge from the pit lakes will be required (after the 218 year filling period).

The filling strategy for the pits over a 218 year period is a conservative approach to ensuring that final quality of runoff from the closed site will meet SSWQOs, and during this time, the pits would not be considered aquatic habitat.

Post closure, the vertical faces of the cliffs represent a potential hazard to wildlife and humans, because of the risk of falling into the pits and also because the area adjacent to the pit walls may be unstable. Accordingly, the closure plan identifies a setback from the perimeter of the pit walls where efforts will be made to secure the site from intrusion by wildlife and people. This potential for mechanical instability of the bedrock around the perimeter of the pits also limits the potential to either blast or fill any nearshore areas to create shallow water littoral habitat for fish.

For the above reasons, the flooded pits were not considered for an active program of aquatic habitat creation.

It is possible that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at

approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m^2. While this is not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application. Feasibility of cutting a channel, pit stability and public safety concerns under the Mining Act (O.Reg 240/00) would however need to be addressed. This is not currently considered as part of closure and would be addressed at an appropriate time prior to final closure.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – ENVIRONMENT - DFO-18

Source: Department of Fisheries and Oceans

Summary of Comment

The flooded area in the pits will cover 210 ha.

Potential Environmental Effects

Not provided

Proposed Action

Indicate the length and width of this new waterbody. Clarify if the increased fetch will enable the waterbody to turn over in the spring and fall and bring bottom water to the surface.

Reference to EIS

Conceptual Closure and Rehabilitation Plan (Version 1), Page 26, 6.4 Surface and groundwater conditions, 3rd paragraph

Response

There will be two water bodies, one in each pit. The West Pit is approximately 1400 m long by 800 m wide by 300 m deep and the East Pit is approximately 1000 m long by 600 m wide by 210 m deep.

Given the current predictions for the open pits it is expected that the water will be suitable for discharge under a fully mixed condition or that the upper waters will be suitable for discharge should the pits stratify. Given the depth of the pits, their behaviour is substantially different from most lakes. Precedent data from other deep pit lakes indicates that, regardless of wind or seasonal action, due to strong chemocline development in stratified open pits, there will be no turnover of water within the deeper areas of the pits (Nordin, 2010; Boehrer and Schulteze, 2006; Stevens and Lawrence, 1998).

References

Boehrer, Bertram and Martin Schulteze. 2006. On the Relevance of Meromixis in Mine Pit Lakes. 7th International Conference on Acid Rock Drainage (ICARD), March 26-30, 2006, St. Louis MO. R.I. Barnhisel (ed.) Published by the American Society of Mining and Reclamation (ASMR), 3134 Montavesta Road, Lexington, KY 40502.

Nordin, Ken. 2010. Evaluation of the Effectiveness of Biological Treatment of Mine Waters. MPERG Report 2010-4. Prepared for and published by: Yukon Mine and Petroleum Environment Research Group. Whitehorse, Yukon. http://www.geology.gov.yk.ca

Stevens, C.L. and G.A. Lawrence. 1998. Stability and meromixis in a water-filled mine pit. Limnol. Oceanogr., 43(5), 1998, 946-954.

INFORMATION REQUEST – DFO-19

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

What fish community indices will be monitored for the EEM program? It usually doesn't include walleye which should be monitored post-closure, especially if any spawning and nursery habitat has been developed (3rd paragraph) for that species.

Reference to EIS

Conceptual Closure and Rehabilitation Plan (Version 1), Page 27, 6.6 Aquatic Flora and Fauna, 4th paragraph

Response

Details of the EEM program will be provided once a schedule for development of the mine has been confirmed. The indices to be used to monitor the health of benthic and fish communities will be selected in accordance with the Metal Mining Environmental Effects Monitoring Technical Guidance Document (Environment Canada 2012). Under the EEM protocol, an EEM monitoring plan will be submitted to Environment Canada for their approval prior to commencing the program. The plan will describe the approach, and the indices that will be used in the EEM program.

INFORMATION REQUEST – DFO-20

Source: Department of Fisheries and Oceans

Summary of Comment

Aquatic field studies were also conducted in the fall of 2010-2012 as mentioned in Table 2-2, page 28.

Potential Environmental Effects

None.

Proposed Action

Revise to include this information.

Reference to EIS

Aquatic Environment TSD (Version 1), Page 23, Section 2.1 Methods, 1st paragraph.

Response

Updated Section 2.1 to state: The process consisted of consultation with regulatory agencies, Aboriginal engagement, a review of existing data sources, and aquatic field studies, which were conducted during the spring, and summer and fall of 2010, 2011 and 2012.

INFORMATION REQUEST – DFO-21

Source: Department of Fisheries and Oceans

Summary of Comment

Not provided

Potential Environmental Effects

Not provided

Proposed Action

When will we know when the "direct loss of habitat at each crossing location will be evaluated once crossing design specifications become available"? Since any new HADDs will be added to the NNLP, this may require an amendment to the Fisheries Act Authorization.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 83, 2nd paragraph

Response

The design of the water crossings will be finalised during the detailed design phase. At that time, any new HADDs will be identified and added to the NNLP.

INFORMATION REQUEST – DFO-22

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

To maintain “fish passage during construction (what about after construction?) and maintain the hydraulic and hydrological characteristics of water courses will require the crossing to have stream simulation design where the culvert diameter or bridge abutments are outside the natural channel width.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 84. last two bullets.

Response

Section 3.2.1 of the Aquatic TSD is a discussion related to construction activities. Further discussion of operations phase is included in Section 3.2.2. Where culvert replacement or new watercourse crossings are being constructed, critical periods for fish migration will be avoided where possible (by observing fish construction windows) or maintained using temporary bi-pass channels. The sizing and design of road crossing structures will address any requirements for fish passage and include onsite mitigation and habitat compensation which is discussed in the No Net Loss / Habitat Offset Plan, which is an appendix of the Aquatic TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-23

Source: Department of Fisheries and Oceans

Summary of Comment

It is not apparent that the loss of habitat due to the toe of the wall/berm, covering about 0.8ha of the drawdown zone of the reservoir is included in the NNLP.

Potential Environmental Effects

Not provided

Proposed Action

Confirm this detail.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 84, last sentence

Response

This habitat loss has been included in the habitat losses described in Table 3.5 of the Aquatic TSD report, as follows:

Infrastructure Feature	Aquatic API	Description	Description of Potential Impact
Other Mine Facilities	■ Sawbill Bay	■ Localized filling within the drawdown zone along Hammond Reef peninsula to provide adequate space for Mine buildings, parking, etc.; approximately 0.8 ha of seasonal habitat within the drawdown zone will be destroyed. Area provides seasonal nursery/foraging habitat for baitfish species, northern pike, smallmouth bass	■ About 0.8 ha of the drawdown zone along the Hammond Reef peninsula shoreline will be destroyed. Resulting loss of about 1200 HU of useable habitat destroyed.

This habitat loss is included in the revised NNLP included in the Final EIS/EA Report.

INFORMATION REQUEST – DFO-24

Source: Department of Fisheries and Oceans

Summary of Comment

The freshwater intake should have a fish screen following the advice proved in DFO's *Freshwater Intake End-of-Pipe Fish Screen Guideline* (March 1995).

Potential Environmental Effects

It is a mitigation measure effective in protecting fish.

Proposed Action

The fish screen for the freshwater intake in Sawbill Bay should be identified in the report as a mitigation measure. The proponent should also commit to the implementation of this mitigation measure.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 85, 3rd paragraph

Response

This paragraph is describing the dewatering of Mitta Lake, not the intake from Sawbill Bay. As stated, the pump intake will be a floating intake located in the middle of Mitta Lake and will be appropriately screened to minimize impingement or entrainment of fish.

The freshwater intakes for the workforce accommodations and for the mine water intake will be screened to prevent entrainment of small-bodied fish in accordance with the DFO operational statement for screening of intakes. The use of screens on the intake structures has been added as a mitigation measure for effects to the aquatic environment; they will be designed according to established velocity criteria to minimize entrainment of fish. This mitigation measure is included in Chapter 8, Table 8-8 of the EIS/EA Report

INFORMATION REQUEST – DFO-25

Source: Department of Fisheries and Oceans

Summary of Comment

It mentions that stockpile logs, rootwads and wetland materials will be used in habitat compensation.

Potential Environmental Effects

NA.

Proposed Action

Indicate where these materials will be used.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 86, 3rd bullet

Response

These materials would be used as part of the microhabitat elements of the compensation measures such as the littoral zone enhancements in Sawbill Bay, the toe of slope along the infrastructure berm at the shore of the embayment just northwest of the pebble crushing station and at the road crossings. Placement will be determined during finalization of the habitat enhancement design. These microhabitat features are discussed in Section 7 of the NNLP/habitat offset document.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-27

Source: Department of Fisheries and Oceans

Summary of Comment

It mentions that walleye habitat may be impacted by the construction of stream crossings and the final paragraph only mentions northern pike and baitfish and their habitat affected by the 15 road crossings.

Potential Environmental Effects

Not provided

Proposed Action

Clarify whether walleye stocks are potentially affected by the water crossings.

Reference to EIS

Aquatic Environment Technical Support Document (Version 1), Page 96, 2nd paragraph

Response

At this time, walleye stocks are not impacted by the crossings directly. There is one crossing (API #62) where walleye spawning has been reported to occur downstream of the crossing. Protection of this spawning site will be part of the planning, design and construction of this crossing.

INFORMATION REQUEST – DFO-28

Source: Department of Fisheries and Oceans

Summary of Comment

None of the potential compensation options include remediation of some of the Steep Rock mine contaminated sites. I understand that there will be an assessment of some of the fishless ponds in March 2013 to see if 'winter kill' is a reason for the ponds not having any fish during the field surveys.

Potential Environmental Effects

None

Proposed Action

Include a description of the remediation of portions of the Steep Rock Mine option in the fish habitat compensation.

Reference to EIS

Aquatic Environment TSD (Version 1), Page 112, 1st paragraph

Response

Due to the results of consultation with First Nations, Métis and the public, the Steep Rock site is no longer being considered as part of the fish habitat compensation plan.

INFORMATION REQUEST – DFO-29

Source: Department of Fisheries and Oceans

Summary of Comment

Scheduling of waterbodies under the MMERs – DFO needs to approve the NNLP for those fish bearing waterbodies that become tailing areas or waste rock piles and indicate that approval to EC to proceed with scheduling.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Aquatic Environment TSD (Version 1), Page 119, Section 4.3

Response

Revised Section 4.3 to state: Approval of the NNLP is required from DFO for those fish bearing waterbodies that become tailing areas or waste rock piles prior to Environment Canada's scheduling of the waterbodies.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-30

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

Do walleye occur upstream of the four water crossings – imply a walleye migration through the crossings?

Reference to EIS

Aquatic Environment TSD (Version 1), Page 124, last paragraph

Response

Walleye do not migrate through any of the identified crossings. The crossing at API#62 is upstream of a known walleye spawning area. The other crossings do not directly impact walleye habitat and are not upstream of walleye habitat. The mitigation for this crossing is provided in the draft No Net Loss Plan/Habitat Offset Plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-31

Source: Department of Fisheries and Oceans

Summary of Comment

None

Potential Environmental Effects

None

Proposed Action

Include a description of the remediation of portions of the Steep Rock Mine option in the fish habitat compensation.

Reference to EIS

Aquatic Environment TSD (Version 1), Page 129-130, Section 5.3 Fish Habitat Compensation

Response

Due to the results of consultation with First Nations, Métis and the public, the Steep Rock site is no longer being considered as part of the fish habitat compensation plan.

INFORMATION REQUEST – DFO-32

Source: Department of Fisheries and Oceans

Summary of Comment

It states that "Between 20 and 30 years after closure, the flooded open pits will begin to overflow and this overflow will be directed into the Upper Marmion Reservoir". This is not consistent with the Conceptual Closure and Rehabilitation Plan (Version 1) p26 as it states it would happen in 78 years.

Potential Environmental Effects

None

Proposed Action

Clarify the timeframe for the flooded open pits to overflow.

Reference to EIS

Hydrology Technical Support Document (Version 1), Page 155, 3rd paragraph

Response

The estimated pit flooding duration has been revised since the EIS/EA was submitted. It is now estimated that the open pits will overflow to Upper Marmion Reservoir about 218 years after mining operations cease. The rationale for this change and details of the revised pit flooding model have been summarized in a technical memorandum included as an addendum to the Conceptual Closure and Rehabilitation Plan.

INFORMATION REQUEST – DFO-34

Source: Department of Fisheries and Oceans

Summary of Comment

Was the drainage area used for a watershed analysis to calculate the design of the crossing so it could handle at least a 1:25 year event?

Potential Enviromental Effects

None

Proposed Action

Clarification

Reference to EIS

Hydrology TSD, Version 1, Section 7.2.2.2, Table 7-5, page 175

Response

Table 7-5 provides drainage areas for existing crossings along the Hardtack/Sawbill Road, and the criteria used to design these crossings is unknown.

The design of crossings is will be completed during the detailed design stage. However, crossings along resource access, and rural arterial and collector, roads are typically designed for floods with return periods ranging from 10 to 50 years, depending on total span.

INFORMATION REQUEST – DFO-36

Source: Department of Fisheries and Oceans

Summary of Comment

Construction of the transmission line should meet DFO's operational statement on *Overhead Line Construction* (version 3.0)

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Hydrology TSD (Version 1), Page 181, 2nd bullet

Response

Yes, the construction of the transmission line will meet DFO's operational statement on Overhead Line Construction (version 3.0).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – DFO-37

Source: Fisheries and Oceans Canada

Summary of Comment

It is estimated that groundwater seepage into the open pit(s) is 740 cubic metres per day. It is not apparent how it was determined that the open pits would take 78 years to fill up with water. It is assumed there are some estimates of precipitation and surface flow going into the pit, in addition to groundwater flow.

Potential Environmental Effects

None

Proposed Action

Describe how it was determined that it would take 78 years for the two pits to fill up. Indicate the volume of the two open pits (joined by a channel) at closure. Confirm whether 740 cubic metres per day is the amount of groundwater going into both pits on a daily basis.

Reference to EIS

Hydrogeology Technical Support Document (Version 1), Page 52, 2.10.1 Predictive modelling, last paragraph

Response

The flood time prediction was calculated with a model which estimated the volumes over time of both inflows (direct precipitation, local runoff, groundwater seepage) and outflows (evaporation, and overflow to Marmion once the water level reached Elev. 420 m.) Modifications to the model assumptions (i.e. less pumping to the pit) made subsequent to the submittal of the EIS/EA report have resulted in a revised pit filling duration. The revised pit filling duration is about 218 years. The basis and results of the revised pit flooding model are provided in a technical memorandum, which is included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

Evaporation increases over time as the flooded area increases. The groundwater inflow term will initially be about 740 m^3/day with the pits fully dewatered, but this inflow term will decrease to about 32 m^3/day as the water level rises to Elev. 420 m because of the decreasing gradient as the pit water level rises.

The water levels in the East Pit and the West Pit were calculated using the area versus elevation, and volume versus elevation relationships for both pits from the mining plan. The total volumes of the East Pit and the West Pit at Elev. 420 m are: 135.39 Mm^3 and 42.68 Mm^3, respectively, for a total of 178.07 Mm^3.

The 218 years accounts for pumping of water from the TMF Reclaim Pond for the first three years after closure and pumping from the seepage collection ponds for the first 5 years after closure. Afterwards, these flows are assumed to be allowed to discharge directly to the environment.

INFORMATION REQUEST – DFO-38

Source: Department of Fisheries and Oceans

Summary of Comment

It states "Fisheries Act Authorizations issued by Fisheries and Oceans Canada and authorizations issued pursuant to the Navigable Waters Act (if applicable)". This is incorrect as Navigable Waters Act permits are issued by Transport Canada.

Potential Environmental Effects

None

Proposed Action

Correct the sentence to indicate that approvals pursuant to the Navigable Waters Protection Act are issued by Transport Canada.

Reference to EIS

Hydrology TSD (Version 1), Page 185, 4th bullet

Response

Note provided in Hydrology TSD (Version 2) with amendment to Version 1 text which reads: Satisfy compliance monitoring requirements included in Certificates of Approval and Permits to Take Water issued by the Ontario Ministry of the Environment pursuant to the Ontario Water Resources Act and in Fisheries Act Authorizations issued by Fisheries and Oceans Canada and authorizations issued by Transport Canada pursuant to the Navigable Waters Act (if applicable).

Ministry of Environment, Environmental Approvals Branch

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-2

Source: Ministry of Environment, Environmental Approvals Board

Summary of Comment

The column titled 'Section in EIS/EA Report' should be more specific. It needs to be more specific both in terms of the specific subsection where items are found, and also to give the location for each bullet. The requirements are not always found in the section listed, thus the correct section of the EA/EIS must be identified as they must be included in the EA/EIS.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Appendix 1.iii

Response

An updated concordance table has been included in the Final EIS/EA Report. The updated concordance table is more detailed and includes the specific subsection where each bulleted point can be found.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-3

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For the ToR section 7.3.3 for Net Effects, make it more clear what information can be found in each of the different sections of the EA/EIS listed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Appendix 1.iii

Response

Revised for clarity as per below.

7.3.3	**Net Effects**	
	A complete list of policies and guidelines will be provided in the EA Report	Section 1.10.7 (Relevant Government Policies and Guidelines) Section 1.10.8 (Aboriginal Policies and Guidelines)
	A complete list of criteria and standards will be provided in the EA Report	Chapter 2 (EA Methods) Section 2.5 Selection of Valued Ecosystem Components Chapter 8 (Environmental and Social Management Planning) Environmental Management Planning, Monitoring and Compliance tables
	A complete list of methods will be provided in the EA Report.	Chapter 2 (EA Methods)
	The net effects for the physical components will be described in detail in the EA Report.	Section 6.4 (Residual Effects Assessment)
	The rationale for selection of specific biological indicators will be provided in the EA Report.	Section 2.5 (Selection of Valued Ecosystem Components)
	The net effects for the biological components will be described in detail in the EA Report.	Section 6.4 (Residual Effects Assessment)

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-4

Source: Ministry of Environment; Environmental Approvals Board

Summary of Comment

Discussion needs to clearly flow through the entire document, from section 2 to the alternatives selection, effects assessment and monitoring.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

VECs: criteria and indicators

Response

The EIS/EA Report has been revised to include a clearer focus on Valued Ecosystem Components (VECs). Chapter 2 includes the list of VECs that were selected and the rationale for their selection. Chapter 3 includes a description of baseline conditions for each selected VEC. Chapter 4 provides a screening level assessment of Project alternatives, based on selected VECs. Chapter 6 has a summary of potential effects that directly references potential effects to VECs. Chapter 7 provides a summary of consultation activities that took place, including the discussions of VECs before they were finalized. Chapter 8 provides a monitoring plan that is directly tied to VECs.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-5

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

There is no clear description of the alternatives to closure and post closure, how the preferred method was determined, or what the project site will look like post closure. Look at the detailed requirements outlined in the Terms of reference to ensure they have been met and are located in all relevant sections of the ToR. It should be discussed in Sections 4, 5, 6 and 8 in much more detail.

Potential Environmental Effects

Not provided

Proposed Action

Not provided

Reference to EIS

Closure and Post Closure

Response

Technical Supporting Document1 was submitted which described the conceptual plan for closure of the project site after mining is completed. The TSD was based on a formal closure plan that was prepared in draft form for eventual certification and submittal to MNDM. (The formal closure plan is currently under internal review and has not yet been submitted to MNDM). The formal closure plan was required to follow a format which is dictated by Schedule 2 to O. Reg. 240/00 under the Mining Act. Schedule 2 requires detailed descriptions of the selected closure methods; however it does not require a discussion of alternative methods that were considered but not ultimately selected.

In the preparation of the conceptual closure plan (and also the formal closure plan), due consideration was given to possible alternative approaches that could be taken to the closure of each element of the project. A technical memorandum providing a brief description of the alternatives that were considered for each element of mine closure as well as the rationale that was used to select the preferred alternative has been included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

[1] Golder Associates Ltd., (2013), "Hammond Reef Gold Project Conceptual Closure and Rehabilitation Plan, Version 1", Document 2012-068, February, 2013.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-6

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

All additions to the project that were not described in the approved Terms or Reference, not just the mine camp alternative, must be included. Additionally more background information on why this new alternative was included must be given.

Potential Environmental Effects

It is incorrect to say the mine camp is the only substantive change.

Proposed Action

In all sections, especially the alternatives assessment, a more detailed rationale for why a new alternative was included is needed. Include also any response from any stakeholder, public, government or Aboriginal on this new alternative.

Reference to EIS

1-25

Response

The only substantive change to the Project, which is not reflected in the Project Description or the ToR, is the inclusion of an on-site accommodation camp for workers. This alternative was initially scoped out of the Project design, however as the Project planning advanced it was necessary to include it as an alternative to ensure the Project remained feasible. A fibre optic line and auxiliary power line were also added at the advanced planning stage, but are not considered substantive because they are using existing rights-of-way or the same poles as the Transmission Line which was already included in both the Project Description and ToR.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-7

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

All environmental components must follow the same format and include discussion of: all study areas, methods, results. In the same level of detail.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 3

Response

The structure of Chapter 3 has been revised for clarity. Each component clearly follows the same outline and provides Study Areas, Methods and Results. Each Results section provides a discussion by VEC. A summarized table of contents for Chapter 3 is provided below.

3.2.2 Geology
- 3.2.2.1 Study Area
- 3.2.2.2 Methods
- 3.2.2.3 Results

3.2.3 Geochemistry
- 3.2.3.1 Study Area
- 3.2.3.2 Methods
- 3.2.3.3 Results

3.2.4 Terrain and Soil
- 3.2.4.1 Study Area
- 3.2.4.2 Methods
- 3.2.4.3 Results

3.2.5.1 Climate
- 3.2.5.1.1 Study Area
- 3.2.5.1.2 Methods
- 3.2.5.1.3 Results

3.2.5.2 Air Quality
- 3.2.5.2.1 Study Areas
- 3.2.5.2.2 Methods
- 3.2.5.2.3 Results

3.2.5.3 Noise

3.2.5.4 Vibration

3.2.5.5 Light

3.2.6 Hydrology
- 3.2.6.1 Study Areas
- 3.2.6.2 Methods
- 3.2.6.3 Results

3.2.7 Hydrogeology
- 3.2.7.1 Study Area
- 3.2.7.2 Methods
- 3.2.7.3 Results

3.2.8 Water and Sediment Quality
- 3.2.8.1 Study Areas
- 3.2.8.2 Methods
- 3.2.8.3 Results

3.2.9 Aquatic Environment
- 3.2.9.1 Study Areas
- 3.2.9.2 Methods
- 3.2.9.3 Results

3.2.10 Terrestrial Environment
- 3.2.10.1 Study Areas
- 3.2.10.2 Methods
- 3.2.10.3 Results - Vegetation
- 3.2.10.4 Results – Avifauna
- 3.2.10.5 Results – Mammals
- 3.2.10.6 Results – Amphibians and Reptiles
- 3.2.10.7 Results – Invertebrates
- 3.2.10.8 Results – Wildlife Corridors

3.3 Socio-economic Environment
- 3.3.1 Study Areas
- 3.3.2 Methods
- 3.3.3 Results

3.4 Physical and Cultural Heritage Resources
- 3.4.1 Study Area
- 3.4.2 Method
- 3.4.3 Results

3.5 Aboriginal Interests
- 3.5.1 Study Areas
- 3.5.2 Methods
- 3.5.3 Results - Aboriginal Setting
- 3.5.4 Results - Aboriginal Valued Ecosystem Components

Noise, vibration and light are the exception to this format, as these components are not focussed on baseline information, but rather modelling and predictions related to Project design information. The existing levels of noise, vibration and light are currently assumed to be unimpacted due to the remote location of the Project site.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-8

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The ToR does not 'require' a preliminary screening.

Potential Environmental Effects

It would be more accurate to say what the approved ToR described as the process.

Proposed Action

None

Reference to EIS

Section 4-1

Response

The Alternatives Assessment Report and Chapter 4 of the EIS/EA have been revised to reflect the process described in the ToR.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-9

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The selection of the preferred alternative (4.1.3) says that "Proceeding with the Project is not expected to have significant negative effects on the biophysical and socio-economic environment…". This needs justification.

Potential Environmental Effects

A more robust comparison between the alternatives is required.

Proposed Action

None

Reference to EIS

Section 4-3

Response

The justification for this statement is provided in the discussion of advantages and disadvantages of the Project found in Section 4.1. A detailed description of the potential effects of the Project on the biophysical environment is provided in Chapter 6. Appropriate mitigation measures are identified in Chapter 6 including measures to address these potential effects.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-10

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The differences in the EA/EIS from the approved ToR regarding the alternative methods must be described with justification.

Potential Environmental Effects

A rationale for why the EIS is consistent with the approved ToR, with the inclusion of new alternative methods, is needed to justify their consideration and selection.

Proposed Action

None

Reference to EIS

Section 4-3

Response

The only substantive change to the Project, which is not reflected in the Project Description or the ToR, is the inclusion of an on-site accommodation camp for workers. This alternative was initially scoped out of the Project design, however as the Project planning advanced it was necessary to include it as an alternative to ensure the Project remained feasible. A fibre optic line and auxiliary power line were also added at the advanced planning stage, but are not considered substantive because they utilize existing rights-of-way and the support infrastructure of the proposed Transmission Line so additional effects are not anticipated beyond what has already been evaluated for the Transmission Line.

The need to consider an on-site accommodation camp as an additional alternative method of carrying out the Project was determined based on detailed planning, consultation, and baseline studies. Detailed planning for the Project clarified the total anticipated workforce, length of the commute and duration of the Project. Consultation activities, including engagement with Aboriginal communities confirmed that employment is important and that many community members live two or more hours from the Project Site. Socio-economic baseline studies confirmed the demographics of the local population, including age distribution and education levels. The conclusion from the detailed planning, consultation and baseline studies was that an on-site accommodation camp would be required to ensure the Project remained feasible.

Upon reaching the decision to include an on-site accommodation camp as an alternative means of carrying out the Project, the government, public and Aboriginal stakeholders were informed of this change.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-11

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The assessment alternative methods must include a discussion of all phases of the project, advantages and disadvantages, clearly and consistently. Criteria and indicators were selected and must be discussed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 4-3

Response

The alternatives assessment is carried out based on the concept of a bounding scenario. A bounding scenario considers the potential effects of an activity for each of the four phases of the Project and selects the phase which has the highest potential to result in effects as the bounding scenario. An evaluation of the potential effects of a bounding scenario also captures the potential effects of different phases or scenarios because they are considered less and are captured within the larger or bounding scenario. The alternatives assessment therefore does not fully present an evaluation of each activity for each phase of the Project, but selects the phase during which the effects of the activity are considered to be most extensive and presents an evaluation for that phase.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-12

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The requirements outlined in section 7.3.3 of the approved ToR have not been sufficiently fulfilled.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

4-3

Response

The requirements outlined in section 7.3.3 of the Terms of References are with regards to the identification and discussion of Net Effects. Net Effects are addressed in Chapter 6 of the effects assessment. Chapter 4 provides an overview of the alternatives assessment process, the alternatives assessed, and the set of preferred alternatives that are carried forward through the EIS/EA Report. The preferred alternatives are described in detail in Chapter 5, and further assessed for physical, biological and socio-economic effects in Chapter 6.

The following provides a summary of the requirements listed in section 7.3.3 of the Terms of Reference, and a reference to where the discussion can be found.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Requirement	Response	Section in EIS/EA Report
A complete list of policies, guidelines, criteria, standards and methods will be provided in the EA Report.	Government guidelines, policies, criteria and standards are considered throughout the EA/EIS Report. All effects listed in Chapter 6 have been assessed based on applicable policies and guidelines, reference to which is made where applicable. Chapter 8 contains a detailed list of monitoring objectives and guidelines that will be used to measure these objectives. It also has an "Environmental Management Planning, Monitoring and Compliance" table for both the physical and biological disciplines, which lists the specific environmental component, monitoring objectives, and "Regulating Authority / Compliance Requirements" that will be used to measure these objectives. Chapter 10 is dedicated to a list of anticipated permits and approvals required to implement the Project.	Table 8-2 Table 8-7 Section 10.0
The net effects for the physical components will be described in detail in the EA Report.	Chapter 6 has a section dedicated to Residual Effects, which is considered to be the same as Net Effects within this assessment.	6.4
The rationale for selection of specific biological indicators will be provided in the EA Report.	Chapter 2 outlines EA methods and gives selection criteria for VEC's. Each VEC is accompanied by its rationale for selection, and indicators.	2.5
The net effects for the biological components will be described in detail in the EA Report.	Chapter 6 has a section dedicated to Residual Effects, which is considered to be the same as Net Effects within this assessment.	6.4
The assessment will be based on the Hammond Reef Gold Project Description, and include all mitigation measures currently incorporated into the Project design	In-project mitigation is considered in the development of the EA/EIS. Chapter 6 includes "Summary of Mitigation" sections as part of the physical effects, biological effects, and social effects assessments. Chapter 6, Section 6.4 further summarizes the potential effects, mitigation measures, and residual effects of the Project through use of a matrix/table for each Project phase.	6.1.5 6.2.4 6.3.6 6.4
Where potentially significant impacts to the environment are identified, additional mitigation measures will be incorporated, where feasible, to minimize the residual impacts, which are then re-evaluated to determine the final net effects of the likely impact.	Potentially significant impacts to the environment have been identified and considered as part of the Effects Assessment found in Chapter 6 of the EA/EIS. Chapter 6, Section 6.4 utilizes a matrix/table for each project phase to summarize the effects assessment. These tables are organized based on Activity and VEC, and detail the potential effects, proposed mitigation measures, residual effects, predicted degree of impact after mitigation, and significance of the residual effect. Through this assessment, all residual (net) effects are anticipated to be of low significance. These predictions will be confirmed through an ongoing monitoring program outlined in Chapter 8. This monitoring program is based on effects to VECs, including mitigation measures for VECs in which there is a potential for a residual effect. In the event that results do not match predictions, contingency measures have been included in Chapter 8.	6.4 8.2.4

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Requirement	Response	Section in EIS/EA Report
The assessment will be conducted with the use of tables that organize and summarize the process described above into comparable and intuitive presentations for each of the construction, operations, and closure and post-closure phases.	Chapter 6, Section 6.4 summarizes the potential effects, mitigation measures, and residual effects of the Project through use of a matrix/table for each Project phase.	6.4

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-13

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The worker camp options are not described in enough detail. Discuss the incentives program to have workers live in Atikokan. Discuss also the negative impacts to workers living on site.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

4-19

Response

The worker incentives have not been determined at this time. Incentives could include moving allowances, housing allowances or spousal hiring programs. The incentives will be defined through discussions with the Atikokan/OHRG Committee. Chapter 4 of the EIS/EA document has been expanded to provide more discussion on possible positive and negative impacts and effects of on-site or off-site accommodation (see Section 4.2.9).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-14

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

A consistent level of analysis is required for all alternative methods.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 4-3

Response

Details have been added to Chapter 4 in the revised report to ensure comparative analysis of alternative methods are comparable.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-15

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For 'environmental characterization' why is it 'could include'? As the assessment method has been determined, be clear as to what was done and why.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

4-27

Response

The environmental characterization includes elements such as climate, geology, hydrology, hydrogeology, water quality and potential impacts on aquatic, terrestrial and bird life, among others (Environment Canada 2011).

INFORMATION REQUEST – EAB-16

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Provide more information on what will be considered (advantages/disadvantages, VECs, based on the approved ToR) for section 3.2.2

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

The alternative means were evaluated against the environmental, technical, economic and social criteria described below. The environmental and social criteria are directly tied to the Valued Ecosystem Components selected for the environmental assessment, as detailed in Chapter 2 of the EIS/EA Report.

Environmental Criteria

The following sub-indicators were considered in the evaluation of potential environmental effects:

- Water Quality: Potential effects on surface water quality;
- Terrestrial Ecology: Potential loss of wetlands, forest cover and terrestrial habitat for species at risk, furbearers, upland breeding birds, moose and wild rice;
- Aquatic Biology: Potential loss of aquatic habitat in Upper Marmion Reservoir, Lizard Lake and other fish bearing water bodies. Species considered include Walleye, Smallmouth Bass, Northern Pike and small bodied forage fish;
- Hydrology: Potential changes in surface water flows and levels and effects on surface water navigability;
- Hydrogeology: Potential effects on groundwater levels and water quality; and
- Air quality: Potential changes in ambient air quality due to emissions from stationary and mobile equipment and the ore processing facility.

Technical Criteria

The technical evaluation considered constructability, operability, construction risk and closure.

Economic Criteria

The economic evaluation considered total project costs including capital costs, operating cost and closure costs.

Social Criteria

The social evaluation considered cultural heritage, services and infrastructure, land use, local resources and potential benefits to the local population and economy.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-17

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The VECS, criteria/indicators identified must be specifically discussed in the assessment.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

Additional detail provided to discuss criteria which were considered in the comparative evaluation. For example the discussion of water discharge points in Section 3.53 has been broken down to detail environmental, technical, social and economic criteria.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-18

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The potential environmental and socio-economic effects of the alternative methods need to be described in greater detail, including by the different phases of the project.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

Additional detail on environmental and social criteria and potential effects has been added. The alternative methods were assessed using a bounding scenario approach. A bounding scenario approach considers the potential effects of a project component during each phase of the Project (i.e., construction, operations, closure and post-closure) and selects the phase which has the highest potential for effects as the basis for comparing the alternatives. The alternatives assessment therefore does not fully evaluate each project component during each phase of the Project, but instead selects the phase which represents the 'worst case' in terms of the selected evaluation criteria for comparison of the alternatives.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-19

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Describe how the bullets in section 3.3.3 relate to the alternatives assessment and selection of the preferred alternative method.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

The description of the International Cyanide Management Code has been removed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-20

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The Auxiliary Transmission line should be discussed in greater detail, include potential effects, with greater justification for why there are no alternatives. Discuss how this relates to the approved Terms of Reference.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

An initial screening of alternatives for the auxiliary line route found that only one route is feasible. The selected route for the auxiliary power line follows an existing right of way. The purpose of the auxiliary line is to bring power from the existing provincial grid to the new substation, in order to allow the instrumentation within the substation to operate.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-21

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For section 3.6.6 and 3.7.5 use a table to make the different advantages and disadvantages of the options clearer.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment TSD

Response

The Alternatives Assessment TSD has been revised to more clearly outline advantages and disadvantages of different alternatives.

Section 3.5.3 of the Alternatives TSD included a comparative evaluation of water discharge locations. This section and all comparative evaluations in the Alternatives Assessment TSD now include a table clearly comparing advantages and disadvantages of the different alternatives. The table created for water discharge locations is provided below.

Table 3-6: Comparative Evaluation of Feasible Alternatives for Water Discharge

POTENTIAL IMPACT	ALTERNATIVE			
	Alternative 1 - Underwater pipeline with discharge to Lynxhead Narrows	**Alternative 2 – Overland pipeline with discharge to Lynxhead Bay**	**Alternative 3 -Overland pipeline to the northwest with discharge into the central portion of Sawbill Bay**	**Alternative 4 - Overland pipeline to the south with discharge to the south end of Sawbill Bay**
Water Quality	Water quality expected to meet MMER. Potential to exceed provincial levels for copper and cyanide under some mixing conditions. Location offers best mixing conditions among alternatives.	Water quality expected to meet MMER. Potential to exceed provincial levels for copper and cyanide under some mixing conditions. Location offers very good mixing conditions.	Water quality expected to meet MMER. Potential to exceed provincial levels for copper and cyanide under some mixing conditions. Location offers poor mixing conditions and change in water quality is expected.	Water quality expected to meet MMER. Potential to exceed provincial levels for copper and cyanide under some mixing conditions. Location offers suitable mixing conditions.
Terrestrial Ecology	Negligible effect to terrestrial habitat.	Small loss of habitat due to construction of above ground pipeline	Minimal loss of terrestrial habitat.	Minimal loss of terrestrial habitat.
Aquatic Environment	Presence of spawning habitat	Presence of spawning habitat	No identified spawning habitat. Change in water quality may affect sensitive species.	No identified spawning habitat
Hydrology	Minimal increase in flows through channel	Minimal increase in flows through channel	Minimal increase in water levels.	Minimal increase in water levels.
Hydrogeology	Negligible effects	Negligible effects	Negligible effects	Negligible effects
Air Quality	Negligible effects	Negligible effects	Negligible effects	Negligible effects
Technical	Longest pipeline, Mitigation against freezing not required.	Risk of freezing presents challenges	Shortest pipeline Risk of freezing presents challenges	Risk of freezing presents challenges
Economic	Highest capital and operating costs due to length of pipeline. Mitigation against freezing not required. Reduced risk of costly maintenance due to freezing	High capital cost due to freezing mitigation (heat tracing/ insulation). Higher risk of costly maintenance issues due to freezing	Shortest pipeline. Lower capital and operating costs. Risk of costly maintenance issues due to risk of freezing	High capital cost due to freezing mitigation (heat tracing/ insulation). Higher risk of costly maintenance issues due to risk of freezing

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

POTENTIAL IMPACT	ALTERNATIVE			
	Alternative 1 - Underwater pipeline with discharge to Lynxhead Narrows	**Alternative 2 – Overland pipeline with discharge to Lynxhead Bay**	**Alternative 3 -Overland pipeline to the northwest with discharge into the central portion of Sawbill Bay**	**Alternative 4 - Overland pipeline to the south with discharge to the south end of Sawbill Bay**
Social	Perceived effect to fishing resource due to presence of spawning habitat.	Perceived effect to fishing resource due to presence of spawning habitat.	Potential effect to fishing resource due to changes in water quality.	No anticipated socio-economic effects.

Section 3.6.3 of the Alternatives TSD included a comparative evaluation of access road alternatives. This section and all Comparative Evaluations in the Alternatives TSD now include a table clearly comparing advantages and disadvantages of the different alternatives. The table created for water discharge locations is provided below.

Table 3-8: Comparative Evaluation of Feasible Alternatives for Access Road Alignment

POTENTIAL IMPACT	ALTERNATIVE	
	Alternative 1 – Hardtack/Sawbill Road	**Alternative 2 - Raft Lake Road**
Water Quality	Existing stream crossings will minimize in-stream works.	New stream crossings will need to be constructed increasing potential for elevated TSS.
Terrestrial Ecology	Minimal habitat loss due to existing road corridor.	Some terrestrial habitat loss due to clearing of currently undisturbed areas.
Aquatic Environment	Minor effects on aquatic habitat due to upgrade of existing stream crossings in some locations	New stream crossings will need to be constructed resulting in some loss of aquatic habitat in streams.
Hydrology	Temporary flow alterations during in-stream works.	Temporary flow alterations during in-stream works.
Hydrogeology	Minimal effects on groundwater quality and quantity.	Minimal effects on groundwater quality and quantity.
Air Quality	No effect on air quality.	No effect on air quality.
Social	Improved access to recreational areas Potential increased hunting and fishing pressures Economic benefits to local contractors	Increased access to recreational areas Potential increased hunting and fishing pressures Economic benefits to local contractors
Technical	Involves widening an existing roadway	Involves constructing new roadway as well as new water crossings, including the potential need for a new bridge.
Economics	Lower cost from upgrading and widening an existing roadway.	Higher costs as a result of constructing new roadway and the potential construction of a bridge.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-22

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Make it more clear in section 3.8 what are the alternative methods that are to be assessed, and why the others have no alternatives.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

This Section has been revised. Office and Support Facilities infrastructure locations were selected to minimize the footprint and to be located close to the pit/processing plant. A comparative evaluation of locations was not undertaken, except for the accommodation camp. The accommodation camp has now been updated to be its own section.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-23

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Section 3.8.1 as previously noted this section needs greater discussion for the justification of its inclusion, and reaction from stakeholders to date. Include more information on the different incentives options.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

Osisko had initially ruled out an accommodation camp within the Project Site as the Town of Atikokan and surrounding communities favoured off-site accommodations for socio-economic benefits associated with increased populations in town. However, as the Project has continued to develop, issues with off-site accommodation have been brought to the attention of OHRG and additional benefits for on-site accommodation have been identified. Therefore, both options of an on-site accommodation camp and off-site accommodation are being re-considered and evaluated. Some of the considerations for including an on site workers accommodation camp is that Aboriginal communities are interested in working at the Site, however it is over 2 hours from the closest First Nations community. The baseline socio-economic study showed that the demographics of the Town can't supply the necessary workforce. Other mines in Canada offer on-site accommodations with a shift rotation (commonly referred to as “fly in/fly out” operations) and Osisko must remain competitive to attract a skilled labour force. Although the Project will include an on-site accommodation camp, Osisko will provide incentives for workers to live in Town. The details of these incentives will be further informed through the Atikokan/Osisko committee.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-24

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Table 3-10, given the concerns raised by the MNR with respect to fishing and hunting, there are potential impacts to the environment. Additionally this point is made in the text of 3.8.1.3.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

Table 3-10 has been renumbered, and is now Table 3-11 in Version 2 of the Alternatives Assessment Report.

The screening question has been revised to ask "Can the alternative be carried out without significant effects to important environmental features?" Although there is a potential for the workers camp to affect the environment, the mitigation measures will allow an on-site accommodation camp to be built without significant effects.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-25

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Section 3.8.1.3, more discussion around the preference of the town of Atikokan and the MNO for the workers to be house in town should be discussed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response (same as EAB-26)

The Alternatives Assessment Report has been revised to include a more detailed discussion around worker accommodation, as follows.

Two alternatives for worker accommodation were considered in a comparative evaluation. The first alternative is an on-site accommodation camp located adjacent to the existing exploration camp. The second alternative is off site accommodation in the Town of Atikokan, where employees will commute to work on a daily basis. There are several advantages and disadvantages associated with on-site and off-site worker accommodation alternatives.

Environmental Criteria

Project-environment interactions resulting from off-site accommodations are minimal. No interactions are anticipated with water quality, terrestrial ecology, aquatic ecology, hydrology or hydrogeology. Some potential interactions are possible with air quality, due to increased traffic on the access road from daily worker commuting. Negligible effects to the environment would occur as a result of off-site accommodations.

Some project-environment interactions are associated with the construction of a 1,200 person accommodation camp on-site. Domestic waste water discharge volumes will increase, and an additional discharge point will be included in the Project design near to the accommodation camp. The effects to water quality are anticipated to be negligible because waste water will be treated prior to discharge. An on-site accommodation camp will result in wildlife disturbance due to the increased presence of humans, and minor habitat loss associated with an increased Project footprint. Effects to aquatic ecology are not anticipated since camp construction will include a buffer zone from the Marmion Reservoir and wastewater will be treated prior to discharge. There will be a potential for interaction with flow patterns and water levels due to water withdrawals for accommodation camp use, however the effects are anticipated to be negligible. No interaction with groundwater quality or quantity or air quality is anticipated.

Social Criteria

Several Project interactions with the social environment are anticipated as a result of an off-site accommodation alternative. Throughout consultation activities, OHRG learned that the Town of Atikokan preferred an off-site accommodation alternative and perceived this alternative to be a direct source of benefits to the Town. The following discussion summarizes some of the key points OHRG learned throughout consultation with the Town.

An off-site accommodation alternative would result in an increased local population. Population decline has been a challenge to the Town of Atikokan due to loss of municipal tax base and the Town's ability to maintain services. Increased local population would result in a diversified economy, stimulation of local markets and increased local incomes.

Some concern has also been expressed with regards to the potential change in community character, increased traffic volumes, and the strain on municipal services and infrastructure that could result from rapid population growth. An off-site accommodation alternative is not anticipated to interact with cultural heritage or land and resource use.

The on-site worker accommodation alternative would also result in interactions with the social environment. Local population growth would not be as pronounced; therefore some economic benefits may also be less immediate. The municipal tax base may not increase as quickly as it would with an off-site accommodation alternative, however the strain on municipal services would also be less. The on-site accommodation alternative would limit the increase in traffic volumes in Town and on the Project access road.

No effect on cultural heritage is anticipated as the site has been surveyed for archaeological potential and identified as being low. A stronger interaction with land and resource use would result from the on-site accommodation alternative, since the camp would increase the Project footprint, and the potential for workers to take part in fishing and hunting would be increased.

Technical Criteria

An off-site accommodation alternative has several technical challenges. As discussed in the meetings held with the Town of Atikokan, government regulators and Aboriginal communities, the socio-economic baseline studies undertaken for the Project indicated that staffing the project from the Town was not possible due to the volume and education levels of the available labour force. Accommodation in Town would be a distance of approximately 40 km from the Mine representing a commute time of 30-60 minutes. Additionally, Aboriginal communities are located more than two hours away from the site, and daily commuting was determined to be impractical.

The on-site accommodation alternative has several technical requirements that were considered. The land base was identified as being available at the current location of the exploration camp, approximately 1 km from the mine site. Additional requirements include potable water and sewage treatment facilities which were deemed feasible at site.

Economic Criteria

The capital and operating cost for an off-site accommodation option are lower for OHRG. The Town of Atikokan perceives that the economic benefits to them would be increased should an off-site accommodation alternative be selected, through the increased municipal tax base associated with population growth.

An on-site accommodation alternative would have a higher cost to OHRG due to the construction of accommodation, potable water treatment and sewage treatment facility.

Conclusion

Based on the comparative evaluation, specifically the technical challenges, Alternative 1, on-site worker accommodation camp, was selected as the preferred alternative. This alternative enhances the ability to attract and provide for skilled workers from areas beyond the LSA by offering flexible living arrangements, which is a key success factor for the Project.

Importantly, the selection of Alternative 1 does not preclude the ability for individual workers to live in and commute from Atikokan. As part of OHRG's commitment to enhancing community benefits from the Project, we have committed to working with the Town to encourage workers to live in Town. Alternative 1 provides opportunities for both workers wishing to live in Town, commuting daily by bus or personal vehicle, and workers preferring a shift rotation, allowing them to reside in the RSA or elsewhere in Canada.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-26

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Table 3-11, more acknowledgement of the comparative negatives to the Town of Atikokan for housing workers on site needs to be included.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response (same as EAB-25)

The Alternatives Assessment Report has been revised to include a more detailed discussion around worker accommodation, as follows.

Two alternatives for worker accommodation were considered in a comparative evaluation. The first alternative is an on-site accommodation camp located adjacent to the existing exploration camp. The second alternative is off-site accommodation in the Town of Atikokan, where employees will commute to work on a daily basis. There are several advantages and disadvantages associated with on-site and off-site worker accommodation alternatives.

Environmental Criteria

Project-environment interactions resulting from off-site accommodations are minimal. No interactions are anticipated with water quality, terrestrial ecology, aquatic ecology, hydrology or hydrogeology. Some potential interactions are possible with air quality, due to increased traffic on the access road from daily worker commuting. Negligible effects to the environment would occur as a result of off-site accommodations.

Some project-environment interactions are associated with the construction of a 1,200 person accommodation camp on site. Domestic wastewater discharge volumes will increase, and an additional discharge point will be included in the Project design near the accommodation camp. The effects to water quality are anticipated to be negligible because wastewater will be treated prior to discharge. An on-site accommodation camp will result in wildlife disturbance due to the increased presence of humans, and minor habitat loss associated with an increased Project footprint. Effects to aquatic ecology are not anticipated since camp construction will include a buffer zone from the Marmion Reservoir and wastewater will be treated prior to discharge. There will be a potential for interaction with flow patterns and water levels due to water withdrawals for accommodation camp use, however the effects are anticipated to be negligible. No interaction with groundwater quality or quantity or air quality is anticipated.

Social Criteria

Several Project interactions with the social environment are anticipated as a result of an off-site accommodation alternative. Throughout consultation activities, OHRG learned that the Town of Atikokan preferred an off-site accommodation alternative and perceived this alternative to be a direct source of benefits to the Town. The following discussion summarizes some of the key points OHRG learned throughout consultation with the Town.

An off-site accommodation alternative would result in an increased local population. Population decline has been a challenge to the Town of Atikokan due to loss of municipal tax base and the Town's ability to maintain services. Increased local population would result in a diversified economy, stimulation of local markets and increased local incomes.

Some concern has also been expressed with regards to the potential change in community character, increased traffic volumes, and the strain on municipal services and infrastructure that could result from rapid population growth. An off-site accommodation alternative is not anticipated to interact with cultural heritage or land and resource use.

The on-site worker accommodation alternative would also result in interactions with the social environment. Local population growth would not be as pronounced; therefore some economic benefits may also be less immediate. The municipal tax base may not increase as quickly as it would with an off-site accommodation alternative; however the strain on municipal services would also be less. The on-site accommodation alternative would limit the increase in traffic volumes in Town and on the Project access road.

No effect on cultural heritage is anticipated as the site has been surveyed for archaeological potential and identified as being low. A stronger interaction with land and resource use would result from the on-site accommodation alternative, since the camp would increase the Project footprint, and the potential for workers to take part in fishing and hunting would be increased.

Technical Criteria

An off-site accommodation alternative has several technical challenges. As discussed in the meetings held with the Town of Atikokan, government regulators and Aboriginal communities, the socio-economic baseline studies undertaken for the Project indicated that staffing the project from the Town was not possible due to the volume and education levels of the available labour force. Accommodation in Town would be a distance of approximately 40 km from the Mine representing a commute time of 30-60 minutes. Additionally, Aboriginal communities are located more than two hours away from the site, and daily commuting was determined to be impractical.

The on-site accommodation alternative has several technical requirements that were considered. The land base was identified as being available at the current location of the exploration camp, approximately 1 km from the mine site. Additional requirements include potable water and sewage treatment facilities which were deemed feasible at site.

Economic Criteria

The capital and operating cost for an off-site accommodation option are lower for OHRG. The Town of Atikokan perceives that the economic benefits to them would be increased should an off-site accommodation alternative be selected, through the increased municipal tax base associated with population growth.

An on-site accommodation alternative would have a higher cost to OHRG due to the construction of accommodation, potable water treatment and sewage treatment facility.

Conclusion

Based on the comparative evaluation, specifically the technical challenges, Alternative 1, on site worker accommodation camp, was selected as the preferred alternative. This alternative enhances the ability to attract and provide for skilled workers from areas beyond the LSA by offering flexible living arrangements, which is a key success factor for the Project.

Importantly, the selection of Alternative 1 does not preclude the ability for individual workers to live in and commute from Atikokan. As part of OHRG's commitment to enhancing community benefits from the Project, we have committed to working with the Town to encourage workers to live in Town. Alternative 1 provides opportunities for both workers wishing to live in Town, commuting daily by bus or personal vehicle, and workers preferring a shift rotation, allowing them to reside in the RSA or elsewhere in Canada.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-27

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Section 3.8.1.4 needs greater discussion.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Alternatives Assessment Report

Response

An on-site accommodation camp is the preferred alternative. Offering on-site accommodation is key to the successful recruitment of skilled workers. It will also improve worker safety by reducing the potential for traffic accidents involving OHRG staff through reducing the number of vehicle trips on the access road (Hardtack/Sawbill). Some of the deciding factors included the fact that Aboriginal communities are interested in working on the Project, however the site is over 2 hours away from the closest First Nations community; the socio-economic baseline study has shown that the demographics of the Town can't supply the necessary workforce; Housing availability in Town is not able to accommodate an increased population of 1,200 workers, the 2006 occupancy rate for private dwellings in Atikokan was 92.4%, representing 108 unoccupied dwellings; Other regional mines provide a fly in/fly out option and Osisko needs to be competitive to attract the skilled workforce. Although Osisko will construct an on site camp, workers will still be encouraged to consider living in Town. Osisko is committed to providing incentives for workers to live in Town, the details of which will be further informed through the Atikokan/Osisko committee.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-28

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Section 4.0 - Must also discuss the methodology for assessment that includes a discussion of the advantages/disadvantages based on all phases of the project comparing the VECs (criteria and indicators) for the environmental and socio-economic assessments.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 4

Response

Detailed alternatives assessment is provided in the Alternatives Assessment TSD, and summarized in Chapter 4 of the EIS/EA Report. The Alternatives Assessment TSD is the only TSD that was re-issued between the Draft and Final EIS/EA Report, because it included substantial changes for clarity and additional details required in response to government review team comments. With regards to the specific comment provided above, the responses are outlined as follows:

Include methodology for alternatives assessment

Section 2 of the Alternatives Assessment TSD outlines the methods used for alternatives assessment.

The approach to assess the alternative means of carrying out the Project consisted of the following steps:

1) List potentially available alternatives.
2) Screen potentially available alternatives against selected criteria to determine feasible alternatives.
3) If more than one alternative is deemed feasible, the feasible alternatives are advanced for comparative evaluation.
4) Select the preferred alternative.

Discuss the advantages/disadvantages of each alternative

Advantages and disadvantages are outlined for each alternative that underwent a comparative analysis. Advantages and disadvantages of each alternative is discussed and then summarized in table form. An example of this comparison is provided below for worker accommodation.

Environmental Criteria

Project-environment interactions resulting from off-site accommodations are minimal. No interactions are anticipated with water quality, terrestrial ecology, aquatic ecology, hydrology or hydrogeology. Some potential interactions are possible with air quality, due to increased traffic on the access road from daily worker commuting. Negligible effects to the environment would occur as a result of off-site accommodations.

Some project-environment interactions are associated with the construction of a 1,200 person accommodation camp on site. Domestic wastewater discharge volumes will increase, and an additional discharge point will be included in the Project design near the accommodation camp. The effects to water quality are anticipated to be negligible because wastewater will be treated prior to discharge. An on-site accommodation camp will result in wildlife disturbance due to the increased presence of humans, and minor habitat loss associated with an increased Project footprint. Effects to aquatic ecology are not anticipated since camp construction will include a buffer zone from the Marmion Reservoir and wastewater will be treated prior to discharge. There will be a potential for interaction with flow patterns and water levels due to water withdrawals for accommodation camp use, however the effects are anticipated to be negligible. No interaction with groundwater quality or quantity or air quality is anticipated.

Social Criteria

Several Project interactions with the social environment are anticipated as a result of an off-site accommodation alterative. Throughout consultation activities, OHRG learned that the Town of Atikokan preferred an off-site accommodation alternative and perceived this alternative to be a direct source of benefits to the Town. The following discussion summarizes some of the key points OHRG learned throughout consultation with the Town.

An off-site accommodation alternative would result in an increased local population. Population decline has been a challenge to the Town of Atikokan due to loss of municipal tax base and the Town's ability to maintain services. Increased local population would result in a diversified economy, stimulation of local markets and increased local incomes.

Some concern has also been expressed with regards to the potential change in community character, increased traffic volumes, and the strain on municipal services and infrastructure that could result from rapid population growth. An off-site accommodation alternative is not anticipated to interact with cultural heritage or land and resource use.

The on-site worker accommodation alternative would also result in interactions with the social environment. Local population growth would not be as pronounced; therefore some economic benefits may also be less immediate. The municipal tax base may not increase as quickly as it would with an off-site accommodation alternative; however the strain on municipal services would also be less. The on-site accommodation alternative would limit the increase in traffic volumes in Town and on the Project access road.

No effect on cultural heritage is anticipated as the site has been surveyed for archaeological potential and identified as being low. A stronger interaction with land and resource use would result from the on-site accommodation alternative, since the camp would increase the Project footprint. The potential for workers to increase fishing and hunting pressure would be mitigated through a restricted fishing and hunting policy imposed on all staff residing at the camp.

The Town of Atikokan and surrounding communities favour off-site accommodation as the local economy benefits from increased population. The economy is enhanced by stimulating local markets and boosting incomes. On the other hand, commuting time may be considered a drawback to potential employees.

In the Town of Atikokan, housing availability currently may not meet demand once mine construction and operation commences, and construction of additional housing may be necessary. As the Project has continued to develop it has become apparent that a portion of the skilled workers hired may be recruited from various regions across Canada. Atikokan and neighbouring towns have small populations and therefore, a small pool of employee candidates to draw from. In addition, many of the skilled worker positions required to be filled are in very high demand as a result of the number of mines being developed in Northern Ontario. Offering the flexibility for workers to continue to live in their existing communities and commuting to the Mine will help attract local skilled workers. Lastly, paid food and accommodation is a benefit to young workers. Another advantage related to the on-site accommodation camp is reduced likelihood of traffic accidents involving Project staff due to the fact that the number of vehicle trips on the access road (Hardtack/Sawbill), particularly in the winter, will be decreased.

Technical Criteria

An off-site accommodation alternative has several technical challenges. As discussed in the meetings held with the Town of Atikokan, government regulators and Aboriginal communities, the socio-economic baseline studies undertaken for the Project indicated that staffing the project from the Town was not possible due to the volume and education levels of the available labour force. Accommodation in Town would be a distance of approximately 40 km from the Mine representing a commute time of 30-60 minutes. Additionally, Aboriginal communities are located more than two hours away from the site, and daily commuting was determined to be impractical.

The on-site accommodation alternative has several technical requirements that were considered. The land base was identified as being available at the current location of the exploration camp, approximately 1 km from the mine site. Additional requirements include potable water and sewage treatment facilities which were deemed feasible at site.

Economic Criteria

The capital and operating cost for an off-site accommodation option are lower for OHRG. The Town of Atikokan perceives that the economic benefits to them would be increased should an off-site accommodation alternative be selected, through the increased municipal tax base associated with population growth. An on-site accommodation alternative would have a higher cost to OHRG due to the construction of accommodation, potable water treatment and sewage treatment facility.

Table 3-12 below outlines and compares the two alternatives based on considerations associated with the environment, socio-economic impacts, constructability, and economics.

Table 3-12: Comparative Evaluation of Feasible Alternatives for Worker Accommodation

POTENTIAL IMPACT	ALTERNATIVE	
	Alternative 1 – On-Site Accommodation Camp	**Alternative 2 – Off-Site Accommodation Camp**
Water Quality	Increased potential to affect water quality through additional water discharge. Domestic waste water will be treated.	No effect on water quality.
Terrestrial Ecology	Loss of additional habitat on site. Wildlife avoidance due to human disturbance.	No additional loss of habitat.
Aquatic Ecology	No effect on aquatic species due to treatment of domestic waste water discharged from the camp.	No effect on aquatic habitat.
Hydrology	Negligible change in flows and water levels due to water withdrawals for accommodation camp use.	No change in surface water flows.
Hydrogeology	No anticipated changes to groundwater quality or quantity.	No change in groundwater quality or quantity.
Air Quality	No interaction with air quality.	Potential change to air quality due to increased daily working commuting.
Social	Less pronounced population growth or municipal tax base increase than off site alternative.	Increased traffic from workers commuting to site. Increased demand on municipal services and infrastructure from increased population in Town. Potential change to community character due to periodic presence of workers in Town.
Technical	Land available approximately 1 km from Site. Sewage treatment facility required.	Ability to staff the Project without offering accommodation and meals is questionable. Long commuting times for Aboriginal community members would require accommodation options closer to Site.
Economic	Capital and operating cost are higher	Capital cost and operating cost are lower More economic benefits for Town through increased property taxes and population growth

Consider all phases of the Project

The alternatives assessment is carried out using a bounding scenario approach. A bounding scenario approach considers the potential effects of a project component during each phase of the Project (i.e., construction, operations, closure and post-closure) and selects the phase which has the highest potential for effects as the basis for comparing the alternatives. The alternatives assessment therefore does not fully evaluate each project component during each phase of the Project, but instead selects the phase which represents the 'worst case' in terms of the selected evaluation criteria for comparison of the alternatives.

Compare potential effects to VECs that could result from the selection of different alternatives

The comparative analysis used environmental, technical, economic and social criteria directly tied to the Valued Ecosystem Components selected for the environmental assessment, as shown below.

Environmental Criteria

The following sub-indicators were considered in the evaluation of potential environmental effects:

- **Water Quality**: Potential effects on surface water quality.
- **Terrestrial Ecology**: Potential loss of wetlands, forest cover and terrestrial habitat for species at risk, furbearers, upland breeding birds, moose and wild rice.
- **Aquatic Biology**: Potential loss of aquatic habitat in Upper Marmion Reservoir, Lizard Lake and other fish bearing water bodies. Species considered include Walleye, Smallmouth Bass, Northern Pike and small bodied forage fish.
- **Hydrology**: Potential changes in surface water flows and levels and effects on surface water navigability.
- **Hydrogeology**: Potential effects on groundwater levels and water quality.
- **Air quality**: Potential changes in ambient air quality due to emissions from stationary and mobile equipment and the ore processing facility.

Technical Criteria

The technical evaluation considered constructability, operability, construction risk and closure.

Economic Criteria

The economic evaluation considered total project costs including capital costs, operating cost and closure costs.

Social Criteria

The social evaluation considered cultural heritage, services and infrastructure, land use, local resources and potential benefits to the local population and economy.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-29

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Ensure that all requirements outlined in the ToR are included. More information on timelines is needed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 5

Response

With respect to the Project Description, the Terms of Reference states: A more detailed description of each phase in the Project life cycle will be included in the EA Report. The description is included in Chapter 5, including a Project schedule. As summarized in Section 1.5, the Project schedule will include four phases: construction (2.5 years), operations (11 years); closure (2 years) and post closure (10 years). Post closure is expected to last 10 years; however it will be influenced by the duration of pit flooding (approximately 218 years). Figure 1.4 provides a simplified Project schedule.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-30

Source: Ministry of Environment; Environmental Approvals Board

Summary of Comment

A formatting point: As an example in 5.1.3 some of the bullets should be further indented to indicate they are sub-bullets. This would add to clarity. Other bullet lists have a similar issue.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 5

Response

Formatting has been corrected in Chapter 5.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-31

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

This section states that "minor changes in the mine plan may result from updated resource modelling…" provide examples of some types of minor changes.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 5.2.1.1

Response

The mine plan and pit design presented in the EIS/EA Report is based on the best available information. The understanding of the ore deposit and the subsurface conditions will continue to evolve as future investigations are completed to support the feasibility study and detailed design/execution plan. An improved understanding may allow for refinement of the mine plan and/or pit design based on economic and safety considerations. Modifications could include minor changes to the pit configuration (e.g., pit slopes and limits), the mining sequence and the mining rates.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-32

Source: Ministry of Environment; Environmental Approvals Board

Summary of Comment

The worker camp options are not described in enough detail. Discuss the incentives program to have workers live in Atikokan. Discuss also the negative impacts to workers living on site.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

4-19

Response

The worker incentives have not been determined at this time. Incentives could include moving allowances, housing allowances or spousal hiring programs. The incentives will be defined through discussions with the Atikokan/OHRG Committee. Negative impacts to workers living on site could include increased demand on municipal services and infrastructure and a potential change to community character due to periodic presence of workers in Town.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-33

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Ensure that, as required by section 7.2.1 of the approved ToR that the socio-economic summary discussion in the EA includes consideration of potential effects during the construction, operation and closure stages of the Project.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Section 6.3 is the Socio-Economic Effects Assessment. The potential socio-economic effects are assessed for each phase of the Project. Section 6.3.1.2 provides an effects assessment of the construction phase, Section 6.3.1.3 provides an effects assessment of the operations phase, and Section 6.3.1.4 provides an effects assessment of the closure and post-closure phase.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-34

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

More justification is required for all of the environmental components including greater consistency for the assessment and level of details given. All environmental components need a discussion of all of the study areas, and effects for each phase of the project with associated mitigation measures. The bounding rationale has not been adequately justified.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

The effects assessment is carried out based on the concept of a bounding scenario. A bounding scenario evaluates the potential effects of an activity for each of the four phases of the Project and selects the phase which has the highest potential to result in effects as the bounding scenario. An evaluation of the potential effects of a bounding scenario also captures the potential effects of different phases or scenarios, since they are less and are fully considered within the larger or bounding scenario. Through the use of a bounding scenario the effects assessment therefore incorporates an evaluation of each activity for each phase of the Project, since the effects in each project phase would be similar to, or less than the effects predicted for the bounding scenario.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-35

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For example, while there may be more severe environmental impacts from one phase of the project, it does not follow that the environmental impacts from another phase of the project are insignificant and therefore not requiring mitigation measures. Mitigation and discussion of effects is required for all phases in more detail.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Tables 6-55 to 6-57 include effects and mitigation measures for each project phase by activity.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-36

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

To accompany this, a continuation of the discussion of the identified VECs (criteria/indicators) is needed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Each component carried out an assessment based on VECs. For example, the terrestrial component selected wetlands as a VEC. Potential impacts to wetlands are discussed in Section 6.2.1.1 using the three indicators identified in Chapter 2: Extent of wetland habitat; Composition/diversity of wetland plant communities; and Hydrological function.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-37

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

There must also be a clear discussion of the net effects post closure. There needs to be a detailed discussion of what the environment will be like after post-closure.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

The net effects post-closure have been described in Chapter 6 of the EIS. Post-closure assessment has been included in each of the sections discussing the effects of the project for each technical discipline. These included changes in stream flows and lake levels, changes in water quality including when the open pits overflow, the changes to the terrestrial environment, and the changes to the aquatic environment. The assessment showed that in post-closure:

- Site drainage would be restored to the extent feasible given that some alterations in drainage will be permanent;
- Lake levels would return to near pre-development levels, since there would be no further water taking, and drainage to Lazard Lake and Upper Marmion Reservoir would be restored:
- Effects on water quality would be negligible when drainage is restored and the pit overflows;
- Terrestrial areas previously disturbed will be restored where feasible, and larger areas such as the TMF will be fertilized and seeded while waste rock piles will be left to revegetate naturally; and
- Aquatic habitats not permanently affected will return to near pre-development conditions as drainage is restored.

INFORMATION REQUEST – EAB-38

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

There must also be a consistent discussion of methods for each environmental component. While this information is described in more detail in each of the TSDs, a summary is still required in the EA/EIS.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Methods are provided in Chapter 2, which gives an overall assessment approach, details assessment criteria for each component and provides assessment methodology by component.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-39

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For each environmental component, for each phase of the project, it must be clear what the impacts will be by project activity as some components will be impacted by more than one project activity. These must be clearly described to justify bounding and describe mitigation measure by phase.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Tables 6-51 to 6-53 include effects and mitigation measures for each project phase by activity. Although each Project activity for each phase is presented in summary form in Tables 6-49 and 6-50, the terrestrial effects assessment considers the construction and operations phases together, since the removal of habitat and alteration of drainage during construction will not be reversed until the closure phase when site decommissioning commences. Effects to terrestrial biology during the construction and operation phases are assumed to be similar.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-40

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For all assessments, methodology and assumptions must be described for clarity.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6

Response

Methods are provided in Chapter 2, which provides a list of criteria for each component and the assessment measures applied by component. Detailed assumptions are provided in each TSD, and general assumptions are also provided in Chapter 6. For example, atmospheric modelling assumptions are detailed in Section 6.1.2.1.1 which details modelling results.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-41

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For the section heading 'Soil Quality/Capability', it is not clear which phases of the project are being discussed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.1.1.1.1

Response

The terrain and soils section including Section 6.1.1.1.1 evaluates the construction, operations and closure/post-closure phases of the project and provides an overall description of potential for terrain and soils alteration.

To clarify, areas such as the open pit, waste rock piles, and tailings are expected to have long term changes to terrain and soils throughout construction, operations and closure/post closure whereas site facilities and road would be expected to have short to moderate term impacts, primarily during construction and operations, since at closure, in these areas, terrain will be reclaimed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-42

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

There is discussion of 'changes can be minimized' - change to 'will' and describe in more detail what these mitigation measures are.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.1.1.1.1

Response

It is important to realize that the current site layout is very compact relative to other mine layouts and that many measures (such as the location of the waste piles, ore stockpiles and processing plant) have been selected to reduce potential habitat and terrain alteration by focusing the development on the peninsula to the extent practical. This also reduces haul distances, resulting in less road requirements, lower potential for spillage and less use of fossil fuels which helps reduce project impacts. It is also important to understand that construction and operation of a mine site requires use of the land within the project footprint.

Some actions that will be used to reduce, change and mitigate disturbance are to:

- At detailed design, continue to plan land use within as small a footprint as reasonably possible;
- Rehabilitate the mill footprint and roads at closure as described in the closure plan; and
- Stockpile overburden separately from the waste rock so that it will be available to assist in rehabilitation measures as described in the closure plan.

Other specific measures used in closure and reclamation are provided in the Conceptual Closure and Rehabilitation Plan as attached to the EIS/EA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-43

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

For the section heading 'Restoration of Soil Quality during Reclamation' give a sense of how much this will help and what the end result will be. Change 'should be completed prior to implementation' to 'will be'.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.1.1.1.1

Response

More detail on the restoration of soils is given in the Conceptual Closure and Reclamation Plan (CCRP) document.

The largest single area of soil reclamation will be about 675 ha of unflooded tailings surface in the Tailings Management Facility (TMF). As described in the CCRP, the tailings surface will be directly re-vegetated by placing organic mulch, fertilizer and seeding. Considering the benign chemistry of the existing tailings, and in consideration of other successful revegetation efforts on closed tailings facilities, direct revegetation is considered feasible, practical and achievable at this site. Within 1 to 2 years after closure, the TMF area will be capable of supporting a sustainable herbaceous cover. Over time trees are expected to overgrow the area and, in the long term, a layer of topsoil will develop. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years.

Natural revegetation and overgrowth by trees is also expected to occur over the following areas: the residual overburden stockpile area, processing plant site, shop areas, camp site, laydown areas and former roadways. Topsoil will develop in the long term in these areas as well. The waste rock areas are expected to be physically and chemically stable and will not be revegetated, thus will constitute a long term change. Some soils will also be permanently lost in the open pit areas as they will be filled with water.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-44

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Not clear what phases of the project is being discussed in this section.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.1.3.1.2

Response

The operations phase was considered the bounding scenario for changes in streamflows. Clarification as to this fact was added to Section 6.1.3.1.2.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-45

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

As discussed above in general terms, the following sentence needs to be backed up with more details of the activities by phase and their impacts and mitigation measures to justify the bounding: "Based on a review of the anticipated activities performed in each phase the greatest potential for water quality effects occurs during the operations phase."

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.1.5

Response

Added the following details to Section 6.1.5: The changes in water quantity and quality that may occur during the Construction Phase will be associated with development of infrastructure. These changes, if any, will be minor and encompassed by changes expected during operations.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-46

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

A summary of the conceptual compensation plan provided in the Aquatic Environment TSD should also be summarized in the EA.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.2.2.1.1

Response

A summary of the No Net Loss Plan is provided in Chapter 8, Section 8.2.3.2.1

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-47

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

This table (and those similar) need to be significantly restructured to create a logical flow. Particularly confusing is how some components have a stated effect that is "irreversible" and a significance of "no residual impact".

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Table 6-49

Response

Table has been revised. It has been renumbered as Table 6-55 in the Final EIS/EA Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-48

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Not clear what the effect is and VEC criteria and indicators should be used.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Table 6-49

Response

Through further discussions with the MOE, Environmental Approvals Branch and the Canadian Environmental Assessment Agency, the Impact Assessment Matrix tables have been moved to the *Section 6.4 Residual Effects Assessment* and revised for clarity. They now appear as Tables 6-55, 6-56 and 6-57. The new tables directly reflect the requests put forward by regulators in our discussions and outline the predicted residual effects, planned mitigation measures and significance of residual effect for each VEC by activity. The following example is provided for the VEC Air Quality during the Site Preparation activity. Each identified mitigation measure is more fully detailed in Chapter 6, *Section 6.1.5 Summary of Mitigation for the Physical Environment, Section 6.2.4 Summary of Mitigation for the Biological Environment* and *Section 6.3.6 Summary of Mitigation for the Social Environment*.

Activity	VEC Affected	Potential Effect	Proposed Mitigation	Residual Effect	Predicted Degree of Impact after Mitigation	Significance of Residual Effect
Site Preparation (clearing and grubbing, site levelling, etc.)	Air quality	Dust and emissions from equipment	Emissions controls are inherent in Project design.	No predicted effects on human health or terrestrial life for most receptors Predicted risks to some human receptors close to site.	**Extent**: Can extend into Local Study Area **Duration**: Confined to initial stages of construction phase **Frequency:** Continuous activity during construction **Reversibility:** Immediately reversible upon cessation of activities **Magnitude**: Low: Effects are considered within bounding estimates of emissions and meet provincial regulations.	**Low:** no impacts predicted for human health or ecological receptors.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-49

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Significance is not the same as residual impact and these concepts should be separated.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Table 6-49

Response

Table has been revised.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-50

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

A more detailed discussion is needed to assess the impact to Aboriginal and treaty rights. See the approved ToR for the requirements with respect to this issue.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.3.3 and 7

Response

The following is a summary of how the EIS/EA Report meets the Terms of Reference requirements for assessing Aboriginal and treaty rights, incorporating traditional land use information, and considering input from Aboriginal communities whose rights could be affected by the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

TOR Requirement	Section	Response
Seek traditional land use information from potentially affected Aboriginal communities	Aboriginal TSD Section 6.1.3 Traditional Use Study Design Section 6.3.3 Traditional Land Use Valued Ecosystem Component	In the summer and fall of 2012 OHRG conducted a series of Elders workshops to better understand traditional land use in the Project area. The workshops determined that First Nations participate in a variety of land use activities including hunting, trapping, fishing, plant harvesting, and collection of natural items. Individual interviews with trapline holders and wild rice harvesters added information from Aboriginal community members on specific traditional land use information. Community surveys were completed during community open house visits to verify information collected during the Elder forums and individual interviews.
Incorporate information about traditional use into the EA Report	Aboriginal TSD Section 6.3.3 Traditional Land Use Valued Ecosystem Component	Traditional knowledge has been incorporated into the environmental assessment through the provision of capacity for traditional protocols during the consultation process and the consideration of information provided into the Project design. OHRG has routinely followed advice provided by elders to include drumming and dancing in Project meetings. Information provided by First Nations and Metis have allowed OHRG to avoid placing infrastructure in areas that are recognized as being special or sacred sites. The effluent treatment plant discharge location and tailings management facility location have both been adjusted to minimize potential impacts to areas with environmental value as identified by Aboriginal communities. OHRG also plans to use traditional knowledge to inform the development of appropriate fish relocation plan for Mitta Lake and other fish-bearing water bodies that will be affected by the Project.
Incorporate information about Aboriginal and treaty rights into the EA Report	Aboriginal TSD Section 6.2.1 Aboriginal and Treaty Rights EIS/EA Report Chapter 7	Identified Aboriginal rights in the Project area are summarized below. Aboriginal rights for the Project area were defined through assertion by First Nations, a Traditional Use Study (TUS) carried out for the Project, and ongoing engagement with First Nations communities. The methods for the TUS are provided in the Aboriginal Interests TSD. Aboriginal people have historically used the Treaty 3 lands for hunting, trapping, fishing, plant gathering. Plants were historically important for medicine. Water ways were historically used for navigation. Water was also used for drinking, cleaning and washing. Country foods are historically important to Aboriginal people, including berries, meat and fish. The traditional language spoken by the Aboriginal people in the Treaty 3 area is Ojibway.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

TOR Requirement	Section	Response
	Section 7.3.2 Aboriginal and Treaty Rights Section 7.3.2.3 Metis Rights	Maintaining language is important to the maintenance of a culture. Aboriginal people in the area continue to practice traditional ceremonies that are often tied to the seasons and include praying, singing, dancing, drumming and use of plants for spiritual purposes. Practicing spiritual beliefs at special sites also occurs in the Treaty 3 lands. Métis communities also assert Aboriginal rights in the area of the Project. The Métis community asserts and exercises aboriginal rights throughout its territory, including: ▪ Hunting, fishing (food and commercial). ▪ Trapping (food and commercial). ▪ Gathering, sugaring, wood harvesting. ▪ Use of sacred and communal sites. ▪ Use of water.
Provide identified Aboriginal communities a sufficient opportunity to understand the Project and express any concerns	EIS/EA Report Chapter 7 Section 7.3.3 Engagement Activities Appendix 7.I Community News Briefs Appendix 7.V Record of Consultation - Aboriginal	An extensive engagement program with Aboriginal communities and people was undertaken as part of the EA studies. The results from this engagement provided valuable background and local cultural and environmental information for the assessment. Most importantly, it allowed OHRG to hear and understand Aboriginal issues and concerns. Records of communication, including correspondence, meetings notes, workshops, site visits and telephone calls were reviewed. It is noted that in January 2013 the Chief of LDMLFN (the closest First Nations reserve land to the Project site) sent a letter to the Canadian Environmental Assessment Agency, Ministry of the Environment and Ministry of Northern Development and Mines stating that OHRG had provided clear and ongoing communications regarding the Project. On February 13, 2013 OHRG received a letter of support from the Fort Frances Chiefs Secretariat (FFCS). The letter stated that the FFCS have been engaged consistently over a period of two years and that OHRG has made efforts to include youth and Elders in the consultation activities. The completion of six Committee Meetings with the Metis Nation of Ontario in November 2012 also formally signalled fulfilment of meaningful consultation on the

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

TOR Requirement	Section	Response
		Project, as per the Memorandum of Understanding between the two parties. On February 11, 2013, OHRG received a letter of support from the Metis Nation of Ontario. The letter stated that OHRG had been undertaking effective consultation with the Metis, that the Project details were well understood and that the Metis are satisfied with the consultation progress to date. OHRG plans continued discussions with Aboriginal communities and ongoing communications regarding identified concerns to date.
Where a duty to consult is owed to Aboriginal communities, identify any potential adverse effects to their Aboriginal or treaty rights arising from the Project and consider appropriate measures to mitigate such effects	Aboriginal TSD Section 6.2.1 Aboriginal and Treaty Rights Section 7.3 Prediction of Likely Effects Section 7.4 Mitigation, Residual Effects and Assessment of Significance EIS/EA Report Section 6.3.2.1 Aboriginal Interests Effects Assessment Section 7.3.2 Aboriginal and Treaty Rights	Hunting and fishing rights, Reserve lands and annual payments were the main benefits to Treaty 3 signatories. Three VECs were considered in the assessment of potential adverse effects to Aboriginal and treaty rights: ■ Aboriginal community characteristics ■ Aboriginal heritage resources ■ Traditional use of land and resources The first two VECs are related to Aboriginal rights, and the third is related to treaty rights. The assessment examined the effects of the Project on the VECs identified for Aboriginal Interests, namely: Aboriginal Community Characteristics, Aboriginal Heritage Resources and Traditional Use of Land and Resources. Interactions were identified between the Project activities and each of the VECs. These interactions were predicted to result in a total of twelve possible effects. The three effects on Aboriginal Community Characteristics, namely those effects on Employment, Business Activity, and Training and Education were assessed as being positive. The Project will contribute to the economic opportunities and development of Aboriginal communities in the RSA. Three of the four effects on Aboriginal Heritage and Resources were identified as being

TOR Requirement	Section	Response
		unlikely to occur, including effects on Archaeological Sites or Special Sites, since the Project will not result in any physical disturbance of any known sites. Development of a protocol is recommended to ensure that in the unlikely event a currently unknown site is discovered during construction, appropriate action can be taken. In the event that there is an effect because of the need to restrict access to a Special Site, the effect will be fully mitigated through the negotiation of an agreement. Three of the effects on Traditional Use of Land and Resources, specifically loss of fishing opportunities, hunting opportunities and plant harvesting opportunities were assessed as being negligible because any effects would be limited to the LSA and would not measurably reduce the overall land use opportunities provided within the RSA. A fourth effect, the removal of land base within three traplines in the LSA, will be compensated through a negotiated agreement with the trapline holders. The effect on the consumption of country foods is unlikely since neither their source nor safety would be affected.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-51

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Not enough information is included to fulfill the requirements of the approved ToR section 9.4.1 which states that the EA Report will meet these objectives by clearly: "documenting how the project has been modified as a result of input from potentially affected Aboriginal communities"; "If necessary, explaining why the Project cannot be modified to reduce or avoid any identified impacts"; "explaining how the communities have been appropriately accommodated, where required, for any impacts on Aboriginal or treaty rights that cannot be avoided". Additionally, it is not clear what the predicted impacts are to Aboriginal or treaty rights as the focus of the EA is on the positive socio-economic benefits of the project.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 6.3.3 and 7

Response

The following is a summary of how the EIS/EA Report meets the Terms of Reference requirements for assessing Aboriginal and treaty rights, incorporating traditional land use information, and considering input from Aboriginal communities whose rights could be affected by the Project.

TOR Requirement	Section	Response
Documenting how the Project has been modified as a result of input from potentially affected Aboriginal communities	EIS/EA Report Chapter 4 Alternatives Assessment	The Project has been modified through the consideration of Aboriginal input into the selection of Alternative Methods of carrying out the Project, including the siting of mine waste facilities. Consultation activities have provided locations of walleye spawning habitat and sacred sites so that they could be avoided by Project infrastructure. Consideration of traditional use information collected through workshops with Elders was considered in the environmental assessment.
If necessary, explaining why the Project cannot be modified to reduce or avoid any identified impacts	n/a	No significant impacts to Aboriginal or treaty rights have been identified.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

TOR Requirement	Section	Response
Explaining how the communities have been appropriately accommodated, where required, for any impacts on Aboriginal or treaty rights that cannot be avoided.	EIS/EA Report Chapter 7 Section 7.3.5 Commitments and Responses	OHRG has initiated a number of strategies that will focus on providing benefits to identified Aboriginal communities. These commitments have been under development throughout the exploration phase of the Project and will be administered and prioritized through three First Nations resource sharing committees and a Metis Consultation Committee. Throughout consultation, OHRG has heard from Aboriginal communities that Aboriginal culture is important. OHRG has worked with Aboriginal communities to respect customs and provide capacity for traditional ceremonies at the Project site and within the communities. OHRG will continue to communicate with Aboriginal communities about environmental concerns through the sharing of environmental studies results and assessments. To date, OHRG has provided detailed information to communities, Chiefs and Elders. Throughout the construction and operations phases of the Project, the established Environmental Committee will provide a mechanism for sharing environmental information with First Nations communities. OHRG is committed to providing economic benefits to Aboriginal communities. Initiatives to maximize the benefits the Project will have on Aboriginal communities include scholarships, partnerships with local academic institutions, on the job training, a hire local priority policy, targeted employment, training and business opportunities.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-52

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

It must also be clear, for all stakeholder consultation, how the project was adapted to reflect and address issues and concerns raised.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Osisko's commitments are detailed in Table 7-4.

INFORMATION REQUEST – EAB-53

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Give timing for when/how outstanding issues will be addressed. Provide a commitment to addressing them.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Osisko will strive to address these concerns prior to construction, throughout the ongoing permitting process. Osisko intends to maintain an ongoing relationship with project stakeholders as the planning process moves forward.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-54

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

What information was provided to OCAP? Be more specific about issues raised, how address, and what is outstanding.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Chapter 7 has been revised to provide additional detail about communications with OCAP.

OCAP has stated an interest in being involved in the EA process for the Project. On April 13, 2012, members of the OHRG consultation team met with OCAP and representatives from the Ministry of Northern Development and Mines to introduce the Project and answer questions and concerns. Meeting notes are included in Appendix 7-III. Hard copies of Project information materials produced for public open house meetings, workshops and community news briefs were provided to OCAP representatives at the April 2012 meeting and on an ongoing basis through regular mail.

OHRG has also corresponded with OCAP on several occasions throughout August 2012. A second information package was provided to OCAP at that time, including information about baseline studies and environmental assessment criteria. This information package included paper copies of posters and fact sheets produced for public open house meetings.

Besides the general requests for Project information and environmental concerns discussed at the April 2012 meeting, OCAP has stated on a number of occasions that they would like to be acknowledged by the Crown as an Aboriginal community and have requested funding for OCAP to participate in the EA process. OHRG is not able to address this concern directly but has shared information with the Crown.

OHRG sent a Notice of Draft Submission of the EIS/EA Report to OCAP on February 15, 2013 and some correspondence was initiated to organize a meeting.

OHRG met with OCAP on April 16, 2013 to present a summary of the findings presented in the Draft EIS/EA Report. The meeting took place in Thunder Bay and included a presentation given by OHRG. The presentation included information on the following points:

- Osisko Mining Corporation
- Hammond Reef Gold Project
- Project Components
- Environmental Assessment Results
- Environmental and Social Management
- Project Schedule

The discussion was focussed on water use and OCAP's Aboriginal status.

Osisko has addressed OCAP's concerns by providing them with Project information and conducting an environmental assessment that fully considered potential impacts and mitigation measures. OCAP will be notified of the publication of the Final EIS/EA report and ensure they are provided with an opportunity to understand the conclusions, mitigation measures and ongoing commitments included in the Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB - 55

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Describe the relationship between the member First Nations and the Fort Frances Chiefs Secretariat.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

The FFCS is a regional governing body comprised of the seven chiefs of the Rainy River District; with the collective authority, granted by the people, to represent the Anishnaabe of the region. The seven individual First Nations are Couchiching First Nation; Lac La Croix First Nation; Mitaanjigamiing First Nation; Naicatchewenin First Nation; Nigigoonsiminikaaning First Nation; Rainy River First Nation; and Seine River First Nation.

Representing seven individual First Nations, the FFCS identifies issues of common interest, and collectively determines solutions through advocacy and partnership.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-56

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Be specific as to the number of times (with dates) that Osisko met with Chief and Council and hosted community events with different First Nations. All consultation events need to be listed and described to ensure that the Crown has adequate oversight with respect to its delegation. These are just summaries in the EA and the full minutes and details are to be provided in the Record of Consultation.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Section 7.3.3 provides a detailed record of all Aboriginal consultation activities. The tables below are included in this Chapter and provide a list of meetings where Osisko met with FFCS and the LDMLFN. Meeting notes and issue tracking is provided in the Terms of Reference for those meetings that took place prior to the official commencement of the environmental assessment (March 2012).

Table 7-6: Summary of FFCS Presentations

Date	Topics of Discussion	Regulatory Milestone
February 11, 2011	Project Overview Environmental Assessment Process	Federal Project Description
April 19, 2011	Project Description Alternative Methods Baseline Study Approach	Commencement of Draft Terms of Reference
October 17, 2011	Project Update Aboriginal Consultation Plan Terms of Reference Process	Commencement of Draft Terms of Reference
February 2, 2012	Project Update Responses to Concerns Resource Sharing Agreement	Submission of Terms of Reference
March 19 2012	Traditional Use Study Proposal	Traditional Use Study
June 18, 2012	Presentation of Baseline Results Responses to Concerns	Commencement of Provincial Environmental Assessment
September 17, 2012	Traditional Use Study Results Project Alternatives	Commencement of Provincial Environmental Assessment
December 3, 2012	Closure Planning Avoidance and Mitigation	Commencement of Closure Planning

Date	Topics of Discussion	Regulatory Milestone
February 21, 2013	Results of the assessment Potential effects Mitigation measures Commitments	Submission of Draft EIS/EA Report
April 15, 2013	Aquatic Health Aboriginal Consultation	Submission of Draft EIS/EA Report
August 19,2013	Comments on EIS/EA Report EA Process RSA Committees	Submission of Draft EIS/EA Report
Planned	Results of the assessment Potential effects Mitigation measures Commitments	Submission of Final EIS/EA Report
Planned	Detailed Closure Planning	Submission of Closure Plan
Planned	Mitta Lake Fish Relocation Planning	Prior to Construction

Table 7-8: Summary of LDMLFN Presentations

Date	Topics of Discussion	Regulatory Milestone
April 18, 2011	Project Description Alternative Methods Baseline Study Approach	Commencement of Draft Terms of Reference
November 29, 2011	Project Update Aboriginal Consultation Plan Terms of Reference Process	Commencement of Draft Terms of Reference
February 20, 2012	Project Update Responses to Concerns Resource Sharing Agreement	Submission of Terms of Reference
March 18 2012	Traditional Use Study Proposal	Traditional Use Study
July 9, 2012	Presentation of Baseline Results Responses to Concerns	Commencement of Provincial Environmental Assessment
October 21, 2012	Traditional Use Study Results Project Alternatives	Commencement of Provincial Environmental Assessment
November 27, 2012	Closure Planning	Commencement of Closure Planning
February 26, 2013	Results of the assessment Potential effects Mitigation measures Commitments	Submission of EIS/EA Report

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Date	Topics of Discussion	Regulatory Milestone
Planned	Results of the assessment Potential effects Mitigation measures Commitments	Submission of Final EIS/EA Report
Planned	Detailed Closure Planning	Submission of Closure Plan
Planned	Mitta Lake Fish Relocation Planning	Prior to Construction

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-57

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Table 7-11 this is too high level. Give more detail.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Appendix 7-V provides a detailed record of communications and a comment response table which clearly outlines each comment, when it was received, and Osisko's response to addressing the comment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-58

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Section 7.3.5.1 needs more detail on the meeting frequency and commitments, and issues to be addressed in these committees.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

The section reference in this IR has changed in Version 2 of the EIS/EA Report. Section 7.3.3.6 has been revised to state:

Three Resource Sharing Committees were set up to provide a communication link between the FFCS communities and LDMLFN and Osisko. The committees include two members from Osisko, and one member each from the FFCS and LDMLFN. The committees meet on a quarterly basis for two way information sharing and to address the social, environmental and economic commitments detailed below.

Environment Committee Mandate: Reviews environmental findings and shares environmental information with community. This committee supports OHRG management in the development, operation and closing of its project by recommending environmental, archeological and historical considerations relating to the participation of the First Nation peoples or partnered communities in the Project.

Social and Cultural Committee Mandate: To provide cross-cultural training to OHRG and First-Nations partners by seeking advice through elders and leaders. Determine and advise on necessary cultural activities for events and activities.

Education and Training Committee Mandate: Identify training, employment and economic opportunities and recommend investment projects and initiatives.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-59

Source: Ministry of Environment, Environmental Approvals Board

Summary of Comment

Update section 7.3.6 as it is past the date when some of the events were scheduled. Give more information on the content/type of issues raised not just that they were heard in Open Houses (for example). Also make timing commitments for when a response will be given.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Chapter 7, Public Consultation and Aboriginal Engagement has been updated to include all meetings with public, government and Aboriginal groups that took place until October 15, 2013.

Further detail has been provided on concerns from Aboriginal groups, including the content of comments received on the Draft EIS/EA Report and OHRG's responses to comments received. Ongoing engagement is planned through the First Nations Resources Sharing Committees as outlined in Chapter 8. Committees are anticipated to meet on a quarterly basis. Community visits to share the results of the Final EIS/EA Report are planned for Winter 2014 and consultation on construction monitoring activities is planned for Spring 2014.

INFORMATION REQUEST – EAB-60

Source: Ministry of Environment, Environmental Approvals Board

Summary of Comment

Section 8.0 needs to be described in greater detail to ensure that all requirements from section 8.3 of the approved ToR have been met.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8

Response (same as EAB-71)

Chapter 8 has been substantially revised to meet the requirements of the Terms of Reference. The following step-wise approach was taken to ensure the guidelines are being met in a clear way:

- Review of all monitoring comments received from Government Review Team;
- Review of monitoring requirements in Terms of Reference;
- Revision of Chapter 8 to clearly meet requirements;
- A presentation was provided to the Government Review Team on October 16, 2013; and
- Further comments were taken into consideration and incorporated into the revised Chapter 8.

A significant revision to Chapter 8 is the inclusion of Environmental Management Planning tables that outline by component:

- Project interaction;
- Potential effect;
- Mitigation measures;
- Monitoring objective;
- Regulations and guidelines; and
- Contingency plan.

A Monitoring Plan table and narrative was also included for each component to specifically outline:

- Potential effect;
- Indicator;
- Location;
- Method;
- Frequency; and
- Duration.

These revisions were presented and explained to the Government Review Team and changes were generally accepted as meeting requirements outlined in the Terms of Reference.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-61

Source: Ministry of Environment - Environmental Approvals Branch

Summary of Comment

Describe in more detail the "pertinent legislation, regulations, industry standards, documents and legislative guides" that were considered in the planning process, and will be followed in the finalization and implementation of the plans.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8-1

Response

Chapter 8 includes summary tables for the physical and biological monitoring plans that detail regulating authority/permitting requirements. Detailed monitoring plans will be developed throughout the permitting phase of the Project. Both provincial and federal agencies are anticipated to be included in monitoring plan development and in the provision of ongoing advice for the environmental management plan.

It is recognized that various permits will include additional detail on monitoring requirements that include legislative requirements and regulations. In order to avoid duplication of effort, details of programs (e.g., water quality, air quality) will be developed in conjunction with permitting requirements during the permitting phase. It is considered that the level of detail as provided is reasonable at an EIS/EA stage and that the intent of the approved ToR as well as the higher level specific attributes of the approved ToR are met.

INFORMATION REQUEST – EAB-62

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Describe in more detail how the different stakeholders will be engaged in the development/finalization of the monitoring plans. When will the discussions take place, how will comments be incorporated. Minimum requirements for monitoring must be described.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8.1.2 (8-2)

Response

Government

Both provincial and federal agencies are anticipated to be included in monitoring plan development and in the provision of ongoing advice for the environmental management plan. It is anticipated that a lead agency will be identified to provide direction which could include:

- Feedback on identified objectives;
- Feedback on design of monitoring studies;
- Review of monitoring reports;
- Verification of the effectiveness of mitigation;
- Recommendation for adaptive management measures; and
- Posting of monitoring program notices and results on the Agency's Internet site.

Public, First Nations and Métis Committees

Three separate committees will be engaged and consulted on the topic of environmental and social monitoring for the Project. The First Nations committee has already been formed, and consultation with Métis and the public has also been ongoing throughout the project planning phase of the Project.

Consultation on construction monitoring activities is planned for Q2 2014. Consultation will include a committee meeting where the following topics will form the basis of discussion:

- Planned monitoring framework;
- Parameters, methods, duration and frequency of monitoring;

- Opportunities for community involvement in monitoring activities; and
- Preferred mechanism for sharing monitoring results.

Osisko will also prepare and present community information materials for review by the committee members. Committees will be asked to provide feedback on the preferred method of sharing of information materials with the communities, and be directly involved in communications efforts. A follow up meeting will take place to provide committee members with the opportunity to share community feedback on monitoring plans.

Consultation on operations monitoring is planned to take place prior to operations phase in 2016 and closure monitoring consultation will likely take place in 2027.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-63

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Explicitly state how the committees will be used to facilitate the development/finalization of the monitoring plans.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8.1.2.2 (8-3) and 8.1.2.3

Response

The following paragraphs provide a preliminary schedule and framework for consulting with each committee to facilitate the development and finalization of the monitoring plans for the Project. This description will be included in the final submission of Chapter 8 of the EIS/EA Report.

Consultation on construction monitoring activities is planned for Q2 2014. Consultation will include a committee meeting where the following topics will form the basis of discussion:

- Planned monitoring framework;
- Parameters, methods, duration and frequency of monitoring;
- Opportunities for community involvement in monitoring activities; and
- Preferred mechanism for sharing monitoring results.

Osisko will also prepare and present community information materials for review by the committee members. Committees will be asked to provide feedback on the preferred method of sharing of information materials with the communities, and be directly involved in communications efforts. A follow up meeting will take place to provide committee members with the opportunity to share community feedback on monitoring plans.

Consultation on operations monitoring is planned to take place prior to operations phase in 2016 and closure monitoring consultation will likely take place in 2027.

Three separate committees will be engaged and consulted on the topic of environmental and social monitoring for the Project. The First Nations committee has already been formed, and consultation with Métis and the public has also been ongoing throughout the exploration phase of the Project.

First Nations Committee

OHRG has initiated a number of Aboriginal committees that will provide focussed communications between OHRG and the communities, and identify ways that the Project can provide ongoing benefits to identified Aboriginal communities. In December 2010, OHRG signed a Resource Sharing Agreement with the member nations of the FFCS and the Lac de Mille Lacs First Nation. OHRG's commitment to providing benefits to First Nations has been ongoing throughout the exploration phase of the Project

Environment Committee Mandate: Reviews environmental findings and shares environmental information with community. Supports OHRG management in the development, operation and closing of its project by recommending environmental, archeological and historical considerations relating to the participation of the First Nation peoples or partnered communities in the Project.

Training, Employment and Economic Development Committee Mandate: Identify training, employment and economic opportunities and recommend investment projects and initiatives.

Social and Cultural Committee Mandate: To provide cross-cultural training to Osisko and First-Nations partners by seeking advice through elders and leaders. Determine and advise on necessary cultural activities for events and activities.

Métis Committee

A Métis consultation committee was formed in November 2011 and engaged throughout the project planning phase of the Project. It is anticipated that a similar committee will be formed prior to the construction phase, likely in 2014. The structure of the committee will be dictated based on a negotiated agreement between Osisko and the Métis Nation of Ontario. Based on the success of consultation activities throughout the exploration phase, it is anticipated that the structure of the committee will be similar to the consultation committee engaged throughout the exploration phase, which included the president of each of the four identified Métis communities, the Captain of the Hunt and the Regional Chair, as well as two Osisko staff members, or as mutually agreed upon between Osisko and the Metis communities.

Atikokan-OHRG Committee

A Town committee will be formed to focus on social management planning. It is anticipated that the committee will be formed prior to the construction phase of the Project, likely in 2014. The structure of the committee will be based on the key parameters to be monitored and is anticipated to include representatives from the following sectors:

- Recreation and tourism
- Emergency response and preparedness
- Health and wellness
- Education and training
- Municipal infrastructure and services

The committee will also include two Osisko staff members. The committee is anticipated to meet on a quarterly basis and will be consulted throughout all phases of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-64

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Explicitly state how the committees will be used to facilitate the development/finalization of the monitoring plans.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8.1.2.3

Response

The following paragraphs provide a preliminary schedule and framework for consulting with each committee to facilitate the development and finalization of the monitoring plans for the Project. This description will be included in the final submission of Chapter 8 of the EIS/EA Report.

Consultation on construction monitoring activities is planned for Q2 2014. Consultation will include a committee meeting where the following topics will form the basis of discussion:

- Planned monitoring framework;
- Parameters, methods, duration and frequency of monitoring;
- Opportunities for community involvement in monitoring activities; and
- Preferred mechanism for sharing monitoring results.

Osisko will also prepare and present community information materials for review by the committee members. Committees will be asked to provide feedback on the preferred method of sharing of information materials with the communities, and be directly involved in communications efforts. A follow up meeting will take place to provide committee members with the opportunity to share community feedback on monitoring plans.

Consultation on operations monitoring is planned to take place prior to operations phase in 2016 and closure monitoring consultation will likely take place in 2027.

Three separate committees will be engaged and consulted on the topic of environmental and social monitoring for the Project. The First Nations committee has already been formed, and consultation with Métis and the public has also been ongoing throughout the project planning phase of the Project.

First Nations Committee

Three Resource Sharing Committees were set up to provide a communication link between the Fort Frances Chiefs Secretariat (FFCS) communities, Lac des Mille Lacs First Nation (LDMLFN) and Osisko. The committees

include two members from Osisko, and one member each from the FFCS and LDMLFN. The committees meet on a quarterly basis for two way information sharing and to address the social, environmental and economic commitments. The environment committee is expected to take the most active role in the monitoring plan development and finalization.

The Environment Committee has been tasked with a mandate to review environmental findings and share environmental information with the communities. The committee also supports OHRG management in the development, operation and closing of its project by recommending environmental, archeological and historical considerations relating to the participation of the First Nation peoples or partnered communities in the Project.

Métis Committee

A Métis consultation committee was formed in November 2011 and engaged throughout the project planning phase of the Project. It is anticipated that a similar committee will be formed prior to the construction phase, likely in Q2 2014. The structure of the committee will be dictated based on a negotiated agreement between Osisko and the Métis Nation of Ontario. Based on the success of consultation activities throughout the project planning phase, it is anticipated that the structure of the committee will be similar to the consultation committee engaged throughout the project planning phase, which included the presidents of the Métis communities, the Captain of the Hunt and the Regional Chair, as well as two Osisko staff members.

Atikokan-OHRG Committee

A Town committee will be formed to focus on social management planning. It is anticipated that the committee will be formed prior to the construction phase of the Project, likely in Q2 2014. The structure of the committee will be based on the key parameters to be monitored and is anticipated to include representatives from the following sectors:

- Recreation and tourism
- Emergency response and preparedness
- Health and wellness
- Education and training
- Municipal infrastructure and services

The committee will also include two Osisko staff members. The committee is anticipated to meet on a quarterly basis and will be consulted throughout all phases of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-65

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

It states that among Osisko's responsibilities include "reporting on the results and outcomes of the program" to whom, on what, and when?

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8.1.2.4

Response

Osisko will report on the results of the monitoring programs through three different pathways: compliance reporting; aboriginal communications and stakeholder communications, as summarized below.

Compliance Monitoring Results

Compliance monitoring results will be reported annually and discussed with regulators. The results of monitoring, as they relate to the findings of external audits, will be reported to national authorities as applicable. Compliance reporting requirements are included in Chapter 8, Section 8.2.

Stakeholder Communications

OHRG has held two public meetings per year since 2011 and continually published a Community News Brief on a bi-weekly basis since 2011. A similar level of information sharing is anticipated throughout the permitting stage of the Project. Consultation on construction monitoring activities is planned for Q2 2014. Consultation on operations monitoring is planned to take place prior to operations phase in 2016 and closure monitoring consultation will likely take place in 2027.

A Town committee will be formed to focus on social management planning. It is anticipated that the committee will be formed prior to the construction phase of the Project, likely in Q2 2014. The structure of the committee will be based on the key parameters to be monitored and include representatives from local sectors.

Aboriginal Communications

Meetings with First Nations Committees and the Métis Consultation Committee have taken place on a quarterly basis since 2011. A similar level of information sharing is anticipated throughout the permitting stage of the Project.

Three Resource Sharing Committees were set up to provide a communication link between the Fort Frances Chiefs Secretariat (FFCS) communities, Lac des Mille Lacs First Nation (LDMLFN) and Osisko. The committees

include two members from Osisko, and one member each from the FFCS and LDMLFN. The committees meet on a quarterly basis for two way information sharing and to address the social, environmental and economic commitments. The environment committee is expected to take the most active role in the monitoring plan development and finalization.

A Métis consultation committee was formed in November 2011 and engaged throughout the project planning phase of the Project. It is anticipated that a similar committee will be formed prior to the construction phase, likely in Q2 2014. The structure of the committee will be dictated based on a negotiated agreement between Osisko and the Métis Nation of Ontario. Based on the success of consultation activities throughout the project planning phase, it is anticipated that the structure of the committee will be similar to the consultation committee engaged throughout the project planning phase, which included the presidents of the Métis communities, the Captain of the Hunt and the Regional Chair, as well as two Osisko staff members.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-66

Source: Ministry of Environment - Environmental Approvals Branch

Summary of Comment

Be more specific about the frequency of "regular meetings" and "periodically" published news briefs. If there is not a set schedule, describe the trigger points that would lead to an event.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8.1.3.2

Response

OHRG has held two public meetings per year since 2011 and continually published a Community News Brief on a bi-weekly basis since 2011. Meetings with First Nations and Métis Committees have taken place on a quarterly basis. A similar level of information sharing is anticipated throughout the permitting stage of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-67

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Does not fully meet the requirements outlined in the approved Terms of Reference. In particular, does not fully consider and discuss: "reflect the results of consultation and be predicated on an ongoing program of consultation over the life of the project"; "describe the mitigation and benefit enhancement measures that will be put in place to address significant residual Project impacts specific to each of the construction, operations, closure and post closure phases"; "describe the monitoring of impact mitigation and benefit enhancement measures"; and "present monitoring costs, schedule and frameworks, as developed during the preparation of the EA."

Potential Environmental Effects

While it is required, and stated in the EA/EIS that on-going consultation will inform the monitoring plan, more detail should be described of the minimum requirements/plan for each phase of the project.

Proposed Action

None

Reference to EIS

Section 8

Response

The monitoring plan included in Chapter 8 was written to meet the requirements included in the Terms of Reference. Additional details have been included in the Final version of this Chapter where required. A summary of the information included in Chapter 8 to meet each requirement stated in comment EAB-67 is provided below.

Reflect the results of consultation:

The socio-economic assessment and Aboriginal findings presented in Chapter 6 Effects Assessment are considered in the Social Management Plan. These findings are based on community consultation activities such as meetings and workshops as presented in Chapter 7 Public and Aboriginal Engagement.

Through ongoing consultation, OHRG has identified measures that will further enhance the economic and education benefits of the Project

Throughout consultation, OHRG has heard from Aboriginal communities that Aboriginal culture is important. OHRG has worked with Aboriginal communities to respect customs and provide capacity for traditional ceremonies at the Project site and within the communities.

The main areas of concern heard from Project stakeholders to date have been protection of environmental integrity, employment opportunities, perspectives of Project development and regional economic impact, and involvement of Aboriginal people in the Project.

Be predicated on an ongoing program of consultation over the life of the project:

Both provincial and federal agencies are anticipated to be included in monitoring plan development and in the provision of ongoing advice for the environmental management plan.

Social indicators and detailed social monitoring will be developed in cooperation with the Atikokan/OHRG Committee and Aboriginal Committees established as the Project planning process moves forward. These indicators will be based on measurements that can be compared over time with those presented in Chapter 3 Baseline Conditions.

Describe the mitigation and benefit enhancement measures that will be put in place:

Mitigation measures are fully detailed in Chapter 6 for the physical, biological and socio-economic environments. Benefit enhancement measures are summarized in Chapter 8 as provided below.

OHRG plans to work with local academic institutions such as school boards to develop specialized labour skills in the workforce. On site and on the job training will be a focus as well as upgrading of workforce skills.

OHRG will continue to share anticipated workforce and equipment requirements information with Aboriginal communities and local economic development corporations. Employment opportunities, and their corresponding job postings, will be communicated to the local and Aboriginal communities in a timely manner. OHRG will implement a hire local priority policy, and seek out business opportunities within the local community, where possible.

OHRG will continue to promote the utilization of Aboriginal and local enterprises whenever possible in supplying goods and/or services required during each phase of the project. Procurement policies that favour local businesses will be implemented, where possible.

Describe the monitoring of impact mitigation and benefit enhancement measures:

A description of the monitoring plan for each environmental component is provided in Chapter 8. For clarity, a monitoring framework table detailing the monitoring parameter, method, duration and frequency has been added to the beginning of each component's section.

Present monitoring costs:

For the purpose of preliminary cost estimation it is assumed that a monitoring budget of $2 million to $3 million per year will be required. These estimates will be included in the feasibility costs for the project and will require refinement and updating as the plans are fully developed following EA approval.

- Environmental, Health and Safety Department workforce training and staff (estimated $450,000 per year)
- Laboratory analyses costs (estimated at $1 million per year)
- Annual inspections and special programs (estimated $1 million per year)
- Review and reporting (estimated $500,000 per year)

Present monitoring schedule and frameworks:

A monitoring framework table detailing the monitoring parameter, method, duration and frequency has been added to the beginning of each component's section. The planned follow up program schedule has also been added as shown below.

Q4 2013 – Submit Final EIS/EA Report

Q1 2014 – Form Atikokan-OHRG Consultation Committee

Q2 2014 - Consult on Monitoring Plans

Q3 2014 – Finalize Construction Monitoring Plans

Q4 2014 – Receive EIS/EA Approval

Q1 2015 – Begin Project Construction

Q1 2016 - Finalize Operations Monitoring Plans

Q1 2027 – Finalize Closure Monitoring Plan

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-68

Source: Ministry of the Environment - Environmental Approvals Branch

Summary of Comment

Clearly describe what monitoring will take place for each phase of the project, and when all protocols/procedures will be in place.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8

Response

A table describing the monitoring parameter, method, frequency and duration has been added for each component. Detailed monitoring plans will be developed and refined throughout the permitting process.

The EIS provides a general overview of the monitoring that will be conducted. Monitoring requirements for many components will be determined by conditions attached to the permits issued by federal and provincial agencies. A detailed description of monitoring requirements can be developed during the permitting stage once these requirements have been set by the relevant agencies. This will avoid duplication of effort.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-69

Source: Ministry of the Environment - Environmental Approvals Branch

Summary of Comment

Be more specific about the frequency of monitoring/sampling for all components of monitoring plans.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8

Response

A table describing the monitoring parameter, method, frequency and duration has been added for each component.

INFORMATION REQUEST – EAB-70

Source: Ministry of the Environment - Environmental Approvals Branch

Summary of Comment

For the both the environmental and social monitoring plan it must be clearly stated what the indicators are and how they will be monitored. The social monitoring plan in particular does not provide enough detail.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8

Response

A table describing the monitoring parameter, method, frequency and duration has been added for each environmental component.

Social indicators will be identified and confirmed through ongoing consultation. These indicators will be included in a detailed social management plan and will be based on measurements that can be compared over time with those presented in Chapter 3 Baseline Conditions.

Social indicators and detailed social monitoring will be developed in cooperation with the Atikokan/OHRG Committee and Aboriginal Committees established as the Project planning process moves forward.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-71

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The bullet point requirements found in section 8.3 of the approved Terms of Reference have not been fulfilled fully. More detail on the plans is required to meet these.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8

Response (same as EAB 60)

Chapter 8 has been revised to ensure that the ToR and EIS guideline requirements have been fully met.

Chapter 8 is organized into physical, biological and social environmental planning and monitoring. The physical and biological components include environmental management planning and monitoring program tables to clearly meet the requirements (as listed below). The environmental management planning tables that outline potential negative effects identified in the effects assessment, mitigation measures and monitoring objectives that have been developed to minimize these effects. The environmental management planning tables also provide a contingency/non-compliance strategy for each potential effect. The frequency and duration of proposed monitoring for each physical and biological component is provided in the environmental monitoring tables.

Table 8-2: Environmental Management Planning, Monitoring and Compliance – Physical Environment
Table 8-3: Proposed Monitoring Program Considerations – Air Quality and Vibration
Table 8-4: Proposed Monitoring Program Considerations – Site Flows and Hydrology
Table 8-5: Proposed Monitoring Program Considerations – Hydrogeology
Table 8-6: Proposed Monitoring Program Considerations – Water Quality
Table 8-7: Proposed Monitoring Program Considerations – Geochemistry
Table 8-8: Environmental Management Planning, Monitoring and Compliance - Biological Environment
Table 8-9: Proposed Monitoring Program Considerations – Terrestrial Ecology
Table 8-10: Proposed Monitoring Program Considerations – Aquatic Environment

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-72

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Not enough detail is provided describing the consultation with the stakeholders: government, public, municipal and Aboriginal. More detail is needed to accurately summarize the types of comments raised, how they were addressed, and what the outstanding issues are. The comments summarized are too high level. In particular, include comments received on the addition of the worker camp on-site and fibre optic cable as additional alternative methods to be assessed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

A summary of consultation activities regarding the on-site workers accommodation, originally captured in Chapter 1, is now also summarized in Chapter 7, Section 7.1.2.4.3 as follows: The need to consider an on-site accommodation camp as an additional alternative method of carrying out the Project was determined based on detailed planning, consultation, and baseline studies. Detailed planning for the Project clarified the total anticipated workforce, length of the commute and duration of the Project. Consultation activities, including engagement with Aboriginal communities confirmed that employment is important and that many community members live two or more hours from the Project Site. Socio-economic baseline studies confirmed the demographics of the local population, including age distribution and education levels. The conclusion from the detailed planning, consultation and baseline studies was that an on-site accommodation camp would be required to ensure the Project remained feasible.

Upon reaching the decision to include an on-site accommodation camp as an alternative means of carrying out the Project, the government, public and Aboriginal stakeholders were informed of this change.

The following provides a summary of consultation activities that included information about the on-site worker accommodation camp:

- Presentation to Atikokan Mayor and Council July 30, 2012
- Presentation to the Metis Nation of Ontario August 3, 2012
- Community News Brief August 13, 2012
- Consultation Update meeting with provincial and federal government leads August 14, 2012
- Community Open House August 18, 2012

- Presentation to Fort Frances Chiefs Secretariat September 17, 2012
- Letter to the CEA Agency September 20, 2012
- Letter to the MOE EAB September 20, 2012
- Letter from CEA Agency to Aboriginal communities October 26, 2012
- Metal Mining Effluent Regulations (MMER) Alternatives Assessment Workshop (provincial and federal government) November 20, 2012

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-73

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Flexibility and Contingency plans are not included in the EA. Contingency plans are not the same as the Federal environmental assessment requirement of the assessment of accidents and malfunctions. Contingency plans are those such as what alternate power source will be used if the transmission line is not up and operational by the time power is needed, and assessing the impacts of that. As well, it is possible to have a power outage to the mine site due to the power substation failure. Describe the proposed contingency plan in the event of a possible malfunction in the power substation as well as other scenarios requiring contingency plans. More events should be identified and discussed.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

8.2.4

Response

Chapter 8 has been updated to include contingency plan for each potential effect. The contingency planning is directly related to monitoring and confirmation of predictions. There is also further discussion in Chapter 8 regarding emergency preparedness planning, which is appropriate to address such issues as major malfunctions.

INFORMATION REQUEST – EAB-74

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Describe what the relevant existing legislation are, and what provincial guidelines and best practices are going to be used for consistency. VECs with the identified criteria and indicators should be described in the plan and how they will be monitored (including frequency/method) for each phase of the project.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8.2

Response

Summary tables are provided for the physical and biological environment that includes regulatory authority/compliance requirements. Best practices are summarized under the implementation, management or mitigation column of these tables. Detailed monitoring plans will be developed throughout the permitting phase of the Project. Both provincial and federal agencies are anticipated to be included in monitoring plan development and in the provision of ongoing advice for the environmental management plan.

A table describing the monitoring parameter, method, frequency and duration has been added for each environmental component.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-75

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

There must be a final more detailed comment-response table that references specific sections of the EA/EIS report where stakeholder comments were addressed, or where the answers to their questions can be found. This is required to be consistent with the approved ToR and the level of detail provided in the draft EA is insufficient.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 7

Response

Appendix 7-V provides a detailed record of communications and a comment response table which clearly outlines each comment, when it was received, and Osisko's response to addressing the comment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-76

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Give a summary for all boxes; don't just say "see section…"

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 8.2.3.1 Table 8-7

Response

All tables in Chapter 8, including the table summarizing recommended terrestrial ecology monitoring program, have been updated. Fullsome information is now included in all cells of the tables, which no longer rely on references to other sections.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-77

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

Be more specific about the timing of the commitments.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Table 9-1

Response

A column has been added in the commitments registry to clarify which phase of the Project the commitment is planned to occur.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EAB-78

Source: Ministry of Environment, Environmental Approvals Branch

Summary of Comment

The list is stated to be not complete as there are outstanding EA studies to be completed. What EA studies need to be complete that have not been? All EA studies should be completed by this stage. Would it be more accurate to characterize this as work that needs to be undertaken for other permits and approvals?

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 10

Response

Yes, it is more accurate to characterize additional work as being tied to permits and approvals, not the EA. The introductory sentence to Chapter 10 has been revised to state: The list of permits/approvals presented is not intended to be a comprehensive list of all permits/approvals required, and OHRG will consult with federal, provincial, and municipal agencies to refine this list as the Project design is developed.

Environment Canada

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-1

Source: Environment Canada

Summary of Comment

Ammonium Nitrate will require an Environmental Emergency Plan under the Environmental Emergency Regulations of the Canadian Environmental Protection Act. Additional information on the regulation may be found at: http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=70.

Potential Environmental Effects

Improper storage and handling of chemicals may result in accidental spills, which if not responded to in a timely and appropriate manner, could lead to contamination of soils, groundwater and surface waters. Development of Environmental Emergency Plans will help to ensure that appropriate measures are in place to prevent such events and that response capabilities are in place.

Proposed Action

The EIS should include a commitment for the proponent to develop an environmental emergency plan for any substances stored on site at the appropriate volumes, as required under the Environmental Emergencies Regulations.

As per the EIS Guideline 10.7, an environmental emergency response plan is required and should include all the substance specific emergency plans.

Reference to EIS

EIS 5-33 Chemicals, Fuel and Explosives Storage

Response

Chapter 8, Section 8.2.4 includes a commitment to develop an emergency preparedness and response plan, and includes a preliminary spill management plan in Section 8.2.4.4. A specific reference to the Environmental Emergency Regulations has been added as follows: The following is a preliminary discussion related to main components emergency response and contingency planning. As per the requirements of the Environmental Emergencies Regulations of the Canadian Environmental Protection Act, OHRG will develop an environmental emergency plan for any substances stored on site at the appropriate volumes. Detailed planning will be completed following EA approval and activities will be adapted once the program is implemented, to meet conditions encountered in the field. The detailed plan will be periodically reviewed and updated following a continuous improvement process throughout the construction, operations, closure and post-closure of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-2

Source: Environment Canada

Summary of Comment

None

Potential Environmental Effects

Other mining projects are in various stages of project development and may have cumulative effects on VEC.

Proposed Action

Provide cumulative effects details including the three additional projects in the Final EIS and amend TSD to reflect possible impacts as per EIS Guideline 13.1.1.

Reference to EIS

EIS 6-179 Section 6.8 Cumulative Environmental Effects

Response

The cumulative impacts section has been revised to include the following projects:

- Planned wood processing facilities, including the Resolute Forest Products Sawmill near Atikokan and the Rentech Wood Pellet Production Facility in Atikokan (formerly known as the Atikokan Renewable Fuels Mill);
- The former Atiko-Sapawe Gold Mine near Atikokan;
- Bending Lake Iron Group proposed Josephine Cone Iron Mine project near Ignace, Ontario; and
- Treasury Metals proposed Goliath Gold Project near Dryden, Ontario.

INFORMATION REQUEST – EC-3

Source: Environment Canada

Summary of Comment

The Closure Plan states that for the TMF, waste rock stockpile, overburden stockpile, and low grade ore stockpile, the seepage collection ponds will be decommissioned once water quality is deemed suitable for direct discharge to the environment.

Potential Environmental Effects

Given that during the closure phase effluent limits under the MMER and MOE's ECA will not be applicable, it is not clear what parameters and benchmark levels will be used to determine when the water quality is suitable to be discharged to the environment. Information on the criteria to be applied to determine whether effluent can be discharged to the environment in a post-closure scenario is necessary to assess the effects of the project on the environment and whether the proposed mitigation measures are appropriate.

Proposed Action

Provide a description of the proposed parameters and benchmark levels that will be used to determine whether post-closure effluent can be discharged to the environment, and the proposed options to manage and treat the effluent if it does not meet the discharge criteria.

EIS Guideline 13.1.1

Reference to EIS

Conceptual Closure and Rehabilitation Plan, Sections 2.0 and 4.0

Response

It is not possible to anticipate what water quality objectives will be in place a number of years after mine closure. Therefore, the EIS notes that criteria that are protective of aquatic life will be used.

INFORMATION REQUEST – EC-4

Source: Environment Canada

Summary of Comment

Section 12.2 states that "fish compensation planning has been ongoing in cooperation with regulatory agencies since 2011." Fish and Fish Habitat Mitigation and Compensation Plans were to be included with the EIS.

Only a preliminary assessment of potential compensation options is included in the Aquatic Environment document; however Appendix 2.III which contains the supporting calculations was not included.

Potential Environmental Effects

Information regarding the proposed compensation measures in relation to the destruction or harm to fish is necessary to determine the impacts of the project on fish and aquatic ecosystems.

While this impact is primarily under the mandate of Fisheries & Oceans Canada, this information is also required for the process of amending Schedule 2 of the Metal Mining Effluent Regulations to allow the use of water bodies frequented by fish for mine waste disposal, which is administered by Environment Canada.

Proposed Action

As per the EIS guideline 9.1.5, the proponent was asked to provide a separate draft Fish Habitat Compensation Plan with sufficient detail to demonstrate that no net loss of productive capacity of fish habitat can be achieved and that plan measures are technically, economically and biologically feasible.

Reference to EIS

EIS - Conclusions: 12.2 Mitigation and Compensation Measures, page 12-6

Aquatic Environment, Sections 3.2 and 3.8

Response

A draft No Net Loss Plan or Habitat Offset Plan is provided in the Aquatic TSD, which describes in detail how the aquatic habitat losses from the project will be offset. The following provides a summary of the habitat losses and proposed offsets for both the MMER listed waterbodies and the Section 35 offsets.

Habitat Losses

Using the Habitat Accounting Model developed for the project, habitat losses were as follows:

- Total Habitat losses: approximately 34,000 Habitat Units;
- Habitat Losses requiring MMER listing (approximately 22 000 HUs):
  - Losses associated with the Waste Rock Management Facility: 5 features representing 1,977 HUs
  - Losses associated with the Tailings Management Facility: 10 features representing 20,211 HUs
- Habitat Losses requiring Section 35 Fisheries Act Authorization: 7 features representing 11,989 HUs.

MMER Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (API#2) that supports northern pike and there are the lower reaches of two headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake and API#8).

The following habitat offset projects are proposed to address these MMER Listed losses (totaling 24,000 HUs):

- A floodplain area at the mouth of Sawbill Creek;
- An area at the mouth of API#1; and
- Snail Bay.

Each of these projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in “mounds” throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake.

Section 35 Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (Mitta Lake) that is considered to have potential as a baitfish resource and there are the lower reaches of several headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake).

The following habitat offset projects are proposed to address these Section 35 listed losses (totaling approximately 12,000 HUs):

- Stocking of several headwater waterbodies that are currently fishless;
- The upper part of Trap Bay;
- An area at the mouth of Lumby Creek;
- Microhabitat features adjacent to an area of filling of a portion of the drawdown zone of Upper Marmion Lake; and
- Microhabitat features associated with the construction of the minewater discharge.

Several fishless ponds will be stocked with fish from Mitta Lake and API#2 to create a potential baitfish resource and also to preserve a remnant fish community representative of Mitta Lake, which will preserve an opportunity to restock these fish in the flooded pits post closure. The Trap Bay and Lumby Creek projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches

will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in “mounds” throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake. The Microhabitat features will include installation of partially submerged logs and felled cedar trees, rocky shoals and other features that will provide shallow water cover for fish species in Upper Marmion Lake.

In addition to the habitat offset projects identified above, it is anticipated that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m2. While this is not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application.

These habitat offsets were discussed in several meetings with DFO/MNR following submission of the EA and on May 29, 2013, DFO stated that “This should be enough direction as to what habitat gains will be created to offset the losses for the EIS phase”.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-5

Source: Environment Canada

Summary of Comment

The EIS states that "Fill slopes around the perimeter …and the toe slopes will be kept above the regulated high water level of Marmion Basin to the greatest extent possible".

Potential Environmental Effects

Direct contact with the water should be avoided to ensure that untreated surface runoff and seepage is not entering the Marmion Lake as per EIS Guideline 9.1.4.

Proposed Action

The EIS should state that "Fill slopes around the perimeter … and the toe slopes WILL be kept above the regulated high water level of Marmion Basin."

Reference to EIS

EIS 5-8, Section 5.1.1

Response

With the exception of some limited areas to the north and west of the processing plant (discussed in the third paragraph on Page 5-8 of the EIS/EA report), the toe of the fill slope will be kept above the regulated high-water level of Marmion Reservoir. Filling into Sawbill Bay was required in one area to achieve the requisite space for the mine infrastructure. An option to construct a retaining wall was considered to avoid filling into the reservoir but was not selected due to the close proximity to the pit and the frequent blasting occurring during mining operations. In total, about 0.8 ha of fish habitat will be affected by the infilling into Sawbill Bay and this habitat has been identified and quantified and included in the offset in the No Net Loss Plan for the project. Where fill is required below the regulated high-water level, imported clean aggregate material will be used to avoid direct contact between the waste rock material and the water in Marmion Reservoir.

INFORMATION REQUEST – EC-6

Source: Environment Canada

Summary of Comment

Appendix 2 IV of the Aquatic Environment TSD was not included. Thus cannot review any of the fish tissue results.

Potential Environmental Effects

The goal of the metal mining Environmental Effects Monitoring program is to evaluate the effects of mining effluent on the aquatic environment, specifically fish, fish habitat, and the use of fisheries resources. The fish tissue results are needed to help evaluate the effectiveness of future pollution prevention and control technologies, practices and programs within the mining sector. The results will be used to determine if better protection of fish, fish habitat and fisheries on a site-specific basis is required.

Proposed Action

Provide Appendix 2 IV of the Aquatic Environment TSD for agency/public review.

Reference to EIS

Aquatic Environment TSD Appendix 2 IV

Response

The Aquatics TSD has an incorrect reference to an appendix that does not exist. The fish tissue analysis is provided in Appendix 2.II. Methods are in Section 5.4.3 and Results are in Section 6.2.

INFORMATION REQUEST – EC-7

Source: Environment Canada

Summary of Comment

Assumptions have been made that an "API is fishless", however, these areas were sampled usually on only 2 occasions and fished for 1 day on each occasion.

Potential Environmental Effects

If the assumption that an API is fishless is incorrect and fish are impacted in the future this undermines the goal of the metal mining Environmental Effects Monitoring program.

Proposed Action

It may be more appropriate to say "No fish captured" for the API# on [Date] using what type of method.

EIS Guideline 9.1.5

Reference to EIS

Aquatic Environment TSD Table 2-6 page 64

Response

We have fished these features numerous times with multiple gear types to the point where MNR/DFO are willing to consider that these features are fishless.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-8

Source: Environment Canada

Summary of Comment

OHRG will develop a customized tailings management system to meet local regulations.

Potential Environmental Effects

EIS Guidelines 13.0 and 10.1.3 confirms that "Pertinent legislation, regulations, industry standards, documents and legislative guides shall be used in the development of the EMPs."

Proposed Action

Amend statement to ensure all regulations for all jurisdictions including local, Provincial and Federal will be met and Industry BMP adopted when possible.

Reference to EIS

EIS 5-29 Section 5.2.5 Tailings Management Facility

Response

Revised Section 5.2.5 to state: OHRG intends to develop a customized tailings management system that addresses the specific needs of OHRG, meets applicable regulations at local, provincial and federal levels and meets Industry Best Management Practices where possible.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-9

Source: Environment Canada

Summary of Comment

Details regarding the draining of Mitta Lake have not been described in the EIS despite several references to the activity throughout the EIS and TSDs.

Pages 6-98 and 6-99 of the EIS mention that Mitta Lake will be drained and water pumped into Sawbill Bay - however, no description of volume or duration of pumping or effects is provided. The proponent assumes no effect from this activity as the two water bodies have similar water chemistry.

The only mitigation measure described is when the water level is low in the pit; the water-sediment mixture will be pumped to the Process Plant Collection Pond (PPCP) for settling of particulates prior to release to the surface waters of ? [water body was not specified but presumably Sawmill Bay?].

Potential Environmental Effects

Impacts to the environment have not been assessed as per EIS Guideline 10.1, 10.2.3.1, 10.2.3.2 and 10.2.4, "…. the proponent shall indicate important details and clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact." Air emissions from pumps and generators used to drain water from Mitta Lake during construction have not been calculated. Impacts to water quantity in Marmion Lake have not been provided. Environmental issues affected by this activity include: air issues (type of pump and fuel, noise, duration, how many pumps), and water issues (volume of water discharged, how water will be discharged to Marmion Lake (pipeline or via the natural outlet stream, depth of discharge).

Proposed Action

The impacts of dewatering activity for Mitta Lake should be included in the Construction activities related to Site Water Quality.

The major water management operations section should also include Mitta Lake dewatering effects.

Reference to EIS

EIS Site Water Quality, Page 5, Section 1.3.4.1 - Construction;

EIS 5-5 Table 5-1;

EIS 5-7 Section 5.1.1 Construction Phase;

EIS 6-22 Section 6.1.3.1.1 Streamflows and Lake Water Levels;

EIS 6-98 6.2.2.1.1 Construction Phase, Loss of Habitat;

EIS 6-21 Table 6-49 Drainage of Mitta Lake;

EIS 5-35 Air Pollution Control Equipment; and

EIS 5-37.

Response

The dewatering of Mitta Lake was assessed and is not anticipated to have a significant effect on air quality, water quality, hydrology or the aquatic environment. Although the detailed step by step plan for the activity has not been finalized at this time, OHRG is committed to working together with Aboriginal communities and government regulators throughout the approvals and detailed planning process to develop an approach that is protective of the environment. With regards to the specific concerns outlined in the comment, responses are provided as follows.

Air Quality: The operations phase was considered to be the bounding scenario for potential effects to air quality. The construction phase uses similar types of equipment as the operations phase, however the activities take place over a shorter time period, with less equipment. Therefore, air emissions are considered to be bounded by the operations phase and were not moved forward to a detailed assessment. The assessment of the potential changes to air quality during the operations phase, and the identification of mitigation measures to minimize those potential effects, is considered to capture all potential effects that would occur during the construction phase. This includes the use of diesel generators to operate pumps throughout the dewatering of Mitta Lake. The air quality assessment showed that the Project would meet regulatory requirements relating to air quality and that no significant effect would occur.

Water Quality: Dewatering of Mitta Lake has been added as a Project-Environment interaction during the construction phase. The potential effects to water quality from this activity were evaluated as being associated with a potential increase in suspended solids. The identified mitigation measure will be to direct the water from Mitta Lake to the PPCP and allow settling to occur before it is discharged to the environment. The proposed discharge location is situated at the south end of Sawbill Bay where it exposed to a secondary flow path from the Upper Seine River Watershed thereby taking advantage of ambient mixing potential in the local receiving water.

Hydrology: The calculated volume of Mitta Lake is 1,277,764 m3 and the planned capacity of the PPCP is 300,000 m3. The total volume of the lake represents approximately four times the capacity of the holding cell. Dewatering will take place in a staged manner throughout the construction phase. Water will be held in the PPCP for sufficient time to allow settling, then released to Marmion Reservoir at the identified discharge point. OHRG will work with the Seine River Watershed Management Committee to optimize release times where possible. Water required for on-site activities will also be sourced directly from the PPCP.

INFORMATION REQUEST – EC-10

Source: Environment Canada

Summary of Comment

No sampling stations were identified for WQ, sediment, benthic and fish in most of the areas being considered for effluent discharge. These are important areas where stations should have been located. At the least, a station should have been located close to effluent discharge Alternative 4 and another station located in between the effluent discharge station and HRWQ-13 since the effluent will be travelling northwest from the effluent discharge point.

Potential Environmental Effects

Data collected at proposed effluent discharge areas, would have provided baseline data for these areas. If sampling is not collected prior to operations and effluent discharge begins, these areas will be influenced by the effluent and there will be no baseline data available to compare it to.

Proposed Action

A commitment should be made by the proponent to collect water quality samples, sediment and benthic samples during 2013 in the area(s) selected for effluent discharge.

EIS Guideline 10.2.3.2

Reference to EIS

Water & Sediment TSD Figure 2-1

EIS 3-96, Section 3.2.7.2 Methods

Response

The water quality sampling locations were adjusted in 2013, and sampling will be conducted at these locations during operations as identified in Section 8 of the EIS/EA document.

Discharge locations were proposed only in final stages of project design, long after the sampling programs had been initiated. In addition, based on comments on the DRAFT EIS/EA report, the discharge location for the effluent from the accommodation camp has been revised. Baseline stations and data will be collected at the final locations as part of the EEM program prior to constructions and operations. As well, provincial permitting requirements are also expected to require periodic monitoring of these areas. It is considered that the data as currently collected is reasonable and suitable for evaluation of potential environmental impacts as part of the EIS/EA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-11

Source: Environment Canada

Summary of Comment

The fish selected for metal analysis was based on the most common size classes.

Potential Environmental Effects

Fish sizes were not provided; therefore the appropriateness of the sampling approach used cannot be evaluated.

Analyzing the largest fish caught for each species may have provided a better picture of bioaccumulation, etc.

Proposed Action

Provide details on sizes of fish sampled at each location, and rationalization for why the largest fish caught were not used for analysis.

EIS Guideline 10.2.4

Reference to EIS

Aquatic Environment TSD Page 34

Response

The length and weight of fish sampled is provided as part of this response and will be included as an Appendix to the Aquatic TSD. The sampling was done on a best catch effort basis and included fish of a range of sizes.

The purpose of sampling and analyzing fish tissue was to establish a baseline prior to construction and operation. As such, a variety of fish sizes were used to characterize existing levels of metals in fish tissues. Since the accumulation of some metals such a mercury increases with the age of the fish, the selection of different size classes provides a better understanding of fish accumulation than focusing only on the largest size class.

INFORMATION REQUEST – EC-12

Source: Environment Canada

Summary of Comment

Larger scale maps should have been used to indicate more precisely the sampling locations for benthic and sediment.

Potential Environmental Effects

The current map only shows a gross area and does not adequately identify if a stream or littoral zone of a lake, etc., was sampled.

Proposed Action

Provide more detailed mapping showing specific information regarding the sample sites.

Reference to EIS

Aquatic Environment TSD Page 70-71 & Figure 2-1

Response

Figure 4 in Appendix 2.II of the Aquatic Environment TSD provides additional locational detail on the benthic (and sediment) and fish tissue sampling sites. All benthic/sediment sampling locations sampled were depositional environments at stream mouths, upstream of the influence of downstream receiving water bodies (e.g., Upper Marmion Reservoir). Figure 4 has been revised to show additional benthic/sediment sites not included in the previous figure.

Attachments

Updated Figure 4 (Aquatic Environment TSD Appendix 2.II).

610000 620000 630000

5430000 5420000

N

TAILINGS MANAGEMENT FACILITY ALTERNATIVE 1
TAILINGS MANAGEMENT FACILITY BASE CASE
TAILINGS MANAGEMENT FACILITY ALTERNATIVE 2
CONSTRUCTION CAMP
EXPLORATION CAMP
HELIPAD
WATER RETENTION POND
TMF ROADWAY AREAS (PIPELINES TO FOLLOW)
OFFICE/ TRUCK SHOP/ FUEL BAY/ PARKING LOT
HELIPAD 1
PROCESS FACILITY
SUBSTATION
MINE WATER SPILL EMERGENCY POND
OPEN PIT
WASTE ROCK STOCKPILE
STOCKPILE (UNKNOWN)
STOCKPILE (OVERBURDEN)
LOW GRADE STOCKPILE AREA
EXPLOSIVES PLANT AND AREA
Serpent Lake
Cornell Lake
Sawbill Bay
Mitta Lake
Lynxhead Bay
Marmion Reservoir
Light Lake
Upper Seine Bay
Hawk Bay

LEGEND

- Benthic Invertebrate Community Sampling Locations (Stream Mouths)
- Fish Tissue Sampling Location
- Raft Lake Cut Location
- Weather Station
- Helipad Location
- Trail
- Road
- Proposed Site Access Road
- Hardtack / Sawbill Access Road Alternative 1
- Raft Lake Access Road Alternative 2
- Proposed Raft Lake Powerline Alternative
- Proposed Hardtack Powerline Alternative
- River/Stream
- Lake
- Wetland
- Project Footprint
- Project Location

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000 3,000
SCALE 1:80,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
BENTHIC INVERTEBRATE AND FISH TISSUE COLLECTION LOCATIONS (2010-2011)

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	REV. ION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	RJ	2 Dec. 2013		

FIGURE: 4

G:\Projects\2013\13-1118-0010_Osisko_Hammond_ReefGIS\MXDs\Reporting\Terrestrial\Benthic\Invertebrate_FishTissueLocations_2010_2011.mxd

INFORMATION REQUEST – EC-13

Source: Environment Canada

Summary of Comment

Environmental Emergency Plans under the Environmental Emergency Regulations under the Canadian Environmental Protection Act is required for some substances stored on site.

Potential Environmental Effects

Add item for completeness.

Proposed Action

Add Environmental Emergency Regulations under the *Canadian Environmental Protection Act* to Table 10-1.

Reference to EIS

EIS 10-4 Table 10-1 Summary of Permitting Requirements

Response

Environmental Emergency Regulations under the Canadian Environmental Protection Act has been added to Table 10-1.

INFORMATION REQUEST – EC-14

Source: Environment Canada

Summary of Comment

National Pollutant Release Inventory reporting is required for certain releases under Canadian Environmental Protection Act.

Potential Environmental Effects

Add item for completeness.

Proposed Action

Add the National Pollutant Release Inventory under the *Canadian Environmental Protection Act* to Table 10-1.

Reference to EIS

EIS 10-4 Table 10-1 Summary of Permitting Requirements

Response

The National Pollutant Release Inventory under the Canadian Environmental Protection Act has been added to Table 10-1.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-15

Source: Environment Canada

Summary of Comment

The assessment of alternatives for waste rock and tailings disposal conducted to date is substantially inadequate. For example, the multiple accounts ledger for tailings and waste rock management facility alternatives contain limited coverage on sub-accounts and indicators. Given the current lack of details provided with respect to the alternatives assessed, as well as the lack of consideration of any potentially viable alternatives to the use of fish-bearing waters for waste rock and tailings disposal, it is not possible to objectively evaluate the acceptability of the alternatives selected for the management of waste rock and tailings.

With respect to waste rock disposal alternatives, EC questions why the establishment of a waste rock disposal area in the central portion of the peninsula was not considered as an option. All waste rock options are very close to the various bays, leaving a very small margin for error in the event of any seepage from the waste rock.

Potential Environmental Effects

This deficiency is considered major and should be addressed before Environment Canada officials can undertake a detailed and meaningful review of the alternatives assessment report. This is also necessary to determine the significance of effects on the environment of the proposed mine waste management options.

Proposed Action

Provide comprehensive and detailed information in accordance with the format and information requirements of Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal, as per section 7.4 of the EIS Guidelines. The environmental, technical, socio-economic and economic accounts in the multiple accounts analysis should be substantially expanded to include more relevant sub-accounts and related indicators with appropriate weightings and merit ratings as part of the qualitative analysis.

EC recommends that the Proponent consider Aboriginal and stakeholder input in the alternative characterization as stated in Section 2.4 of Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal.

Reference to EIS

Alternatives Assessment Report

Response

On July 23, 2013, Osisko met with the Government Review Team (GRT) to discuss the assessment of mine waste alternatives. At the meeting, Environment Canada provided suggestions for augmenting the sub-accounts and indicators used in the assessment and agreed to review and comment on a revised list. Subsequently, Osisko developed and sent a revised list of sub-accounts and indicators for use in the multiple accounts ledger of the Osisko Hammond Reef Gold (OHRG) Mine Waste Alternatives Assessment document. The revised indicator lists were developed based on the following:

- Records of consultation with Aboriginal groups, the Public and the GRT;
- Comments and suggestions provided by the GRT; and

- Example Mine Waste Alternative Assessment reports provided by Environment Canada: including the New Prosperity Project, the Meliadine Project, the Meadowbank Mine and the KSM Project.

Osisko's discussions with Environment Canada will be reflected in the Final Report through several changes that have been made to the Alternative Assessment section. These changes can be summarized as follows:

- Clear description of the pre-screening of sites for consideration including definition of screening criteria;
- Definitions of indicators and metrics used for evaluation;
- A more thorough evaluation of alternatives through an expanded list of sub-accounts and indicators;
- Identification of non-distinguishing indicators and the rationale for not including them in the multiple accounts ledger; and
- A summary of key concerns raised during consultation and an explanation of how they are captured in the multiple accounts ledger.

The revision provides a more comprehensive evaluation that better depicts the extensive engineering and consultation efforts undertaken by Osisko to select the most suitable alternatives for the Hammond Reef Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-16

Source: Environment Canada

Summary of Comment

Metal Mining Effluent Regulations under the *Fisheries Act* requires effluent discharge concentrations to be reported.

Potential Environmental Effects

Add item for completeness.

Proposed Action

Add the Metal Mining Effluent Regulations to Table 10-1.

Reference to EIS

EIS 10-4 Table 10-1 Summary of Permitting Requirements

Response

The Metal Mining Effluent Regulations have been added to Table 10-1.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-17

Source: Environment Canada

Summary of Comment

The proponent states that during operation, the effluent discharge from the treatment effluent plant may, on occasion, exceed guidelines for the protection of aquatic life and the site specific water quality objectives during "wet years". The mine continues to say that the mixing zone at the end of the discharge will be small.

Under the pollution prevention provisions of the Fisheries Act, EC does not accept mixing zones. Once the mine is under the MMER the effluent discharged will have to meet the MMER effluent limits at end of pipe as per EIS Guideline 10.2.3.2.

Potential Environmental Effects

Subsection 36(3) of the Fisheries Act specifies that, unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water.

Proposed Action

Statements within the Aquatic Environment TSD and the EIS regarding conclusions on impacts to the aquatic environment from the discharge of treated mine effluents should not rely on the use of mixing zones in receiving waters to meet regulatory limits. The wording in these documents should be amended to be consistent with the federal requirements under the Fisheries Act.

Reference to EIS

Aquatic Environment TSD Pg. 117

Response

The predicted quality of the discharge from the mine site meets the MMER guidelines. The mixing zone is used to demonstrate where water quality will meet PWQO/CWQG or background levels, which are much lower than the MMER guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-18

Source: Environment Canada

Summary of Comment

Errors seem to have been made as to where the effluent discharge options enter the receiving water body.

Potential Environmental Effects

Effluent Discharge Option D and Effluent Discharge Option C should be flipped in the diagram. The arrow for Effluent Discharge Option B points at (6) but should really point at (3).

Proposed Action

Provide clarification to the locations of the effluent discharge options.

Reference to EIS

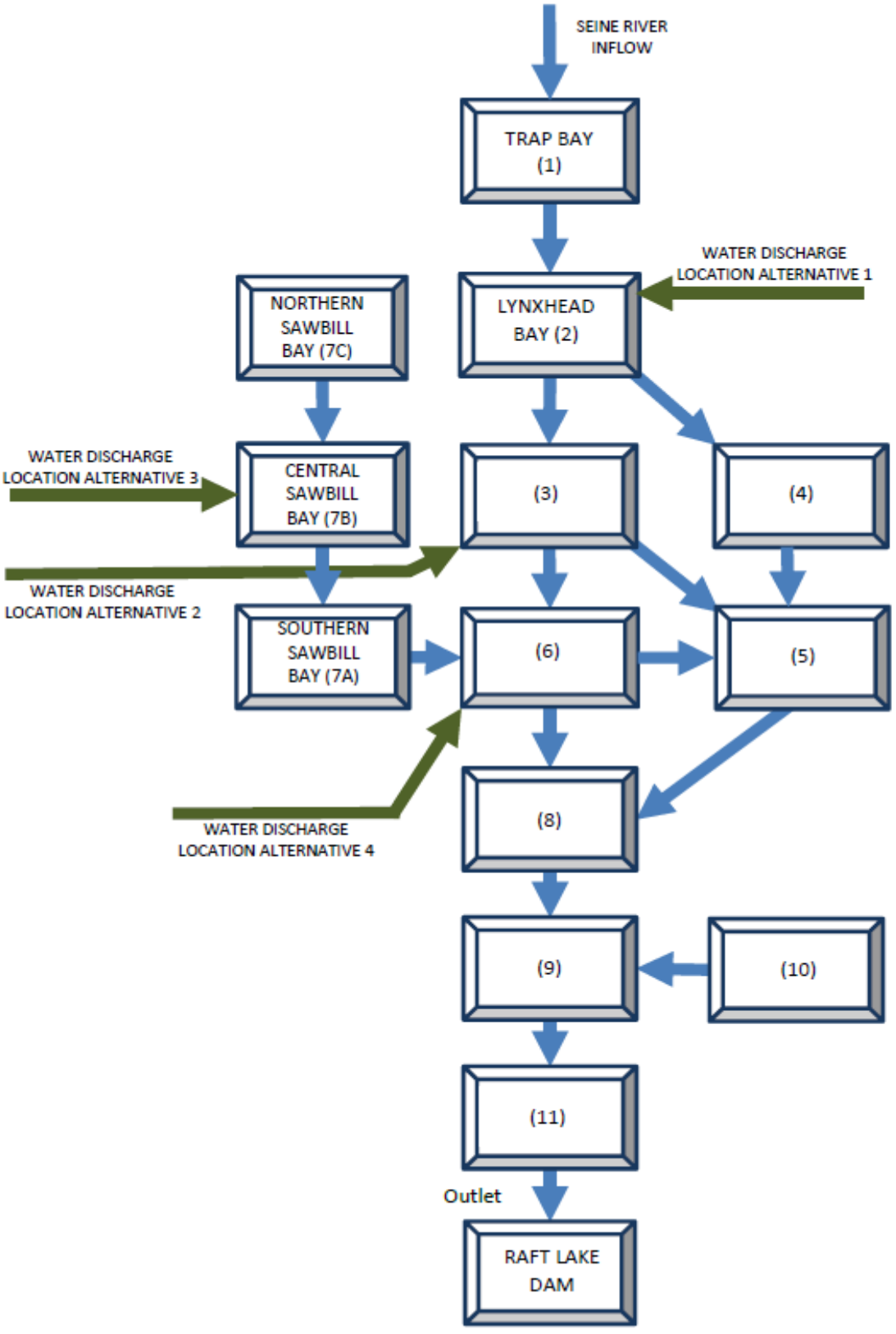
Lake Water Quality TSD Figure 3-1

Response

Water discharge alternatives (effluent discharge options) entering the receiving water body have been updated in Figure 3-1. As per Environment Canada comments, Water Discharge Location Alternative 2 (Effluent Discharge Option B) now points at (3), instead of (6); Water Discharge Location Alternative 3 (Effluent Discharge Option D) and Water Discharge Location Alternative 4 (Effluent Discharge Option C) were flipped in the diagram. However, Water Discharge Location Alternative 4 (Effluent Discharge Option C) should be pointing at (6) instead of (7A) and has been updated as such.

Attachments

Updated Figure 3-1.



PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
BOX MODEL FOR UPPER MARMION LAKE

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	GVA	12 Nov. 2012		
GIS				
CHECK	REJ	30 May. 2013		
REVIEW	KJD	30 May. 2013		

FIGURE: 3-1

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\BoxModelforUpperMarmionLake.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC -19

Source: Environment Canada

Summary of Comment

The table on page 53 describing the Summary of Effluent Mixing Proportions in Marmion Reservoir is very confusing and difficult to understand.

Potential Environmental Effects

A graphical representation of the effluent mixing proportions in the Marmion Reservoir would convey the information more clearly for a better understanding of the effects on water quality.

Proposed Action

Provide a map that depicts the predicted effluent concentrations (in %) using different colours to illustrate the various effluent concentrations. This provides an easy way to visualize the location and extent of the effluent plume.

Reference to EIS

Lake Water Quality TSD Table 4-3

Response

Given the characteristics of Sawbill Bay and Marmion Reservoir a simple box model was used to develop mixing proportions based on potential inflows and outflows. The locations on the Table correspond to the mixing zones within the lake as depicted in Figure 1-6 of the Lake Water Quality TSD. Attached is a figure showing a graphical representation of the average effluent mixing proportion. Each mixing basin is shaded relative to the average % mixing (i.e., higher mixing proportion is highlighted in darker shading). These proportions are then used to calculate the concentrations based on the existing lake water quality and input water quality from the discharge. The predicted concentrations are provided in tabular form for each of the key mixing zones (see Appendix 2.III of the Lake Water Quality TSD).

Higher effluent mixing proportions will exist in the vicinity of the effluent diffuser. Based on preliminary mixing-zone assessment, the average mixing proportion in Basin 6 (the basin in the box model in which the effluent is discharged) is expected to be reached within 400 m of the diffuser. Site specific water quality objectives (SSWQO) for cyanide and copper are expected to be reached within 30 m of the diffuser. The results of the preliminary mixing-zone assessment are included as supplemental information in the Lake Water Quality TSD (Version 2) as an attached Technical Memorandum entitled *Conceptual Diffuser Design and Mixing Zone Assessment for Effluent Discharge from the Osisko Hammond Reef Gold Project.*

Attachments

New figure showing zones.

605000 610000 615000

5425000 5420000

N

Freshwater Intake - Camp Site Potable

Camp Site Effluent Discharge Point

7c

Sawbill Bay

7b

Freshwater Intake - Process and Plant Potable

7a

Discharge Location

Lynxhead Bay

6 2 3 10 9 11 8 5 4 1

Raft Lake Dam

Outflow

Marmion Sluiceway

Inflow

Siene River

Lower Marmion Lake

Hawk Bay

LEGEND

- Proposed Location of Mine Processing Plant
- Effluent Discharge Point
- Discharge Location
- Freshwater Intake - Camp Site Potable
- Freshwater Intake - Process and Plant Potable
- Main River Flow
- Secondary Flow Path
- Major Tributaries
- Road
- River/Stream
- Lake
- Wetland
- Model Compartment

Average Mixing Proportion (%)

- 0.000
- 0.011
- 0.012
- 0.045
- 0.076
- 0.085
- 0.087
- 0.089
- 0.090
- 0.118

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

500 0 500 1,000 1,500 2,000
SCALE 1:50,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
MARMION RESERVOIR
AVERAGE EFFLUENT MIXING PROPORTIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	KDV	30 May. 2013		
REVIEW	KDV	30 May. 2013		

FIGURE: EC-19

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\EC19\AverageEffluentMixingProportions.mxd

INFORMATION REQUEST – EC-20

Source: Environment Canada

Summary of Comment

The proposed mitigation measures are only briefly discussed on page 12-6. Little detail is provided elsewhere in the relevant sections of the EIS and supporting documents.

Potential Environmental Effects

Details on the design and implementation of the proposed mitigation measures are required in order to assess whether the proposed measures are appropriate and effective. This is necessary to make the determination on the significance of environmental effects of the project, and whether these effects can be mitigated. Information on the proposed effluent treatment option(s) is necessary to determine the impacts to water quality and whether these impacts can be mitigated.

Proposed Action

Provide detailed, quantitative descriptions of the mitigation measures as proposed for all mine components as per EIS Guideline 10.2.3.2.

Reference to EIS

EIS - Conclusions: 12.2 Mitigation and Compensation Measures, page 12-6

Response

Chapter 6 has been revised to provide details of planned mitigation measures for the physical, biological and social environments. Further detail on planned mitigation measures are also provided for each identified potential effect in Chapter 8, Tables 8-2, 8-8 and 8-11.

With regards to water quality, water discharges from the Project are predicted to meet either baseline conditions, guideline values or site specific water quality objectives after initial mixing through an effluent diffuser. The effluent treatment plant is considered a contingency measure that will be designed and constructed only if the water quality monitoring deems it necessary. If an effluent treatment plant is necessary, information will be provided during detailed design of the plant. The mitigation measures for water quality are planned to take a step wise approach based on adaptive management. The key water quality mitigation measures include:

- Capture of runoff and seepage to collection ditches and sumps;
- Recirculation of water in process plant;
- Capture of water within the reclaim pond and PPCP to settle solids;
- Implementation of phosphorus management to reduce nutrient loading as necessary;
- Operation of a treatment facility for suspended solids as necessary;
- Development of a contingency plan for the treatment of metals or phosphorus as necessary; and
- Operation of a diffuser to enhance effluent mixing with receiving waters.

INFORMATION REQUEST – EC-21

Source: Environment Canada

Summary of Comment

The Proponent's geochemical characterization of tailings is based on only one (1) tailings sample, which was produced as an aggregate of many samples of the ore. Given the volume of tailings (231 Mt) that would be generated from the processing of the ore, this is not an adequate coverage of the number of tailings samples.

The Proponent has not undertaken or provided the mineralogical information on the tailings samples.

In the EIS Guideline in Section 10.2.3.2 and in Section 9.1.1 Geology and Geochemistry it is specified the Proponent will provide:

- representative lithologic descriptions including age, colour, grain size, mineralogy, physical strength, hardness, weathering characteristics, depositional setting and correlations; and
- estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of ARD or ML.

Potential Environmental Effects

It is important to properly undertake the geochemical characterization of all waste materials that would be generated by a mine. This characterization is critical to understanding the potential impacts that these waste materials can have on water quality, and the mitigation measures that would need to be implemented to prevent such impacts from occurring. This information is necessary to determine the significance of effects on the environment of the proposed tailings disposal option.

Proposed Action

Provide a complete geochemical and mineralogical characterization of the tailings which:

- Consider more samples of the tailings as representative of the total volume of tailings that would be generated, following the MEND (2009) guidelines;
- Consider both pre samples as well as post-metallurgical test samples for geochemical characterization;
- Consider both individual samples as well as composites of samples and run them for the geochemical characterization.
- Describe the mineral phases present in the tailings;
- Describe the abundance of the mineral phases present in the tailings; and
- Indicate the relative proportion of sulphide and carbonate mineral phases in the tailings.

Reference to EIS

Geochemistry, Geology and Soil TSD 3.3.1.2 Tailings, page 28

Response

Tailings are composed of the rock types described in the Geochemistry, Geology and Soils TSD as further discussed in a letter to Osisko in response to MOE-NR-GW-02, which can be found in the Supplemental Information package of the Geochemistry, Geology and Soil TSD. Only gold is removed in the process, thus the tailings and rock are essentially the same. For all rock types expected to be encountered in the tailings ample information is provided with respect to that as indicated in the EIS Guideline in Section 10.2.3.2 and in Section 9.1.1 Geology and Geochemistry:

- Representative lithologic descriptions (Section 2.0 of the Geochemistry, Geology and Soils TSD) – these are the same as those of the waste and ore.
- Age – (Geological age range is provided in Section 2.0 of the Geochemistry, Geology and Soils TSD) – the age of the minerals is the same as that of the ore.
- Colour – provided in geochemical sample descriptions (Appendix A of the Geochemistry, Geology and Soils TSD) – the colour of the minerals will be the same as those of the host rocks.
- Grain size – not relevant for bedrock – provided for tailings in Geochemistry, Geology and Soils TSD Appendix 2.VI, Attachment 2.VI.1 “Final Data Report: Tailings Mineralogy, Geochemistry and Grain Size – Hammond Reef Gold Project – April 2012”.
- Mineralogy – provided in Appendix 2.IV of Geochemistry, Geology and Soils TSD.
- Physical strength, hardness, and weathering characteristics – these factors are more relevant for engineering design and for geochemical conditions when evaluating mines in tropical regions, or sedimentary deposits and are generally noted only when the lack of physical strength may lead to geochemical implications for the deposit. For the rock types encountered in this deposit Bedrock types of the Canadian shield such as the tonalities, granites and altered granites found within this deposit the rocks are typically indurate and do not rapidly weather. The hardness of the rock types encountered is typically between about 5 and 7 on the Mohs scale, however the hardness of individual mineral grains within the rock type will vary.
- Depositional setting and correlations – this is provided in Section 2.0 of the Geochemistry, Geology and Soils TSD.
- Estimates of the potential for mined materials (including waste rock, tailings and low grade ore) to be sources of ARD or ML – these are provided in the Geochemistry, Geology and Soils TSD, and in the Supplemental Information Package of the Geochemistry, Geology and Soil TSD. To summarize, the waste rock, tailings, low grade ore, and open pit walls are expected to be non-acid generating with excess neutralizing capacity for all rock types and lithologies encountered on site. Metal leaching potential is expected to be low as indicated in the Geochemistry, Geology and Soils TSD, and as evaluated for the site conditions and project description in the Site Water Quality TSD.

The questions presented in this information request are further addressed as follows:

Q: “Consider more samples of the tailings as representative of the total volume of tailings that would be generated, following the MEND (2009) guidelines;”

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

A: The tailings sample was generated from a set of ten variable Metallurgical (Met) samples each of which was tested individually, the results of which are provided in the Supplemental Information Package of the Geochemistry, Geology and Soil TSD. The ABA results show that regardless of the location within the deposit, the sulphide-sulphur contents of the samples were generally low, ranging from 0.09 to 0.35 wt% as S. The CaNPR values ranged from 5.8 to 62 t $CaCO_3$/1,000 t. Each of the individual samples, as well as the composite sample, are classified as non-acid generating with excess neutralization potential according to the MEND (2009) and AMIRA (2002) guidelines. It should be noted that at this stage of the project there is very little actual tailings available for testing. As stated in MEND (2009), Section 8.2 “Prior to mining, the choice of material to sample is often restricted to drill core and to metallurgical testing for tailings”; and , “Limitations in the availability and accessibility of materials to be sampled need to be considered in the design of a sampling program”.

Q: Consider both pre samples as well as post-metallurgical test samples for geochemical characterization;

A: These have been considered. Gold makes up very little of the overall rock (less than 1 g/t or 1 part per million), therefore the post-metallurgical tailings samples and the pre-metallurgical tailings samples are expected to be essentially the same, although the post metallurgical samples are expected to be more homogeneous. Additional discussion regarding sample representativeness and processing is provided in the Supplemental Information Package of the Geochemistry, Geology and Soil TSD. It is expected that during operations additional geochemical monitoring of post-metallurgical tailings will be conducted.

Q: Consider both individual samples as well as composites of samples and run them for the geochemical characterization.

A: This has been considered. In addition to the metallurgical samples, several of the waste rock samples contained some higher grade material that could be considered ore if it occurred in closer proximity to larger ore zones. These samples were tested and were sampled from the drillholes BR-165; BR-167; BR-164, BR-166 and BR-169. Table 1 presents these waste rock sample IDs. The results from these samples are included in Appendix 2.III of the Geochemistry, Geology and Soils TSD and are similar to the overall waste rock and tailings results.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Table 1: Comparison of ABA and NAG Test Results for Higher Grade Waste Rock, Tailings and Overall Waste Rock Samples.

Samples		Sulphur Species (wt %)			Carbonate (wt %)	Potentials (t $CaCO_3$/1,000t)			NPR[(a)] (ratio)	CaNPR[(a)] (ratio)	NAG[(a)] pH (s.u.)
		Total	Sulphate	Sulphide		NP[(a)]	AP[(a)]	CaNP[(a)]			
Higher Grade Waste Rock Samples											
Drill Hole ID	**Sample ID**										
BR-164	2010-HR-103	0.019	0.02	< 0.01	2.67	49.9	0.31	44	161	143	10.95
BR-165	2010-HR-014	0.009	< 0.01	< 0.01	0.539	15.8	0.31	9	51	29	8.01
	2010-HR-016	0.022	< 0.01	0.02	1.01	27	0.62	17	43.5	27	8.73
	2010-HR-021	0.124	0.02	0.11	1.36	33.3	3.33	23	10	6.8	10.75
BR-166	2010-HR-093	0.03	0.03	< 0.01	3.18	49.7	0.31	53	160	170	10.57
	2010-HR-096	0.012	0.01	< 0.01	2.41	45.5	0.31	40	147	129	10.95
BR-167	2010-HR-072	0.005	< 0.01	< 0.01	2.30	44.7	0.31	38	144	123	11.2
	2010-HR-073	0.005	< 0.01	< 0.01	0.574	15	0.31	10	48.4	31	8.3
BR-169	2010-HR-077	0.114	0.05	0.07	2.16	44	2.19	36	20.1	16	11.01
Tailings Sample											
SGS Lakefield		0.175	0.08	0.09	4.84	76.6	2.85	80	27	28	11.14
Overall Waste Rock Samples - Average by Lithology											
Fine Grained Granite (n = 16)		0.03	0.02	0.02	4.3	75	0.59	72	143	127	11
Chloritic Granite (n = 31)		0.04	0.02	0.02	2.9	54	0.76	48	135	120	11
Tonalite (n = 30)		0.04	0.02	0.03	1.5	33	0.93	24	76	55	10
Altered Granitoid (n = 8)		0.04	0.03	0.01	2.5	45	0.43	41	120	112	10
Pegmatite (n = 11)		0.04	0.02	0.03	2.1	41	0.79	35	71	55	10
Mafic Dyke (n = 9)		0.06	0.04	0.03	6.3	116	0.93	105	228	209	11
Chloritic Granite Porphyry (n = 5)		0.05	0.03	0.02	5.4	91	0.67	90	195	196	11
Minor Units (n = 13)		0.06	0.02	0.05	3.4	62	1.4	56	189	173	10

Notes:

(a) NP = neutralization potential; AP = acid potential; CaNP = carbonate neutralization potential; NPR = neutralization potential ratio; and CaNPR = carbonate neutralization potential ratio; and NAG = net acid generation.

Q: Describe the mineral phases present in the tailings; Describe the abundance of the mineral phases present in the tailings.

A: The mineral phases present in the tailings are the same as those of the waste rock and ore and are described in detail in Section 2.0 of the Geochemistry, Geology and Soils TSD. Additional information on the mineralogy of the tailings specifically including abundances is provided in Geochemistry, Geology and Soils TSD Appendix 2.VI, Attachment 2.VI.1 "Final Data Report: Tailings Mineralogy, Geochemistry and Grain Size – Hammond Reef Gold Project – April 2012".

Q: Indicate the relative proportion of sulphide and carbonate mineral phases in the tailings.

A: This is provided in the Supplemental Information Package of the Geochemistry, Geology and Soil TSD, including the range present in the metallurgical samples, and combined composite sample.

References

AMIRA (AMIRA International Ltd.). 2002. *ARD Test Handbook – Prediction and Kinetic Control of Acid Mine Drainage*. Environmental Geochemistry International Pty. Ltd. and Ian Wark Institute, University of South Australia.

MEND (Mine Environment Neutral Drainage). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada. December 2009.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-22

Source: Environment Canada

Summary of Comment

The Hydrogeology Technical Support Document identifies that the temporal boundary for the 3-D groundwater flow model of the Mine Area is the end of mine operations. Section 2.10 Prediction of Potential Changes provides that this "….model was modified to incorporate the fully excavated Mine along with adjustments to the infiltration rate at the adjacent stockpiles. As discussed in Section 1.8, the temporal boundary for hydrogeology at the end of mine operations was the only phase of the Project considered for predictions of the change in groundwater quantity as this represents the phase of the Project when groundwater level declines associated with mining will be at their greatest lateral extent."

In the EIS Guidelines in Section 10.2.3.1 Hydrology and Hydrogeology it is specified that the Proponent will:

- Provide the results of a groundwater flow model of the local catchment for the post closure period incorporating all major permanent mine components, including the open pits, TIAs, and mine rock stockpiles.

Potential Environmental Effects

Information regarding the proposed changes to groundwater of the Mine Site Area in a post closure period is necessary to assess the effects of the project on water quality and the environment and whether the proposed mitigation measures are appropriate.

Proposed Action

As per Section 10.2.3.1 of the EIS Guidelines provide the results of the 3-D groundwater flow model of the Mine Area incorporating all major mine components.

Reference to EIS

Hydrogeology TSD Section 2.10

Response

Following Section 10.2.3.1 a 3-D groundwater flow model has been prepared to represent the greatest potential impact to water level declines. This is considered reasonable within the overall context of the site. Following the operational phase the groundwater drawdown and impact will reduce over time (estimated at 218 years post closure). Conservatively, following closure, a simple but robust model was prepared using a water balance approach to evaluate potential for groundwater water influence.

From a groundwater elevation perspective this is considered more appropriate than a detailed hydrogeological approach since the changes in boundary conditions and pit infilling conditions vary depending on surface water conditions, and the surface water has a much larger influence on groundwater levels than does the groundwater flow regime. This approach is considered to contain less uncertainty than a hydrogeological modelling approach over a long period of time due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

In Closure and Post Closure the infiltration, groundwater and runoff are all assigned the leachate water quality of the material on which the precipitation lands, and all of that mass is directed to the Marmion basin. The Site Water Quality model and Lake Water Quality Mixing Model thus include potential groundwater flow components and all mass associated with these groundwater flow components, thus implications to groundwater are conservatively accounted for in current site water quality predictions into closure and post closure. Geochemically the materials are all non-acid generating with low metal leaching potential, so this approach is considered reasonable from a geochemical stability perspective.

Responses to Information Requests MNDM-18 and MOE-NR-GW-16 provide additional information on potential for impact at point of groundwater discharge to receiving waters and show that there are no anticipated adverse effects on aquatic life; even should no attenuation of groundwater concentrations occur along the flow paths between the TMF, WRSF, Ore Stockpile or Overburden Stockpile and the receiving water.

Osisko considers that, given the site specific conditions, the level of detail as provided is reasonable at an EIS/EA stage and that the intent of the EIS Guidelines, and approved ToR as well as the higher level specific attributes of the EIS Guidelines and approved ToR are met.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-23

Source: Environment Canada

Summary of Comment

Local scale lake water monitoring stations are deficient near the project site. No water level monitoring stations were installed in Sawbill Bay or in Trap Bay. The nearest monitoring station to the mine site is located 7 km from the project site at the outlet of Lizard Lake. There were inconsistencies between the monitoring stations in the timing of lowest water levels. Furthermore there are significant periods of missing data in the water level records for the Upper and Lower Marmion Reservoirs. Based on this, the prediction of changes in water levels due to the mining project on a local scale and in particular during dry years is questionable.

Potential Enviromental Effects

Reliable and precise information on changes of water levels on a local scale is required to predict the impact of changes of water levels on local biota. The Proponent needs to provide enough information to adequately describe whether the Project will have significant environmental effects.

Proposed Action

Verification of the accuracy of the predicted changes in water levels at local scale is needed. The project's overall monitoring program should include water level monitoring stations in Sawbill Bay and Trap Bay. These new stations should be implemented as soon as possible prior to project initiation.

Reference to EIS

Hydrology TSD, Version 1, Section 5.1.1.2, Table 5-1, page 51

Response

Sawbill Bay and Trap Bay are part of the Upper Marmion Reservoir, which is a single water body. Water level data for Upper Marmion Reservoir are collected on an ongoing basis by H2O Power Limited Partnership and Valerie Falls Limited as part of compliance monitoring under the 2004 to 2014 Seine River Water Management Plan. The data are published charted on the Seine River Watershed Information website, http://www.seineriverwmp.com/raft.html. Section 8.0 of the Hydrology TSD (pages 185 to 189) outlines a monitoring program, the objectives of which include verifying the accuracy of the predicted changes in flows and lake water levels; and confirming the assumptions underlying the predicted changes. The 3rd bullet in Section 8.2.2 provides for the sourcing of water level data for the Upper Marmion Reservoir from the waterpower companies throughout the construction, operations, closure and post-closure phases of the project. The 2nd and 3rd bullets in Section 8.2.3 provide for analysis/modelling using these data to update/confirm estimates of the predicted changes.

The prediction of changes in water levels in Upper Marmion Reservoir was not based on data recorded at Raft Lake Dam. The potential changes in water levels in Upper Marmion Reservoir as a result of the Project were assessed using spreadsheet monthly water balance models of existing conditions and of conditions during the operations phase of the Project (2nd paragraph of Section 6.2.1.4). The models are described in Section 5.2.1.4. Based on the above, the installation and operation of water level monitoring stations in Sawbill Bay and Trap Bay is not considered necessary.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-24

Source: Environment Canada

Summary of Comment

How will the effects be measured on artifacts, cultural, archaeological & spiritual sites?

Potential Environmental Effects

The details describing how effects on artifacts, cultural, archaeological and spiritual sites will be measured was not provided in the Aboriginal Interests TSD.

Proposed Action

Provide how effects on artifacts, cultural, archeological and spiritual will be measured / quantified as per EIS Guideline 10.3.1.

Reference to EIS

Aboriginal Interests Technical Document 5.1.3, Table 5-1

Response

The predicted effects will be monitored on an ongoing basis by the Resource Sharing Committees. These committees are set up to provide a link between Osisko and the communities, for both communication purposes and to ensure that where outcomes do not match the predictions, corrective actions can take place.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-25

Source: Environment Canada

Summary of Comment

Under "Traditional use of land and resources" medicinal plants is missing as an Indicator.

Potential Environmental Effects

Medicinal plants should be included as a valued ecosystem component under "Traditional Use of Land and Resources".

Proposed Action

Add "Medicinal Plants" as an Indicator of project effects.

Reference to EIS

Aboriginal Interests Technical Document 5.1.3, Table 5-2

Response

Plant harvesting includes the harvesting of medicinal plants.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-26

Source: Environment Canada

Summary of Comment

"Heritage resources are defined as archaeological artifacts and culturally special sites". What is the source of the definition of "heritage resources" being used here?

Potential Environmental Effects

Heritage resources are an important valued ecosystem component for Aboriginal communities.

Proposed Action

Provide source of definition (i.e. Ontario Ministry of Tourism, Culture & Sport, CEAA, academia, etc.)

Reference to EIS

Aboriginal Interests Technical Document 6.3.2

Response

The definition is provided based on Project-specific work. The environmental assessment uses Heritage Resources as a VEC, and defines the VEC to allow the reader to follow through the assessment clearly. The VEC combines archaeological sites and special sites because they are referenced in this way by the Elders, community members and committee members included in the traditional land use work for the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-27

Source: Environment Canada

Summary of Comment

The main access roads for the project are identified. Are there any other secondary or maintenance roads being constructed?

Potential Environmental Effects

Additional environmental impacts associated with additional roads need to be assessed in the EIS as per EIS Guideline 10.2.5.

Proposed Action

Provide maps to show all the roads being constructed, e.g. pipeline access roads, TMF access roads, etc.

Reference to EIS

EIS 5-29 Section 5.2.5 Tailings Management Facility

Response

All currently planned mine site roads are included on Figure 5-1.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-28

Source: Environment Canada

Summary of Comment

The EIS listed "TMF discharge location(s)."

Potential Environmental Effects

Is there more than one discharge location or was this a typo?

Proposed Action

Clarify whether there will be more than one discharge location.

Reference to EIS

EIS 5-29 Section 5.2.5 Tailings Management Facility

Response

Almost all of the tailings will be discharged from a single central discharge point to form an overall conical shape for the tailings deposit. A relatively small volume of tailings will be discharged from locations along the perimeter dams and from at least one point off the northern hillside. This perimeter discharge is intended to prevent water from ponding against the upstream faces of the dams.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-29

Source: Environment Canada

Summary of Comment

None

Potential Environmental Effects

There is missing information on the geochemical characterization of overburden material as well as the total volume of the material. This information is needed to assess the potential impacts that the effluent generated from the overburden stockpiles could have in the receiving aquatic environment, and whether these impacts can be mitigated.

Proposed Action

The Proponent should undertake detailed geochemical characterization of the overburden material that includes mineralogical analyses, acid base accounting, shake-flask leaching and humidity cell kinetic testing, as undertaken for waste rock and tailings samples.

Information should also be provided on:

- the total volume of overburden that would be generated from the mine development;
- the volume of overburden material that is to be used for construction; and
- the volume of overburden material that will remain stockpiled during closure.

Reference to EIS

Geochemistry, Geology and Soil TSD

Response

The quaternary mapping of the area describes the typical overburden expected in the project site (Section 2.1 of the Geochemistry, Geology and Soil TSD). As indicated in Ontario Geological Survey Open file Report 5986, the surface sediments in the RSA are discontinuous due to bedrock outcrops, and consist predominately of a thin, discontinuous veneer of drift (till) over bedrock (Dyer 1999). Within the RSA modern fluvial deposits occupy major river valleys, such as along the Seine River (Dyer 1999). Glaciolacustrine deposits may contain sand silt or clay and may occur in localized zones. One of these zones containing sand and silt till is located to the northeast of Marmion Reservoir. A zone of glaciolacustrine wet silt with organics is also found immediately at the north end of Sawbill Bay (Figure 2-1).

The overburden stockpile would be designed to contain all overburden material excavated during mine development. Based on the mining plan, the stockpile will contain about 9.2 Mt (about 4.5 Mm^3) of overburden, and it will occupy a 36.8 ha footprint (see Project Description TSD). Runoff and seepage from the stockpile would be collected in a perimeter ditch system and conveyed to one of four collection ponds, with the collected water pumped to the PPCP for use as re-claim in the plant or for treatment and discharge.

According to the Conceptual Closure and Rehabilitation Plan (CCRP), some of the overburden will be used at closure for site regrading purposes. This has not been quantified, but it may be that about 25% of the original volume will be used around the site. The top surface of the material remaining in the stockpile (roughly 3.8 Mm^3)

will be graded and drainage measures will be put in place. The overburden is expected to support vegetation, so the surface will be directly revegetated, without the use of topsoil. Water in the four collection ponds will continue to be monitored after closure. Runoff and seepage water will continue to be pumped to the open pits until such time as the water quality becomes acceptable for direct discharge to the environment. At that time, the ponds will be breached and the pumping systems will be removed.

Given the moderate side slopes, it is expected that the reshaped Overburden Stockpile will be resistant to erosion once the vegetation is established. In the short term, good construction practice measures (e.g., silt fences, hay bale barriers, etc.) will be used to control erosion. Also, all runoff from the stockpile will report to one of the four collection ponds which will be effective in removing suspended solids by sedimentation.

Geochemical Discussion - Overburden

Of note is that the overburden materials are generally of similar characteristics to the nearby host materials from which they originate. Given that the waste rock and ore deposit chemistry is non-acid generating with low potential for metal leaching it follows that the chemistry of the overburden derived from this material will have similar characteristics, furthermore, the overburden will have been subjected to more weathering and leaching over a very long period of time, as such is expected to have lower potential for metal leaching than the bedrock from which the material originated, especially that which is fluvial, or lacustrine in origin.

Overburden units are described in Section 4.0 (Soils) of the Geochemistry Geology and Soils TSD. Given the glacial history of the region the discontinuous, overburden will be similar to surface soils, as such the chemistry result presented in Table 4-5 of the Geochemistry, Geology and Soils TSD are considered reasonable and valid for evaluation of overburden chemistry characteristics. Test results from these materials show consistent, low solid phase metal concentrations over the local study area.

In addition to the chemistry analyses of near surface samples presented in Table 4-1 of the Geochemistry, Geology and Soils TSD, six additional overburden samples were analyzed for geochemical characteristics as part of the feasibility study (Supplemental Information package of the Geochemistry, Geology and Soil TSD). These samples were subjected to static testing (e.g. ABA, metal analyses and short term leach tests). It is expected that additional geochemical sampling of overburden would be undertaken as part of operational monitoring, furthermore, water management at the project site as described in the Site Water Quality TSD has allowed for capture and treatment of water from the overburden stockpile until such time as the water is suitable for direct release to the environment.

The results of the available overburden chemical and geochemical test results show that the overburden is expected to be non-acid generating with low metal leaching potential. Given that the ABA results show the samples are clearly non-acid generating the metal leaching results would be expected to improve over time, thus use of these short term leach test results in overburden water quality evaluation is considered a reasonable worst case. As indicted in MEND (2009) “kinetic testing is often limited to samples identified as important and representative by static tests”, thus, given the site overburden emplacement characteristics and static test results for overburden to date, humidity cell tests are not recommended or considered appropriate for these overburden materials at this time.

References

MEND (Mine Environment Neutral Drainage). 2009. *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials*. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada. December 2009.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-30

Source: Environment Canada

Summary of Comment

The EIS and Site Water Quality (SWQ) TSD states that a collection system will control runoff (surface drainage) and seepage using ditches, pumping stations, runoff collection, settling ponds, and perimeter containment. Also, the SWQ TSD states "Seepage losses out of facilities which collect water will be estimated through the use of a SEEP/W finite element model. At this point in the Project development, only seepage losses through the TMF dams have been estimated. Seepage losses from the PPCP will be calculated by similar means when the operating pond levels have been determined. The SEEP/W model was developed in support of the Project Feasibility Study, and is beyond the scope of the EIS/EA."

Any seepage and surface drainage that contains a deleterious substance that is derived from within the operations area and in particular from the mine components is considered effluent under the MMER. The design of these systems (as described above) and their discharge structures and locations, a major component of the water management system, has not been adequately described in the EIS or in the SWQ TSD.

EIS Guidelines, Sec. 10.2.3.1 Hydrology and Hydrogeology specifies that the Proponent will:

- provide the conceptual design features of all collector and diversion ditches, culverts, bridges, and water storage facilities (including sediment ponds and seepage collection ponds). Cross-sections of the ditches and water storage facilities shall be provided and include the run-off flow return period to which the works can convey all flows, and to which the works can withstand flows without significant damage.

EIS Guidelines, Sec. 10.2.3.2 Water Quality and Aquatic Ecology specifies that the Proponent will:

- include volumes, water quality, discharge structures and location, potential effects on the receiving environment from all cumulative site water discharges and the description of any mitigation strategies and/or treatment processes.

Potential Environmental Effects

Details on the proposed management of seepage and surface drainage that contains a deleterious substance that is derived from within the operations area and in particular from the mine components is necessary to assess the effects of the potential release of effluent to the environment. In addition, the details need to include the proposed management of seepage out of the facilities which collect water and include but is not limited to the PPCP. The Proponent needs to provide enough information about mitigation measures and all of the systems and components of the water management system for reviewers to be able to assess their expected effectiveness. Information about mitigation measures is critical to being able to assess whether the Project will have significant environmental effects with appropriate mitigation measures in place.

Proposed Action

As per EIS Sections 10.2.3.1 and 10.2.3.2 provide a detailed description of the proposed measures to manage, contain and collect seepage and surface drainage from the operations area and all mine components. Provide

details on the seepage losses, locations, rates, quality from the facilities which collect water and the PPCP. A quantitative assessment of the effectiveness of these measures should also be provided.

Reference to EIS

EIS - Project Components: Section 5.2.7

Water Management System Page 5-35

Site Water Quality TSD Section 3.4.3

Response

The project is currently at the feasibility stage of design. A conceptual design has been developed whereby a total of 5 seepage collection ponds (SCPs) will be built at low points around the perimeter of the Tailings Management Facility (TMF). In addition, 3 SCPS will be constructed around the Waste Rock Stockpile; 3 SCPs will be constructed around the Overburden Stockpile and 3 SCPS will be constructed around the Low Grade Ore Stockpile. Conceptual design details for the SCPs, collection ditches and other water management infrastructure, including details on the design approach and criteria and typical cross-sections, have been provided in a technical memorandum included in the Supplemental Information Package of the Version 2 Hydrogeology TSD. More advanced design details for the SCPs and the associated facilities (i.e., ponds, dykes, pump stations, ditches, etc.) will be developed later in the detailed design stage. These facilities will all be designed and constructed following engineering good practice. Taken together, the overall seepage collection system represents a high degree of effort to capture seepage that has been in contact with mine wastes, and one that considerably exceeds the practice on most mine sites in Ontario to date.

As described in the EIS Section 5.2.7, the Process Plant Collection Pond (PPCP) will have two cells, the emergency spill cell and the runoff cell. The former will be lined with a geomembrane. The latter may be unlined because it will receive water runoff collected from the TMF and SCPs as well as local area runoff. Also, hydrogeologic modelling predicts that the runoff cell will likely be within the hydraulic capture zone of the Open Pits, so that seepage from the runoff cell would be inherently contained in the site water management system. The PPCP is currently at the conceptual stage of design and conceptual design details have been provided in a technical memorandum included in the Supplemental Information Package of the Version 2 Hydrogeology TSD. More advanced design details will be developed later in the detailed design stage. Detailed design will include modeling to predict the direction and approximate magnitude of any seepage losses. The PPCP will be designed and constructed following engineering good practice.

Rather than conducting detailed modelling at this stage of the project (i.e. prior to having a detailed design), a more conservative approach was taken for the purposes of the assessment. For the assessment the water quality model conservatively includes mass loading from all site facilities for ALL water (including: net precipitation, mine water inflow, mill process water, TMF water, ore stockpile water etc…). Since the model conservatively uses ALL water incident on the site to predict mass load and ultimate water quality in Marmion Basin the predictions not only provide data that allows for assessment of whether the Project will have significant environmental effects, but does so conservatively. Additional details and analyses on potential water quality of the individual site facilities which shows that they will not cause adverse impacts regardless of where they discharge is provided in response to MOE-NR-GW-16 and MNDM-18.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-31

Source: Environment Canada

Summary of Comment

The SWQ TSD describes and identifies that the existing water quality program for the Project are compared to Ontario Provincial Water Quality Objectives (PWQO), Canadian Council of Ministers of the Environment Canadian Water Quality Guidelines (CCME CWQG), and, the Municipal/Industrial Strategy for Abatement Effluent Monitoring and Effluent Limits for the Metal Mining Section Ontario Regulation 560/94 (O.Reg. 506/94). In this list the Federal regulatory requirements that are outlined in the *Metal Mining Effluent Regulations* (MMER) under the *Fisheries Act* is omitted. S4.5 again omits the MMER.

The proponent has not proposed or described the discharge water quality criteria for end of pipe during any phases of the project. Effluent at the final discharge point(s) of the mine must at a minimum meet the MMER criteria.

Therefore, when the methods used to develop the Environmental Management Plans (EMPs), specifically the water management plan, outlined in the SWQ TSD for the site discharge and its mitigation do not identify that effluent discharge from the site must comply with the MMER, EC must interpret that the SWQ TSD does not conform to the EIS Guidelines.

Potential Environmental Effects

Water management and treatment are major components of the mine design given the potential for metal leaching to the environment from the mine components. Information on the proposed or predicted effluent water quality at the final discharge points to the environment is necessary to determine the impacts to water quality and whether these impacts can be mitigated. This information is critical to being able to assess whether the Project will have significant environmental effects with appropriate mitigation measures in place.

Proposed Action

As per Section 13.1 of the EIS Guidelines, Environmental Management Planning provide details for the proposed Environmental Management Plans (EMP) outlining the proper measures and controls to be implemented in order to decrease the potential for environmental degradation from mine effluent during all phases of project development. Section 13.1 also clearly identifies that all pertinent regulations shall be used in the development of EMPs.

Reference to EIS

Site Water Quality TSD 2.0 Methods, S2.2 Guidelines and Indicators

Conceptual Closure and Rehabilitation Plan, Sections 2.0 and 4.0

Response

The discharge pipe water quality is provided as “Reclaim Tank (Final Discharge)” in Tables 4-10 through 4-13 for various scenarios. This is clarified in the amended tables attached.

To be clear, the values provided in the tables are for comparison purposes only, it is understood that discharge must meet appropriate regulations and guidelines such as MMER and this is expected to be addressed through permitting following approval of the EIS/EA. MMER guidelines (Metal Mining Effluent Regulations, Fisheries Act SOR/2002-222, Schedule 4, Maximum Authorized Monthly Mean Concentration) in addition to MISA (Municipal/Industrial Strategy for Abatement, O. Reg 560/94, Schedule 1, Monthly Average Concentration Limit), PWQO and CCME CWQG guidelines, have been added to the attached tables to better allow for comparisons.

Effluent mixing will be enhanced through the construction and operation of a diffuser at the discharge location. A conceptual diffuser design has been developed and a preliminary mixing-zone assessment has been completed to evaluate effluent mixing at the discharge location. This assessment provides estimated concentration gradients in the near-field mixing zone near the effluent diffuser. The results of the preliminary mixing-zone assessment are provided as an attachment to the response to EC-19 and will be included as an addendum to the Lake Water Quality TSD. Further mixing throughout Marmion Basin is assessed through the lake-wide mixing model described in the Lake Water Quality TSD.

Water management and water quality controls are provided in the water management section of the project description (Chapter 5 of the EIS/EA, Table 5.1) and in Chapter 8 of the EIS/EA. Table 8-2: (Environmental Management Planning, Monitoring and Compliance – Physical Environment). Section 8.2.2.4 (Water Quality) of Chapter 8 provides the preliminary objectives and framework (including proposed monitoring parameters, locations, methods, frequency and duration) for development of the Environmental Management Plan (EMP) and identifies that operational monitoring will be undertaken should the project proceed to ensure compliance with appropriate water quality regulations and guidelines. Additional details of the EMP will be developed throughout the detailed design phase should the project proceed.

Attachments

Amended Tables 4-10 through 4-13.

Table 4-10: Summary of Steady State (Average) Conditions Results During Operations

Parameter	Units	Guidelines			Reclaim Tank (Final Discharge)	Seepage from TMF	Natural Runoff	Site Runoff
		CCME CWQG[a]	PWQO[b]	MISA[c]				
pH	**s.u.**	6.5–9.0	6.5–8.5	6.0–9.5	7.7 - 7.8	7.8	6.9	6.9
Cyanide	**mg/L**	0.005			**0.16 – 0.23**	**0.028**[d]	N/A	N/A
NO_3[e]	**mg/L as N**	13	13		1.2 – 2.0	0.00004	0.04	0.04
NH_4[e]	**mg/L as N**				15 - 16	20	0.02	0.02
SO_4	**mg/L**				142 - 200	242	1	1
Cl	**mg/L**				18 - 25	31	1.1	1.1
Hg	**mg/L**	0.000026	0.0002		0.000009 – 0.00001	0.00001	0.000005	0.000005
Ag	**mg/L**	0.0001	0.0001		0.00001 – 0.00002	0.00001	0.0001	0.0001
Al	**mg/L**	0.1	0.075		0.01 – 0.02	0.02	0.054	0.054
As	**mg/L**	0.005	0.005	1	0.00004 – 0.00005	0.0001	0.0006	0.0006
B	**mg/L**		0.2		0.0006 – 0.002	0.00002	0.019	0.019
Ca	**mg/L**				19 - 24	28	13	13
Cd	**mg/L**	Note[f]	0.0001		0.00002	0.00002	**0.00005**	**0.00005**
Co	**mg/L**		0.0009		**0.002**	**0.003**	0.0003	0.0003
Cr	**mg/L**	0.001	0.001		0.0002	0.0002	0.0006	0.0006
Cu	**mg/L**	0.002	0.001	0.6	**0.06 – 0.09**	**0.11**	0.0007	0.0007
Fe	**mg/L**	0.3	0.3		0.00007	0.0001	**0.4**	**0.4**
K	**mg/L**				24 – 34	40	0.78	0.78
Mg	**mg/L**				10 – 13	16	1.8	1.8
Mo	**mg/L**		0.04		**0.05 – 0.07**	**0.08**	0.0006	0.0006
Na	**mg/L**				62 - 87	106	1.2	1.2
Ni	**mg/L**	0.025	0.025	1	0.007 – 0.009	0.01	0.001	0.001
P	**mg/L**	0.004-0.1	0.02-0.03		0.02	0.02	0.008	0.008
Pb	**mg/L**	0.001	0.001	0.4	0.0001	0.0002	0.0004	0.0004
Sb	**mg/L**		0.02		0.002	0.002	0.002	0.002
Se	**mg/L**	0.001	0.1		0.0006 – 0.0007	0.0008	0.0004	0.0004
U	**mg/L**		0.005		0.005 – **0.006**	**0.007**	0.002	0.002
V	**mg/L**		0.006		0.00002 – 0.00005	0.00004	0.0005	0.0005
Zn	**mg/L**	0.03	0.02	1	0.002	0.002	0.003	0.003

Notes:

[a] Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

[b] Provincial Water Quality Objectives.

[c] Municipal/Industrial Strategy for Abatement.

[d] Assuming 5 ppm in CN circuit and natural degradation of cyanide as described in Section 4.2.3.

[e] Assuming no oxidation of ammonia to nitrate.

[f] Cadmium guideline based on hardness calculation where CCME CWQG for Cd, ug/L = 100.86[log(hardness))-3.2.

Hardness, mg equivalent/L CaCO3 = ([Ca,mg/L]*2.497) + ([Mg,mg/L]*4.116).

Bold values are greater than one or more of the environmental guidelines.

Table 4-11: Summary of First Flush Conditions Results During Operations

Parameter	Units	Guidelines			Reclaim Tank (Final Discharge)	Seepage from TMF	Natural Runoff	Site Runoff
		CCME CWQG[a]	PWQO[b]	MISA[c]				
pH	**s.u.**	6.5–9.0	6.5–8.5	6.0–9.5	7.7 - 7.8	7.8	6.8	6.8
Cyanide	**mg/L**	0.005			**0.16 – 0.23**	**0.028**[d]	N/A	N/A
NO_3[e]	**mg/L as N**	13	13		1.2 – 2.0	0.00004	0.06	0.06
NH_4[e]	**mg/L as N**				15 - 16	20	0.02	0.02
SO_4	**mg/L**				150 - 206	242	2.2	2.2
Cl	**mg/L**				19 - 26	31	1.1	1.1
Hg	**mg/L**	0.000026	0.0002		0.000009 – 0.00001	0.00001	0.000005	0.000005
Ag	**mg/L**	0.0001	0.0001		0.00001	0.00001	0.00004	0.00004
Al	**mg/L**	0.1	0.075		0.01 – 0.02	0.02	**0.25**	**0.25**
As	**mg/L**	0.005	0.005	1	0.0002 – 0.0003	0.0001	0.0004	0.0004
B	**mg/L**		0.2		0.0006 – 0.002	0.00002	0.003	0.003
Ca	**mg/L**				21 - 26	28	11	11
Cd	**mg/L**	Note[f]	0.0001		0.00004 – 0.00005	0.000017	**0.00002**	**0.00002**
Co	**mg/L**		0.0009		**0.002**	**0.003**	0.0005	0.0005
Cr	**mg/L**	0.001	0.001		0.0002	0.0002	0.0009	0.0009
Cu	**mg/L**	0.002	0.001	0.6	**0.06 – 0.09**	**0.11**	0.001	0.001
Fe	**mg/L**	0.3	0.3		0.00007	0.0001	**1.3**	**1.3**
K	**mg/L**				25 – 34	40	0.37	0.37
Mg	**mg/L**				10 – 14	16	1.8	1.8
Mo	**mg/L**		0.04		**0.05 – 0.07**	**0.08**	0.0003	0.0003
Na	**mg/L**				63 - 88	106	1.2	1.2
Ni	**mg/L**	0.025	0.025	1	0.007 – 0.009	0.01	0.001	0.001
P	**mg/L**	0.004-0.1	0.02-0.03		0.02	0.02	0.03	0.03
Pb	**mg/L**	0.001	0.001	0.4	0.0001	0.0002	0.0003	0.0003
Sb	**mg/L**		0.02		0.002	0.002	0.00007	0.00007
Se	**mg/L**	0.001	0.1		0.001	0.0008	0.0005	0.0005
U	**mg/L**		0.005		0.0006 – 0.0007	**0.007**	0.00008	0.00008
V	**mg/L**		0.006		0.0001 – 0.0002	0.00004	0.0006	0.0006
Zn	**mg/L**	0.03	0.02	1	0.003	0.002	0.003	0.003

Notes:

[a] Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

[b] Provincial Water Quality Objectives.

[c] Municipal/Industrial Strategy for Abatement.

[d] Assuming treatment efficiency of 20 ppm and natural degradation of cyanide as described in Section 4.2.3.

[e] Assuming no oxidation of ammonia to nitrate.

[f] Cadmium guideline based on hardness calculation where CCME CWQG for Cd, ug/L = 100.86[log(hardness))-3.2.
Hardness, mg equivalent/L CaCO3 = ([Ca,mg/L]*2.497) + ([Mg,mg/L]*4.116).

Bold values are greater than one or more of the environmental guidelines.

Table 4-12: Summary of Worst Case Condition Results During Operations (75th Percentile Process Water)

Parameter	Units	Guidelines			Reclaim Tank (Final Discharge)	Seepage from TMF	Natural Runoff	Site Runoff
		CCME CWQG[a]	PWQO[b]	MISA[c]				
pH	**s.u.**	6.5–9.0	6.5–8.5	6.0–9.5	7.6 - 7.7	7.8	6.8	6.8
Cyanide	**mg/L**	0.005			**0.16 – 0.23**	**0.028**[d]	N/A	N/A
NO_3[e]	**mg/L as N**	13	13		1.2 – 2.0	0.00004	0.06	0.06
NH_4[e]	**mg/L as N**				15 - 16	20	0.02	0.02
SO_4	**mg/L**				174 - 225	250	2.2	2.2
Cl	**mg/L**				22 - 29	35	1.1	1.1
Hg	**mg/L**	0.000026	0.0002		0.000009 – 0.00001	0.00001	0.000005	0.000005
Ag	**mg/L**	0.0001	0.0001		0.00001 – 0.00002	0.00001	0.00004	0.00004
Al	**mg/L**	0.1	0.075		0.009 – 0.01	0.01	**0.25**	**0.25**
As	**mg/L**	0.005	0.005	1	0.0001 – 0.003	0.0004	0.0004	0.0004
B	**mg/L**		0.2		0.001 – 0.006	0.00002	0.003	0.003
Ca	**mg/L**				26 - 30	31	11	11
Cd	**mg/L**	Note[f]	0.0001		**0.0002**	0.000026	**0.00002**	**0.00002**
Co	**mg/L**		0.0009		**0.002 – 0.003**	**0.003**	0.0005	0.0005
Cr	**mg/L**	0.001	0.001		0.0003	0.0002	0.0009	0.0009
Cu	**mg/L**	0.002	0.001	0.6	**0.08 – 0.11**	**0.14**	0.001	0.001
Fe	**mg/L**	0.3	0.3		0.0001	0.00007	**1.3**	**1.3**
K	**mg/L**				30 – 38	41	0.37	0.37
Mg	**mg/L**				13 – 16	17	1.8	1.8
Mo	**mg/L**		0.04		**0.05 – 0.07**	**0.09**	0.0003	0.0003
Na	**mg/L**				68 - 92	108	1.2	1.2
Ni	**mg/L**	0.025	0.025	1	0.008 – 0.01	0.01	0.001	0.001
P	**mg/L**	0.004-0.1	0.02-0.03		0.02 – 0.03	0.03	0.03	0.03
Pb	**mg/L**	0.001	0.001	0.4	0.0001 – 0.0002	0.0002	0.0003	0.0003
Sb	**mg/L**		0.02		0.002	0.003	0.00007	0.00007
Se	**mg/L**	0.001	0.1		0.001	0.001	0.0005	0.0005
U	**mg/L**		0.005		**0.006 – 0.007**	**0.008**	0.00008	0.00008
V	**mg/L**		0.006		0.0002 – 0.0005	0.000009	0.0006	0.0006
Zn	**mg/L**	0.03	0.02	1	0.007 – 0.01	0.002	0.003	0.003

Notes:

[a] Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

[b] Provincial Water Quality Objectives.

[c] Municipal/Industrial Strategy for Abatement.

[d] Assuming treatment efficiency of 20 ppm and natural degradation of cyanide as described in Section 4.2.3.

[e] Assuming no oxidation of ammonia to nitrate.

[f] Cadmium guideline based on hardness calculation where CCME CWQG for Cd, ug/L = 100.86[log(hardness))-3.2.

Hardness, mg equivalent/L CaCO3 = ([Ca,mg/L]*2.497) + ([Mg,mg/L]*4.116).

Bold values are greater than one or more of the environmental guidelines.

Table 4-13: Summary of Worst Case Condition Results During Operations (Maximum Process Water)

Parameter	Units	Guidelines			Reclaim Tank (Final Discharge)	Seepage from TMF	Natural Runoff	Site Runoff
		CCME CWQG[a]	PWQO[b]	MISA[c]				
pH	**s.u.**	6.5–9.0	6.5–8.5	6.0–9.5	8.3	7.7	6.8	6.8
Cyanide	**mg/L**	0.005			**0.16 – 0.23**	**0.028[d]**	N/A	N/A
NO_3[e]	**mg/L as N**	13	13		1.2 – 2.0	0.00004	0.06	0.06
NH_4[e]	**mg/L as N**				15 - 16	20	0.02	0.02
SO_4	**mg/L**				192 - 250	280	2.2	2.2
Cl	**mg/L**				42 - 57	69	1.1	1.1
Hg	**mg/L**	0.000026	0.0002		0.000009 – 0.00001	0.00001	0.000005	0.000005
Ag	**mg/L**	0.0001	0.0001		0.00001 – 0.00002	0.00001	0.00004	0.00004
Al	**mg/L**	0.1	0.075		0.009 – 0.01	0.01	**0.25**	**0.25**
As	**mg/L**	0.005	0.005	1	0.00001 – 0.00002	0.00003	0.0004	0.0004
B	**mg/L**		0.2		0.001 – 0.006	0.00002	0.003	0.003
Ca	**mg/L**				20 - 21	36	11	11
Cd	**mg/L**	Note[f]	0.0001		**0.0002**	0.000028	**0.00002**	**0.00002**
Co	**mg/L**		0.0009		**0.002 – 0.003**	**0.003**	0.0005	0.0005
Cr	**mg/L**	0.001	0.001		0.00009	0.0002	0.0009	0.0009
Cu	**mg/L**	0.002	0.001	0.6	**0.09 – 0.13**	**0.16**	0.001	0.001
Fe	**mg/L**	0.3	0.3		0.0001	0.00008	**1.3**	**1.3**
K	**mg/L**				33 – 42	47	0.37	0.37
Mg	**mg/L**				10 – 11	21	1.8	1.8
Mo	**mg/L**		0.04		**0.06 – 0.08**	**0.09**	0.0003	0.0003
Na	**mg/L**				80 - 109	129	1.2	1.2
Ni	**mg/L**	0.025	0.025	1	0.008 – 0.01	0.01	0.001	0.001
P	**mg/L**	0.004-0.1	0.02-0.03		0.03	0.03	0.03	0.03
Pb	**mg/L**	0.001	0.001	0.4	0.0003 – 0.0004	0.0004	0.0003	0.0003
Sb	**mg/L**		0.02		0.002	0.003	0.00007	0.00007
Se	**mg/L**	0.001	0.1		0.001	0.001	0.0005	0.0005
U	**mg/L**		0.005		**0.006 – 0.008**	**0.009**	0.00008	0.00008
V	**mg/L**		0.006		0.00002 – 0.0005	0.000002	0.0006	0.0006
Zn	**mg/L**	0.03	0.02	1	0.007 – 0.01	0.002	0.003	0.003

Notes:

[a] Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

[b] Provincial Water Quality Objectives.

[c] Municipal/Industrial Strategy for Abatement.

[d] Assuming treatment efficiency of 20 ppm and natural degradation of cyanide as described in Section 4.2.3.

[e] Assuming no oxidation of ammonia to nitrate

[f] Cadmium guideline based on hardness calculation where CCME CWQG for Cd, ug/L = 100.86[log(hardness))-3.2.

Hardness, mg equivalent/L CaCO3 = ([Ca,mg/L]*2.497) + ([Mg,mg/L]*4.116).

Bold values are greater than one or more of the environmental guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-32

Source: Environment Canada

Summary of Comment

Figure 3-25 of the EIS: Water Quality, Sediment and Profile Sample Locations provides a rough location of the water quality sampling locations for the Mine Site Area. Section 10.2.3.1 of the EIS Guidelines gives in part that the EIS will "include details about changes in overall water chemistry to impacted water bodies from all sources of run-off and effluent discharges from the site". There are a number of water bodies that seem likely or possible to receive and be impacted by surface drainage and seepage from the mine components within the operations area that do not appear to have been sampled for water quality and chemistry. This list of water bodies include the Area of Potential Impact (API) numbers 2, 3, 4, 5, 8, 14, 15, 16, 17, 47, and 48.

Potential Environmental Effects

Information on the existing water quality and chemistry as well as the predicted changes to API 2-5, 8, 14-17, and 47-48 in the environment is necessary to determine the impacts to water quality and whether these impacts can be mitigated. This information is critical to being able to assess whether the Project will have significant environmental effects with appropriate mitigation measures in place.

Proposed Action

As per Section 10.2.3.1 of the EIS Guidelines, provide the existing water quality and chemistry and an assessment and prediction of the changes.

Reference to EIS

EIS - Existing Conditions: 3.2.6.3.1 Water Quality, and, Technical Supporting Documents

Response

The Areas of Potential Impact (API) address potential impacts to the aquatic habitat (see Aquatic Environment TSD). Based on current flow conditions (see Hydrology TSD), the current Water and Sediment Quality monitoring locations and are considered sufficient at this time to develop a generalized understanding of baseline water and sediment quality in the Water Quality LSA that is applicable to the API locations indicated. (e.g. Station HRWQP-7 relate to API 2-5; Station HRWQP-7 relate to API 8; Stations HRWQP-2, HRWQ-6, HRWQ32, HRWQ-3 and HRWQ-5 relate to API 14-17; Stations HRWQ35, HRQW36 and HRWQ4 relate to API 47-48).

It is considered that the information provided is reasonable and suitable for prediction of environmental impacts of the project site at the level of detail required for an EIS/EA. Additional monitoring will be undertaken as part of ongoing work, and during operations should the project proceed.

INFORMATION REQUEST – EC-33

Source: Environment Canada

Summary of Comment

In sec. 4.0 Water Quality Model, under sec. 4.5 Site Discharge and Mitigation, it is stated that effluent discharge from the Project site must comply with O.Reg 560/94 and that PWQO and CCME CWQG are receiving water quality guidelines and are not directly applicable to site discharge.

The PWQO and CCME CWQG may not be directly applicable to site discharge at end of pipe, but they are to be used to determine the appropriate discharge criteria for the final discharge points to ensure protection of the receiving water body.

Predictions of receiving water body quality have been provided in the SWQ and Lake Water Quality TSDs; however there is no information on the proposed effluent discharge criteria to be applied in order to achieve the predicted water quality objectives for the receiving water bodies.

Potential Environmental Effects

Information on the proposed effluent discharge criteria is necessary to determine the impacts to water quality and whether these impacts can be mitigated. As stated above, this information is critical to being able to assess whether the Project will have significant environmental effects with appropriate mitigation measures in place.

Proposed Action

As per Section 10.2.3.2 of the EIS guidelines, provide an assessment and prediction of all site water discharges, potential effects on the receiving environment, and the description of any mitigation strategies and/or treatment processes.

Reference to EIS

Site Water Quality TSD

Lake Water Quality TSD

Response

The discharge pipe water quality predictions are provided as “Reclaim Tank (Final Discharge)” in the Site Water Quality TSD Tables 4-10 through 4-13 for various scenarios. The CCME CWQG, the PWQO and MISA have been provided in the tables for reference. Exceedances are in bold.

Water management and water quality controls and mitigations are provided in the water management section of the project description (Chapter 5 of the EIS/EA, Table 5.1) and in Chapter 8 of the EIS/EA Table 8-2: (Environmental Management Planning, Monitoring and Compliance – Physical Environment). It is considered there is suitable information provided to have an understanding of the potential environmental impacts to a level necessary for decision making for the EIS/EA.

Discussions regarding development of site specific discharge criteria are underway with the Ontario MOE. These criteria will be developed through permitting stages of the project following acceptance of the EIS/EA.

Criteria developed will be suitably protective of the environment. Furthermore, operational monitoring will be undertaken should the project proceed to ensure compliance with appropriate regulations and guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-34

Source: Environment Canada

Summary of Comment

The deeper basins of Lizard Lake, Turtle Bay and Lynxhead Bay were not sampled for water quality.

Potential Environmental Effects

Water quality sampling sites in Sawbill Bay and the other important water bodies adjacent to the project site (i.e. Lizard Lake, Turtle Bay and Lynxhead Bay) would help to provide a clearer understanding of the baseline conditions surrounding the mine site to assist the prediction of effects on water quality.

Proposed Action

Provide a rationale as to why the deeper basins of Lizard Lake, Turtle Bay and Lynxhead Bay were not sampled for water quality. As per EIS Guideline 10.2.3.2

Reference to EIS

EIS 3-79, Section 3.2.6.5;

EIS 3-79, Section 3.2.6.6;

EIS 3-82, Section 3.2.6.7

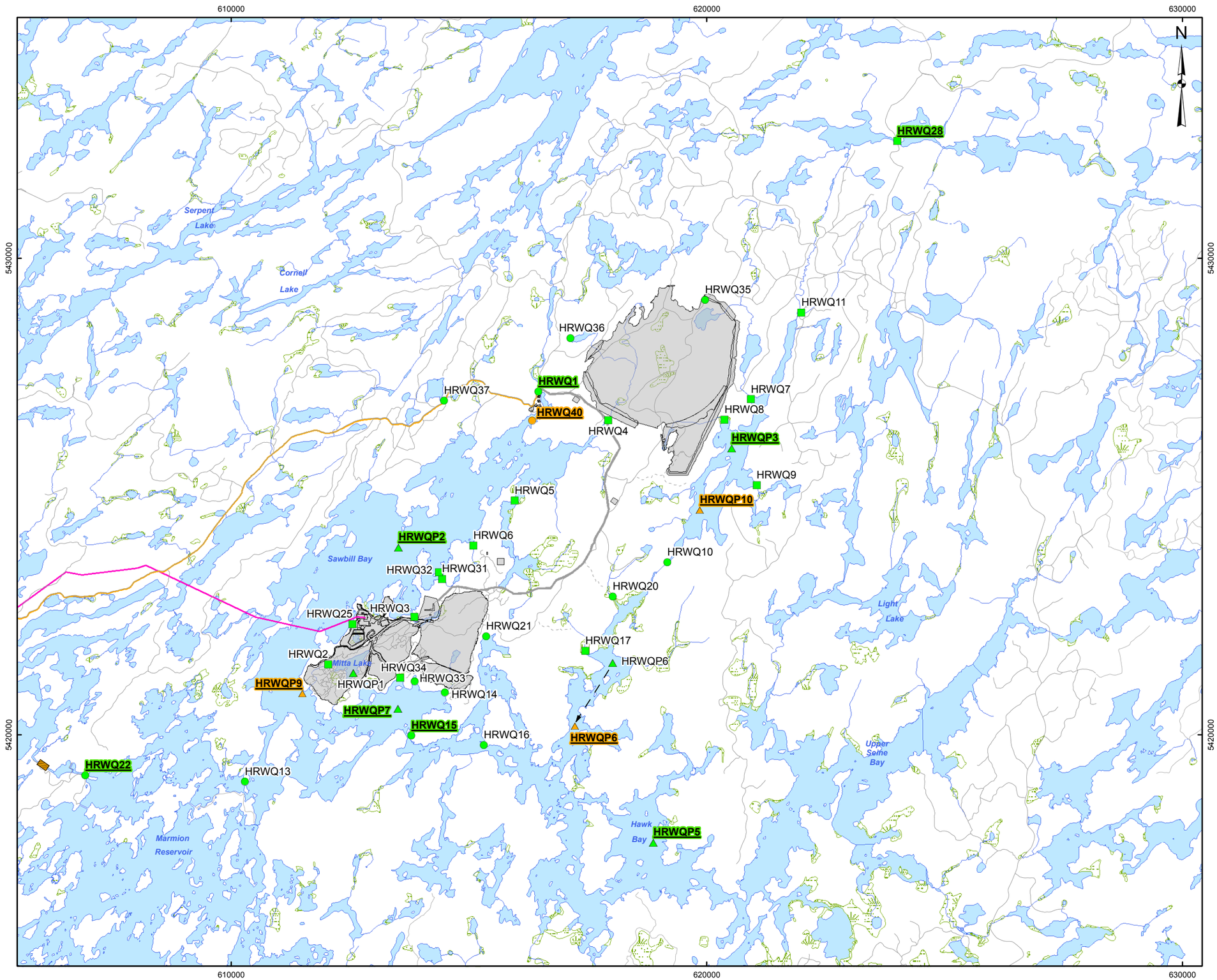
Response

In order to provide a longer term data set, water quality sampling commenced before complete bathymetry data were available. Follow-up sampling will include samples from deeper areas of the basin to provide a clearer understanding of the baseline conditions.

The 2013 water quality monitoring program has been revised to ensure that the deep basins of these waterbodies are included in the sampling plan. A revised figure presenting the 2013 water quality monitoring stations is attached.

Attachments

Figure 1 – Water Quality, Sediment and Profile Sample Locations – 2013 Water Quality Monitoring Program



LEGEND

- New Surface Water Sample Location
- New Profile Sample Location
- Surface Water Sample Location
- Surface Water and Sediment Sample Location
- Profile Sample Location (Surface Water and Sediment)
- Raft Lake Cut Location
- Road
- Trail
- River/Stream
- Lake
- Wetland
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities

SAMPLE LABELS

- HRWQx / HRWQPx — 2013 Sample Location (New)
- HRWQx / HRWQPx — 2013 Sample Location (Existing)
- HRWQx — 2010 - 2012 Sample Location

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000 3,000
SCALE 1:80,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
WATER QUALITY, SEDIMENT AND PROFILE SAMPLE LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	11 Sep. 2013		
CHECK	REJ	11 Sep. 2013		
REVIEW	KJD	11 Sep. 2013		

FIGURE: 1

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\WaterQuality\Sediment_ProfileLocations.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-35

Source: Environment Canada

Summary of Comment

There is mention of an effluent treatment plant (ETP) in several sections of the EIS; however, no description of this facility has been given in the Project Description or supporting documents.

Potential Environmental Effects

Water treatment is considered a major component of the mine design given the potential for metal leaching to the environment from the pits, waste rock and ore, overburden and low grade ore stockpiles. Information on the proposed effluent treatment option(s) is necessary to determine the impacts to water quality and whether these impacts can be mitigated. As stated previously, information about mitigation measures is critical to being able to assess whether the Project will have significant environmental effects with appropriate mitigation measures in place.

Proposed Action

A quantitative assessment of the effectiveness of any water quality treatment measures should also be provided as per EIS Guideline 10.2.3.2

Reference to EIS

EIS Project Components: 5.2.7 Water Management System, Page 5-37

Conceptual Closure and Rehabilitation Plan Pages 1, 6 and 20

Response

As indicated in the Site Water Quality TSD, and Lake Water Quality TSD treatment is only required as a contingency measure, as such the quantitative assessment of discharge water quality is provided and is appropriate for the project.

Of note is that, contrary to the discussion in the preamble to the information request, the geology and geochemistry of the materials to be mined result in non-acid generating conditions and low potential for metal leaching from the pits, waste rock and ore, overburden and low grade ore stockpiles. For most parameters the runoff and waters reporting to the water management system from the materials will meet appropriate guidelines.

Preliminary evaluation of potential treatment measures has been undertaken and will be presented as part of the project feasibility study, with an appropriate cost allowance made. Additional treatment design will be undertaken as part of detailed design process should the project proceed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-36

Source: Environment Canada

Summary of Comment

Existing air quality background information for the project area was determined using eight monitoring stations, of which four stations are located in Alberta, Quebec, Northwest Territories, and Saskatchewan (1,000 km to 2,500 km away from the project site). Those stations are great distances from the project and are unlikely to represent the air quality conditions in the project area.

The existing air quality background for the project site was established by choosing the lowest value of the monitored data in the eight stations for all air pollutants (see Table 3-17, page 3-33, Main EIS Report). For example, the 1-hr NO_2 concentration at Thunder Bay (the closest stations used in the assessment) in Table 3-17 is 33.86 µg/m^3; however, the corresponding background concentration in Table 3-17 is 2.32 µg/m^3 from the station Fort Liard, Northwest Territories (2,343 km away).

The EIS Guidelines (section 10.2.1) requires that the air quality assessment include suitably conservative estimates of background concentrations to determine worst-case cumulative air quality concentrations.

Potential Environmental Effects

The current selection of the air quality monitoring stations to determine the air quality background concentrations are not suitably conservative. As such they would lead to cumulative air quality impacts results that would be less conservative than suggested in the EIS guidelines.

The air quality near Atikokan is often affected by emissions transported from the United States and so background air quality should reflect this influence.

Proposed Action

Suitably conservative background concentrations should be derived by considering stations that reflect the regional air quality influences from the northern Great Lakes states. Suitable stations include Thunder Bay, Sault Ste Marie and perhaps Pickle Lake or Brandon, Manitoba. The air quality conditions at these stations would be averaged or subject to some form of expert judgment. EC recommends removing the more distant and unrepresentative stations (Fort Liard, La Loche, Fraserdale, Senneterre and Fort Chipewyan) from consideration in the determination of suitably conservative background concentrations.

Consideration could also be given to AQ stations in Minnesota, Wisconsin and Northern Michigan.

Air quality background concentrations should be determined using a more reasonable method such as by averaging values among the reasonably representative stations (rather than simply selecting the lowest value). (EIS Guideline: 10.2.1 Atmospheric Environment)

Reference to EIS

EIS Report: 3.2.3.2 Air Quality, Pages 3-30 to 3-33

Atmospheric Environment TSD: 3.0 Air Quality, Pages 14-47

Response

The existing air quality levels presented in the Atmospheric Environment TSD are considered representative of the conditions for the Project. The Project is located in an area of northern Canada not immediately near to any large industrial sources. The air quality monitoring stations used when describing existing air quality include a series of stations across northern Canada running from the west (Fort Liard) through to the east (Senneterre), consistent with the general air flow from the west to the east. In some cases, the effect of local activities can be seen to be present in the available data (e.g., PM_{10} levels in La Loche and Brandon). However, the data from west of the stations show a consistent pattern across the country (e.g., $PM_{2.5}$ in Fort Liard: 6.77 µg/m^3; $PM_{2.5}$ in Fort Chipewyan: 4.93 µg/m^3; $PM_{2.5}$ in La Loche: 8.66 µg/m^3; $PM_{2.5}$ in Thunder Bay: 8.50 µg/m^3; $PM_{2.5}$ in Senneterre: 8.21 µg/m^3). The similarity in these reading suggest there is a consistent "background" level across these northern Canadian sites that is appropriate for use at the Project.

The stations selected to be used to assess the background air quality were discussed with regulators at a meeting held on June 1, 2012 to specifically discuss the approach to determine the existing air quality for the site. At this meeting the MOE suggested reviewing US background data from Minnesota, Michigan and Wisconsin as these states are in some areas physically closer to the Project location than some of the Canadian stations. This data was reviewed as part of the preparation of the Atmospheric Environment TSD. There are a significant number of stations that provide particulate matter values, however data from the other Criteria Air Contaminates are only available from stations that appear to be located close to major metropolitan areas. Without a detailed knowledge of the areas surrounding the stations the data may not be appropriate for inclusion in the assessment. While the monitoring results from the stations are publically available the background information on surrounding land use is not. For these reasons it was decided not to include any US data in the analysis as the Canadian data was sufficient.

However based on feedback from the regulators the data from the Winnipeg station was included in the assessment. The Winnipeg data for PM_{10} was used to validate the PM_{10} readings of the selected stations.

As stated previously, some of the stations show the influence of local sources. Examples of this include the PM_{10} readings in Brandon. A review of aerial photographs show the relative proximity of the monitoring station to the rail sidings in town, as well as a pattern suggesting coal dust deposition (black coloured ground near uncovered rail cars carrying coal). The 1-hour and 24-hour NO_2 readings in both Thunder Bay and Brandon are elevated relative to the other stations. This is to be expected as both stations are located in urban areas, adjacent to heavily travelled roadways. However, NO_2 levels collected in an urban area adjacent to a roadway would not be considered indicative of the remote rural nature of the Project area.

Professional judgment was used as the basis for selecting the lowest values from the station data as representing the background air quality as opposed to the average values. The actual background values are not used in the Atmospheric Environment TSD. The background values were passed on to the human health and ecological risk team for use in their TSD.

In the inhalation assessment of the human health risk assessment, predicted air concentrations were compared to chronic and acute health-based thresholds, which represent safe concentrations from a human exposure perspective. All of the predicted acute concentrations were less than acute thresholds. All of the predicted chronic concentrations were less than chronic thresholds except for acrolein and nitrogen dioxide. A risk assessment was carried out for acrolein and nitrogen dioxide to evaluate risk for the human health VECs at the Site. Risks were compared to MOE target levels and found to indicate safe levels of exposure. The inhalation

assessment did not include comparison of predicted air concentrations to background, the assessment focused on potential effects from predicted concentrations only.

In the multimedia assessment, predicted soil and surface water concentrations were compared to baseline concentrations, but these baseline concentrations were measured at the Site, and they are not associated with the uncertainty and variability that the background air concentrations have, which were not measured at the Site.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-37

Source: Environment Canada

Summary of Comment

Construction phase of the project was not assessed for air quality. This phase uses similar types of equipment/activities as the operation phase. Operation phase is the bounding condition for assessment. This cannot be verified unless assessment for construction phase is conducted.

Potential Environmental Effects

There are various activities in construction phase that are not similar to operation phase such as site preparation and construction of facilities and roads, concrete plant, use of diesel generators for power and so on (Table 5-1 of Main EIS describes the activities in construction and operation phase). All these activities are sources of various indicator compounds and need to be assessed to ensure compliance with standards are achieved or mitigation measures applied when necessary (with emphasis on TSP, $PM_{2.5}$, PM_{10} and NO_x). This is not possible without assessment.

Proposed Action

An air quality (AQ) assessment for construction phase needs to be conducted in order to verify operation phase of the project is bounding case and to ensure compliance with standards are achieved throughout this phase. The EIS should assess AQ impacts from all phases of the project including assessment of short term AQ impacts from site preparation and construction activities. (EIS Guidelines: 10.1 Assessment Methodology and 10.2.1 Atmospheric Environment).

Reference to EIS

AETSD (page 15) Temporal Boundaries

Response

The justification and reasoning for identifying the Operations Phase of the Project as the bounding assessment is documented in Section 3.1.1.1 of the Atmospheric TSD. The Construction Phase of the Project will involve many of the same types of emission sources as the Operations Phase (e.g., emissions from diesel engines, fugitive dust). However, during the Construction Phase there is expected to be less equipment working for a shorter duration of time. Based on feedback received from Environment Canada during a meeting held on October 10, 2013 and email correspondence subsequent to this meeting, an additional investigation was performed to compare the potential emissions during both the Operations and Construction phases. The results of this investigation are provided in a technical memorandum included in the Supplemental Information Package of the Atmospheric Environment TSD and conclude that the peak annual vehicle distance traveled and diesel fuel consumption (considering primary power generation during the construction phase only) will be higher during the operations phase. Thus, the emissions from the Project will be higher during the Operations Phase. Assessing the emissions from the Operations Phase captures the effects of the Construction Phase since the types of emission sources are the same and the emissions will be higher than during Construction. Because the emission will be lower during the Construction Phase, the predicted effects would also be less than during the Operations Phase.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-38

Source: Environment Canada

Summary of Comment

The regional study area appears to be very short distance away from the local study area and Atikokan power generating station is not included in regional study area as part of the cumulative effects analysis.

Potential Environmental Effects

If the appropriate regional study area is not selected then the AQ assessment may not accurately reflect existing conditions or include projects that may impact the cumulative effects analysis.

Proposed Action

Provide an explanation as to how Regional Study Area (RSA) was selected and its distance from local study area and project site. RSA should be expanded to cover a much larger area and in doing so the cumulative effects analysis has to be conducted for existing and upcoming projects within RSA, for example Atikokan power generating station should be included in RSA and part of cumulative analysis study. (EIS Guidelines: 6.3.2 Spatial Boundaries and 10.9 Cumulative Environmental Effects).

Reference to EIS

AESTD (page 18 and figure 3-1) Regional Study Area (RSA)

EIS 3-30 Section 3.2.3.2

Response

The Regional Study Area (RSA) used in the air quality assessment is described in Section 3.1.1.2 of the Atmospheric Environment TSD. This RSA corresponds with the dispersion modelling domain, and represents limits of where direct air quality effects are expected to occur. The RSA encloses an area 30x30 km, generally centred on the location of the mine. Within the RSA is an area defined as the Local Study Area (LSA) which encloses an area extending approximately 10km from the disturbance footprint of the Project.

As required by the EA guidelines, an assessment of the potential cumulative effects of the Project, including cumulative air quality effects are discussed in Chapter 6.8 of the main EIS document. Expanding the extend of the air quality RSA to include the community of Atikokan, and the Atikokan power generation station would not have altered the conclusions presented in the Atmospheric Environment TSD regarding the ability of the Project to comply with regulatory permitting requirements in Ontario. Nor would expansion of the RSA have materially changed the conclusions of the cumulative effects assessment. The Atikokan Generating Station is located near the Town of Atikokan, and according to Ontario Power Generation, "….produced up to 205 megawatts (MW) of power, using low-sulphur/ignite coal from Western Canada", prior to September 2012. On September 11, 2012, "…Atikokan ceased using coal as fuel and the unit was taken out of service to be converted to use biomass." The planned biomass fueled facility will be required to meet all of the regulatory requirements in Ontario, which will help ensure that there would be no cumulative air impacts with the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-39

Source: Environment Canada

Summary of Comment

Indicator compounds represent compounds that are expected to be emitted from the project activities and should not only be limited to compounds that are part of O.Reg.419/04.

Potential Environmental Effects

In addition to the assessment of substances listed as part of Ontario Regulations, there are other key compounds generated from diesel/gasoline combustion related to on road and off road activities such as VOCs, PAHs, Benzene, Acrolein, Acetaldehyde, 1,3-butadiene and Formaldehyde that are not included as part of the assessment.

Proposed Action

The AQ assessment should include substances generated from fossil fuel combustion. The emission rate of some these substances were estimated/calculated in Table 3-14 and could be used for dispersion modelling to predict concentrations. Where applicable the results should be compared with existing provincial/federal standards. (EIS Guideline: 10.2.1 Atmospheric Environment)

Reference to EIS

AESTD (page 18), 3.1.2 Indicator Compounds

Response

The air quality assessment incorporated two distinct, but complimentary approaches for describing the potential effects of the Project. The primary method was done in a manner consistent with the air quality regulations in Ontario (i.e., O.Reg. 419/05). Ontario will be the jurisdiction charged with regulating air emissions from the Project should it proceed, and thus, describing the effects in a manner that is consistent with these regulations is critical for allowing a meaningful review to proceed. For this reason, the Atmospheric Environment TSD correctly focusses on these compounds and the relevant sources that would be regulated under O.Reg. 419/05.

Changes in air quality can also have an effect on the receiving environment. Therefore, dispersion modelling was also completed using all emission sources from the Project, and the results used as impacts in the Human Health and Ecological Risk Assessment TSD. These predicted concentrations and deposition rates were described in Appendix 3.IV of the Atmospheric Environment TSD.

It is considered that the methods and parameters included in the EIS/EA assessment are reasonable and appropriate for evaluation of the potential human health and ecological impacts of the project at a level appropriate for an EIS/EA and are consistent with methods and parameters typically used for EA and regulatory assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-40

Source: Environment Canada

Summary of Comment

The AQ assessment focuses on compliance with O.Reg. 419/05 and considers the emissions from selected stationary sources and excludes the emissions from mobile sources and construction activities.

Potential Environmental Effects

In addition to the assessment of stationary sources, all other potential sources of emissions should be identified and assessed including emissions from linear infrastructure study area, mobile sources, off road sources and all sources related to construction and operation activities. The purpose of EA is to ensure all sources of emissions related to project are assessed as these activities may have potential effects on AQ (surface mobile vehicle exhaust emissions, bulldozing, material handling, grading and unpaved fugitive dust are major contributors to air emissions).

For example AQ assessment results provided in Table 3-19 (page 43) indicated that NO_X 24-hr avg from operation phase is predicted (POI) to be 173.72 µg/m^3 and the provincial standard is 200 µg/m^3. If this predicted NO_X concentration is only based on emissions from stationary sources and does not include NO_X emissions from diesel powered engines, then the predicted number would not reflect accurate emissions of NO_X for all sources of the project which may or may not exceed the standard (this applies to other indicators such as TSP).

Proposed Action

An AQ assessment of all sources of emissions are required to ensure all potential effects on air quality associated with all project phases (construction and operation) including point, mobile and construction related sources are identified and total emission rate used for modelling should be based on all above activities.

(EIS Guidelines: 10.1 Assessment Methodology and 10.2.1 Atmospheric Environment)

Reference to EIS

AESTD (page 33), 3.1.6.5 Emissions included in the AQ assessment

Response

The potential effects of the Project on air quality have been evaluated in two ways. Firstly, those emissions associated with the Project that would be subject to evaluation under the permitting framework in Ontario (i.e., O. Reg. 419/05) were assessed in a manner consistent with the regulations. Under O. Reg. 419/05, the emphasis is on controlling the stationary process air emissions from operating facilities. In addition to assessing the ability of the Project to meet the air permitting requirement in Ontario, predictions of changes in air quality resulting from all sources of air emissions including all mobile sources expected to be used during operations (whether they are regulated under O. Reg. 419/05 or not) were undertaken and the results used as input to other disciplines (e.g., Human Health and Ecological Risk) to assess how changes in air quality could affect the receiving environment.

In addition, based on feedback received from Environment Canada during a meeting held on October 10, 2013 and email correspondence subsequent to this meeting, a new data table has been prepared that includes the predicted concentrations at all human heath receptors that were modeled previously. This new table is provided in a technical memorandum included in the Supplemental Information Package of the Atmospheric Environment TSD. It incorporates emissions from both the mobile and stationary sources, and compares the values to the appropriate National Ambient Air Quality Objectives (NAAQO) or Canadian Ambient Air Quality Standards (CAAQS). These parameters include a prediction of $PM_{2.5}$ and NO_2 as discussed with Environment Canada. The model predicts that concentrations are below the appropriate NAAQO or CAAQS criteria at all of the receptors.

In assessing the effects on air quality, the focus was on the emissions during the Operations Phase. In determining whether the Project would meet the permitting requirements within Ontario, only the emissions during the Operations Phase would be relevant. However, it was also determined that the emissions (and these effects) would be highest during the Operations Phase. Also based on feedback received from Environment Canada subsequent to the submission of the Draft EIS/EA Report, an additional investigation was performed to compare the potential emissions during both the Operations and Construction phases. The results of this investigation are also provided in the technical memorandum included in the Supplemental Information Package of the Atmospheric Environment TSD and conclude that the peak annual vehicle distance traveled and diesel fuel consumption (considering primary power generation during the construction phase only) will be higher during the operations phase. Thus, the Operations Phase of the Project represents a bounding case for air quality. During the Construction Phase, the types of emission would be similar to those during operations, but the amount of equipment and the overall emissions and resulting effects would be lower.

It is considered that the methods and parameters included in the EIS/EA assessment are reasonable and appropriate for evaluation of the potential human health and ecological impacts of the project at a level appropriate for an EIS/EA and are consistent with methods and parameters typically used for EA and regulatory assessment. The results as provided allow for, and include an appropriately conservative (i.e. bounding case) evaluation of potential for human health and ecological impacts at the time when the largest sources \ scale of potential emissions occur in operations (e.g. blasting of a large pit, hauling of large quantities of waste rock and placement in a large waste rock facility, maintenance of the same roadways as used in construction, active hauling of supplies and maintenance of site access roads – similar to in construction, tailings deposition in a large tailings management facility, and processing including crushing and grinding). During construction most of these emissions will not be present on site, smaller quarry areas may be used, and smaller tonnages of materials will be moved and placed for laydown pads, thus the operations phase is considered a reasonable, worst case, bounding scenario.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-41

Source: Environment Canada

Summary of Comment

Table 3-20 shows summary of in-design mitigation incorporated in the AQ assessment but does not provide details on the procedures.

Potential Environmental Effects

Insufficient information is provided on the procedures for implementing the best management practices and mitigation measures for AQ emissions that require an adaptive management approach to their implementation and does not include benchmarks/thresholds that will be monitored to determine when mitigation measures will be implemented and how air emissions will be monitored to ensure a timely response to prevent exceedences.

Proposed Action

The AQ in-design mitigation should include more details and specific information on: objectives to be achieved through AQ mitigation measures, listing of methods to be applied and the condition that trigger mitigation measures and the efficiency of each measure, for example explain how 80% control was placed on the roadways due to BMP to control fugitive dust from unpaved roads (Table 3-6, page 30). (EIS Guideline 10.1.3 Mitigation Measures)

Reference to EIS

AESTD (page 44), 3.3 In-Design Mitigation

Response

Fugitive dust throughout the Project will be managed through the implementation of a comprehensive Fugitive Dust Best Management Practices Plan (BMPP) which will include a list of methods to be applied and the conditions that trigger mitigation measures such as the application of chemical dust suppressants and re-grading, and also accounts for natural mitigation from rain and snowfall.

Due to the implementation of the BMPP, which includes facility engagement and accountability, emissions from some sources such as tailings are not likely to be a significant source of air emissions. Therefore, such insignificant sources have been excluded from the assessment as a potential source of particulate matter. Other sources such as unpaved roads have been included in the dispersion modelling assessment but a control efficiency has been applied as part of the emission estimation process. This is standard practice and follows the guidance in Section 7.4 of the Ontario Ministry of the Environment “Procedure for Preparing an Emission Summary and Dispersion Modelling Report” document dated March 2009.

The 80% control efficiency value is a conservative reduction factor for unpaved roads that is achievable for mining sites when a BMPP is in place. Section 6.1 of Appendix 3.I describes in more detail how the control efficiency values were estimated for the fugitive dust from unpaved roads. Not only does the control efficiency account for the fact that a comprehensive BMPP is in place but also for the fact that the emission rate estimates using AP-42 emission factors and the dispersion modelling approach for roadways is very conservative and typically over-predicts concentrations. This control factor technique has been approved by the MOE when

assessing fugitive emissions from roads for provincial permitting purposes and more accurately represents the emissions from roadways.

Once the final design of the Osisko project is confirmed, a comprehensive BMPP, as described in Section 3.3 of the Atmospheric TSD, will be created for the site which will include specific objectives to control fugitive emissions from the unpaved roads.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-42

Source: Environment Canada

Summary of Comment

The AQ assessment focuses on compliance with provincial O.Reg. 419/05 and considers the emissions from selected stationary sources and excludes the emissions from mobile and off road sources and construction activities. The predicted maximum POI concentrations were assessed using the emission rates for activities identified in Table 3-9. The air quality assessment results shown in Table 3-19 did not include dispersion modelling outputs for PM_{10} and $PM_{2.5}$. The EIS Guidelines (sec 10.2.1) called for an emphasis on $PM_{2.5}$ and PM_{10} dispersion results, but none were reported.

Potential Environmental Effects

Table 3-19 shows the results from AQ assessment for operation phase only for sources that are required by Reg 419, other sources such as mobile, off-road, construction are not part of the assessment; however these are significant sources of emissions for a number of indicator compounds such as fugitive dust, TSP, and Criteria air contaminants and should be assessed. There are also existing standards for PM_{10} and $PM_{2.5}$ that should be used as reference for comparison. The PM_{10} and $PM_{2.5}$ assessment results are essential to evaluate the impacts on the atmospheric environment.

Proposed Action

The AQ assessment should include emissions from all potential sources that may have potential impact on AQ, therefore the results should be re assessed to include all sources (as shown in Table 3-14). The table should also include the (revised) background concentrations that are added to predicted concentrations. The table should also include assessment results for PM_{10} and $PM_{2.5}$ and Canada Wide Standards (CWS for $PM_{2.5}$ is 30 ug/m^3-24 hr avg), Ambient Air Quality Criteria (AAQC for PM_{10} is 50 ug/m3-24 hr avg) and National Ambient Air Quality Objectives (NAAQO- Annual stds for NO_2, SO_2 and SPM) existing standards could be used as references for comparison. (EIS Guidelines: 10.1 Assessment Methodology and 10.2.1 Atmospheric Environment)

Reference to EIS

AESTD (page 43) 3.2.3 AQ assessment results

Response

As described in the response to EC-40, the effects of the Project on air quality were evaluated in two manners. The first was done in a manner consistent with the regulatory framework governing air emissions in Ontario (i.e., O. Reg. 419/05), which focusses on the stationary process emissions from operating facilities. The emphasis of the Atmospheric Environment TSD was to demonstrate that the facility could meet the permitting requirements of the jurisdiction in which it will operate. However, the predicted changes in air quality associated with all potential sources including mobile, off-road and stationary sources was also completed (see Appendix 3.IV) and the results provided to other disciplines (e.g., Human Health and Ecological Risk) for an assessment of how changes in air quality could affect the receiving environment.

An evaluation of the effects of changes in air quality on the receiving environment are comprehensively addressed in the relevant sections of the EIS [e.g., Human Health and Ecological Risk Assessment (HHERA) TSD]. The HHERA TSD included comparison of PM_{10}, $PM_{2.5}$, SO_2, CO and NO_2 to relevant screening thresholds, including CCME NAAQO and CWS, as well as MOE AAQCs, specifically the screening for PM_{10} and $PM_{2.5}$ was included in Tables 4-16 and 4-17 of the HHERA TSD and the screening for SO_2, CO and NO_2 was included in Appendix 3.I, Tables 2, 5 and 6.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-43

Source: Environment Canada

Summary of Comment

The monitoring program and follow-up program does not provide information on frequency and methods of sampling program and it does not cover ambient air quality monitoring for indicator compounds that are greater than 51% of the MOE limits such as NO_X.

Potential Environmental Effects

Section 7 provides a summary of monitoring program for fugitive dust and TSP/PM_{10}/$PM_{2.5}$ but it does not cover other CACs (NO_X, SO_2, CO) or other substances that are over 51% of MOE limits. Table 3-19 indicates that NO_X, HCl, HCN and NaOH are above 51% of standard guideline.

Proposed Action

Information on monitoring and follow up program should be provided: whether there would be any CAC more specifically NO_X sampling/continuous monitoring will be conducted. Also information on duration, frequency and timeline of sampling locations and methodology of sampling protocol for each substance should be provided. The sampling program should include the construction phase as well to ensure compliance with standards are achieved and effective mitigation measures are taken when necessary. (EIS Guidelines: 10.2.1 Atmospheric Environment and 13.1.2 Follow-Up and Monitoring Program)

Reference to EIS

AESTD (page 113), 7.0 Monitoring program

Response

The recommended air quality monitoring program for the Project is explained in Section 7.0 of the Atmospheric Environment TSD and is based on the results of both the air quality assessment and subsequent assessments of effects due to the predicted change in air quality. Since no significant effects with respect to air quality due to the Project were identified, the air quality monitoring program recommended for the Project is based on typical monitoring programs that are in place at other Ontario mining and processing facilities and includes the following:

- stack testing of selected process sources for TSP, NO_X, HCl, HCN and NaOH;
- verification road dust sampling for silt loading and metals content; and
- ambient air monitoring for TSP, PM_{10} and $PM_{2.5}$.

The purposes of the proposed monitoring program is to help confirm that the facility is complying with Ontario regulatory requirements, to confirm the conservative nature of the information used in the air quality assessment and evaluate the effectiveness of the Fugitive Dust Best Management Practices Plan (BMPP). The regulatory requirements for air quality in Ontario focus primarily on controlling facility process emissions. Therefore, the proposed air quality monitoring program has included sampling of process emissions at source for those compounds with predicted concentrations that were more than 51% of the relevant Ontario criteria, namely,

TSP, NOx, HCI, HCN and NaOH. Sampling these emissions at source is a more definitive approach for confirming both the magnitude of these process emissions into the environment and the conservatisms used in the assessment.

Because of the nature of the Project, Ontario also requires that the fugitive particulate and metals emissions from the road surfaces on-site be regulated. The second two components of the proposed monitoring program (i.e., road dust sampling and ambient particulate monitoring) will provide information to confirm the likely silt and actual loadings on the surfaces of the on-site roads, as well as the effectiveness of the BMPP in place at the site.

The recommended air source testing program would include a single campaign to confirm the process emissions once the facility is operational. The need for any additional process monitoring would be established as part of the separate provincial permitting process that would be initiated once the EA is approved. The ambient particulate sampling would be established to correspond with the National Air Pollution Surveillance (NAPS) schedule of a 24-hour integrated sample every six days. This program was proposed to commence once operations at the facility starts, consistent with the Ontario compliance requirements that only address emissions once operations are underway. The road dust sampling would be undertaken once annually during the dry summer months, and continue from the start of operations until a consistent silt loading is achieved. These details on frequency and schedule were also included in Table 7-1 of the Atmospheric Environment TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-44

Source: Environment Canada

Summary of Comment

Windrose charts shown on page 3-29 of the main EIS Report (using data observed for the period January 1, 2006 to December 31, 2010):

1) The data source for producing the windrose is not stated in the report.

2) The annual windrose chart (Jan. 1, 2006–Dec 31, 2010) in the main report is considerably different from another windrose chart using the data provided by the MOE in Atmospheric Environment TSD on page 11 (Jan. 1, 2005–Dec. 31, 2009).

Potential Environmental Effects

The windrose charts in the main report and Atmospheric Environment TSD are surprisingly different, given that the data observation time periods are very similar: one from January 1, 2006 to December 31, 2010 and another from January 1, 2005 to December 31, 2009.

Proposed Action

The proponent should clarify the source of the data used for reproducing windrose charts in the main report.

Reference to EIS

Main EIS Report: 3.2.3.1 Climate, Pages 3-24 to 3-29

Atmospheric Environment TSD: 2.0 Meteorology and Climate, Pages 9-13

Response

Chapter 2 of the Atmospheric Environment TSD provides a description of the dispersion meteorology, including wind roses, used in the air quality assessment. The dispersion meteorology used in the air quality assessment covers the period from January 1, 2005 through December 31, 2009, and was prepared specifically for use in this assessment by staff at the MOE. In preparing this data set, MOE staff determined that data from the Atikokan (AOT) station (Climate ID: 6020LPQ) was to be used. For those hours when data were not available, data were infilled using the Upsala automatic station (Climate ID: 6049095) and the station at Dryden Airport (Climate ID: 6032120). The development of this data set and a thorough review of the data is provided in Appendix 2.1 to the Atmospheric Environment TSD.

Section 3.2.5.1 of the main EIS Report provides a summary of the Climate for the Project area. In addition, this section of the EIS provides selected meteorological data including observations of temperature, precipitation and wind from the Atikokan Marmion station (Climate ID: 6020384). The MOE determined that data from this station were not appropriate for use in dispersion modelling; therefore, no data from the station was used in the Atmospheric Environment TSD.

The wind rose chart in the EIS was taken from an earlier version. The correct chart is provided in the TSD. The chart in the EIS will be revised to be consistent with the version in the TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-45

Source: Environment Canada

Summary of Comment

The EIS Guidelines (section 9.1.2 and section 10.2.1) indicate that meteorological information provided in the EIS should describe the occurrence of weather phenomena including events such as tornadoes, lighting, temperature inversions and fog. Special consideration shall be given in the analysis to extreme and rare meteorological phenomena.

This information appears to be missing from the reports.

Potential Environmental Effects

Extreme weather phenomena have great impacts on the local environment and potentially on the mine operations and should be addressed in the reports.

Proposed Action

The proponent should add information to address some extreme and rare meteorological phenomena that could affect mine operations and the environment, such as extreme rainfall and tornados.

The extreme rainfall events should be considered in the atmospheric and hydrological environmental assessment. For example, during 8-11 June 2002 the 49th Parallel Severe Rainstorm dumped up to 400 mm of rainfall in northwestern Ontario near the Canada-U.S. border. Atikokan registered 176 mm as the maximum one-day rainfall event recorded. This event should be reflected in the extreme rainfall data in the EIS and Hydrology TSD.

Reference to EIS

Main EIS Report: 3.2.3.1 Climate

Hydrology TSD: 4.2.1.2, Pages 33-43

Response

Extreme precipitation events are presented in Section 4.2.1.2.3 of the Hydrology TSD. Rainfall depth-duration-frequency (DDF) data, and rainfall plus snowmelt DDF data, for Atikokan are included, together with Probable Maximum Precipitation (PMP) estimates for the Project site. For small drainage basins (25 km^2), the estimated 24-hour PMP for the project site is 528 mm (Table 4-9 of the Hydrology TSD). This exceeds the example provided during June 2002. As noted in the EA (Chapter 5), the TMF will conform to Canadian Dam Association (CDA) guidelines and will have an emergency spillway to convey excess runoff during extreme rainfall events to avoid damage to the TMF infrastructure. The CDA guidelines identify the appropriate design rainfall event for the TMF based on potential dam failure consequences. Release of water to the environment through the emergency spillway would only occur during storm events of 100-yr return period or larger and is not predicted to result in adverse effects, since the TMF water would be substantially diluted with rain water during such an event. Similarly, extreme rainfall events are not predicted to result in adverse effects due to release of excess water from the PPCP, since there would be similar dilution due to significant precipitation. Additionally, overflow

from the PPCP will be discharged directly to Upper Marmion Reservoir through a diffuser which will further enhance mixing and dilution. As a result, there are no predicted adverse effects from these events.

The occurrence of tornadoes were considered not to be of reasonable likelihood because weather records indicate that only 2 tornadoes have been recorded in northwestern Ontario in the last 100 years, neither of which was located near Atikokan. Therefore, any resultant effects on the operation or the environment were not considered further. If a tornado were to occur, the effects would depend on the nature of the damage. Damage to the processing facilities and other critical mine facilities would result in temporary cessation of mining until the damage could be repaired.

All buildings and infrastructure that may be susceptible to damage from lightning will be designed and constructed with appropriate mitigation following standard methods and procedures. Therefore, lightning is not expected to have any effect of mine operations.

Other climatic events such as temperature inversions and fog would be short-lived, and may result in localized concerns with air quality. The development of the meteorological data used in the air dispersion modelling is described in Appendix 2.I of the Atmospheric Environment TSD. Within this dispersion meteorological data set, observed meteorological phenomena such as temperature inversions and fog are included. The maximum predicted concentrations, which incorporates the meteorological data set, were documented in the Atmospheric Environment TSD and a frequency assessment was passed on to the Human Health and Ecological Risk assessment team for their analysis. The risk assessment has shown, there are not significant risks due to continuous exposure to air emissions, and therefore, there would be no significant effects predicted due to short-term temporary exposures.

INFORMATION REQUEST – EC-46

Source: Environment Canada

Summary of Comment

Details regarding what actions Osisko will implement to reduce greenhouse gas emissions are not described in the EIS or TSD. EIS Guideline 10.2.1.

Potential Environmental Effects

Specific details regarding type of diesel fuel, type of diesel engines, type of vehicles and trucks (on and off road), pumps and generators are not provided and therefore EC cannot provide comments on the accuracy of the emissions reported.

Proposed Action

Provide details describing what actions will be implemented to reduce greenhouse gas emissions. EC's Code of Practice for Metal Mines Section 4.4.5 on Page 67 suggests some actions which Osisko could implement to reduce emissions of greenhouse gas emissions.

Reference to EIS

Atmospheric Environment TSD Greenhouse Gas Emissions Section 6.5, Page 110

Response

A greenhouse gas emission plan will be developed and implemented to minimize releases of greenhouse gases. The plan will follow the recommended approach in Environment Canada's Code of Practice for Metal Mines and will describe:

- potential sources of releases of greenhouse gases;
- factors that may influence releases of greenhouse gases;
- measures to minimize releases of greenhouse gases;
- monitoring and reporting programs for releases of greenhouse gases;
- mechanisms to incorporate the results of monitoring programs into further improvements;
- measures to minimize releases; and
- mechanisms to periodically update the plans.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-47

Source: Environment Canada

Summary of Comment

The proponent has stated that "In order to avoid the destruction of nests and the potential injury or mortality of migratory birds, land clearing shall take place outside of the nesting period for birds where applicable. However, if clearing cannot be restricted to outside of the nesting period, a biological monitor must be on site to precede the land clearing activities and conduct nest searches of the entire area to be cleared. Any nest found should be protected with a buffer zone appropriate for the species and the surrounding habitat until the young have left their nest. Appropriate species-specific buffers can be determined by notifying the Canadian Wildlife Service regional office." Table 6-50 (on p. 6-122 in the EIS) also states that “Pre-clearing surveys will be conducted as required to mark exclusion areas and buffer zones.”

Potential Environmental Effects

EC generally recommends against conducting nest searches to avoid affecting migratory birds. With the exception of a few circumstances (nests in open areas, when the birds nest in isolated trees, on man-made structures and/or in colonies), EC does not recommend the use of nest surveys to determine whether nests are present. The risk of disturbing nests (which is a contravention of the Migratory Birds Convention Act, 1994) is high during nest surveys. Additionally, there is a high probability of obtaining false negatives during nest surveys (i.e., a survey will determine that there are no nests present when in actuality there are nests in the surveyed habitat).

For forested habitats, EC considers “non-intrusive searching methods” such as using point counts placed along transects to determine whether nests are present in an area. These methods use singing territorial males as a proxy to establish whether the breeding season has started. Buffers are generally only appropriate as an avoidance tool when nests are easily identified (such as nests in open areas, when the birds nest on isolated trees, on man-made structures and/or in colonies - as above). It is unlikely that nest surveys will detect all nests and thus buffers will not be established around all nests that are actually in the habitat. In any case, CWS has not developed species-specific buffers, mainly due to the differences in buffer sizes depending on the particular situation (e.g., type of nesting habitat, activities taking place in the surrounding area).

Proposed Action

The following points should be reflected in the EIS and Terrestrial Ecology TSD:

EC defines the core breeding period for migratory birds in this Bird Conservation Region which is identified as BCR 12 as follows:

Forest, Open and Wetland: May 9th to July 31st

Scrub: May 24th to August 8th

Please refer to EC's technical document at http://ec.gc.ca/paom-itmb/default.asp?lang=EN&n=8D910CAC-1#_003 for additional details on EC's recommendations on determining the presence of nests.

EC does not recommend marking active nests with flagging tape, painted stakes, or other similar material as this increases the risk of nest predation.

In circumstances where active nests are readily identified and can be monitored without disturbance to the nest, the proponent should consider submitting any completed nest records to the Ontario Nest Records Scheme managed by the Royal Ontario Museum.

Reference to EIS

Terrestrial Ecology TSD Section 3.7.1.6

Terrestrial Ecology TSD Section 3.8.1.1

EIS Section 6.2.1.3

EIS Section 6.2.3

Response

In order to protect nesting migratory birds, in accordance with the *Migratory Birds Convention Act*, the primary measure undertaken will be to avoid land clearing during the migratory bird nesting period (approximately May 9 to August 8 in the Project study areas-BCR 12). As EC indicated, nest searches have proven to be ineffective at finding all nests in various habitats such as forested habitats. In other habitats, nest searches can be effective. For instance, nests in open areas, nests on isolated trees, nests on man-made structures and nests in colonial nesting sites are relatively easier to locate than those in densely vegetated areas. As the majority of the land to be cleared for the Project is forested, all efforts shall be made to clear vegetation outside of the breeding bird nesting window.

If clearing cannot be scheduled outside of the nesting period, particularly in communities other than forested communities, a “non-intrusive searching method” using point counts placed along transects will be conducted. These methods use singing territorial males as a proxy to determine whether breeding has started and nests are present in an area. If active nests are located, a setback from the nest shall be applied which will indicate to workers in the area that there shall be no activity in the setback areas until the nesting period is over. The *Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales* (MNR 2010) provides some standards and guidelines for harvesting during the critical breeding period, in terms of setback from species specific nests. In circumstances where active nests are readily identified and can be monitored without disturbance to the nest, the proponent shall consider submitting completed nest records to the Ontario Nest Records Scheme managed by the Royal Ontario Museum.

References

OMNR. 2010. Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales. Toronto: Queen’s Printer for Ontario. 211 pp.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-48

Source: Environment Canada

Summary of Comment

In Table 1-1 on Page 14, "Valued Ecosystem Components for Terrestrial Ecology", "Rationale for Selection" only references provincial species at risk designations for Common Nighthawk and Canada Warbler.

Potential Environmental Effects

Species at risk should be described in terms of their federal designations under the Species at Risk Act.

Proposed Action

This Table should also include "Federally, Common Nighthawk is designated as Threatened under Canada's Species at Risk Act" and "Federally, Canada Warbler is designated as Threatened under Canada's Species at Risk Act."

Reference to EIS

Terrestrial Ecology TSD Section 1.6

Response

Federal species designations have been included in the consideration of Valued Ecosystem Components for Terrestrial Ecology.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –EC-49

Source: Environment Canada

Summary of Comment

Many of the impacts to terrestrial ecology within LSA are identified, and are negligible, but some impacts within the MSA are not identified - at least not in the text. For example, it is noted in the text that with respect to the change in habitat suitability, "The effect is reversible once the operation of the mine has ceased" (p. 6-94, para. 1). Yet the pits that will ultimately fill with water as part of the proposed closure plan and rehabilitation plan will not return to original "suitable conditions" for terrestrial biota.

More specifically, it is estimated that 465 ha (11.6%) of the highly preferred habitat for Canada Warbler (i.e., Red Pine-White Pine Forest/Fir-Spruce-Mixedwoods/ Pine-Spruce Mixedwoods) will be lost in the LSA.

While it is mentioned in Table 6-50 on p. 6-122 that this impact in the MSA is "Not reversible", there should be some discussion in the text in the context of habitat suitability, or lack thereof, for VECs in particular (e.g., Canada Warbler).

Potential Environmental Effects

The information requested on Canada Warbler (listed as Threatened under SARA) and other BCR priority species is needed to adequately consider adverse effects on migratory birds.

Proposed Action

There are vague references to the possible displacement of "some individuals" (p. ES-8, para. 4), but EC recommends the number of Canada Warbler (individuals or pairs) that will be displaced by the project be highlighted, and that this information be provided for all BCR Priority species. In addition, Table 3-26 on p. 148 of the TETSD should include a column showing the "Estimated Loss of Bird Abundance in Zone of Influence (ZOI) in Application Case". The "% Change Baseline to Application" should remain in Table 3-26, to illustrate that the numbers are small in the context of the LSA.

Reference to EIS

EIS Section 6.2.1.3

Terrestrial Ecology TSD Section 3.7.1.1 and 3.7.2.1

EIS Executive Summary

Terrestrial Ecology TSD Section 3.8.1.2

Response

The predicted number of individuals or pairs of upland breeding birds (Canada Warbler and the 21 BCR 12 priority species) displaced based on the density of bird species per habitat type has been calculated and is provided in the table attached.

Attachments

Table: Estimated Displacement of BCR Priority Species of Upland Breeding Birds

Attachment

Table: Estimated Displacement of BCR Priority Species of Upland Breeding Birds

Estimated Displacement of BCR Priority Species of Upland Breeding Birds					
BCR 12 Priority Species	**Habitat**	**Total area in Mine Site Area (ha.)**	**Mean Density (birds/ha)**	**Estimated Displacement by Habitat (number of birds)**	**Estimated Total Displacement (number of birds)**
Bay-breasted warbler	dense mixed	150.49	0.03	5	108
	dense coniferous	430.43	0.24	103	
Blackburnian warbler	dense coniferous	430.43	0.07	30	41
	dense mixed	150.49	0.07	11	
Black-throated green warbler	dense coniferous	430.43	0.07	30	35
	dense mixed	150.49	0.03	5	
Canada warbler	dense coniferous	430.43	0.03	13	41
	dense deciduous	191.22	0.07	13	
	dense mixed	150.49	0.1	15	
Chestnut-sided warbler	dense deciduous	191.22	0.14	27	32
	dense mixed	150.49	0.03	5	
Common yellowthroat	marsh	20.33	0.24	5	18
	open fen	48.52	0.24	12	
	thicket swamp	7.2	0.14	1	
Conneticut warbler	treed bog	16.63	0.36	6	6
Least flycatcher	dense deciduous	191.22	0.65	124	135
	dense mixed	150.49	0.07	11	
Mourning warbler	dense deciduous	191.22	0.07	13	33
	dense mixed	150.49	0.1	15	
	marsh	20.33	0.24	5	
Nashville warbler	conifer swamp	206.87	0.79	163	498
	dense coniferous	430.43	0.31	133	
	dense deciduous	191.22	0.14	27	
	dense mixed	150.49	0.51	77	
	open fen	48.52	0.48	23	
	thicket swamp	7.2	0.72	5	
	treed bog	16.63	0.72	12	
	treed fen	80.8	0.72	58	
Northern flicker	dense coniferous	430.43	0.03	13	19
	marsh	20.33	0.24	5	
	thicket swamp	7.2	0.14	1	
Purple finch	dense coniferous	430.43	0.03	13	30
	dense mixed	150.49	0.03	5	
	open fen	48.52	0.12	6	
	treed bog	16.63	0.36	6	
Ruffed grouse	dense deciduous	191.22	0.07	13	13
Swamp sparrow	conifer swamp	206.87	0.03	6	58
	dense mixed	150.49	0.03	5	
	marsh	20.33	0.24	5	
	open fen	48.52	0.84	41	
	thicket swamp	7.2	0.14	1	
Veery	dense deciduous	191.22	0.36	69	81
	dense mixed	150.49	0.07	11	
	thicket swamp	7.2	0.14	1	
White-throated sparrow	conifer swamp	206.87	0.51	106	550
	dense coniferous	430.43	0.55	237	
	dense deciduous	191.22	0.22	42	
	dense mixed	150.49	0.41	62	
	marsh	20.33	0.48	10	
	open fen	48.52	0.24	12	
	thicket swamp	7.2	0.72	5	
	treed bog	16.63	0.72	12	
	treed fen	80.8	0.79	64	
Yellow-bellied sapsucker	dense coniferous	430.43	0.07	30	62
	dense deciduous	191.22	0.14	27	
	dense mixed	150.49	0.03	5	

INFORMATION REQUEST –EC-50

Source: Environment Canada

Summary of Comment

In the summary of "Residual Effect: Loss of habitat", the "Suggested Frequency, Duration, and Location of Monitoring" is extremely vague, as it simply mentions "Breeding bird point counts" (Table 4-1 on p. 156). The text also recommends annual monitoring and continued use of EC protocols to determine bird density, diversity, and richness.

Potential Environmental Effects

A certain level of detail on proposed monitoring should be provided in order to give a good sense that any monitoring commitments will yield appropriate results.

Proposed Action

Table 4-1 should also list the monitoring specifics (e.g., the frequency, duration, and location of breeding bird point counts at the same locations used to determine baseline levels).

Reference to EIS

Terrestrial Ecology TSD Section 4.0

Terrestrial Ecology TSD Section 4.3

Response

The intent is that the annual breeding bird surveys during the monitoring period will follow the same methodology as the surveys conducted during the baseline program in terms of frequency, duration, etc. The station locations will depend on the site work during any given year. While every effort will be made to replicate stations for a yearly comparison, stations may need to shift or be deleted due to habitat changes. Additionally, the breeding bird point count data will be analyzed according to the methods in the baseline reporting (e.g. abundance estimates) so that inferences on long-term trends can be made.

The preliminary monitoring program outlined in Chapter 8 has been revised to provide information on the frequency, duration and location of the terrestrial monitoring plan.

INFORMATION REQUEST – EC-51

Source: Environment Canada

Summary of Comment

It is stated on page 95 of the Terrestrial Ecology TSD that, "Mitigation will include implementing progressive reclamation for the Project to minimize the net area disturbed at any one time. The Soil Salvage Plan developed for the Project includes the salvage of suitable overburden and topsoil material." There is no mention of separating overburden from topsoil in the Conceptual Closure and Rehabilitation Plan (CCRP), and EC has not found any figures in the documentation which show separate overburden and topsoil stockpiles. It is possible that the separation of overburden and topsoil is only planned for the progressive reclamation of temporary construction work spaces, if at all.

Potential Environmental Effects

Terrestrial habitat restoration as part of the Closure Plan is an important mitigation for impacts on migratory birds and other wildlife.

Proposed Action

The separation of overburden and topsoil should be a standard practice for all of the soil that is removed, even if the overburden consists "mainly" of topsoils, as has been suggested in the Executive Summary (Pg. ES-1, paragraph. 5).

Reference to EIS

Terrestrial Ecology TSD Section 3.3.1.1

Conceptual Closure and Rehabilitation Plan

Terrestrial Ecology TSD Section 3.4.1.1

EIS Executive Summary

Response

It should be practicable to separately strip topsoil in the following areas: the open pits, the process plant area and the shops areas. This topsoil will be stockpiled within the footprint of the Overburden Stockpile, but separately from the overburden materials.

It is not intended to strip topsoil or overburden under the Waste Rock Stockpile footprint or under the main footprint of the Tailings Management Facility (TMF). Topsoil will be stripped under the footprint of the TMF dams. Such topsoil will be separately stockpiled near the toes of the dams.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-52

Source: Environment Canada

Summary of Comment

It is noted that, "Organic material (peat) will be salvaged in wetland areas for subsequent use in reclamation."

Potential Environmental Effects

Terrestrial habitat restoration as part of the Closure Plan is an important mitigation for impacts on migratory birds and other wildlife.

Proposed Action

EC fully supports the approach of using peat salvaged from wetland areas for reclamation, and this approach should be explicitly stated in the CCRP.

Reference to EIS

Terrestrial Ecology TSD Section 3.3.1.1

Response

It should be practicable to separately strip peat if it occurs in the following areas: the open pits, the process plant area and the shops areas. This peat will be stockpiled within the footprint of the Overburden Stockpile, but separately from the overburden materials.

It is not intended to strip topsoil, overburden or peat under the Waste Rock Stockpile footprint or under the main footprint of the Tailings Management Facility (TMF). If peat occurs under the footprint of the TMF dams, it will be stripped. Such peat will be separately stockpiled near the toes of the dams.

INFORMATION REQUEST – EC-53

Source: Environment Canada

Summary of Comment

Similarly, Table 3-4 on Pg. 85 describes the removal and stockpiling of sediment from Mitta Lake, but the CCRP has not identified this material for use in reclamation.

Potential Environmental Effects

Terrestrial habitat restoration as part of the Closure Plan is an important mitigation for impacts on migratory birds and other wildlife.

Proposed Action

Again, EC recommends that the CCRP should identify the stockpiled sediment as a material to be used in reclamation.

Reference to EIS

Terrestrial Ecology TSD Section 3.2.1

Response

Water from Mitta Lake will be pumped out into the Marmion Reservoir prior to operations. Lake bottom sediment, combined with surrounding soil overburden and stripping materials will be stockpiled in the overburden stockpile, where feasible, and used for progressive reclamation of the Mine.

INFORMATION REQUEST – EC-54

Source: Environment Canada

Summary of Comment

It is stated on p. 132 that "Common nighthawk is known to breed in open areas such as woodland clearings and rocky outcrops, but its breeding habitat is varied and it takes advantage of newly opened habitats created by land clearing (COSEWIC 2007). It is likely that breeding habitat for this species may be created with the clearing and fragmentation of forested areas."

Potential Environmental Effects

There were three observations of Common Nighthawk within the LSA during the 2010-2012 field surveys (TETSD Sec. 2.2.4.1.3, p. 78. para. 1), and EC agrees that the clearing of forested areas can potentially create habitat for this species. Some previous mine sites in the province have become hotspots for Common Nighthawk (e.g., Deloro Mine).

Proposed Action

The proponent should explore opportunities to create habitat, for example, in select areas of the Tailings Management Area which have low erosion potential.

Reference to EIS

Terrestrial Ecology TSD Section 3.7.1.1

Terrestrial Ecology TSD Section 2.2.4.1.3

Response

This is noted. Opportunities to create Common Nighthawk habitat will be explored during future planning for closure and post-closure.

INFORMATION REQUEST – EC-55

Source: Environment Canada

Summary of Comment

It is stated on Page 104 that "Native species of trees, shrubs and other vascular plants will be used for revegetation at closure. Where feasible, the same variety of plant species currently composing the different forest ecosites will be used for reclamation."

Potential Environmental Effects

While it is good practice to use native species for reclamation, to the extent possible, the approach of using "the same variety of plant species" will only be feasible when revegetating temporary construction work spaces where the topsoil has been salvaged and reapplied.

Proposed Action

In these situations, the topsoil will not be "… a seed source for quick rehabilitation/restoration of vegetative species", as has been suggested on p. 104, and in fact, replanting will be necessary in these areas.

Reference to EIS

Terrestrial Ecology TSD Section 3.4.1.1

Response

Post mine closure, the topsoil that was salvaged from the site and stockpiled, will be spread over selected areas on site that are devoid of organic soils to accelerate re-vegetation. Tailings surfaces will be amended with fertilizer to promote revegetation in order to reduce erosion, and waste rock will neither have a topsoil cover, nor will it be amended since the surface will not be expected to erode. It is expected that successional ecological processes will lead to the establishment of a community of colonizing species, such as Labrador-tea, white birch and trembling aspen. With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years.

INFORMATION REQUEST –EC-56

Source: Environment Canada

Summary of Comment

With respect to the suggested frequency, duration and location of monitoring, it is noted in Table 4-1 on page 155 that monitoring should occur "Throughout the MSA, in areas of progressive rehabilitation. Frequency and duration of monitoring shall be site specific and specified on re-vegetation plans."

Potential Environmental Effects

These monitoring criteria are extremely vague, and may not contribute effectively to the successful revegetation of the site.

Proposed Action

EC recommends that plantings should be monitored annually in late spring and early fall until woody plantings are 'free-to-grow' (e.g., 1 m minimum height) and herbaceous plantings are sufficiently established to minimize erosion in the long-term. The late-spring surveys will highlight problem areas (if any) that can be the focus of supplementary planting the following fall; in some cases it will be unnecessary to wait a full year to replant failed planting stock.

Reference to EIS

Terrestrial Ecology TSD Section 4.0

Terrestrial Ecology TSD Section 4.3

Response

There will not be specific plantings during the re-vegetation of the site. The natural re-vegetation of the TMF and waste rock areas will be inspected as part of the post-closure inspection of these facilities. For instance, there will need to be regular dam inspections of the TMF, during which time the establishment of vegetative cover will be monitored.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-57

Source: Environment Canada

Summary of Comment

It is stated that, “Soils in the TMF footprint will be covered over permanently, and soils will not be salvaged under the TMF” (EIS Sec. 6.2.3, Table 6-50, p. 6-124). The TMF will be graded and revegetated (EIS Ex. Sum., p. ES-2, para. 6), and there will be a direct revegetation of the tailings surface without placing a layer of topsoil (EIS Sec. 1.6.3, p. 1-15, para. 2; EIS Sec. 5.1.3, p. 5-12, para. 3). It is further stated that, “The tailings will be tested to determine what nutrients are lacking and then the surface will be seeded and fertilized” (EIS Sec. 5.1.3, p. 5-12, para. 3; CCRP Sec. 3.0, p. 8, para. 2).

Potential Environmental Effects

This approach to revegetation and stabilization of the tailings surface is seldom successful in the long-term, since there is typically an initial flush of growth, followed by a gradual decline in vegetation cover as the applied fertilizer is depleted.

It should be noted that sufficient quantities of native seed would not normally be available unless firm commitments (i.e., down payments/advances) are made to suppliers well in advance (i.e., a year or more) of when the seed is actually required. It is doubtful that suppliers would make arrangements to collect huge volumes of seed in advance on the off chance a proponent may have a major requirement.

Proposed Action

EC recommends that topsoil be stripped from the footprint of the tailings area and used to support the growth of native vegetation on the tailings in the long-term. This approach would make the proposed applications of fertilizer (EIS Sec. 5.1.3, p. 5-12, para. 3) and soil amendments (EIS Sec. 6.2.3, Table 6-51, p. 6-129; CCRP Sec. 3.0, p. 8, para. 2) unnecessary.

Reference to EIS

EIS Section 6.2.3

EIS Executive Summary

EIS Section 1.6.3

EIS Section 5.1.3

Conceptual Closure and Rehabilitation Plan Section 3.0

Response

It is not intended to strip topsoil or overburden under the main footprint of the Tailings Management Facility (TMF). Topsoil will be stripped under the footprint of the TMF dams. Such topsoil will be separately stockpiled near the toes of the dams and used selectively during progressive reclamation. It is not planned to place a layer of topsoil or overburden soil on top of the tailings; rather the tailings will be directly re-vegetated by placing organic mulch, fertilizer and seeding. During operations, test plots will be established on representative areas of the tailings surface. Details of the re-vegetation procedures (i.e., nutrients required, fertilizer, sources and

suitability of organic mulch, seed mixes) will be developed and verified. The organic mulch to be used in the direct revegetation of the TMF will likely comprise either pulp mill sludge or stabilized sewage sludge. It is noted that there are numerous precedents for using these types of materials on mine sites in Ontario, which implies that such use is both operationally feasible and environmentally acceptable. Considering the benign chemistry of the existing tailings, and in consideration of other successful revegetation efforts on closed tailings facilities, direct revegetation is considered feasible, practical and achievable at this site.

The surface area of tailings requiring re-vegetation will be roughly 675 hectares. Placement of a 0.3 m layer of topsoil over the area would require over 2.0 Mm^3 of topsoil. This volume of topsoil would simply not be available and stripping of topsoil from the entire TMF area would be cost probative to the Project. In principle, the entire Overburden Stockpile of about 4.5 Mm^3 could be transported to the TMF and spread over exposed tailings in a layer averaging about 0.67 m thick. Spreading the overburden (or topsoil) on top of tailings would be challenging from a construction point of view because it would be difficult to haul truck loads of overburden (or topsoil) over tailings. While this could be done using high mobility equipment, it would be costly, probably in excess of $30 M. The benefit of doing so is questionable because the tailings can be directly re-vegetated without placement of the topsoil or overburden.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-58

Source: Environment Canada

Summary of Comment

It is stated that, “Soils in waste rock stockpile will be covered over permanently. Soils will not be salvaged under the waste rock or the ore stockpiles” (EIS Sec. 6.2.3, Table 6-50, p. 6-125), and that, “At closure the top surface of the waste rock stockpile will be graded to help shed runoff and reduce infiltration”, and “… no active revegetation is likely required” (EIS Sec. 1.6.3, p. 1-15, para. 4; EIS Sec. 5.1.3, p. 5-12, para. 6; CCRP Sec. 2.3, p. 6, para. 3; CCRP Sec. 4.3, p. 14, para. 7; CCRP Sec. 6.5, p. 26, para. 6). As noted above, with respect to the reversibility of habitat suitability, it is stated that, “The effect is reversible once the operation of the mine has ceased” (EIS, Sec. 6.2.1.3, p. 6-94, para. 1). In fact, it is stated that, “As progressive reclamation occurs, soils will be recovered from the stockpile and spread over reclaimed areas that would benefit from soil addition” (EIS Sec,. 5.2.3, p. 5-22, para. 1).

Potential Environmental Effects

Leaving the WRS unvegetated at closure does not reverse the habitat suitability.

Proposed Action

EC recommends using stripped topsoil to establish vegetation on the waste rock stockpile (WRS). The WRS would benefit from such soil addition even though geochemical testing has shown that the rock is non-acid generating with excess neutralizing capacity (EIS Ex. Sum. p. ES-6, para. 1; EIS Sec. 1.6.3, p. 1-15, para. 4). The WRS should be graded to retain runoff and increase infiltration to establish and sustain vegetation.

Reference to EIS

EIS Section 6.2.3

EIS Section 1.6.3

EIS Section 5.1.3

Conceptual Closure and Rehabilitation Plan Sections 2.3, 4.3 and 6.5

EIS Section 6.2.1.3

EIS Section 5.2.3

Response

It is not intended to strip topsoil or overburden under the Waste Rock Stockpile footprint.

The waste rock stockpile will have conservative sideslopes of about 2.5:1 (H:V) overall. The rock will comprise hard fragments that are physically stable (i.e., they will not be subject to weathering or erosion). The selected closure measures for the Waste Rock Stockpile include minor regrading of the top surface and implementation of drainage measures to convey runoff to the toe of the stockpile without erosion. There is no requirement for active revegetation of the pile surface to maintain physical stability.

The waste rock has been classified as geochemically stable (i.e., it will not generate acidic runoff). Initially after closure, water collected in the four seepage collection ponds will continue to be monitored and it will be pumped back into the Open Pit until such time as the water quality in the individual ponds becomes acceptable for direct discharge. When the water quality is shown to consistently meet acceptable discharge levels, individual seepage pond dykes will be breached and their pumping systems will be removed. There is no need or particular benefit to place a cover over the waste rock to reduce infiltration.

The waste rock pile will have a surface area of about 205 ha. Placing a 0.3 m thick layer of topsoil over this surface would require about 0.615 Mm^3 of topsoil, this quantity is not readily available locally and would be cost prohibitive to import or strip from the footprint of the stockpile. It would be technically feasible to place overburden on some or all of the waste rock pile to encourage re-vegetation. However placing this volume of overburden would be a very costly and the only benefit would be aesthetic. Given the remote location of the mine site, the visibility of the waste rock stockpile is relatively limited in comparison to many waste rock piles across Ontario. It will not be visible from any current permanent habitation.

The waste rock pile has been taken into consideration in the assessment of loss of natural land cover. This loss has been considered as a residual effect on wetland and forest cover as well as a residual effect on species VECs from habitat loss. Taken through the full impact assessment, the effect of the loss contributed by the waste rock pile and other project infrastructure has been evaluated as being of low significance due to:

- the availability of natural land cover in the surrounding areas of the MSA, LSA and the RSA; and
- re-naturalization of other parts of the Project footprint through progressive rehabilitation during operations and restoration opportunities during the closure and post-closure phases that are both feasible and practical.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – EC-59

Source: Environment Canada

Summary of Comment

With respect to site decommissioning, it is stated that, “Restoration of areas of habitat lost during construction and operations will promote return of wildlife” (EIS Sec 6.2.3, Table 6-51, p. 6-128).

Potential Environmental Effects

While revegetation of the waste rock stockpile cannot possibly completely restore a productive forest, the proposed approach will provide some habitat value for wildlife. Revegetation will also lend some credibility to the statement made in the context of the “Closure of Waste Rock Stockpile” that, “Some habitat lost in construction will be restored” (EIS Sec. 6.2.3, Table 6-51, p. 6-130), and the statement made in the context of mitigation and compensation measures that, “Disturbed areas will be revegetated to the extent practicable upon closure to restore disturbed areas and entourage return of wildlife” (EIS Sec. 12.2, p. 12-6, para. 1).

Proposed Action

EC recommends that revegetation of the waste rock stockpile be undertaken.

Reference to EIS

EIS Section 6.2.3

Response

The waste rock stockpile will have conservative sideslopes of about 2.5:1 (H:V) overall. The rock will comprise hard fragments that are physically stable (i.e., they will not be subject to weathering or erosion). The selected closure measures for the Waste Rock Stockpile include minor regrading of the top surface and implementation of drainage measures to convey runoff to the toe of the stockpile without erosion. There is no requirement for active revegetation of the pile surface to maintain physical stability.

The waste rock has been classified as geochemically stable (i.e., it will not generate acidic runoff). Initially after closure, water collected in the four seepage collection ponds will continue to be monitored and it will be pumped back into the Open Pit until such time as the water quality in the individual ponds becomes acceptable for direct discharge. When the water quality is shown to consistently meet acceptable discharge levels, individual seepage pond dykes will be breached and their pumping systems will be removed. There is no need or particular benefit to place a cover over the waste rock to reduce infiltration.

It would be technically feasible to place overburden on some or all of the waste rock pile to encourage re-vegetation. However placing this volume of overburden would be a very costly and the only benefit would be aesthetic. Given the remote location of the mine site, the visibility of the waste rock stockpile is relatively limited in comparison to many waste rock piles across Ontario. It will not be visible from any current permanent habitation.

The waste rock pile has been taken into consideration in the assessment of loss of natural land cover. This loss has been considered as a residual effect on wetland and forest cover as well as a residual effect on species

VECs from habitat loss. Taken through the full impact assessment, the effect of the loss contributed by the waste rock pile and other project infrastructure has been evaluated as being of low significance due to:

- the availability of natural land cover in the surrounding areas of the MSA, LSA and the RSA; and
- re-naturalization of other parts of the Project footprint through progressive rehabilitation during operations and restoration opportunities during the closure and post-closure phases that are both feasible and practical.

Health Canada

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-1

Source: Health Canada

Summary of Comment

None

Potential Environmental Effects

HC's expertise focuses on empirical and predicted data in regards to human health risk assessments. Health Canada does not verify modelling results and assumes that correct and accepted and/or validated methods were used.

Proposed Action

If changes to models or predictions lead to revised results differ from the originally submitted results, it is advised that the report be resubmitted to Health Canada for review.

It is also advised that changes made to the Human Health Effects Assessment be reflected in relevant sections of the EIS and TSDs as appropriate.

Reference to EIS

HHERA TSD, Section 4

Response

Thank you for your comment. Yes, Health Canada will be advised of any changes to models or predictions.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-2

Source: Health Canada

Summary of Comment

None

Potential Environmental Effects

The report does not health.

Proposed Action

Please clarify and provide more detail to support the assumptions made to the exposure scenarios based on access to the site as part of the human health risk assessment.

Reference to EIS

HHERA TSD, Section 4.2

Response

The HHERA evaluated the Project which comprises of four phases: construction, operations, closure and post-closure. The predicted emissions from the operations phase were used to represent the Project as assessed in the HHERA because this phase is considered to have the maximum emission estimates and is thus, associated with the highest potential change in air and surface water quality. The post-closure phase was evaluated separately for water quality and there are no anticipated air emissions during this phase. The HHERA evaluated the health effects to human receptors who are recreationally using the area (i.e., camping, fishing, hunting, gathering etc.) within 10 km from the Mine Study Area and whom may be exposed to releases from the Project to water and air (including dusts).

The HHERA evaluated short- and long-term exposures by inhalation based on the maximum emission estimates predicted over the Project lifetime. The HHERA also considered dust deposition to soil based on the highest annual deposition rate over the entire Project lifetime. Exposure to water was considered based on predicted water concentrations for the operations phase and post-closure phases.

As discussed in Chapter 5 of the EIS/EA Report, full-time security staff will be employed to monitor and restrict site access to the extent practicable, and maintain security on-site during the construction and operations phases of the Project. Prior to closure, a fence or rock barrier wall will be constructed around the pit perimeter to prevent inadvertent access by the public to any slopes. The conceptual closure and rehabilitation plan, including environmental management and remediation, is presented as a separate TSD in the EA report, and provides details of how the site will be managed post-closure. The closure and rehabilitation plans include environmental management measures and engineering controls that are intended to mitigate exposures to Project-related contaminants of concern by the public. Therefore, anticipated changes in air quality, soil quality and water quality during the closure and post-closure phases are not anticipated to be higher than those predicted for the operations phase.

Therefore, the HHERA has conservatively evaluated the maximum predicted emissions from the Project.

INFORMATION REQUEST – HC-3

Source: Health Canada

Summary of Comment

None

Potential Environmental Effects

Typically the generation of dust through vehicular transport and outdoor handling of materials on site (such as those proposed in this project) may result in an operable inhalation pathway. The lack of detail presented on dust in the CSM does not allow a review of the potential exposure to humans through the inhalation pathway.

A change in the CSM may alter the results of the human health risk assessment as presented, leading to an inaccurate assessment.

Proposed Action

Please provide more detail on the inhalation pathway for the CSM presented in Figure 4-1. In addition, please provide a rationale for not including the tailings management facility as a potential pathway for human exposure.

Reference to EIS

HHERA TSD, Figure 4-1

Response

The CSM has been updated to indicate that inhalation of dust was considered. This pathway is evaluated in Section 4.6 of the HHERA TSD.

Attachments

Revised Figure 4-1 (HHERA TSD).

Conceptual Site Model for Hammond Reef Gold Project – Human Receptors

FIGURE 4-1

Source	Release Mechanism and Transport	Primary Residency Media	Primary Exposure Route	Secondary Residency Media	Secondary Exposure Route	Tertiary Residency Media	Quaternary Residency Media	Human Exposure Route	Human Receptors: Community Resident / Member of Aboriginal Community	Human Receptors: Off-Duty Worker	Human Receptors: Recreational User / Trapper
Water Discharge to Sawbill Bay; Tailings Management Facility Seepage		Surface Water						Ingestion	O	O	O
								Dermal Contact	O	O	O
		Surface Water	Direct Uptake	Sport Fish				Ingestion	O	O	O
				Forage Fish	Ingestion	Piscivore		Ingestion	O	O	O
				Aquatic Plants	Ingestion	Aquatic Herbivore		Ingestion	O	O	O
							Terrestrial Predator	Ingestion	O	O	O
		Sediment						Incidental Ingestion	O	O	O
								Dermal Contact	O	O	O
Vehicular Transport on Project Site; Outdoor Materials Handling on Project Site	Dust Generation & Wet/Dry Deposition	Soil						Incidental Ingestion	O	O	O
								Dermal Contact	O	O	O
		Soil	Root Uptake	Terrestrial Plants	Ingestion	Herbivore / Omnivore		Ingestion	O	O	O
	Atmospheric Emissions	Air and dust						Inhalation	O	O	O

LEGEND

X Pathway incomplete and/or not evaluated

O Pathway complete and evaluated

Date: May 2013	Golder Associates	CAD: GD
Project: 13-1118-0010		CKD: TRS
Version 2		

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-4

Source: Health Canada

Summary of Comment

None

Potential Environmental Effects

The report did not include information related to the COPCs in country foods as part of the multi-media human health risk assessment. The clarification email provided by the proponent to Kitty Ma on March 12, 2013 addresses the issue of depositions affecting soil, and ensuring that soil concentrations do not exceed agricultural guideline levels. However, information related to the deposition of emissions onto plants which may be consumed directly by people during the operational phase of the project has not been provided. Since some harvesting of country foods is permitted in the local study area, it is appropriate to include as part of the multi-media assessment a discussion about the concentrations as a result of the project and the potential impact on human health.

Proposed Action

Given that the operational phase is used as a bounding scenario, please discuss whether monitoring data is needed during the post-closure phase to confirm the results of modelling where soil concentrations remain below the appropriate guideline.

Reference: Health Canada. 2010. Supplemental Guidance on Country Foods. (HHRAfoods) can be obtained at:

http://www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/country_foods-aliments_locale/index-eng.php

Reference to EIS

HHERA TSD, Section 4.7

Response

The multimedia screening carried out for soil included a comparison of the predicted concentrations to the maximum existing concentrations (HHERA TSD, Appendix 3.II). For PAHs, all of the predicted soil concentrations were <0.6% above maximum existing concentrations and for metals, the predicted soil concentrations were <0.9% above maximum existing concentrations. As the deposition rates that were used to calculate soil concentrations would be the same deposition rates that would be used to calculate country food concentrations (e.g., for vegetation), it is expected that changes in country food concentrations as a result of the Project would be limited to less than 1%. Therefore, the change in exposure to COPCs in country foods as a result of the Project is expected to be negligible.

However, to demonstrate this quantitatively, chemical uptake in vegetation is modelled and predicted concentrations are compared to measured existing concentrations. In order to focus the assessment on a worst-case COPC, the chemicals with the highest percent increase in soil concentrations compared to baseline were identified; including barium, cadmium, calcium, potassium, sodium and strontium. Among this list, calcium, potassium, sodium and strontium were excluded as being generally non-toxic. Although cadmium was detected

in baseline soil, it was not detected in baseline vegetation, meaning that a site-specific uptake factor could not be calculated. Barium, meanwhile, was detected in both soil and vegetation in all samples and site-specific uptake factors can be calculated. Therefore, barium was selected as a worst-case COPC to evaluate potential impacts on country foods.

In order to support the HHERA (see Section 3.1.1 of the HHERA TSD), blueberries and Labrador tea were collected from within the Regional Study Area (RSA), along with co-located soil samples. Both types of vegetation are known to be collected in the area and used for human consumption. Co-located soil samples were collected so that site-specific plant uptake factors could be calculated. An uptake factor is the vegetation concentration divided by the soil concentration. Existing barium concentrations in Labrador tea and blueberries (from HHERA TSD, Appendix 2.I) and calculated uptake factors are provided in Tables 1 and 2.

Table 1: Soil and Labrador Tea Concentrations and Uptake Factors for Barium

	S5C	S22B	S6B	HR-LAB-01	HR-LAB-03
Soil (µg/g)	28.0	63.0	48.0	na	na
Labrador Tea (µg/g)	22.0	**34.3**	29.3	22.7	18.2
Uptake Factor	**0.79**	0.54	0.61	-	-

Concentrations are reported on a dry weight basis; na = not analyzed; maximum values are in bold

Table 2: Soil and Blueberry Concentrations and Uptake Factors for Barium

	MBerry1	Berry2	MBerry3	MBerry4-1	220	Blue 225
Soil (µg/g)	26	78	24	21	30	47
Blueberry (µg/g)	2.4	3.8	4.0	4.2	4.2	**7.0**
Uptake Factor	0.09	0.05	0.17	**0.20**	0.14	0.15

Concentrations are reported on a dry weight basis; maximum values are in bold

Incremental plant concentrations incorporating the contribution of Project emissions were calculated based on plant exposure from direct deposition onto leaves or berries and chemical uptake from soil. The equations are provided in the table 3 below.

Table 3: Equations for Predicting Incremental Concentrations in Labrador Tea and Berries

Media	Equation
Total plant concentration	PC = Pd + Pr
	PC = incremental concentration (mg/kg dry wt) Pd = incremental concentrations due to air deposition (mg/kg dry wt) Pr = incremental concentration due to root uptake (mg/kg dry wt)
Plant concentration due to air deposition	Pd = 1,000 x [D_{yd} + (Fw x D_{wyd})] x Rp [1-exp(-kp x Tp)]/(Y_p x kp)
	Pd = incremental concentration due to air deposition (mg/kg dry wt) D_{yd} = dry particle deposition rate (g/m^2/y) Fw = Fraction of COPC wet deposition that adheres to plant surface D_{wyd} = wet deposition rate (g/m^2/y) Rp = interception fraction; represents portion of chemical deposition intercepted by plants Y_p = crop yield (kg dry wt/m^2) Tp = length of plant exposure to deposition per harvest (yr) kp = chemical removal from the plant surface by weathering (yr^{-1})
Plant concentration due to root uptake	Pr = SC x BAF
	Pr = incremental concentration due to root uptake (mg/kg dry wt) SC = predicted incremental soil concentration (mg/kg dry wt) BAF = bioaccumulation factor (unitless)

Source: U.S. EPA 2006.

Incremental plant concentration due to air deposition

The maximum dry and wet particle deposition rates for barium from all receptor locations were used (i.e., 1.1E-4 g/m^2/yr and 2.3E-6 g/m^2/yr). A value of 0.6 was used as the fraction of COPC wet deposition that adheres to plant surfaces (Fw), consistent with the U.S. EPA (2006) recommendation for cations. The default value of 0.39 for interception fraction (Rp) (U.S. EPA 2006) was determined to be sufficiently conservative for wild plants because the surface areas of fruit (e.g., tomatoes, apples) and leafy vegetables (e.g., lettuce, cabbage) are much greater than berries and Labrador tea leaves. The default value of 2.24 for crop yield (Yp) from U.S. EPA (2006) was used, and is considered a likely over-estimate of the crop yield for Labrador tea and berries in the RSA. Length of plant exposure (Tp) was estimated to be three months (0.25 yr) for blueberries and Labrador tea, given the growing season and length of snow-cover in the area. The default value of 18 yr^{-1} for kp was adopted from U.S. EPA (2006).

Incremental plant concentration due to root uptake

The maximum site-specific uptake factors (provided in Tables 1 and 2) for Labrador tea and blueberries were used, use of the maximum uptake factor is a conservative assumption that will generally over-estimate predicted plant concentrations.

The incremental plant concentration calculations for barium for Labrador tea and blueberries are presented below. The maximum predicted incremental soil concentration from all receptor locations (HHERA TSD, Appendix 3.II) of 0.057 mg/kg for barium was used.

Pd = 1,000 x [D_{yd} + (Fw x D_{wyd})] x Rp [1-exp(-kp x Tp)]/(Y_p x kp)

Pd = 1,000 mg/g x [0.00011 g/m^2/yr + (0.6 x 0.0000023 g/m^2/yr)] x 0.39[1-exp(-18/yr x 0.25yr)] / (2.24 kg/m^2 x 18 yr^{-1})

Pd = 0.00107 mg/kg

Pr (Labrador tea) = SC x BAF = 0.057 mg/kg x 0.79 = 0.045 mg/kg

PC (Labrador tea) = Pd + Pr = 0.00107 mg/kg + 0.045 mg/kg = **0.046 mg/kg**

Pr (blueberries) = SC x BAF = 0.057 mg/kg x 0.20 = 0.0114 mg/kg

PC (blueberries) = Pd + Pr = 0.00107 mg/kg + 0.0114 mg/kg = **0.012 mg/kg**

The predicted incremental concentration for Labrador tea (0.046 mg/kg) represents a 0.1% increase above the maximum measured existing concentration (34.3 mg/kg). The predicted incremental concentration for blueberries (0.012 mg/kg) represents a 0.2% increase above the maximum measured existing concentration (7.0 mg/kg). Overall, the Project contribution to vegetation concentrations in the RSA is considered to be negligible. This is supported by a quantitative evaluation for barium, a chemical with among the highest incremental changes in soil concentrations and detected uptake into Labrador tea and blueberries.

Given the conservative nature of the predicted Project-related emissions that are applied in the multi-media screening and the negligible incremental change in vegetation concentration, monitoring data is not required during post-closure.

References

U.S. EPA. 2005. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. U.S. EPA Office of Solid Waste. EPA520-R-05-006. Washington, D.C.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-5

Source: Health Canada

Summary of Comment

Air Quality

Accuracy of modelling predictions

Potential Environmental Effects

There are uncertainties in the assessment related to modelling, representativeness of emission estimates (in particular the estimates of fugitive dust) and there is lack of adequate on-site meteorological information.

Proposed Action

HC suggests COPCs emissions be included in the air quality monitoring program to verify the accuracy of the modelling predictions, or please provide a rationale justifying why such emissions will not be included.

Reference to EIS

None

Response

Dispersion models were relied on in assessing the effects of air quality on the receiving environment. The potential uncertainties associated with dispersion modelling have been managed through the assessment process in the following ways:

- Use the best model – Dispersion modelling was completed using the AERMOD modelling system, which is a widely accepted dispersion model in North America and Internationally. The AERMOD modelling system was developed jointly by the United States Environmental Protection Agency (U.S.EPA) and the American Meteorological Society (AMS) through a multi-year initiative to incorporate “state-of-the-art” modelling techniques for local scale models. The AERMOD system is the current regulatory default model in Ontario.
- Use the best meteorology – In selecting the dispersion meteorology to use in assessing the potential air quality effects, discussions were held with MOE staff, who undertook to develop a 5-year dispersion meteorological data set specifically for use on this Project. The MOE considered all relevant available sources of meteorological data when preparing the meteorological data set used, and thus this data set is considered both appropriate and relevant for the assessment.
- Assess the bounding emissions case – Throughout the life of the Project, activity levels and the associated emissions will vary. It was determined that the air emissions would be higher during the Operations Phase as there would be similar types of equipment during most phase, but the numbers and associated emissions would be much lower during the Construction Phase, the Closure Phase and the Post-Closure Phase.

- Use conservative emission estimates – During the Operations Phase, activity levels and the associated emissions were determined to be highest during years 6 – 9 of operations (see section 3.1.4.1 of the Atmospheric Environment TSD). In fact, the emissions used in the assessment were calculated based on the conservative assumptions that the maximum extraction rates (65,000 tonnes/day of ore and 10,000 tonnes/day of waste rock), the longest haul routes (based on the final year of operation) and the maximum ore processing rate (22,000,000 tonnes/year) were occurring continuously through the Operations Phase.
- Use the highest model results – The maximum predicted concentration determined in accordance with Ontario modelling guidelines (i.e., excluding meteorological anomalies) were used in assessing whether the Project could meet the air permitting requirement in Ontario. However, the absolute maximum predictions were provided as inputs for assessing how changes in air quality could affect the receiving environment (e.g., Human Health and Ecological Risk). This is highly conservative because the predicted concentration during meteorological anomalies (which have been included) are not considered likely to occur in reality. In addition, maximum concentrations represent the values likely to occur only a small percentage of the time.

Given the highly conservative nature of the modelling used to determine the inputs for assessing effects of air quality on the receiving environment (e.g., Human Health and Ecological Risk), there is no need to expand the scope of the air monitoring. The proposed monitoring program will confirm the conservatism of the emission estimates used in the modelling.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-6

Source: Health Canada

Summary of Comment

Air Quality

Shutdowns and Equipment failure

Potential Environmental Effects

In the EIS, few details were provided on accidents and malfunctions. Events such as emergency shutdown and equipment failures can lead to increased concentrations of COPCs in the air. It may be informative in terms of "worst-case scenario" to include these possible events in the air dispersion model predictions.

Proposed Action

HC suggests a discussion on emission increases due to short term events like shutdowns and equipment failure be included in the air quality assessment or a rationale be provided justifying why such events were not included.

Reference to EIS

None

Response

Chapter 6.6 of the main EIS document describes and assesses effects of malfunctions and accidents, which include short-term events like shut-downs and equipment failures. Since a baghouse failure could result in increased air emissions the equipment would be inspected on a regular basis and a preventative maintenance program would be in place to ensure through proactive regular maintenance that all equipment is kept in good working condition.

From an air quality perspective, there is no equipment at the site that would have measurably higher emissions during start-ups and shut-downs. Therefore, there would be no appreciable change in effects during these infrequent and short-term events. However Osisko will be implementing operation and maintenance procedures for equipment that discharges to the environment, such as dust collectors, so that during routine equipment malfunctions and shut-downs there will be systems in place so that there will not be significant increases to atmospheric discharges.

INFORMATION REQUEST – HC-7

Source: Health Canada

Summary of Comment

Air Quality

Land clearing

Potential Environmental Effects

There was no mention of land clearing activities in the EIS. Some land clearing activities (i.e. burning) during the construction phase may contribute to changes in air quality and represents a potentially significant source of PM2.5, PM10, TSP and CO emissions.

Proposed Action

Please clarify if land clearing activities (i.e. burning) will take place and describe them.

Reference to EIS

None

Response

Yes, land clearing will take place, however burning is not planned. Osisko intends to use the services of the existing forest harvesting industries to harvest the timber. Clearing and grubbing is included in the description of the construction phase of the Project. As stated in Chapter 5: During the construction phase, equipment will be transported to the site and site preparation activities will be undertaken. Clearing, grubbing, and site grading will be undertaken where infrastructure is to be placed. Clearing and grubbing is included in Table 5-1 as a construction activity under the following components: Linear Infrastructure, Aggregate Sites, Support and Ancillary Infrastructure, Mine, Stockpiles, Waste Rock Management Facility, and Tailings Management Facility.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-8

Source: Health Canada

Summary of Comment

Air Quality.

Vehicle exhaust emissions.

Potential Environmental Effects

Since Diesel emissions (i.e. from haul trucks) may occur on a daily basis due to vehicle traffic within the Mine Study Area (see comment # 12 below), including vehicle exhaust emission in the air quality assessment would provide predictions that are more protective of human health.

Proposed Action

HC suggests a discussion on vehicle exhaust emission associated with all phases of the project be included in the air quality assessment or please provide a rationale justifying why such emission source is excluded.

Reference to EIS

None

Response

The air quality assessment for the Project considers air emissions in two ways. Firstly, the air emissions from stationary process sources and selected fugitive road dust sources were evaluated in accordance with the regulatory framework governing air quality in Ontario (i.e., O.Reg. 419/05). In addition, air emissions from all sources (including sources and compounds not addressed under O.Reg.419/05) were used to predict how changes in air quality could affect the receiving environment (e.g., Human Health). The assessment effects on the receiving environment due to changes in air quality were assessed in the appropriate sections of the EIS (e.g., the Human Health and Ecological Risk Assessment TSD). The predictions used for assessing the effects of changes in air quality on the receiving environment (e.g., Human Health) include the contribution of vehicle exhaust emissions.

The dispersion model predictions used for determining how the Project could meet the air permitting requirements in Ontario (O.Reg. 419/05) focussed on the emissions during the Operations Phase as the regulation places an emphasis on managing the stationary process emissions from operating facilities. However, the Operations Phase of the Project was determined to be the bounding case as both the air emissions and the associated effects would be greater than the other Project phases. The types of emission sources during the Operations Phase are similar to other stages in the Project life (e.g., vehicle emissions) but will include more equipment at higher emission levels than during the Construction Phase, the Closure Phase or the Post-Closure Phase.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – HC-9

Source: Health Canada

Summary of Comment

Air Quality

Fugitive dust (Tailings)

Potential Environmental Effects

In mining operations, tailings can be a potentially significant source of wind-blown fugitive dust and subsequent deposition of particulate and associated contaminants in surrounding areas.

Proposed Action

Please provide more detail and clarity regarding the management of the tailings and fugitive dust, to support its exclusion from the assessment as a potential source of particulate matter.

Reference to EIS

Atmospheric TSD Section 1.3.4

Response

Fugitive dust throughout the project, including during the Closure Phase, will be managed through the implementation of a comprehensive fugitive dust Best Management Practices Plan (BMPP) which will include management practices for wind erosion from tailings during Operations and re-vegetation during Closure as described in Section 4.2 of the Conceptual Closure and Rehabilitation Plan TSD. Some typical steps to be included in the BMPP for managing dust generation from the tailings areas are ensuring a minimum moisture content of the tailings to keep the area wet and/or installing wind screens. Wet or moist tailings would not be a significant source for dust generation. As stated in the Conceptual Closure and Rehabilitation Plan TSD, the "closure measures are designed to physically stabilize the tailings surfaces to prevent erosion and dust generation." The type of closure measures considered include covering and re-vegetation, which would eliminate the potential for dust generation.

The combination of the closure plan activities and the implementation of the BMPP, which includes facility engagement and accountability, will ensure that the potential emissions from tailings are an insignificant source. Therefore, they have been excluded from the assessment as a potential source of particulate matter. This is standard practice and follows the guidance in Section 7.4 of the Ontario Ministry of the Environment "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" document dated March 2009.

Once the final design of the Osisko project is confirmed, a comprehensive site-specific BMPP, as described in Section 3.3 of the Atmospheric Environment TSD, will be created for the site which will include specific objectives to control fugitive emissions from tailings.

INFORMATION REQUEST – HC-10

Source: Health Canada

Summary of Comment

Air Quality

Monitoring and Background concentrations

Potential Environmental Effects

In the air quality assessment, ambient Air Quality data are taken from distant (very far in some cases) monitors in regards to the project site; this might not adequately represents the actual background contaminant concentrations in the project study area.

For example, La Loche and Fort Chipewyan monitoring stations may be impacted by their regional industries/ operations and may not provide a good comparative background for this project location.

In order to improve predicted changes and potential impact, it is advised to have the actual project emissions scenario be compared with a realistic baseline/background emission scenario.

Proposed Action

HC suggests using more acceptable/representative background contaminant concentrations to account for existing emission sources.

Reference to EIS

Atmospheric TSD Sections: 3.0, 3.2.1, 3.4, 7.0

HHERA TSD Sections: 2.5.2, 1.4, 3.0, App.3.III

Response

The existing air quality levels presented in the Atmospheric Environment TSD are considered representative of the conditions for the Project. The Project is located in an area of northern Canada not immediately near to any large industrial sources. The air quality monitoring stations used when describing existing air quality include a series of stations across northern Canada running from the west (Fort Liard) through to the east (Senneterre), consistent with the general air flow from the west to the east. In some cases, the effect of local activities can be seen to be present in the available data (e.g., PM_{10} levels in La Loche and Brandon). However, the data from most of the stations show a consistent pattern across the country (e.g., $PM_{2.5}$ in Fort Liard: 6.77 µg/m^3; $PM_{2.5}$ in Fort Chipewyan: 4.93 µg/m^3; $PM_{2.5}$ in La Loche: 8.66 µg/m^3; $PM_{2.5}$ in Thunder Bay: 8.50 µg/m^3; $PM_{2.5}$ in Senneterre: 8.21 µg/m^3). The similarity in these reading suggest there is a consistent “background” level across these northern Canadian sites that is appropriate for use at the Project.

Professional judgment was used as the basis for selecting the lowest values from the station data as representing the background air quality as opposed to the average values. The actual background values are not used in the Atmospheric Environment TSD. The background values were passed on to the human health and ecological risk team for use in their TSD.

The background air concentrations were added to the predicted air concentrations from the Project and the total concentrations (background + Project-related predictions) were evaluated in the inhalation assessment of the human health risk assessment. In this assessment, the predicted concentrations (including background) were compared to chronic and acute health-based thresholds, which represent safe concentrations from a human exposure perspective. All of the predicted concentrations were less than the acute thresholds following short term exposures. All of the predicted concentrations were less than chronic thresholds following long-term exposures, with the exception of acrolein and nitrogen dioxide. A risk assessment was carried out for acrolein and nitrogen dioxide to evaluate risk for the human health VECs at the Site.

Ministry of Northern Development and Mines

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-1

Source: Ministry of Northern Development and Mines

Summary of Comment

The document indicates that "during closure, direct discharge of water from the site will cease and runoff will be directed to the open pits".

Potential Environmental Effects

This does not appear to account for the decommissioning of the pumps in the surface drainage network. It is unclear how water will flow to the open pits from the collection low points.

Proposed Action

The proponent should provide more details regarding closure and decommissioning of the site drainage network if these details are not provided in the conceptual closure plan.

Reference to EIS

Site Water Quality TSD 4.5.2

Response

Monitoring and management at closure for all site areas will be described in a formal closure plan to be submitted to MNDM which will include details regarding the site drainage network at closure, pumping requirements, if any, and redirection of water if appropriate depending on the results of monitoring and meeting of appropriate discharge standards. Note in the above statement that, although direct discharge would cease this does not preclude pumping to the open pit if necessary until such a time as water meets acceptable criteria and can be discharged directly to the environment.

INFORMATION REQUEST – MNDM-2

Source: Ministry of Northern Development and Mines

Summary of Comment

The plan appears to be to revegetate the tailings without the application of topsoil.

Potential Environmental Effects

Revegetation without application of topsoil can be problematic, especially when attempting to introduce native species. Once the applied fertilizers are exhausted, the vegetation becomes stressed and is then more susceptible to wind and water erosion.

Proposed Action

Consideration should be given to using stockpiled overburden as a cover over the tailings to promote naturalization of the area.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.2

Response

As described in the conceptual closure plan, the selected measures for the TMF include using re-vegetation to stabilize the exposed tailings surface against erosion by wind and water. It is not planned to place a layer of topsoil or overburden soil on top of the tailings; rather the tailings will be directly re-vegetated by placing organic mulch, fertilizer and seeding. During operations, test plots will be established on representative areas of the tailings surface. Details of the re-vegetation procedures (i.e., nutrients required, fertilizer, sources and suitability of organic mulch, seed mixes) will be developed and verified.

Considering the benign chemistry of the existing tailings, and in consideration of other successful revegetation efforts on closed tailings facilities, direct revegetation is considered feasible, practical and achievable at this site.

The surface area of tailings requiring re-vegetation will be roughly 675 hectares. Placement of a 0.3 m layer of topsoil over the area would require over 2.0 Mm3 of topsoil. This volume of topsoil would simply not be available. In principle, the entire Overburden Stockpile of about 4.5 Mm3 could be transported to the TMA and spread over exposed tailings in a layer averaging about 0.67 m thick. Spreading the overburden on top of tailings would be challenging from a construction point of view because it would be difficult to haul truck loads of overburden over tailings. While this could be done using high mobility equipment, it would be costly, probably in excess of $30 M. The benefit of doing so is questionable because the tailings can be directly re-vegetated without placement of the overburden. In addition, dispersing the overburden over an area of 675 ha would likely yield more sediment to the environment than simply stabilizing the Overburden Stockpile in place as discussed in MNDM-7.

INFORMATION REQUEST – MNDM-3

Source: Ministry of Northern Development and Mines

Summary of Comment

Closure of the waste rock pile does not include application of topsoil. There appears to be available overburden, which is to be regraded and seeded. This approach is not conducive with the requirements of Part 9, Sections 68, 69 and 70 of the Rehab Code.

Potential Environmental Effects

It will be difficult for native species to colonize what will amount to a barren mass of blasted rock and this will result in greatly delayed naturalization of the site. At 120 (or 153, or 160 metres depending on which figure is correct) above the surrounding land surface, the waste rock pile will be a dominant feature of the landscape, one that will be the most visually striking legacy of the mine. Not making an effort to return the Site to a pre-mining or sustainable condition. Bare waste rock will delay natural revegetation and increase infiltration through the WR.

Proposed Action

Consideration should be given to covering the waste rock pile with topsoil with seeding to promote colonization of native species and accelerate the naturalization of the site following closure. Overburden stockpile could be used to cover WR stockpile to the extent possible, to accelerate the natural revegetation of this area. Benches could be covered with overburden and vegetated progressively during operation.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.3

Response

At closure, the waste rock stockpile will contain about 215 Mt of waste rock. The stockpile will have conservative sideslopes of about 2.5:1 (H:V) overall. The rock will comprise hard fragments that are physically stable (i.e., they will not be subject to weathering or erosion). The selected closure measures for the Waste Rock Stockpile include minor regrading of the top surface and implementation of drainage measures to convey runoff to the toe of the stockpile without erosion. There is no requirement for active revegetation of the pile surface to maintain physical stability.

The waste rock has been classified as geochemically stable (i.e., it will not generate acidic runoff). Initially after closure, water collected in the four seepage collection ponds will continue to be monitored and it will be pumped back into the Open Pit until such time as the water quality in the individual ponds becomes acceptable for direct discharge. When the water quality is shown to consistently meet acceptable discharge levels, individual seepage pond dykes will be breached and their pumping systems will be removed. There is no need or particular benefit to place a cover over the waste rock to reduce infiltration.

The waste rock pile will have a surface area of about 205 ha. Placing a 0.3 m thick layer of topsoil over this surface would require about 0.615 Mm3 of topsoil, this quantity is not readily available locally and would be cost prohibitive to import. It would be technically feasible to place overburden on some or all of the waste rock pile to

encourage re-vegetation. However placing this volume of overburden would be a very costly and the only benefit would be aesthetic. Given the remote location of the mine site, the visibility of the waste rock stockpile is relatively limited in comparison to many waste rock piles across Ontario. It will not be visible from any current permanent habitation.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-4

Source: Ministry of Northern Development and Mines

Summary of Comment

Seepage collection and treatment.

Potential Environmental Effects

Upon closure, the pumping stations will be decommissioned and it appears they will become "seepage collection ponds". The water from these ponds will be pumped to the open pits until such time as the water is of acceptable quality for discharge. The metal leaching potential of the waste rock could result in seepage water that does not meet discharge quality requirements for some time. It is also not clear how these ponds will be managed to prevent overflow/discharge to surface waters in the case of extreme or unexpected precipitation events.

Proposed Action

The proponent will need to provide more details regarding surface water management post closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.3

Response

Both the tailings and the waste rock have been classified as non-acid generating. The metal leaching characteristics are discussed in the Geochemistry, Geology and Soils TSD. Preliminary closure and post-closure water quality modelling indicates that there would be no adverse impacts to aquatic life based on the predicted discharge concentrations into the downstream receivers. Details on site water quality modelling are provided in the Site Water Quality TSD. OHRG has committed to monitor the water quality and to continue to pump water to the open pit until such time that it is suitable for direct discharge. It is difficult to predict the water quality over time in each of the seepage collection ponds; however the expectation is that pumping will become unnecessary within 4 years or less.

The water quality in each of the SCPs is expected to improve over time. Initially, water in the TMF Reclaim Pond will be pumped to the Open Pits; however once the water becomes suitable for discharge, the invert of the Reclaim Pond spillway will be lowered, allowing the water to flow through the existing emergency spillway channel into Sawbill Bay. As the water quality in each individual SCP becomes suitable for discharge to the environment, that individual SCP dam will be breached and the pumping infrastructure will be removed. The suitability for direct discharge will be evaluated based on absence of negative impacts in the receiver in comparison with water quality objectives for the protection of aquatic life to be established for each receiver.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-5

Source: Ministry of Northern Development and Mines

Summary of Comment

Overburden Stockpile.

Potential Environmental Effects

The current plan is to regrade the surface of this stockpile after using relatively minor quantities on the site. This could result in erosion and sedimentation of adjacent surface water bodies.

Proposed Action

The overburden material would make useful cover for the TMA and/or the waste rock pile and serve to accelerate the naturalization of the site.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.4

Response

Based on the mining plan, the Overburden Stockpile will contain about 9.2 Mt (4.5 Mm3) of overburden. During pit stripping, the overburden will be placed into the stockpile in a stable configuration with overall sideslopes of about 3:1 (H:V). There will be four seepage collections points. At closure, some of the overburden will be used for regrading around the Project site. The top surface of the material remaining in the stockpile will be graded and drainage measures will be put in place. The overburden is expected to support vegetation, so the surface will be directly revegetated, without the use of topsoil. Water in the four seepage collection points will continue to be monitored after closure. The seepage water will continue to be pumped to the open pits until such time as the water quality becomes acceptable for direct discharge to the environment. At that time, the ponds will be breached and the pumping systems will be removed.

Given the moderate sideslopes, it is expected that the reshaped Overburden Stockpile will be resistant to erosion once the vegetation is established. In the short term, good construction practice measures (e.g., silt fences, hay bale barriers, etc.) will be used to control erosion. Also, all runoff from the stockpile will report to one of the four seepage collection ponds which will be effective in removing suspended solids by sedimentation.

In principle, the entire Overburden Stockpile could be transported to the TMA and spread on the 675 ha area of exposed tailings in a layer averaging about 0.67 m thick. Spreading the overburden on top of tailings would be challenging from a construction point of view because it would be difficult to haul truck loads of overburden over tailings. While it could be done using high mobility equipment, it would be costly, probably in excess of $30 M. The benefit of doing so is questionable because the tailings can be directly re-vegetated without placement of the overburden. In addition, dispersing the overburden over an area of 675 ha would likely yield more sediment to the environment than simply stabilizing the Overburden Stockpile in place as discussed above.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-6

Source: Ministry of Northern Development and Mines

Summary of Comment

Water Management at closure - this section does not discuss cessation of pumping from the seepage collection ponds.

Potential Environmental Effects

None

Proposed Action

This section should include a statement regarding the cessation of pumping from the seepage collection ponds and incorporate more details regarding surface water management post closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.7

Response

It is currently planned to have a total of 13 Seepage Collection Ponds (SCPs) on the site during operations. As shown on Figure 6-1, these SCPs will remain in operation for a period after closure and the water quality in each will be monitored. Water collected in SCPS 1 to 5 will continue to be pumped to the inside of the TMF and will report to the TMF Reclaim Pond. Water collected in the other 8 SCPs will be pumped to the Open Pits.

The water quality in each of the SCPs is expected to improve over time. Initially, water in the TMF Reclaim Pond will be pumped to the Open Pits; however once the water becomes suitable for discharge, the invert of the Reclaim Pond spillway will be lowered, allowing the water to flow through the existing emergency spillway channel into Sawbill Bay. As the water quality in each individual SCP becomes suitable for discharge to the environment, that individual SCP dam will be breached and the pumping infrastructure will be removed. The suitability for direct discharge will be evaluated based on absence of negative impacts in the receiver in comparison with water quality objectives for the protection of aquatic life to be established for each receiver.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-7

Source: Ministry of Northern Development and Mines

Summary of Comment

Non hazardous waste is to be deposited at an approved solid non hazardous waste facility within the tailings management facility. There is no mention of a waste management facility on site in the terms of reference; it states that a solid non hazardous waste facility will be constructed in partnership with the town of Atikokan at an offsite location.

Potential Environmental Effects

A solid non hazardous waste facility within the tailings management facility would need to be included in the closure plan (including monitoring, FA, etc…).

Proposed Action

It is recommended that OHRG meet with MNDM to discuss all issues related to closure.

Reference to EIS

Conceptual Closure and Rehabilitation Sec. 4.1 Paragraph 5

Response

The terms of reference is correct with respect to the management of waste during operations. The plan is to establish a facility for non-hazardous solid waste in the TMF at the time of closure. This is intended to deal with the debris that will be generated by the demolition of the site facilities. After demolition is completed, the TMF landfill will be closed following the terms of the licence. This will involve placing a cover over the wastes as well as post-closure monitoring. It is agreed that the costs associated with this landfill are to be included in the Financial Assurance amount.

A draft version of a closure plan has been prepared for eventual certification and submittal to MNDM. It is currently under review and it is not yet ready for formal submission complete with a Financial Assurance package. OHRG participated in a teleconference with MNDM of July 29, 2013 to discuss this plan prior to formal submittal.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-8

Source: Ministry of Northern Development and Mines

Summary of Comment

No financial assurance (FA) information provided.

Potential Environmental Effects

A solid non hazardous waste facility within the tailings management facility would need to be included in the closure plan (including monitoring, FA, etc…).

Proposed Action

A rough estimate of the FA would be helpful for discussion with aboriginal groups, public, government agencies and stakeholders.

Reference to EIS

Conceptual Closure and Rehabilitation General Comment

Response

It is agreed that the costs associated with this landfill are to be included in the Financial Assurance amount.

A draft version of a closure plan has been prepared for eventual certification and submittal to MNDM. It is under currently under review and it is not yet ready for formal submission complete with a Financial Assurance package. OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss this plan prior to formal submittal.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-9

Source: Ministry of Northern Development and Mines

Summary of Comment

A rough estimate of the FA would be helpful for discussion with aboriginal groups, public, government agencies and stakeholders.

Potential Environmental Effects

This is a requirement of the closure plan. It's important for the public and Aboriginal groups to be aware of the possibility of temporary suspension and periods of inactivity. In these scenarios, the closure plan must outlines the measure OHRG will take during temporary suspension and a state of inactivity.

Proposed Action

OHRG may wish to include information on temporary suspension and/or state of inactivity in the EA report to aid discussions with aboriginal groups, public, and stakeholders. It will be required in the closure plan.

Reference to EIS

Conceptual Closure and Rehabilitation General Comment

Response

The closure plan for the EA report is a conceptual plan only. The Terms of Reference for the project did not require discussion of the actions should a temporary suspension or state of inactivity occur. In parallel, a draft version of a closure plan has been prepared for eventual certification and submittal to MNDM. It is currently under review and it is not yet ready for formal submission. As required, the draft MNDM closure plan contains the requisite chapters describing actions under temporary suspension and state of inactivity.

OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss this draft plan prior to formal submittal. OHRG would also welcome the opportunity to discuss plans for temporary suspension and state of inactivity with aboriginal groups, the public, and stakeholders prior to formal submittal.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-10

Source: Ministry of Northern Development and Mines

Summary of Comment

Section 4.3.3 of the terms of reference states that OHRG will assess alternative methods for the decommissioning and closure phase. It is not clear what alternatives have been assessed related to decommissioning and closure.

Potential Environmental Effects

A description of alternatives related to tailings dams (i.e. consider additional options that improve "walk-a-way" characteristics of the site) and revegetation (specifically of the WR, TMF, ore processing facility site, stockpile) may identify economic and technically feasible options not currently being considered.

Proposed Action

MNDM requests clarification on nature and extent of options that were considered and assessed related to decommissioning and closure. OHRG may wish to consider alternative ways to address the comments and concerns expressed by the ministry about mine closure/post-closure. As noted elsewhere, it is recommended that OHRG meet with MNDM to discuss all issues related to closure.

Reference to EIS

Conceptual Closure and Rehabilitation General Comment

Response

In the preparation of the conceptual closure plan (and also the formal closure plan), due consideration was given to possible alternative approaches that could be taken to the closure of each element of the project. A technical memorandum that provides a brief description of the alternatives considered for each element of mine closure as well as the rationale that was used to select the preferred alternative is included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss closure of the Project site prior to the formal submission of the certified closure plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-11

Source: Ministry of Northern Development and Mines

Summary of Comment

Need to include roads, miscellaneous infrastructure and waste rock piles in summary of mine decommissioning.

Potential Environmental Effects

None

Proposed Action

Include roads, miscellaneous infrastructure and waste rock piles in summary of mine decommissioning.

Reference to EIS

ES-2

Response

For brevity, these items were not discussed in the Executive Summary. Closure of the roads and miscellaneous infrastructure is described in Section 4.1 in the Conceptual Closure and Reclamation Plan Version 1. Closure of the waste rock stockpile is described in Section 4.3 of the same document.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-12

Source: Ministry of Northern Development and Mines

Summary of Comment

Figure 5-9 -shows emergency spillway but no discharge, will excess water be pumped back to effluent treatment plant?

Potential Environmental Effects

None

Proposed Action

Figure 5-9 -shows emergency spillway but no discharge, will excess water be pumped back to effluent treatment plant?

Reference to EIS

Figure 5-9 (EIS Project Description)

Response

The TMF dams will be protected against damage or failure resulting from overtopping by the inclusion of an Emergency Spillway in the TMF Reclaim Pond. This is a standard engineering design feature that is required to protect all dams. (See for example Canadian Dam Association Guidelines, 2007). The Reclaim Pond will be operated at all times with adequate freeboard to ensure that the emergency spillway will contain an "environmental design storm" (EDS) without discharge. For the TMF, the EDS will be the 100 year return 30 day duration rainfall – snowmelt event.

The required freeboard in the TMF Reclaim Pond will be maintained by pumping water back to the Processing Plant Collection Pond (PPCP). Water from the PPCP will be reclaimed for re-use in the Processing Plant. Excess water in the PPCP will be treated in the Effluent Treatment Facility if necessary and then discharged.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-13

Source: Ministry of Northern Development and Mines

Summary of Comment

Figure 5-1 -shows a discharge location as well as 2 effluent discharge locations, what's the difference?

Potential Environmental Effects

NA

Proposed Action

Explain the difference.

Reference to EIS

Figure 5-1

Response

The “Discharge Location” represented by the square symbol is the point where process effluent will be discharged into Marmion Reservoir. These waters will undergo treatment in an Effluent Treatment Facility (ETF) if necessary to meet appropriate discharge guidelines.

The two “Effluent Discharge Locations” (represented by the triangular symbols) are where the treated liquid sewage streams (after treatment in the rotary biologic contactor systems) will be released. The effluent from the sewage system at the camp will be released into Sawbill Bay, while the liquid effluent from the sewage system at the Maintenance Shop will be released into a collection pond which will then be pumped to the Processing Plant Collection Pond (PPCP). Water in the PPCP will either be re-used in the Processing Plant, or it will be treated in the ETF and released at the Discharge Location discussed above.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM 14

Source: Ministry of Northern Development and Mines

Summary of Comment

Kinetic testing indicates the potential to leach metals from the mine tailings (Al, Cu, Cd, Ag, Cr, Zn and Fe). The proposed action: "Where values are above guideline values, additional water quality evaluation within an overall site wide context is required."

Potential Environmental Effects

It is unclear what the proponent intends to do to mitigate metal leaching from the mine tailings.

Proposed Action

The proponent must provide a mitigation strategy for metal leaching from the waste rock.

Reference to EIS

Geochemistry, Geology and Soil TSD 3.6.2

Response

The results provided in the Geochemistry Geology and Soil TSD are not amenable to direct comparisons to water quality guidelines for any other purpose than to identify parameters that require further assessment within the context of the overall site and discharge. This is the case for many reasons as follows:

- liquid to solid ratio under laboratory conditions is not reflective of natural conditions;
- precipitation / runoff will alter concentrations in the natural environment;
- longer term geochemical reactions under field conditions would be expected to improve water quality under natural conditions for this particular site (e.g. carbonate neutralization due to naturally occurring minerals); and
- there is no Aquatic Habitat on the waste rock piles, tailings, or site.

Additional water quality evaluation within an overall site wide context :

To determine if there will be a potential for impact, one must use the geological understanding and geochemistry results and apply them to our understanding of the project, in considering also the management system, surface water system, groundwater system, and downstream environments. This has been completed for each of the metals identified above, for this project, including site runoff, tailings, and waste rock and is presented in the Site Water Quality TSD; Lake Water Quality TSD; Aquatic Environment TSD; and HHERA TSD to develop the impact assessment for the project as presented within the EIS/EA document.

Mitigation:

Of note is that the materials of this deposit, including the tailings and waste rock are non-acid generating with low potential for metal leaching and that the mitigation strategies employed (i.e. water management as described

in the Site Water Quality TSD) are expected to be effective in eliminating potential for impacts from the site, waste rock, and tailings runoff under operational, closure and post closure conditions.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM 15

Source: Ministry of Northern Development and Mines

Summary of Comment

Figure 2-10 shows predicted groundwater flow patterns based on groundwater elevations but does not present groundwater contours.

Potential Environmental Effects

There is no way to determine if the proponents conclusions regarding groundwater flow direction are an appropriate reflection of the piezomatic surface without contouring the data.

Proposed Action

Provide additional maps showing groundwater elevation contours.

Reference to EIS

Hydrogeology TSD 2.4

Response

Please see attached updated Figure 2-10, renumbered as Figure 2-10A, with groundwater elevation contours added.

Attachments

Figure 2-10A

611500 612000 612500 613000

5422000 5421500 5421000 5420500

Mitta Lake
431.01

Marmion Lake
415

BRH-0005B 439.605
BRH-0001B 428.247
BR-6241 439.1
BR-6030 439.1
BR-6224 431.5
BR-6037 433.62
BR-6267 437.85
BR-6270 435.87
BR-6221 437.45
BR-6210 431.829
BR-6203 432.322
BR-6051 434.56
BR-6144 431.63
BR-0325 434.6
BR-6021 434.53
BR-6192 438.141
BR-0442 440.23
BR-0390 434.73
BR-1012 433.78
BR-6103A 436.25
BR-6223 433.72
BR-0115 434
BR-6004 433.8
BR-6213 433.649
BR-6190 433.97
BR-6057 433.627
BR-6191 433.297
BR-6072 432.91
BR-6126A 433.63
BR-6217 432.593
BR-6129 435.67
BR-6106 432.46
BR-6113 433.56
BRH-0003 416.5
BR-1290 445.59
BR-1162 436.09
BR-1249 428.55
BR-1112 428.82
BR-1278 430
BR-1283 432.34
BR-1102 429.13
BR-1095 435.68
BR-1093 435.02
BR-1280 435.06
BR-1214 435.32
BR-1207 428.1
BR-1237 438.17
BR-0384 428.37
BR-1229 436.71
BR-1197A 428.36
BR-1174 426.72
BR-1216 427.65
BR-1128A 432.837
BR-1163 428.6
BR-1190 430.05
BR-1069 433.93
BR-1061 435.03
BR-0097 434.557
BR-0092 432.86
BR-1199 431.33
BR-1129 428.87
BR-1228 428.81
BR-1176 426.217
BR-1187 428.01
BR-1146 425.05
BR-0090 434.29
BR-0401 418.6
BR-1056 434.13
BR-0231 433.75
BR-1050 447.673
BR-1198 423.46
BR-1248 426.763
BR-1227 426.61
BR-1042 432.88
BR-0058 436.12
BR-1188 416.638
BR-0073 419.991
BR-1048 434.06
BR-0246 434.05
BR-1159 431.79
BR-0408 416.53
BR-0413 415.96
BR-1272 418.923
BR-0226 432.82
BR-0216 434.61
BR-1003 434.75
BRH-0008B 419.534
BR-0061 422.51
BR-0220 432.63
BR-1060 430.59
BR-1193 434.19
BR-1168A 433.71
BR-0046 418.63
BR-1263 424.094
BR-0081 433.77
BR-1051 426.44
BR-1151 425.42
BR-0433 421.556
BR-1135 422.55
BR-1223 426.45
BR-1154 433.58
BR-1161 432.2
BR-0437 426.13
BR-1144 421.14
BR-1153A 432.66
BR-1267 420.95
BR-1150 432.47
BR-1063 423.92
BR-1261 419.63
BR-1225 421.279
BR-1238 432.05
BR-1177 418.51
BR-1246 433.09
BR-1109 431.35
BR-1011 420.72
BR-1077 418.666
BR-1064 427
BR-0377 419.19
BR-1094 421.25
BR-1194A 433.74
BR-1157 429.46
BR-1251A 422.574
BR-1073 431.25
BR-1078 426.08
BR-1070 430.22
BRH-0002B 422.339
BR-1080 420.796
BR-1083 418.12

N

LEGEND

- 434.61 Groundwater Elevation (masl)
- Monitoring Well
- Inferred Direction of Shallow Groundwater Flow
- Inferred Groundwater Divide
- Groundwater Elevation Contour (masl)
- Mapped Faults
- Intermediate Contour (5m interval)
- Ditch
- Marsh/Swamp
- Road
- Trail
- River/Stream
- Lake

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

100 0 100 200 300 400
SCALE 1:7,000 METERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
GROUNDWATER ELEVATIONS AND INFERRED FLOW DIRECTIONS - WEST PIT AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	26 Jun. 2013		
CHECK	MSO	26 Jun. 2013		
REVIEW	JMP	26 Jun. 2013		

FIGURE: 2-10A

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Working\ProposedWestpit_GW_Elevations_InferredGW_Flow.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-16

Source: Ministry of Northern Development and Mines

Summary of Comment

While the water quality model accounts for surface inputs into the open pit, the quality of groundwater seepage into the open pit appears to be based on existing water quality and does not account for potential impacts from the waste rock pile.

Potential Environmental Effects

Due to the metal leaching potential of the waste rock, subsurface flow from the waste rock pile could potentially impact pit lake water quality and/or result in impacts to surface water receivers.

Proposed Action

Potential impacts to the bedrock aquifer from the waste rock pile need to be accounted for in the water quality model.

Reference to EIS

Site Water Quality TSD 4.2.1

Response

A water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

For Waste rock, Ore Stockpile, and Overburden the total annual precipitation is assigned a value of 758 mm. Mass load values are assigned to 85 % of the precipitation, whereas the remaining 15 % is assumed to be lost to the system due to evaporation and reduction in snow accumulation due to the height of the pile. This is considered a reasonable and conservative assumption given that the measured evaporation rates from rock piles at other Canadian Shield mine sites (Macroline, 2008 as cited in Areva, 2011) indicate that evaporation from the top of the pile can be as high as 60% of rainfall, and that evaporation in other natural areas of the Canadian Shield is several hundred mm (>20 % of rainfall) (Singer and Cheng (2002).

It is considered that the mass load assigned to the waste rock (both for surface water and groundwater) is reasonably represented within the current system as modelled using this water balance approach, and is appropriately conservative. All of this mass is directed to the PPCP and contained within the system. Thus, although not directly reporting to the Open Pit, the mass is accounted for in the final discharge values. At closure mass continues to be assigned to 85% of precipitation.

Geochemical testing indicates that the waste rock (all lithologies encountered) is non-acid generating with excess neutralization potential and low potential for metal leaching over the long-term, based on both static and kinetic testing. Should deeper groundwater flow occur additional attenuation reactions including adsorption and chemical precipitation would also be expected to improve water quality. Additional discussion on the potential influence of groundwater with respect to the Marmion basin is provided in the response to MNDM-18.

References:

Areva, 2011; Hydrology of Waste Rock Piles in Cold Climates; Technical Appendix 5I of the Kiggavik Project Environmental Impact Statement. December 2011.

Macroline, J., 2008. Investigations of water and tracer movement in covered and uncovered unsaturated waste rock, PhD. Dissertation, University of British Columbia, Vancouver, Canada.

INFORMATION REQUEST – MNDM-17

Source: Ministry of Northern Development and Mines

Summary of Comment

The calculation of hydraulic gradient used to determine cyanide degradation rates assumes a 20 m elevation difference between the water level in the TMF and Lizard Lake.

Potential Environmental Effects

In order to determine the potential cyanide degradation and quantify associated water quality impacts, the model assumptions must be sound.

Proposed Action

The tailings pile will eventually be 60m above the lowest ground elevation. The proponent should provide a technical justification for assuming the assumed 20 m elevation difference.

Reference to EIS

Site Water Quality TSD 4.2.3

Response

There will be a seepage collection system around the TMF. The 20 m elevation distance was based on the expected change in elevation near the edge of the dam. Although the tailings pile will eventually be 60 m above the lowest ground elevation this will be at a point where the distance (dl) will be much greater than near the edge of the tailings, thus will not contribute substantially to the rate of discharge. Using the same equations as presented in Section 4.2.3 for the Site Water Quality TSD, assuming the same dl, and conservatively using a dh of 60 m, results in a reduction in time for the water to migrate from 47 to 16 years. When considering the updated process water concentration of 0.28 mg/L (based on a decrease in cyanide concentration from 20 ppm to 5 ppm in the output from the cyanide destruction circuit - see response to IR-MOE-SW-8 for details) and revised discharge time of 16 years, the predicted cyanide concentration that could report to Lizard Lake would be 0.0068 mg/L. Furthermore, the TSD conservatively assumes a 10 year duration of flow along the pathway to account for uncertainty, thus the predicted concentration provided in the TSD of 0.03 mg/L Cyanide is considered appropriately conservative and allows for uncertainty in flow pathway length or duration.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-18

Source: Ministry of Northern Development and Mines

Summary of Comment

The discussion of simulated effects does not appear to include potential groundwater mounding within the waste rock pile and the effect this could have on groundwater flow.

Potential Environmental Effects

Due to the metal leaching potential of the waste rock, subsurface flow from the waste rock pile could potentially impact pit lake water quality and/or result in impacts to surface water receivers.

Proposed Action

Account for the influence of the waste rock pile on the local hydrodynamics.

Reference to EIS

Hydrogeology TSD 2.10.2

Response

The expected high hydraulic conductivity would not support development of a substantial mound within the waste rock pile, furthermore the difference in hydraulic conductivity between waste rock and the underlying bedrock will be several orders of magnitude, thus the local hydrodynamics are not expected to change substantially (i.e. water flow will follow the existing bedrock contours and catchment areas). Regardless of mounding or minor hydrodynamic changes, to account for water entering the pile and in order to provide a conservative impact assessment a water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence, whereby all water reporting to the pile is assigned an expected leachate water quality based on geochemical testing and is assumed to be released. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

For Waste rock, Ore Stockpile, and Overburden the total annual precipitation is assigned a value of 758 mm. Mass load values are assigned to 85% of the precipitation, whereas the remaining 15 % is assumed to be lost to the system due to evaporation and reduction in snow accumulation due to the height of the pile. This is considered a reasonable and conservative assumption given that the measured evaporation rates from rock piles at other Canadian Shield mine sites (Macroline, 2008 as cited in Areva, 2011) indicate that evaporation from the top of the pile can be as high as 60% of rainfall, and that evaporation in other natural areas of the Canadian Shield is several hundred mm (>20 % of rainfall) (Singer and Cheng (2002).

It is considered that the mass load assigned to the waste rock (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure mass continues to be assigned to 85% of precipitation falling on the waste rock pile.

Geochemical testing indicates that the waste rock (all lithologies encountered) is non-acid generating with excess neutralization potential and low potential for metal leaching over the long-term, based on both static and

kinetic testing. Should groundwater flow occur, additional attenuation reactions including adsorption and chemical precipitation would also be expected to improve water quality.

For Waste Rock and Ore, the predicted worst case groundwater concentrations of aluminum (0.25 mg/L), arsenic (0.03 mg/L), copper (0.009 mg/L), and uranium (0.007 mg/L) are greater than the PWQO protection of aquatic life guidelines (PWQO) as presented in the Site Water Quality TSD, Table 4-8 and Table 4-9. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04 (with the exception of aluminum for which there is no GW3 criteria). When accounting for a 10 times dilution along the flow path (similar to the rationale used in developing the GW3 criteria) it is considered that there is no anticipated adverse effect on aquatic life due to these concentrations (i.e. aluminum would be below the PWQO at the point of discharge).

Since PWQOs do not provide acute guidelines, concentrations of the above parameters were compared to the U.S. EPA Ambient Water Quality Criteria CMC (Freshwater Acute) values. These represent acute concentrations to which aquatic life should only be exposed to for short periods of time.

Aluminum – no guideline available

Arsenic – 0.34 mg/L

Copper – 0.013 mg/L

Uranium – no guideline available.

Based on comparison with the above guidelines, the undiluted groundwater concentrations expressing to surface waters would not be considered as acutely toxic.

Given the current accounting of flows and mass load, and the geochemical conditions of the materials on site, it is considered that the groundwater component is negligible with respect to influencing the overall results or conclusions of the EIS/EA with respect to potential for water quality impacts from the site.

Parameter	Units	Guidelines		Waste Rock Run Off [a]	Ore Run Off [b]	
		PWQO [c]	GW3 [d]	Maximum ALL[f]	Steady State	Worst Case
Al [e]	mg/L	0.075	-	*0.25*	0.04	*0.25*
As	mg/L	0.005	1.5	*0.03*	0.0002	*0.03*
Cu	mg/L	0.001	0.069	*0.009*	0.0005	*0.009*
U	mg/L	0.005	0.33	*0.007*	0.0002	*0.007*

Notes:

a) Presented in Table 4-8, Site Water Quality TSD.

b) Presented in Table 4-9, Site Water Quality TSD.

c) MOEE (Ministry of Environment and Energy). 1999. Provincial Water Quality Objectives (PWQO), PIBS 3303E, Queen's Printer for Ontario. July 1994, reprinted February 1999. Values greater than the PWQO are in *italic font*.

d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

e) A 10 times dilution or attenuation along the groundwater flow path would result in aluminum concentration lower than the PWQO values.

f) Maximum Runoff for all Rock Types.

MOE, under O. Reg 153/04 has developed groundwater protection values (GW3) that would be protective of aquatic life based on aquatic protection values (APVs). The APVs are based on the U.S. EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life and therefore are considered to provide suitable protection for aquatic life.

Prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path. Attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers. "Under most conditions, copper is present in aqueous solution as the divalent cation, Cu2+, or as Cu(II) hydroxide or carbonate complexes. However, copper is not especially mobile in aquatic environments due to the relatively low solubility of Cu(II)-bearing solids and high affinity of copper for mineral and organic surfaces." (U.S. EPA, 2007).

References:

Areva, 2011; Hydrology of Waste Rock Piles in Cold Climates; Technical Appendix 5I of the Kiggavik Project Environmental Impact Statement. December 2011.

Macroline, J., 2008. Investigations of water and tracer movement in covered and uncovered unsaturated waste rock, PhD. Dissertation, University of British Columbia, Vancouver, Canada.

MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011.

Singer, S.N., and Cheng, C.K. 2002. An Assessment of the Groundwater Resources of Northern Ontario. Hydrogeology of Ontario Series (Report 2). Ministry of the Environment. Toronto. Canada.

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-19

Source: Ministry of Northern Development and Mines

Summary of Comment

The number of boreholes completed with monitoring wells appears to be inadequate. It does not appear that sufficient monitoring wells have been placed within the boundary of the proposed tailings impoundment. It is difficult to determine the hydrodynamics of the subsurface in these areas.

Potential Environmental Effects

It is important to note that there is a potential for the mine tailings to leach metals and downward migration into the subsurface could result in impacts to nearby or adjacent surface water bodies.

Proposed Action

Installation of monitoring wells over a broader area of the footprint of the TMA.

Reference to EIS

Hydrogeology TSD 2.4

Response

Additional boreholes and data will be collected during the detailed design and construction phases of the project such that the collection system can be appropriately designed and constructed. However, based on the assessment of potential adverse effects as described below, there would be no anticipated adverse effects on nearby receiving waters,

In order to conservatively predict potential for impact to the environment a water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence. All precipitation (minus evaporation) and process water entering the TMF is assigned a water quality and based on the geochemical testing results, and the resulting mass is accounted for and tracked in the model. As such, the mass load assigned to the TMF water (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure all precipitation (less evaporation) continues to be applied a water quality based on the TMF process water chemistry and is thus conservative. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

The seepage collection system is an engineered system which will require detailed design as part of the detailed design phase of the project. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings. More details regarding the seepage collection system will be developed as part of the detailed design phase of the project, following EIS/EA approval. In the water balance model all runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and potential groundwater flow.

Furthermore, looking specifically at the concentrations expected in the TMF water, Table 4-10 of the Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase. The predicted TMF groundwater concentrations of cyanide, cobalt, copper, molybdenum and uranium are greater than the PWQO protection for aquatic life regulatory guidelines (PWQO). The MOE, in developing the groundwater protection values (GW3), has assumed that there will be a minimum of a 10x reduction in concentration due to dilution within the receiving waterbody (MOE 2011). With this dilution, all parameters, with the exception of copper for the predicted TMF water quality will be below the PWQO guidelines. Under the assumed conditions, the predicted concentration of copper entering downstream waters could be 0.11 mg/L compared to a GW3 value of 0.089 mg/L (MOE 2009). Based on the assumptions in MOE (2011) the mixed concentration in the downstream waters would be predicted to be 0.011 mg/L. The SSWQO developed for lakes in the Project area was 0.0079 mg/L. Therefore, copper concentrations in downstream receiving waters could be slightly higher than the SSWQO should water from the TMF enter receiving waters through groundwater flow paths.

As a result, the potential effects of copper at 0.011 mg/L on aquatic life that could be present in the pond were considered with respect to published toxicity data to determine whether there could be an adverse effect on aquatic life should groundwater with this concentration enter to the pond. The U.S. EPA ECOTOX database was accessed to obtain toxicity data for copper. The Aquatic Ecology TSD has noted that the fish fauna of this pond is characterized by small-bodied forage fish. Therefore, toxicity data for fathead minnow, a typical test species in toxicity tests, was used to predict the potential for adverse effects on fish species. The potential effects on invertebrates were also assessed through a review of the available toxicity data.

The lowest reported effects concentration for the fathead minnow reported in the database was a MATC (calculated as the geometric mean of the NOEC and LOEC) of 0.016 mg/L during a 7 day exposure. Reported no effects concentrations (NOECs) for the amphipod *Hyalella azteca* ranged from 0.013 mg/L to 0.05 mg/L. The results indicate that should water at the predicted TMF concentration reach the downstream waters, there would be no anticipated adverse effect on aquatic life.

It should be noted that the above prediction of copper in groundwater is considered conservative in that it does not provide for attenuation of copper concentrations along the flow path. Since the TMF is located more than 100 m from downstream water bodies, attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Parameter	Units	Guidelines			Groundwater Quality reporting from TMF
		CCME CWQG[a]	PWQO[b]	MISA[c]	
pH	**s.u.**	6.5–9.0	6.5–8.5	6.0–9.5	7.8
Cyanide	**mg/L**	0.005			**0.03**[d]
NO_3[e]	**mg/L as N**	13	13		0.00004
NH_4[e]	**mg/L as N**				20
SO_4	**mg/L**				242
Cl	**mg/L**				31
Hg	**mg/L**	0.000026	0.0002		0.00001
Ag	**mg/L**	0.0001	0.0001		0.00001
Al	**mg/L**	0.1	0.075		0.02
As	**mg/L**	0.005	0.005	1	0.0001
B	**mg/L**		0.2		0.00002
Ca	**mg/L**				28
Cd	**mg/L**	Note[f]	0.0001		0.00002
Co	**mg/L**		0.0009		**0.003**
Cr	**mg/L**	0.001	0.001		0.0002
Cu	**mg/L**	0.002	0.001	0.6	**0.11**
Fe	**mg/L**	0.3	0.3		0.0001
K	**mg/L**				40
Mg	**mg/L**				16
Mo	**mg/L**		0.04		**0.08**
Na	**mg/L**				106
Ni	**mg/L**	0.025	0.025	1	0.01
P	**mg/L**	0.004-0.1	0.02-0.03		0.02
Pb	**mg/L**	0.001	0.001	0.4	0.0002
Sb	**mg/L**		0.02		0.002
Se	**mg/L**	0.001	0.1		0.0008
U	**mg/L**		0.005		**0.007**
V	**mg/L**		0.006		0.00004
Zn	**mg/L**	0.03	0.02	1	0.002

Notes:

[a] Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines for the protection of freshwater aquatic life.

[b] Provincial Water Quality Objectives.

[c] Municipal/Industrial Strategy for Abatement.

[d] Assuming treatment efficiency of 5 ppm and natural degradation of cyanide as described in Section 4.2.3.

[e] Assuming no oxidation of ammonia to nitrate.

[f] Cadmium guideline based on hardness calculation where CCME CWQG for Cd, ug/L = 100.86[log (hardness))-3.2. Hardness, mg equivalent/L $CaCO_3$ = ([Ca,mg/L]*2.497) + ([Mg,mg/L]*4.116).

Bold values are greater than one or more of the environmental guidelines.

References

MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011.

U.S. EPA ECOTOX database. http://cfpub.epa.gov/ecotox/ Accessed July 2013.

INFORMATION REQUEST – MNDM-20

Source: Ministry of Northern Development and Mines

Summary of Comment

The number of boreholes completed with monitoring wells appears to be inadequate. It does not appear that sufficient monitoring wells have been placed down-gradient of the waste rock pile. It is difficult to determine the hydrodynamics of the subsurface in these areas and there is a need to monitor for potential subsurface impacts due to the potential for metal leaching from the waste rock.

Potential Environmental Effects

It is important to note that there is a potential for the mine tailings to leach metals and downward migration into the subsurface could result in impacts to nearby or adjacent surface water bodies.

Proposed Action

Installation of monitoring wells down-gradient of the waste rock pile.

Reference to EIS

Hydrogeology TSD 2.4

Response

See response to MNDM-18. Additional boreholes and data will be collected during the detailed design and construction phases of the project such that the seepage collection system can be appropriately designed and constructed.

In order to conservatively predict potential for impact to the environment a water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence since this is considered to have less uncertainty than using hydraulic conductivity, furthermore this approach accounts for all potential mass loading to the water system. Implications of direct water quality discharge is provided in response to MNDM-18.

INFORMATION REQUEST – MNDM-21

Source: Ministry of Northern Development and Mines

Summary of Comment

It appears that there is a surface water course between Monitoring Well BRH-0018 and the tailings area.

Potential Environmental Effects

This well may serve to provide background information on groundwater which may report to surface water but at least one additional monitoring well needs to be installed between this surface feature and the tailings impoundment so that potential impacts to surface waters can be monitored.

Proposed Action

Installation of additional monitoring wells.

Reference to EIS

Hydrogeology TSD 2.4

Response

Additional boreholes and data will be collected during the detailed design and construction phases of the project such that the collection system can be appropriately designed and constructed. This location will be considered for an additional installation.

INFORMATION REQUEST – MNDM-22

Source: Ministry of Northern Development and Mines

Summary of Comment

Water quality in the pits discharging to the environment is expected to be suitable for direct discharge (approximately 78 years after closure). If not, treatment options will be considered at that time.

Potential Environmental Effects

Water quality from pits is uncertain and could affect local water quality in Marmion Reservoir.

Proposed Action

Monitoring program required during pit flooding (after TMF contributions have ceased) to confirm/predict that pit water quality will be suitable for discharge to the environment. FA will have to be managed accordingly.

Reference to EIS

Conceptual Closure and Rehabilitation Section 4.7

Response

The pit overflow estimate has been revised, and is now estimated to occur approximately 218 years after closure. The basis and rationale for this change and details of the pit flooding model are provided as an addendum to the Conceptual Closure and Rehabilitation Plan.

As noted in the EIS, pit water quality will be monitored in post-closure prior to pit overflow. If water quality is not suitable, treatment options will be considered. A commitment to monitor water quality in the pits prior to overflow has been added to Chapter 8.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-23

Source: Ministry of Northern Development and Mines

Summary of Comment

Atikokan Bass Classic-The event is recognized as an important cultural event. This event could be changed due to possibly limiting the area, 100+ boats are accustom to fishing in.

Potential Environmental Effects

There may be some perception of negative effects on outdoor tourism/recreation due to construction of a mine site in the area, and associated effects on visual aesthetics.

Proposed Action

Negative perceptions can be mitigated by reinforcing the positive outdoor tourism/recreation reputation of the study area. One example is the Bass Classic, a major attraction to fisherman of all levels of experience. OHRG has provided sponsorship of this event and will continue to do so.

Reference to EIS

Table 5 Social/Cultural Criteria

Response

Thank you for your comment. Osisko intends to work closely with the Town through a Committee format. Our current plan for this Town Committee is to include a representative from the Tourism and Recreation sector. Opportunities for ongoing community investment will be discussed through the Committee.

Osisko met with the Tourism Operators in May 2013 and has committed to providing capacity for the local tourist industry to promote and market recreational opportunities in the area as a means of offsetting potential impacts to the industry that may occur as the result of Project development. This commitment has been added as a mitigation measure in Chapter 6 and as a formal commitment in Chapter 9 of the Final EIS/EA Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-24

Source: Ministry of Northern Development and Mines

Summary of Comment

Aboriginal engagement has clearly been substantial. Correspondence has been received from Aboriginal communities in support of OHRG engagement efforts to date. However, comments previously provided to OHRG related to its consultation log and tracking table should be reviewed and followed going forward.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Chapter 7, section 8.3, Appendix 7, and Aboriginal Interest TSD

Response

Aboriginal concerns are detailed in Section 7.3 of Chapter 7 Public and Aboriginal Consultation and the corresponding Appendix 7-V Record of Consultation – Aboriginal. Two key tables within these documents provide a record of key issues raised by Aboriginal communities and outline both where within the EIS/EA Report the issue is fully addressed as well as communication activities that took place to specifically discuss and follow up on key issues. These tables have been updated to include activities that took place up to October 15, 2013 and revised for clarity based on comments received from the Government Review Team.

One example Key Issue raised by an Aboriginal Community is provided below. The community is Naicatchewenin First Nation and the Key Issue is Water Quality. Table 7-14 in Chapter 7 is intended as a summary which is then further expanded in Appendix 7-V through both a table, and detailed documentation of each communication activity.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Example line from Aboriginal Community Concern Concordance Table in Chapter 7

Community	Key Issues Raised	Follow Up Communications	Section Issue Addressed in EIS/EA Report
Naicatchewenin First Nation	Water quality	Presentation to Fort Frances Chiefs Secretariat Community visit including poster sharing water quality results Community news brief sharing water quality results	Chapter 5 Project Description Section 5.2.7 Water Management System Chapter 6 Effects Assessment Section 6.1.3: Water Quantity and Quality Chapter 8 Environmental Management Planning Section 8.2.2.4 Water Quality

Example line from Comment Response Table in Appendix 7-V

Date	Type	Purpose	Aboriginal Group	Key Issues Raised	Community Concern	Response	Follow Up	Documents
2/22/2012	Email	Comments on Terms of Reference	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Thank you for sharing your concerns. These issues will be addressed in the EIS/EA Report, although we hope to be able to provide additional information in the interim.	Share information about water quality and water management practices.	• 2012-02-22 Naicatchewenin First Nation.pdf
6/18/2012	Presentation at monthly Chiefs meeting	To present and discuss the baseline data and results; To present the revised project layout; To provide responses to outstanding concerns To provide an update on the Traditional Use Study (TUS)	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Most of the water will be reclaimed from the tailings. A polishing pond will clean tailings water. Before water is released to the Marmion Reservoir, it will be tested to make sure it meets standards. The effluent discharge point will be tested to make sure it meets standards. The effluent discharge point will be in an area with good mixing characteristics. The effluent discharge point will avoid areas that have important fish habitats.	Community visit Community news brief	• 2012-06-18 FFCS Notes and Presentation.pdf
11/6/2012	Community visit	To provide an overview of Project alternatives and collect information about community land use	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	Community members were provided information about planned water management systems and the potential effects to water quality from the OHRG project through the use of posters and a Project overview video.	Community news brief	• Naicatchewenin Open House Meeting Notes.pdf

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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Date	Type	Purpose	Aboriginal Group	Key Issues Raised	Community Concern	Response	Follow Up	Documents
30/8/2013	Community news brief	To share the results of the environmental assessment in plain language form	Naicatchewenin First Nation	Water quality	Water quality issues have been raised as the past mining practices in the area have given us reason for great concern (Atikokan's Hogarth Pit)	A summary of water quality work and planned water management strategies was provided in plain language form to the band office for community information. Some of the water management strategies Osisko will be implementing to ensure water quality is not affected negatively include: ■ Avoiding effluent discharge near walleye spawning areas. ■ Use of a buffer zone between the pit and Marmion Reservoir. ■ Treatment of suspended solids if necessary. ■ Capture of seepage around the Tailings Management Facility, the Waste Rock stockpile and the ore stockpiles. ■ Water quality monitoring at site and in Marmion Reservoir.	Quarterly meetings with Environmental Resource Sharing Committee	2013-08-30 Sharing the Results of the Water Quality Assessment – Community News Brief.pdf

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-25

Source: Ministry of Northern Development and Mines

Summary of Comment

11.0 -The title is misleading. It would be more accurate if titled "Economic and Social Impacts of the Project".

Potential Environmental Effects

None

Proposed Action

Consider a new title

Reference to EIS

Section 11.0

Response

Section 11 was written to meet the EIS Guidelines for Benefits to Canadians and is more representative with the suggested Table of Contents that was provided to OHRG from the federal and provincial government leads. The Section has been updated to reflect a more fulsome picture of the benefits the Project could provide.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-26

Source: Ministry of Northern Development and Mines

Summary of Comment

Local benefits to Atikokan through employment, local spending with supplies/contractors/suppliers, both direct and indirect could decrease dependency on government funding (tax revenues, EI contributions, sales tax, CPP contributions) in the future.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Socio-economic Environment TSD #13

Response

Thank you for your comment. Yes, we agree that many indirect economic benefits could occur as a result of the Project. These suggestions will be incorporated into Chapter 11, Benefits of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-27

Source: Ministry of Northern Development and Mines

Summary of Comment

OHRG has committed to working with the Town of Atikokan and Atikokan Economic Development Corporation in regards to economic opportunities. This will be done through a local monitoring committee that will be established to facilitate ongoing communications with the public and ensure the long term well-being of the Town of Atikokan is represented.

Potential Environmental Effects

No further details have been given regarding this committee.

Proposed Action

Provide details on the committee

Reference to EIS

5.2.1 8.0

Response

As stated in Chapter 8, Section 8.3.1, the Atikokan/OHRG Committee will be set up in a similar manner as the Malartic/Osisko Committee. The structure of the committee will be finalized in cooperation with the Town; however it will likely have six members and one coordinator and meet on a quarterly basis, or as required. Committee members will represent the local community at meetings with Osisko management. OHRG will work with the Atikokan/OHRG Committee to develop measures that contribute to the quality of life of the local populations, including improvements to local infrastructure as may be required. A long term beneficiary fund will likely be created with criteria for selection of projects supported by the Atikokan/OHRG Committee such as a project's capacity to improve the cultural, social, physical, educational and environmental components of life for Atikokan residents.

INFORMATION REQUEST – MNDM-28

Source: Ministry of Northern Development and Mines

Summary of Comment

Early discussions with OHRG and terms of reference revealed they would not have a camp on site, but rather would transport workers on the mine access road on a daily basis from Town of Atikokan. OHRG is now supporting accommodations through a camp on-site with incentives for workers to live in town and commute to the worksite.

Potential Environmental Effects

What are the incentives for the workers to encourage them to re-locate and live in Atikokan? With increased population, housing shortage both temporary for construction and long term for mine workers could be an issue.

Proposed Action

Possibly incentives could include memberships to cultural and sporting organizations to integrate workers and families into the community. Work with community on a potential spousal hiring program. In regards to housing issue, town is currently engaging the services of consultants to identify shortages and offer recommendations. The capacity of the town to implement those recommendations could be an issue i.e. financial, human resources etc.

Reference to EIS

5.2.1 8.0

Response

The Town of Atikokan prefers that workers are housed in Town, and Osisko has committed to providing logistical means and incentives for workers to do so. These incentives could include, for example, providing employees with relocation costs, a housing allowance or potentially working with the Town to create affordable rental housing. The details of the incentives have not been determined and will be finalized as the Project planning process progresses and through ongoing consultation.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-29

Source: Ministry of Northern Development and Mines

Summary of Comment

What measures will take place to train potential local/regional/surrounding area workers including First Nations?

Potential Environmental Effects

OHRG has stated they will invest in and off site training. What will the offsite training consist of? Who will be the training partners? How will local sustainable employment be supported via training, education and opportunities to develop transferable skills and experience?

Proposed Action

OHRG have identified school boards as potential partners and employee transition planning after mine closure. In order to be prepared a prediction of potential supplier growth and changes in labour force (employed and unemployed) needs to be done.

Reference to EIS

Socio-economic Environment TSD #13

Response

OHRG plans to work with local academic institutions such as school boards to develop specialized labour skills in the workforce. On site and on the job training will be a focus as well as upgrading of workforce skills.

OHRG will continue to share anticipated workforce and equipment requirements information with Aboriginal communities and local economic development corporations. Employment opportunities, and their corresponding job postings, will be communicated to the local and Aboriginal communities in a timely manner. OHRG will implement a hire local priority policy, and seek out business opportunities within the local community.

OHRG will continue to promote the utilization of Aboriginal and local enterprises whenever possible in supplying goods and/or services required during each phase of the project. Procurement policies that favour local businesses will be implemented.

Yes, a prediction of potential supplier growth and changes in labour force was carried out. Labour Market is one of the VECs identified for the Socio-economic component. This assessment includes a description of anticipated opportunities for growth of businesses and growth of the local and regional labour force.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-30

Source: Ministry of Northern Development and Mines

Summary of Comment

Project will affect population and demographics through direct and indirect employment. Migration of workers with families is expected. This increase in population will result opportunities for new and existing businesses. This increase in population will also result in more demands on community services and infrastructure.

Potential Environmental Effects

Some services (health, emergency and protection, education, recreation, water and waste) and infrastructure are underutilized, while others do not have capacity to accommodate an increase in population. These demands will vary between construction, operation, closure and post-closure phases.

Proposed Action

Socio-economic effects will be considered for all four phases. OHRG stated during construction phase public services/infrastructure is below capacity and could readily accommodate additional demands. Predicting changes in population, age, gender, mobility rates will assist in being prepared. Prediction in changes and access to services and infrastructure is a key and will need to be monitored. OHRG and the community will need to work together to ensure this is communicated.

Reference to EIS

6.3 Chapter 3 Socio -economic Environment TSD #13

Response

Thank you for your comment. Yes, Osisko will continue to work with the community to ensure good communication and strong understanding of the local population.

OHRG has been sharing information with the Town throughout the EA process and has received feedback through meetings and workshops during the Terms of Reference preparation stage of the EA planning process. The workshop on September 20, 2012 built on information sharing to date and allowed for a focussed discussion on the socio-economic aspect of the Project. The use of stakeholder feedback such as this workshop will be integral to developing the Social Management Plan for the Project, as detailed in Chapter 8.

The Mayor and seven Town councillors, the Town Clerk and a board member of the Economic Development Corporation attended the workshop. Five representatives from OHRG attended, including the consultation team and staff working at Site.

Feedback was provided by attendees through group discussion and question and answers. The key topics of discussion raised during the workshop were:

- General consensus that the socio-economic information presented was accurate.
- Some knowledge of local camping sites and trappers cabins was shared.
- General agreement that the labour force assumptions for the four Project phases are reasonable, however the Town expressed an interest in increasing the percentage of workers that live in Town.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-31

Source: Ministry of Northern Development and Mines

Summary of Comment

7.1.2.8 - the feedback from the open houses should have statistical parameters applied in that it is a sample of larger population.

Potential Environmental Effects

RFN has expressed a concern with using numbers from these venues to represent community practices.

Proposed Action

The feedback from the open houses should have statistical parameters applied.

Reference to EIS

Section 7.2.8

Response

This section reference has changed in Version 2 of the EIS/EA Report; it is now Section 7.1.2.3.

The open house information provided in Section 7.1.2.3 is from a public open house, and does not relate directly to First Nations. The information was gathered as a snapshot to provide a general picture and is not intended to be statistically representative. The titles of the figures have been revised to remove the wording "Community Survey" and replace with "Public Open House Comment Form Results" in order to avoid confusion.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-32

Source: Ministry of Northern Development and Mines

Summary of Comment

Approximate timeframes for these action items would be helpful.

Potential Environmental Effects

Not all actions have timeframes.

Proposed Action

Follow-up to outstanding concerns related Aboriginal consultation is critical. An understanding of when and how the activities will occur is important to the Crown's on-going monitoring of OHRG consultation efforts

Reference to EIS

Section 7.3.6

Response

These concerns will be addressed throughout the ongoing permitting process.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-33

Source: Ministry of Northern Development and Mines

Summary of Comment

Although Malartic and Hammond Reef share similar characteristics from an operational perspective this table suggest that there will be similarities in mining royalties and taxes collected by the Crown. Ontario royalties/tax laws not the same as Quebec and this comparison is not particularly meaningful.

Potential Environmental Effects

None

Proposed Action

Base estimates on Ontario's tax regime or clarify that there are differences between jurisdictions.

Reference to EIS

Table 11-2

Response

Although Hammond Reef Project will be subject to Ontario royalty and taxes laws that differ from those in Quebec, where the Canadian Malartic mine is located, the values below are considered reasonable estimates for general comparison. This statement has been added to Section 11.2 in advance of Table 11.2.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-34

Source: Ministry of Northern Development and Mines

Summary of Comment

Creating employment, optimizing local support sector jobs, creating awareness/growth with existing local businesses are important issues that need to be addressed.

Potential Environmental Effects

Through awareness with local and regional business, direct and indirect, they can understand the expectations of this business opportunity. There may be issues pertaining to how jobs are allocated (local versus non-local, Aboriginal versus Non-Aboriginal)

Proposed Action

Socio-economic component of the EA will include assessment of potential effects on local economy. OHRG is committed to hiring local and outsourcing contracts to local suppliers where possible. Is there procurement policies going to be developed? A good procurement framework can result in additional jobs during construction and operation stages. How will that be communicated? What are the timeframes? OHRG will communicate through the HR team and community news briefs.

Reference to EIS

7.2.1 Table 5 social and Cultural Criteria 5.2.9 Office and support Facilities

Response

Osisko actively pursues local economic development by seeking local goods and services. A specific procurement policy and communications plan has not been developed at this time. The anticipated timeframe for this type of work to be completed is upon approval of the EA, prior to construction and ongoing throughout the Project phases. The Atikokan-OHRG Committee as well as the Economic and Employment Committee formed with First Nations as part of the RSA and the regional Metis Consultation committee will likely provide a forum for these types of communications.

INFORMATION REQUEST – MNDM-35

Source: Ministry of Northern Development and Mines

Summary of Comment

Low-grade Ore Stockpile.

Potential Environmental Effects

Other TSDs indicate that the low grade ore stockpile will be processed prior to closure yet the Conceptual Closure Plan indicates that a portion may remain and be closed in "the same manner as the waste rock stockpile."

Proposed Action

The proponent should commit to processing this material rather than leaving another visual legacy of the mining activity. This will also ensure that the potential for surface water impacts from this material is greatly reduced.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.5

Response

The low grade ore stockpile is expected to be processed and Osisko anticipates that nothing will remain of this stockpile at closure. However, in order to be conservative in the assessment, the net effect was determined by considering that some amount of the low grade ore stockpile could remain on the landscape at closure. Actions described to deal with a residual stockpile at closure should be read as a contingency plan only.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-36

Source: Ministry of Northern Development and Mines

Summary of Comment

This TSD indicates that the tailings management facility will be raise approximately 63 m from the lowest existing elevation surrounding the facility, while other TSD indicate that the height will be only 60 metres.

Potential Environmental Effects

No real environmental effects, but these discrepancies should be cleared up before finalizing the documents.

Proposed Action

There needs to be consistency between the TSDs.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 2.4

Response

At the ultimate stage of development, the top of the deposition cone will be Elev. 492 m. The lowest point on the perimeter at the downstream toe of the dams is Elev. 416m. Therefore, the correct overall height is 76 m. This has been corrected in the EIS/EA report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-37

Source: Ministry of Northern Development and Mines

Summary of Comment

This TSD indicates that the waste rock pile will be elevated 160 m from the lowest existing elevation surrounding the facility, while other TSD indicate that the height will be only 120 metres

Potential Environmental Effects

A 40 m change in elevation is quite significant from a visual/aesthetic perspective.

Proposed Action

There needs to be consistency between the TSDs.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 2.4

Response

The plan for the Waste Rock Management Facility (WRMF) shows a maximum elevation of 550 m at the end of mining. By comparison, the lowest elevation at the toe of the WRMF is 420 m. Therefore, the correct maximum overall height is 130 m. This has been corrected in the EIA/EA report.

INFORMATION REQUEST – MNDM-38

Source: Ministry of Northern Development and Mines

Summary of Comment

The TSD indicates that a portion of the graded slope along the north side of the Ore Processing Facility area will be "periodically submerged during high tide."

Potential Environmental Effects

While many inland waters (the Great Lakes in particular) experience minor tidal events, it is not clear how high the tides on the Marmion Reservoir actually get.

Proposed Action

Suggest rewording to indicate "submerged during periods of high water" or something similar.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.1

Response

Use of the term “high tide” is incorrect. The high water levels in the Upper Marmion Reservoir are controlled by inflows as well as the control structures at the Raft Lake Dam. A more appropriate description would be “periods of high water”.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-39

Source: Ministry of Northern Development and Mines

Summary of Comment

Approval could be required from other federal and provincial departments to discontinue the monitoring program, if justified. This is not solely MNDM responsibility.

Potential Environmental Effects

None

Proposed Action

Remove last sentence of second paragraph

Reference to EIS

Conceptual Closure and Rehabilitation Section 5.3.1, 2nd paragraph.

Response

In Section 5.3.1 it is stated that,

"If *after 5 years it can be shown that there are no lingering effects as a result of operations, an application could be made to the MNDM to terminate the monitoring program."*

Based on experience with other closure plans, it was understood that MNDM normally acts as lead agency in such matters; nonetheless, OHRG would be prepared to also discuss modifications or cancellations of the monitoring program with other pertinent agencies.

INFORMATION REQUEST – MNDM-40

Source: Ministry of Northern Development and Mines

Summary of Comment

This section of the TDS indicates that the waste rock pile will be 156 m. This number varies from that presented in previous sections and from numbers presented in other TSDs.

Potential Environmental Effects

No real environmental effects, but these discrepancies should be cleared up before finalizing the documents.

Proposed Action

There needs to be consistency between the TSDs.

Reference to EIS

Conceptual Closure and Rehabilitation Plan 4.3.

Response

The WRMF design shows the top elevation of the pile at Elev. 550 m. By comparison, the lowest elevation at the toe of the pile is Elev. 420 m. As a result, the correct height of the waste rock pile is 130 m. This detail has been updated in the EIS/EA Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-41

Source: Ministry of Northern Development and Mines

Summary of Comment

A summary of land tenure should be inserted here from Figure 1, Table 1 and 2 in Appendix 1.VI.

Potential Environmental Effects

None

Proposed Action

A summary of land tenure should be inserted here from Figure 1, Table 1 and 2 in Appendix 1.VI.

Reference to EIS

Project Description Section 5.0.

Response

A summary of current land use is provided in Section 1.7 of the EIS/EA report. A summary of land tenure is provided in Section 1.8.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-42

Source: Ministry of Northern Development and Mines

Summary of Comment

Ministry of Northern Development and Mines

Potential Environmental Effects

None

Proposed Action

Change to Ministry of Northern Development and Mines.

Reference to EIS

Section 1-20.

Response

Corrected to Ministry of Northern Development and Mines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-43

Source: Ministry of Northern Development and Mines

Summary of Comment

Consider adding "The vision of MNDM is a Northern Ontario economy and provincial minerals sector that are healthy, competitive and sustainable."

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Section 3.3.7 - paragraph 2

Response

Added to Section 3.3.3.12: The vision of MNDM is a Northern Ontario economy and provincial minerals sector that are healthy, competitive and sustainable.

INFORMATION REQUEST – MNDM-44

Source: Ministry of Northern Development and Mines

Summary of Comment

In addition to the tailings management area and waste rock pile, it does not appear that overburden is going to be used to enhance vegetation growth over areas such as the ore stock piles and the ore processing facility area.

Potential Environmental Effects

The overburden should be spread out on site to enhance vegetation growth on site particularly over areas such as the ore stock piles, waste rock piles, ore processing facility area and the tailings management area. In section 2.3 it says it will naturally revegetate. These areas could have overburden applied and if necessary seeded with native grasses and trees.

Proposed Action

It is recommended that OHRG meet with MNDM to discuss all issues related to closure.

Reference to EIS

Conceptual Closure and Rehabilitation

Response

Based on the mining plan, the Overburden Stockpile will contain about 9.2 Mt (4.5 Mm^3) of overburden. Section 4.4 states that some of the overburden may be used for re-grading purposes throughout the Project Site. For reasons discussed in the attached alternatives memo included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan, it is not intended to place overburden on either the TMF or the Waste Rock Stockpile.

Overburden that remains in the Overburden Stockpile after use on the Project Site will be stabilized in place. The top surface of the material remaining in the stockpile will be graded and drainage measures will be put in place. The overburden is expected to support vegetation, so the surface will be directly revegetated, without the use of topsoil. Water in the four seepage collection points will continue to be monitored after closure. The seepage water will continue to be pumped to the open pits until such time as the water quality becomes acceptable for direct discharge to the environment. At that time, the ponds will be breached and the pumping systems will be removed. It is expected that stabilizing the remaining Overburden Pile in this manner will release less suspended solids to the environment than if the entire mass of overburden was used widely across the Project Site.

OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss closure of the Project site prior to the formal submission of the certified closure plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-45

Source: Ministry of Northern Development and Mines

Summary of Comment

Annual inspections of tailings dams and monthly inspections of spillway and drainage channels is proposed into perpetuity.

Potential Environmental Effects

Sites requiring perpetual care and maintenance continue to pose a long-term risk to the environment.

Proposed Action

Clarification needs to be provided regarding the required long term care and maintenance required for the TMF. i.e. will this be allowed to return to a forested landscape, or will trees have to be removed from the TMF in perpetuity? If dams are to remain inactive in perpetuity, is there a period after which they will have to be reconstructed? Efforts to improve the "walk-a-way" characteristics of this site on closure should be re-evaluated.

Reference to EIS

Conceptual Closure and Rehabilitation Section 5.1

Response

As described in the conceptual closure plan, the TMF will be re-vegetated to stabilize the exposed tailings surface against erosion by wind and water. It is not planned to place a layer of topsoil or overburden soil on top of the tailings; rather the tailings will be directly re-vegetated by placing organic mulch, fertilizer and seeding with a mixture of grasses. Erosion protected channels will be constructed to convey surface runoff where concentrated flows could occur. It is not intended to plant trees on the tailings surface; however trees will be allowed to invade naturally and will not be removed. Once the vegetation is established, there should be little or no requirement for ongoing maintenance on the tailings surface itself, and it will eventually return to a forested landscape.

The dams around the TMF will remain in perpetuity; however aside from a small residual pond in the former Reclaim Pond, the dams will not retain any water. As indicated in Table 5.1, the TMF dams will need to be inspected on an annual basis in perpetuity. A provision is also made for inspection of the spillway and drainage channels on a monthly basis during the ice-free season to prevent blockage by beavers or other debris. Trees will be periodically removed from the surfaces of the dams because trees can potentially damage dams in the long term.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-46

Source: Ministry of Northern Development and Mines

Summary of Comment

Information is not presented according to schedule 2 or Reg. 240. Some sections are missing.

Potential Environmental Effects

Information should be presented according to schedule 2 or Reg. 240 to improve clarity and inform the reader of all aspect considered in closure planning.

Proposed Action

It is recommended that OHRG meet with MNDM to discuss all issues related to closure.

Reference to EIS

Conceptual Closure and Rehabilitation General Comment

Response

The conceptual Closure Plan report was prepared as a Technical Supporting Document (TSD) for the EIA. It is relatively brief and conceptual in nature and it is not intended to be submitted to MNDM under O.Reg 240/00. In parallel, a formal closure plan has been prepared in draft form for eventual certification and submittal to MNDM. The formal closure plan is currently under internal review however and it has not yet been submitted to MNDM. According to the attached letter from MNDM dated November 9 2012, the certified Closure Plan will not be accepted as filed until the completion of the federal and provincial EA processes. The formal closure plan strictly follows the format which is dictated by Schedule 2 to O. Reg. 240/00 under the Mining Act.

OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss the closure plan prior to it being formally submitted.

Attachments

Letter from MNDM on November 9, 2012 entitled '*Notice of Project Status – Mine Production Osisko Hammond Reef Gold Project, 23 km northeast of the Town of Atikokan'*

Ministry of Northern Development and Mines

Mineral Development and Lands Branch

933 Ramsey Lake Road, B6
Sudbury ON P3E 6B5
Tel.: (705) 670-5784
Fax: (705) 670-5803
Toll Free: 1-888-415-9845, Ext 5784

Ministère du Développement du Nord et des Mines

Direction de l'exploitation des minéraux et de la gestion des terrains miniers

933, chemin du lac Ramsey, étage B6
Sudbury ON P3E 6B5
Tél.: (705) 670-5784
Téléc.: (705) 670-5803
Sans frais : 1-888-415-9845, poste 5784

Ontario

November 09, 2012

Sudbury File Number: O05
Thunder Bay File Number: HMR-02

Ms. Alexandra Drapack
Director, Sustainable Development
Osisko Hammond Reef Gold Ltd.
155 University Avenue, Suite 1440
Toronto ON M5H 3B7

Dear Ms. Drapack:

RE: **Notice of Project Status – Mine Production**
Osisko Hammond Reef Gold Project, 23 km northeast of the Town of Atikokan

Your Notice of Project Status for the Osisko Hammond Reef Gold Project, as required under Section 141.(1)(a) of the *Mining Act*, R.S.O.1990, Chapter M14 for Mine Production was received on October 30, 2012. Copies will be circulated to the ministries of the Environment, Labour, Transportation and Natural Resources, the Town of Atikokan, and the Canadian Environmental Assessment Agency. It will also be provided to Couchiching First Nation, Lac La Croix First Nation, Mitaanjigamiing First Nation, Naicatchewenin First Nation, Nigigoonsiminikaaning First Nation, Rainy River First Nation, Seine River First Nation, Lac des Mille Lacs First Nation, Wabigoon Lake Ojibway Nation and appropriate representatives of the Métis Nation of Ontario.

This Notice indicates that the Osisko Hammond Reef Gold Project will be changing status from undeveloped mining lands to mine production. A Closure Plan has not been filed for this site.

You are required to give public notice and file a certified Closure Plan prior to commencing Mine Production, pursuant to Section 141.(1)(b) and (c) of the *Mining Act*, R.S.O.1990; Chapter M14. Financial assurance must be submitted with the Closure Plan.

I am aware that Osisko Hammond Reef Gold Ltd. is currently conducting an environmental assessment (EA) for the project under the *Ontario Environmental Assessment Act* and the former *Canadian Environmental Assessment Act* (S.C.1992, c.37). The certified Closure Plan will not be accepted as filed until the completion of the federal and provincial EA processes. This will ensure that the Crown's Duty to Consult with Aboriginal communities is met and this is consistent with the intent of the *Canada-Ontario Agreement for Environmental Assessment Cooperation* and the *One-window Coordination Process for Mineral Development Projects in Ontario.*

.../2

For questions related to the financial assurance, please contact Ed Solonyka at 1-888-415-9845 ext. 5829. For any other questions regarding the Closure Plan, please contact Patrick Barnes, Mineral Exploration and Development Consultant at 807-475-1583.

Sincerely,

<Original signed by>

Robert Merwin.
A / Director of Mine Rehabilitation

INFORMATION REQUEST – MNDM 47

Source: Ministry of Northern Development and Mines

Summary of Comment

Kinetic testing indicates the potential to leach metals from the waste rock (Al, As, Cu, Se, Vd). The proposed action: "Where values are above guideline values, additional water quality evaluation within an overall site wide context is required."

Potential Environmental Effects

It is unclear what the proponent intends to do to mitigate metal leaching from the mine tailings.

Proposed Action

The proponent must provide a mitigation strategy for metal leaching from the mine tailings.

Reference to EIS

Geochemistry, Geology and Soil TSD 3.61

Response

Same response as provided for IR MNDM 14.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-48

Source: Ministry of Northern Development and Mines

Summary of Comment

It is not clear that the proponent has adequately assessed the influence geological structures could play on local groundwater migration, particularly after the pit lakes have filled up to an elevation above Marmion Reservoir.

Potential Environmental Effects

Impacted water from the pit lake could migrate through geological structures and impact Marmion Lake.

Proposed Action

Additional monitoring wells are required, particularly on N-S trending geological features

Reference to EIS

EIS Chapter 3, 3.2.5.3

Response

Current water quality predictions indicate that the water will meet site specific water quality objectives as developed for Marmion Basin within the pit at closure and post-closure therefore there is no risk to Marmion Basin due to seepage out of the open pit. Geochemistry test work shows the tailings, waste rock, and pit walls to be non-acid generating with excess neutralizing capacity, therefore it is expected that the water quality will not degrade over time at closure.

Monitoring will be conducted during operations as part of routine operation of a mine site (see Table 8-2 and 8-5 of the EIS/EA). As part of these and other operational activities, additional information will be available prior to closure and is expected to include:

- Mapping of pit fractures;
- Observations of significant inflows to the pit at discrete fractures, if any ;
- Water quality reporting to the pit;
- Water quality of tailings, waste rock and site facilities; and
- Recording of inflow and pumping data from various locations and sumps within the pit.

Given that the pit is not expected to overflow for 218 years following closure it is considered that there is ample time to modify or amend pit water quality prior to groundwater elevations reaching the point where overflow or seepage to Marmion basin would be required, however at this time predictions of water quality indicate that no mitigation measures are necessary.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNDM-49

Source: Ministry of Northern Development and Mines

Summary of Comment

Voluntary rehabilitation should refer to pre-existing hazards, all new mine features will be rehabilitated per certified Closure Plan.

Potential Environmental Effects

None

Proposed Action

Remove mention of MNDM policy on voluntary Rehab.

Reference to EIS

Section 1.10.7

Response

Voluntary rehabilitation removed from Section 1.10.7.

Ministry of Natural Resources

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-1

Source: Ministry of Natural Resources

Summary of Comment

It is felt that the conclusions of the predicted impacts in the ES and the EIS, are overly optimistic in their outcome and assumptions are not clearly justified. It is also felt that there may be difficulties in delivery and implementation of some of the mitigation measures identified.

Potential Environmental Effects

The 'Code of Practice' identifies that proponents should make every effort to avoid or minimize potential adverse environmental effects through the application of impact management measures; however, it may not be possible to manage all of them. There will be times when an undertaking will have social/economic benefits as a whole and all affects cannot be eliminated or restored completely.

Proposed Action

Mitigation measures are implemented to minimize the environmental impacts of the project (as described on ES-11). The proponent should revisit their approach to the presenting the ES, mitigation commitments and conclusions.

Reference to EIS

Executive Summary (ES) and EIS Report overall

Response

The EA has been conducted using reasonable exposure scenarios, conservative assumptions, and presents a realistic prediction of potential impacts. All assumptions have been explained, and calculation details have been provided. Appropriate mitigation measures have been included where there are potential impacts identified. Based on discussions with MNR we have, however, included a discussion in the ES and EIS related to permanent changes in the Mine Study Area which will result from the project, particularly those related to landforms.

We are confident in our conclusions. Based on the findings of the environmental assessment and planned mitigation measures, as documented in this EIS/EA Report, the Hammond Reef Gold Project can be developed such that there is no significant residual impact to the biophysical environment. Furthermore, it is considered that the Project provides substantial socio-economic benefits to Aboriginal people, the local community and the region and has garnered significant community support through ongoing partnerships and information sharing.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-2

Source: Ministry of Natural Resources

Summary of Comment

The ES is not presented in accordance with the Code.

Potential Environmental Effects

MOE's Code of Practice requires that the ES be consistent with how the EIS is organized. Section headings that appear in the main document should appear in the ES followed by a summary of that section and the conclusions reached.

Proposed Action

The ES should have section headings consistent with the EIS (i.e. Chapter 6).

Reference to EIS

ES

Response

The Executive Summary has been revised to include headings which follow the organization of the EIS/EA Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-3

Source: Ministry of Natural Resources

Summary of Comment

Prediction of Impacts social environment should include - quality of life for all communities.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Amend

Reference to EIS

EIS: ES-5

Response

The socio-economic VECs were selected to represent economic, social and land and resource use features that can be measured and are considered to be important in relation to Project effects and cumulative effects. Quality of life can be subjective and is not an easily measurable indicator; however the combination of socio-community VECs selected do represent a full picture of quality of life through measurement of such indicators as changes in dependency ratios, changes in median incomes, changes in access to health services.

INFORMATION REQUEST – MNR-4

Source: Ministry of Natural Resources

Summary of Comment

Water quality - it is better to identify that water quality standards will meet or exceed regulated requirements, rather than make a direct statement that there will be no effects at all.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

This needs to be openly identified and considered during the environmental assessment planning process. For example, it might be questioned that if there is such certainty to the quality of the water, why the water intake for the camp 2km away.

Reference to EIS

EIS: ES-7

Response

There are instances where baseline water quality in the regional and local study areas is above regulated values, such as CCME, or PWQO, therefore it is considered more appropriate to ensure the project has no adverse impacts as defined in the EIS/EA document. The ability of the Project to meet WQ standards is however provided in Chapter 6 of the EIS/EA Report and in the Water Quality TSD.

INFORMATION REQUEST – MNR-5

Source: Ministry of Natural Resources

Summary of Comment

The importance of the fishery for tourism is undervalued.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

There needs to be a better description of the fishery (i.e. as it is in section 3.3.7.4 of the EIS and 6.6 of Closure and Rehab report) and the value/importance to the socio economics as well as recreation needs to be identified.

Reference to EIS

EIS: ES-9

Response

Fishing is assessed using three indicators: recreational fishing participation; fishing areas, licence sales and harvest volumes; and baitfish areas and harvest volumes. Assessment of direct effects is focused on the alteration of fishing areas in the LSA important to recreational and commercial fishing. The Project will not result in the removal of any commonly-used fishing areas. Further the Project will not restrict access to any of these areas. Direct negotiation with commercial baitfish harvest license holders may be required where the value of the license is reduced due to access to baitfish habitat being restricted by construction/mining activities or, where waterbodies containing bait fish are permanently altered by the placement of site infrastructure.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-6

Source: Ministry of Natural Resources

Summary of Comment

Cumulative effects - the report should identify if there is potential to the Seine River watershed.

Potential Environmental Effects

Impact of the mine to Crown land and resource use is not limited to the project footprint. There is potential to impact downstream values such as recreational fisheries, recreational opportunities, and impacts to other stakeholders.

Proposed Action

Not provided

Reference to EIS

EIS: ES-11

Response

The impact assessment section has noted that there is no predicted impact to the Seine River downstream of the Raft Lake Dam for hydrological or water quality impacts. As a result, there would also be no impact to aquatic life. This has been assessed directly in the impact assessment, since it represents a direct effect rather than a cumulative impact.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-7

Source: Ministry of Natural Resources

Summary of Comment

Environmental and Social Management - there are indications that this part of the planning is still under construction and details are not defined. A complete environmental effects monitoring plan needs to be identified in the EIS.

Potential Environmental Effects

There needs to be a monitoring plan in place, vs. a commitment to prepare one with agencies. Need to identify at what stage the local monitoring committee will be in place. More detail on the Resource sharing Committee is needed.

Proposed Action

Provide a complete monitoring plan with details in the EIS.

Reference to EIS

EIS: ES-12

Response

Yes, the environmental and social management planning is still underway for the Project. Osisko's approach is to include the community members directly in our detailed planning, through three distinct committees: First Nations, Métis and Public. The final EIS/EA Report provides the structure of these committees, proposed timelines and frequency of committee meetings.

The final EIS/EA Report has also been revised and additional details have been included to ensure that Section 8.3 of the Terms of Reference is clearly met. This section of the Terms of Reference states that the following specific points must be included in the Monitoring Plan:

1. A description of the potential negative environmental effect for each criterion.
2. Mitigation and protection measures planned for each criterion and performance measures.
3. How the Project will be monitored to ensure that mitigation strategies are meeting performance objectives.
4. A contingency plan to be implemented should monitoring reveal that mitigation measures have failed.
5. A description of frequency and duration of monitoring for each negative impact, for each phase of the project.
6. A non-compliance strategy that will identify a plan of action for out of compliance situations.

All of these aspects are addressed within Chapter 8 of the final EIS/EA Report.

INFORMATION REQUEST – MNR-8

Source: Ministry of Natural Resources

Summary of Comment

The statement that there are no predicted residual impacts from the project is unrealistic.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

The proponent should revisit their approach to how they will present the ES, mitigation commitments and conclusions.

Reference to EIS

EIS: ES-13

Response

We are confident in our conclusions. Based on the findings of the environmental assessment and planned mitigation measures, as documented in this EIS/EA Report, the Hammond Reef Gold Project can be developed such that there is no significant residual impact to the biophysical environment. Furthermore, it is considered that the Project provides substantial socio-economic benefits to Aboriginal people, the local community and the region and has garnered significant community support through ongoing partnerships and information sharing.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-9

Source: Ministry of Natural Resources

Summary of Comment

Glossary is inadequate. Definitions need to be consistent with what is defined under the applicable legislation. Also incomplete, needs to include more terms that are used frequently: Biophysical, Geochemical, Geochemistry, Propane farm, Waste rock, Low grade ore etc. Also, terms need to be consistent with the technical reports, i.e. CP/Rehab has different definition for overburden.

Potential Environmental Effects

A common understanding of the terminology and references is essential in the delivery of an EA. It is important to accurately represent permitting and approvals as they are related to the project, this includes the definitions.

Proposed Action

Definitions under LRIA/ESA/ARA not as per the US Dept. of the Interior.

Reference to EIS

EIS: xxx-xxxvi

Response

The definitions provided in the glossary are considered to be appropriate for use in the EIS/EA Report. The glossary has been expanded to include the additional terms identified.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-10

Source: Ministry of Natural Resources

Summary of Comment

Study Area should include wider area around components. i.e. the road from the TMF to the Mine has a buffer, but the primary road and the power supply corridor do not. If this is the study area map that is the general reference map for the project footprint, it needs to be expanded. The legend is also not clear, what do the blue circles represent? What is shown as the water management system?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Figure 1-3 needs to be revised to show the expected footprint of the road, as well as any buffers and the legend needs to be amended.

Reference to EIS

EIS Fig 1-3 and Fig 2-1

Response

Both the mine site road and the site access road include buffer zones. The mine site road may appear to have a larger buffer area because the route has not yet been sited to the same level of precision as the access road has been sited - since the access road already exists. The Linear Infrastructure Study Area (LISA) encompasses the footprints of the access road. The width of the LISA depends on the environmental component that is being described. For example, the aquatic component considers a 1 km buffer zone and the hydrology component considers a 30 m buffer. Yes, the blue circles represent the water management system as indicated in the legend but for clarity, they have been removed from the figures. Revised figures 1-3 and 2-1 are attached to the response to MNR-195.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-11

Source: Ministry of Natural Resources

Summary of Comment

There is no figure showing the auxiliary power line, the fibre optic line or the water supply pipeline. Or communications towers.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment. This requires a map that shows the project in its entirety.

Proposed Action

The EIS requires one map that shows of all the project components together. The map needs to be on a scale that clearly shows the components, and likely will require a larger sheet of paper than the Figures presented.

Reference to EIS

EIS Figures general

Response

A number of figures have been provided in Chapter 5 that show details of project infrastructure as well as an overview of the entire project area. The attached figure shows the auxiliary power line and the fibre optic line; this detail has also been added to Figure 5-1 of the EA. The locations of the water supply pipeline and the communications tower will be determined during final engineering design.

Attachments

Figure MNR-11

600000 610000 620000

5430000 5420000 5410000

N

Cornell Lake
Sawbill Bay
Mitta Lake
Lynxhead Bay
Marmion Reservoir
Hawk Bay
Highway 622

LEGEND

- Trail
- Road
- Provincial Highway
- Existing Transmission Line
- River/Stream
- Lake
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Fibre Optic Line and Auxiliary Power Line
- Mine Facilities
- Linear Infrastructure Study Area (60m Corridor)
- Mine Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2 0 2 4
KILOMETERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
PROPOSED ALIGNMENT FOR FIBRE OPTIC AND AUXILIARY POWER LINE

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 1
DESIGN	CGE	14 Nov. 2008	MNR-11	
GIS	JO	02 Aug. 2013		
CHECK	SP	02 Aug. 2013		
REVIEW	SP	02 Aug. 2013		

G:\Projects\2013\13-1118-0010_Osisko_Hammond_ReefGIS\MXDs\Reporting\InformationRequests\MNR11\ProposedAlignment_Fibre_Optic_Aux_PowerSupply.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-12

Source: Ministry of Natural Resources

Summary of Comment

The report is incorrect in addressing aggregates. The reference should be in accordance with the ARA. Borrow pits do not exist under the act and the permitting process can be involved and lengthy. The ToR identified in the ToR, Table 4 under Land and Resource Use - it is important aggregates are included in the EA and sources and indicators are identified.

Potential Environmental Effects

It is important to accurately represent permitting and approval requirements as they relate to the project. It is a requirement of the environmental assessment to identify aggregate sites which are potential or known sites to be developed or where aggregate can be purchased.

Proposed Action

In order to extract aggregate from Crown land authorization under the ARA is required. This would be under the authority of a permit. For example: Category 9 (which is restricted to extracting sand and gravel no closer than 1.5 m above the established groundwater table), Category 11 (authority to quarry aggregate material no closer than 1.5 m above the established water table) etc. These permits require a site plan, site plan notes and summary statement prepared by a geoscientist or professional engineer, natural environment report, cultural heritage report prepared by an archaeologists, and public consultation. The EA also needs to report on aggregates as an extractive resources as identified in Table 4 in the ToR

Reference to EIS

EIS: Pages 1-13, 1-16, 1-9, 5-41-2-2, 1-13, 5-7, Table 5-1, section 5 and throughout the EIS and Closure/Rehab tech report: pages 1 and 6 as well as Socio-Economic Environment section 1.7.2.3

Response

It is acknowledged that the term ‘aggregate pit’ should be used in place of ‘borrow pit’.

The attached table provides a preliminary estimate of the aggregate quantities required for the Hammond Reef Gold Project. OHRG currently holds three Category 9 permits in the vicinity of the Project (Permit IDs 20320, 608022 and 609661) and these aggregate pits would remain in use. OHRG has also identified other prospective sources to address some of these requirements. In due course, they will apply for additional Category 9 permits. Such applications will fully comply with the requirements of the Aggregate Resources Act. Depending on commercial considerations, (i.e. haul distance, purchase costs, royalties, etc.), OHRG may address additional requirements by either purchasing aggregate from commercial sources or by crushing waste rock (providing testing indicates that it is acceptable from a geochemical standpoint).

Attachments

Table 1: Granular Aggregate Requirements.

Table 1 – Granular Aggregate Requirements

Use	Material Type	Description	Volume (m^3)
Road Aggregate	Granular B Type I	Sand and Gravel	135,200
	Granular B Type II	Sand and Gravel	7,700
	MG-112-Granular Material	Sand	150,000
	Granular A	Sand and Gravel	90,700
Concrete Aggregate	Concrete Coarse Aggregate	Gravel	75,000
	Concrete Fine Aggregate	Sand	37,500
Tailings Dam Construction Material	TMF Dam Zone 3 Bedding	Sand	58,300
	Total Granular Requirements		**554,700**

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-13

Source: Ministry of Natural Resources

Summary of Comment

Tailings disposal pipeline - there needs to be a section in the ER that identifies the alternatives, identify what alignments are preferred and provide drawings.

Potential Environmental Effects

The ToR made a commitment this would be done.

Proposed Action

It is expected that the CPRR would include alternatives for such things as treatment options identified on pg 5-13, and closure layouts.

Reference to EIS

EIS: 1-13

Response

It is neither practicable nor necessary to evaluate alternative means for every aspect of the Project. Accordingly, the identification, assessment and selection of alternative means focused on alternative means for those aspects of the Project that have the greatest potential for adverse environmental effects. The alternative for the tailings pipeline is directly linked to the selected alternative for the TMF. The alignment was selected to follow the existing roadway and avoid fish habitat to the extent possible. No further evaluation is required.

INFORMATION REQUEST – MNR-14

Source: Ministry of Natural Resources

Summary of Comment

Tailings dams to be designed in accordance with Ontario Dam safety Guide (?) and in accordance with the LRIA. The design was completed by Golder, but is not included in the EIS. And will be peer reviewed by an independent expert, but not MNR.

Potential Environmental Effects

It is important to accurately represent permitting and approval requirements as they relate to the project.

Proposed Action

More detail around the approval of tailings dams is required.

Reference to EIS

EIS 1-13

Response

Section 1.6.1: The tailings dams will be designed according to Canadian Dam Association (CDA) Guidelines and Ontario MNR Guidelines. The Lakes and Rivers Improvement Act (LRIA) provides the Minister of Natural Resources with the legislative authority to govern the design, construction, operation, maintenance and safety of dams in Ontario. The MNR has authority to approve dams in Ontario and CDA guidelines are referenced in the Ontario Mine Closure regulations. The design of the tailings dams was completed by Golder Associates Ltd. (Golder) and will be peer reviewed by an independent expert in tailings dam construction and operation before being submitted for approval by the MNR.

INFORMATION REQUEST – MNR-15

Source: Ministry of Natural Resources

Summary of Comment

Tailings dams will remain in place as permanent impoundments, no active re-vegetation is likely required for stability of the waste rock stockpile. See comments on CP/Rehab report.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Re-vegetation is a requirement for more than stability. If the site is to be restored.

Reference to EIS

EIS 1-15

Response

Yes, the tailings dams will be permanent structures. The surface of the tailings will be directly re-vegetated to ensure physical stability, prevent dust generation, and improve aesthetics.

The Waste Rock Management Facility (WRMF) is not expected to generate acidic runoff and is expected to be physically stable without vegetation. Therefore, active re-vegetation of the WRMF is not proposed.

INFORMATION REQUEST – MNR-16

Source: Ministry of Natural Resources

Summary of Comment

Forestry - reference to current companies needs to be updated.

Potential Environmental Effects

Crossroute Forest is now under Resolute Forest Products and Sapawe Forest is now under Rainy Lake Tribunal Resource Management Inc.

Proposed Action

Replace proper names throughout the document.

Reference to EIS

EIS 1-16

Response

The proper names have been replaced throughout the EIS/EA Report. This information has been clarified in the Part A of the Version 2 Terrestrial Ecology TSD

INFORMATION REQUEST – MNR-17

Source: Ministry of Natural Resources

Summary of Comment

Outdoor Tourism - there is little mention of the recreational fishery and tourism values. Commercial bait harvesting should be included under socio/economic.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Need to identify the sport fishery as a tourism and recreational value. And events such as the Atikokan Classic will be impacted.

Reference to EIS

EIS 1-16

Response

Section 1.7 is a brief overview of land use, which is intended to give an overview of the area and provide context for the reader. Section 1.7.5 does include a brief discussion of the recreational fishery. Fishing is also discussed in Chapter 3, Section 3.3.3.12.4 and an assessment of potential effects to the recreational fishery is discussed in Chapter 6, Section 6.3.1.

INFORMATION REQUEST – MNR-18

Source: Ministry of Natural Resources

Summary of Comment

Traditional Use - it is recognised that details of the traditional use study would not be public, but a list of traditional uses that were considered should be provided (such as the wild rice that was mentioned).

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Provide a list of the types of traditional uses that were considered.

Reference to EIS

EIS 1-17

Response

Section 1.7 is a brief overview of land use, which is intended to give an overview of the area and provide context for the reader. Section 1.7.7 states that traditional use takes places in the area. Traditional use is further discussed in Chapter 3, Section 3.3.12 and an assessment of potential effects to traditional use is discussed in Chapter 6, Section 6.3.2.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-19

Source: Ministry of Natural Resources

Summary of Comment

Land Tenure - would be better described as Land Ownership.

Potential Environmental Effects

None

Proposed Action

Amend terminology

Reference to EIS

EIS 1-18

Response

The term Land Tenure is explained and is consistent with the requirements of the EIS Guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-20

Source: Ministry of Natural Resources

Summary of Comment

Designated Environmental or Cultural Sites is considered significant features, but not land tenure.

Potential Environmental Effects

This is in the wrong section.

Proposed Action

Amend section.

Reference to EIS

EIS 1-18

Response

Section 1.8.3 Designated Environmental or Cultural Sites has been moved to Section 1.7.7, under Land Use.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-21

Source: Ministry of Natural Resources

Summary of Comment

H20 Power is not formerly Abitibi Bowater; they are a completely separate company.

Potential Environmental Effects

None

Proposed Action

Amend.

Reference to EIS

EIS 1-21

Response

Removed reference to Abitibi Bowater.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-22

Source: Ministry of Natural Resources

Summary of Comment

The accommodation camp was not the only substantive change to the project; the fibre optic line was also excluded initially.

Potential Environmental Effects

Clear presentation of the project alternatives is a fundamental and important part of the environmental assessment.

Proposed Action

The ER needs to elaborate on these two added components (as per comments throughout).

Reference to EIS

EIS 1-25

Response

Section 1.10.1.2: A fibre optic line and auxiliary power line were added at the advanced planning stage. As discussed in Section 3.8.2 of the Alternatives Assessment report, the selected alignment for the fibre optic communication line follows the auxiliary transmission line along Highway 622 and then uses the same corridor and support structures as the selected project transmission line. This alignment does not result in additional biophysical or socio-economic impact and material and installation costs are minimized. Therefore, other alternatives were not considered and the addition of the fibre optic line is not considered substantive change.

The on-site worker accommodation camp was also added during the advanced planning stage and the assessment of accommodation alternatives is discussed in Section 3.8 of the Alternatives Assessment report. The location of the on-site camp was selected because the existing camp was sited there. The location is only feasible and logical due to the proximity to the road and the fact that an area is already cleared. The combination of on-site and off-site accommodation was selected as a means of compromise and willingness to cooperate with the Town. The Town of Atikokan prefers that workers are housed in Town, and Osisko has committed to providing logistical means and incentives for workers to do so.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-23

Source: Ministry of Natural Resources

Summary of Comment

There is no table in the EIS that shows what was required in the Approved Terms of Reference.

Potential Environmental Effects

Clear presentation of the project alternatives is a fundamental and important part of the environmental assessment.

Proposed Action

The EIS does not have a table that clearly summarizes the requirements of the Terms of Reference and a corresponding section in the EIS of where it is addressed.

Reference to EIS

EIS - absent

Response

Appendix 1.III Concordance Tables provides a detailed table with EIS Guideline and Terms of Reference requirements and the location these requirements can be found in the report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-24

Source: Ministry of Natural Resources

Summary of Comment

There was no alternative assessment workshop on November 11.

Potential Environmental Effects

None

Proposed Action

Clarify the workshop, the date and who attended.

Reference to EIS

EIS 1-26

Response

The date of the workshop was November 20, 2012.

Attendees in Person:

Osisko: Alix Drapack

Golder: Craig Hebert, Brian Hindley, Erin Thomas, Michelle Bingley

GRT: Amiel Blajchman (CEAA), Sheelagh Hysenaj (EC)

Attendees via Teleconference:

Steve Parker (Golder), David Laverdiere (EC), Charles Dumaresq (EC), France Beaudet (EC), Pascal Billau (EC), Rob Dobos (EC), Neville Ward (DFO), Lisa Fowler (DFO), Angelique Magee (NRCan), Patrick Barnes (MNDM)

INFORMATION REQUEST – MNR-25

Source: Ministry of Natural Resources

Summary of Comment

There is incorrect reference to MNRCrown Land Use Policies. Ontario's Crown Land Use Policy Atlas provides area specific Crown land use policy direction for the site. The proposed mine falls within the Finlayson, Marmion, and Greytrout General Land Use Areas. A brief description should be provided for each one, specifically the land use intent. Reference to Atikokan District Land Use Guidelines is incorrect.

Potential Environmental Effects

The direction in the land use policies needs to be identified (in this section) and addressed in the ER. It is currently not.

Proposed Action

Finlayson - land use intent: resource extraction, recreational and tourism use, AoC applied to specific lakes. Greytrout: land use intent: forestry, tourism, recreation, AOC of 120m of specific lakes. Marmion - tourism and recreation from quality fishery, resource extraction if compatible. AOC of 120m.

Reference to EIS

EIS 1-33

Response

Section 1.10.10: The Project Site is located in, or in close proximity to, three General Resource Areas: Finlayson, Marmion and Greytrout, as identified by the MNR (2006). Exploration and extraction activities are allowed in these areas. The Mine Study Area is located within the Finlayson and Marmion General Resource Areas. The Linear Infrastructure Study Area is located within the Finlayson and Greytrout Areas.

Existing land uses within the Finlayson and Greytrout Areas include tourism, recreation, trapping, commercial bait fishing, mineral exploration, aggregate extraction and logging. Recreational use by both residents and visitors for angling and hunting is intensive. Future commercial outpost camps are proposed for Finlayson and Lizard Lake (MNR 2006). The Marmion General Resource Area consists of Marmion Reservoir, which has a 120 m modified management area around it. Angling, boating, canoeing and camping by residents and visitors occur throughout the open water season. Other activities include trapping, commercial bait fishing, mineral exploration and logging (MNR 2006).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-26

Source: Ministry of Natural Resources

Summary of Comment

Aggregate sites need to be shown in the EA. Potential and known sources need to be shown, there needs to be a description that includes what the plans are: aggregate extraction vs. quarry vs. concrete plant.

Potential Environmental Effects

It is important to accurately represent permitting and approval requirements as they relate to the project.

Proposed Action

It is a requirement of the environmental assessment to identify aggregate sites which are potential or known sites to be developed or where aggregate can be purchased in the EIS.

Reference to EIS

EIS 2-2

Response

The attached table provides a preliminary estimate of the aggregate quantities required for the Hammond Reef Gold Project. OHRG currently holds three Category 9 permits in the vicinity of the Project (Permit IDs 20320, 608022 and 609661) and these aggregate pits would remain in use. OHRG has also identified other prospective sources to address some of these requirements. In due course, they will apply for additional Category 9 permits. Such applications will fully comply with the requirements of the Aggregate Resources Act. Depending on commercial considerations, (i.e. haul distance, purchase costs, royalties, etc.), OHRG may address additional requirements by either purchasing aggregate from commercial sources or by crushing waste rock (providing testing indicates that it is acceptable from a geochemical standpoint).

Attachments

Table 1: Granular Aggregate Requirements

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Use	Material Type	Description	Volume (m^3)
Road Aggregate	Granular B Type I	Sand and Gravel	135,200
	Granular B Type II	Sand and Gravel	7,700
	MG-112-Granular Material	Sand	150,000
	Granular A	Sand and Gravel	90,700
Concrete Aggregate	Concrete Coarse Aggregate	Gravel	75,000
	Concrete Fine Aggregate	Sand	37,500
Tailings Dam Construction Material	TMF Dam Zone 3 Bedding	Sand	58,300
	Total Granular Requirements		**554,700**

INFORMATION REQUEST – MNR-27

Source: Ministry of Natural Resources

Summary of Comment

The attempt to identify a corresponding study area with each VEC is understandable, however the MSA (Fig 1-3 and 2-1) limit the project components that have not been identified as VECs.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Figure 1-3 needs to be revised to show the expected footprint of the road, as well as any buffers and the legend needs to be amended.

Reference to EIS

EIS 2-3

Response

Figure 1-3 provides the expected footprint of the access road, including a 30 metre buffer. The pipeline study area appears larger because unlike the access road, the exact alignment for the pipeline has not yet been selected.

INFORMATION REQUEST – MNR-28

Source: Ministry of Natural Resources

Summary of Comment

No mention of the existing Communication Tower and Weather Station within the project boundaries. Are they to be considered in Support and Ancillary Infrastructure?

Potential Environmental Effects

The existing Communication Tower and Weather Station are currently authorized on the landscape under the tenure of a Land Use Permit. Will these two sites be rolled into the project and authorized by the tenure under the Mining Act or will they be excluded.

Proposed Action

Confirm the two sites are part of the project, and the current land use authority will no longer be required once the Mining Act land use authority is applicable.

Reference to EIS

EIS Chapter 1, Page 1-8, Item 1.4 Project Overview

Response

Updated Section 1.4: Support and Ancillary Infrastructure, such as communications tower, weather station, on-site roads, warehouses, truck shop, administration offices, and other support facilities.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-29

Source: Ministry of Natural Resources

Summary of Comment

No mention of the Accommodation Camp in this section.

Potential Environmental Effects

Osisko has indicated that the inclusion of the Accommodation Camp in this project is essential to being able to provide the work force for it; the Accommodation Camp should be recorded within the document infrastructure.

Proposed Action

Add the Accommodation Camp to appropriate locations within the EIS/EA document.

Reference to EIS

EIS Chapter 1, Page 1-13, Item 1.6.1 Project Overview

Response

The Accommodations Camp was listed on pages 1-9 (Section 1.4) and 1-14 (Section 1.6.2), and was described in detail on pages 1-25 to 1-26. The Accommodations Camp will be listed in Section 1.6.1 of the revised EIS/EA report.

INFORMATION REQUEST – MNR-30

Source: Ministry of Natural Resources

Summary of Comment

To MNR knowledge Wild Rice is not harvested within the Project Site as mentioned in this section.

Potential Environmental Effects

Provides inaccurate information on current land use.

Proposed Action

Remove from this section unless OSISKO has supporting information.

Reference to EIS

EIS Chapter 1, Page 1-15, Item 1.7.1 Project Overview

Response

Updated Section 1.7: Existing land uses in the area surrounding the Project Site are mineral exploration, forestry, aggregate extraction, trapping, commercial bait fishing, angling, boating, canoeing, hunting and tourism.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-31

Source: Ministry of Natural Resources

Summary of Comment

3rd Paragraph indicates the project site is located entirely on Crown Land. Although a major portion of the project area is Crown land the Pits, Processing Area, Low Grade Ore Stockpile, Parking Lot and Security Station, and portions of the Waste Rock Pile are located on Lands held by OSISKO under Mining Leases or on Patent Lands.

Potential Environmental Effects

Provides inaccurate information on Regulatory Framework and Role of Government.

Proposed Action

Correct this statement to appropriately reflect that the project is not located entirely on Crown land.

Reference to EIS

EIS Chapter 1, Page 1-33, Item 1.10.10 Project Overview

Response

The statement has been edited to reflect that the majority of the Project Site is located on Crown Land with portions been held by Osisko under Mining Leases or on Patent Lands.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-32

Source: Ministry of Natural Resources

Summary of Comment

Labelling on map - Atikokan and Area Metis is not interim

Potential Environmental Effects

Not provided in comment

Proposed Action

Correct on the figure

Reference to EIS

Chapter 2, Figure 2-3A

Response

Figure has been revised to address the comment

Attachments

Revised EIS Figure 2-3A

400000 500000 600000 700000 800000

5600000 5500000 5400000 5300000

N

ONTARIO

LAKE NIPIGON

LAKE SUPERIOR

U. S. A.

Kenora
Dryden
Eagle Lake
Lac Seul
Ojibway Nation of Saugeen (Savant Lake)
Northwest Métis Nation of Ontario Council
Wabigoon Lake Ojibway Nation
Northwest Angle No.37
Naotkamegwanning
Ojibways of Onigaming
PROJECT LOCATION
Naicatchewenin
Nigigoonsiminikaaning
Mitaanijigaming
Seine River
Rainy River
Couchiching
Fort Frances
Sunset Country Métis Council
Atikokan
Atikokan Métis Council
Lac Des Mille Lacs
Lac La Croix
Thunder Bay
Thunder Bay Métis Council

LEGEND

- City/Town
- Road
- Existing Railway
- River
- Waterbody
- First Nation Community
- First Nation Community within the Regional Study Area
- Métis Community Council
- Métis Community Council within the Regional Study Area
- First Nation Reserve
- First Nation Reserve within the Regional Study Area
- Regional Study Area



REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Historical Indian Treaties obtained from Natural Resources Canada,
The Atlas of Canada (2010).
First Nations Communities from Indian and Northern Affairs Canada.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

30 15 0 30 60
SCALE 1:1,750,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
ABORIGINAL INTERESTS REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	11 Nov. 2010		
GIS	JO	30 May. 2013		
CHECK	SP	30 May. 2013		
REVIEW	SP	30 May. 2013		

FIGURE: 2-3A

G:\Projects\2013\13-1118-0010_Osisko_Hammond_ReefGIS\MXDs\Reporting\InformationRequests\MNR32\Aboriginal_Interests_RSA.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-33

Source: Ministry of Natural Resources

Summary of Comment

Mine Study Area - does not include reference to the Accommodation Camp, the Communications Tower, and the Weather Station. Are they to be included in this?

Potential Environmental Effects

Provides inaccurate information regarding the physical works included in this area.

Proposed Action

Include these works within the appropriate study area.

Reference to EIS

EIS Chapter 2, Page 2-3, Item 2.2.2.2 Definition of Project

Response

The accommodation camp, communications tower, and weather station are included in the MSA and are considered "Support and Ancillary Infrastructure."

INFORMATION REQUEST – MNR-34

Source: Ministry of Natural Resources

Summary of Comment

The RSA for the Aboriginal Interests should include the Kenora Metis in Kenora and the Northwest Metis in Dryden in it. These community councils are identified in the Aboriginal Communities having an interest in the Project in EIS Chapter 1 Page 1-19.

Potential Environmental Effects

The Aboriginal Interests TSD indicates that this RSA was chosen because it is governed by the regional First Nations government body, the Fort Frances Chief Secretariat (FFCS). Why would you exclude the MNO Community Councils that are identified as having an interest in the Project?

Proposed Action

Explain the exclusion of the Kenora Metis Community Council and the Northwest Metis Nation of Ontario Council (in Dryden) from inclusion in the Aboriginal Interests Regional Study Area.

Reference to EIS

EIS Chapter 2, Figure 2-3A Definition of Project

Response

The Regional Context for Aboriginal Interests, Figure 4-1 in the Aboriginal Interests TSD includes a larger area that encompasses all communities with an interest in the Project. The RSA was chosen because it is the area governed by the regional First Nations government body, the Fort Frances Chiefs Secretariat (FFCS). In December 2010, OHRG signed a Resource Sharing Agreement with the member nations of the FFCS and the Lac de Mille Lacs First Nation. As part of OHRG's commitment to honour this agreement, an encompassing approach has been taken to consultation activities throughout the Project planning process and potential effects to all signatory communities have been considered. The economic effects on Aboriginal communities from the Project identified and assessed in this TSD are assumed to occur primarily within the RSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-35

Source: Ministry of Natural Resources

Summary of Comment

Upper Marmion managed for flood control.

Potential Environmental Effects

Provides incorrect information regarding the current water management plan for this location. The Seine River Water Management Plan does not provide management for floods. Once a flood situation exists the Dam operators and the MNR cooperatively manage the operational dams in order to minimize the effect of the flood.

Proposed Action

Correct this information regarding Upper Marmion Lake.

Reference to EIS

EIS/EA Report, Executive Summary, Existing Conditions, page ES-4, 4th and 5th paragraphs

Response

The Executive Summary will be amended to read:

The Upper Marmion Reservoir is currently managed for flood control and hydro-electric power generation. As part of broad changes to the river systems in the area that began in the 1920's, the Upper Marmion Reservoir was created by damming and flooding the existing Seine River. The original flow of the river was altered such that the system currently drains through a constructed cut (Raft Lake Cut) at the western end of the Reservoir. The water level in Upper Marmion Reservoir is maintained by a dam, the Raft Lake Dam, at the western end of the Raft Lake Cut. From the Raft Lake Dam, the system drains west into Finlayson Lake, where water then flows south through a constructed channel to the Valerie Falls Generating Station.

As a result of both flood control and hydro-electric power generation requirements, the water level in Upper Marmion Reservoir fluctuates up to 2.5 - 3 m annually as water is drawn down in the spring to provide flood control capacity.

Any other references to the management of Upper Marmion Reservoir for flood control in the EIS/EA report will be appropriately amended.

INFORMATION REQUEST – MNR-37

Source: Ministry of Natural Resources

Summary of Comment

In 3.3.4.1.1 Northwest Catholic District School Board provides Primary/Junior education program at St. Patrick's School (primary/junior school) in Atikokan, there is no mention of this here as well it is missing from the Figure 3-48

Potential Environmental Effects

Provides inaccurate information.

Proposed Action

Correct the information to reflect this additional school.

Reference to EIS

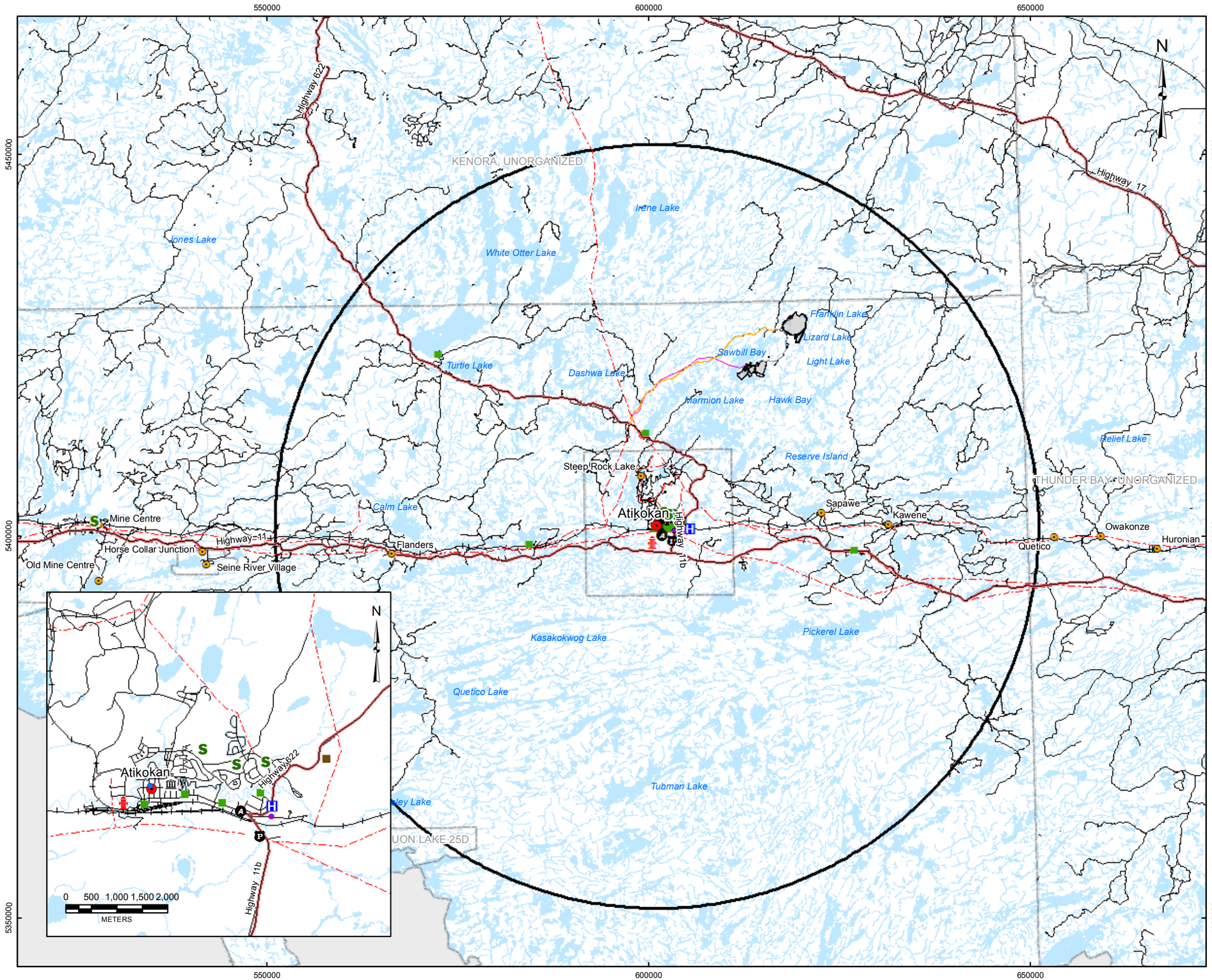
EIS, Chapter 3, Page 3-150, Section 3.3.4.1 Services and Infrastructure and Figure 3-48 Services and Infrastructure in LSA

Response

Figure 3-48 and Section 3.3.4.1 (now Section 3.3.3.9 in Revised EIS/EA report) have been revised to include St. Patrick's School.

Attachments

Revised Figure 3-48 (EIS)



LEGEND

- Local Study Area City/Town
- Small Community
- Provincial Highway
- Existing Railway
- Power Transmission Line
- River/Stream
- Lake
- Daycare/Pre-School
- Library
- Recreation Facility
- Public Swimming Pool
- Hotel/Lodge
- Waste Disposal Site
- Ambulance
- Fire Station
- Hospital
- Police
- School
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities
- Local Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Waste Disposal Site - Town of Atikokan Official Plan Review Appendix 7.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

5 2.5 0 5 10 15 20 25 30
SCALE 1:500,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
SERVICES AND INFRASTRUCTURE IN THE LOCAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

FIGURE: 3-48

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\EIS\Chapter 3\Services_Infrastructure_LSA.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-38

Source: Ministry of Natural Resources

Summary of Comment

Two waste disposal sites show up on this figure that are not operational sites. These two Crown waste sites must be removed from this figure and the Municipal Waste site discussed in section 3.3.4.7 should be shown on this figure.

Potential Environmental Effects

Provides inaccurate information

Proposed Action

Correct the information

Reference to EIS

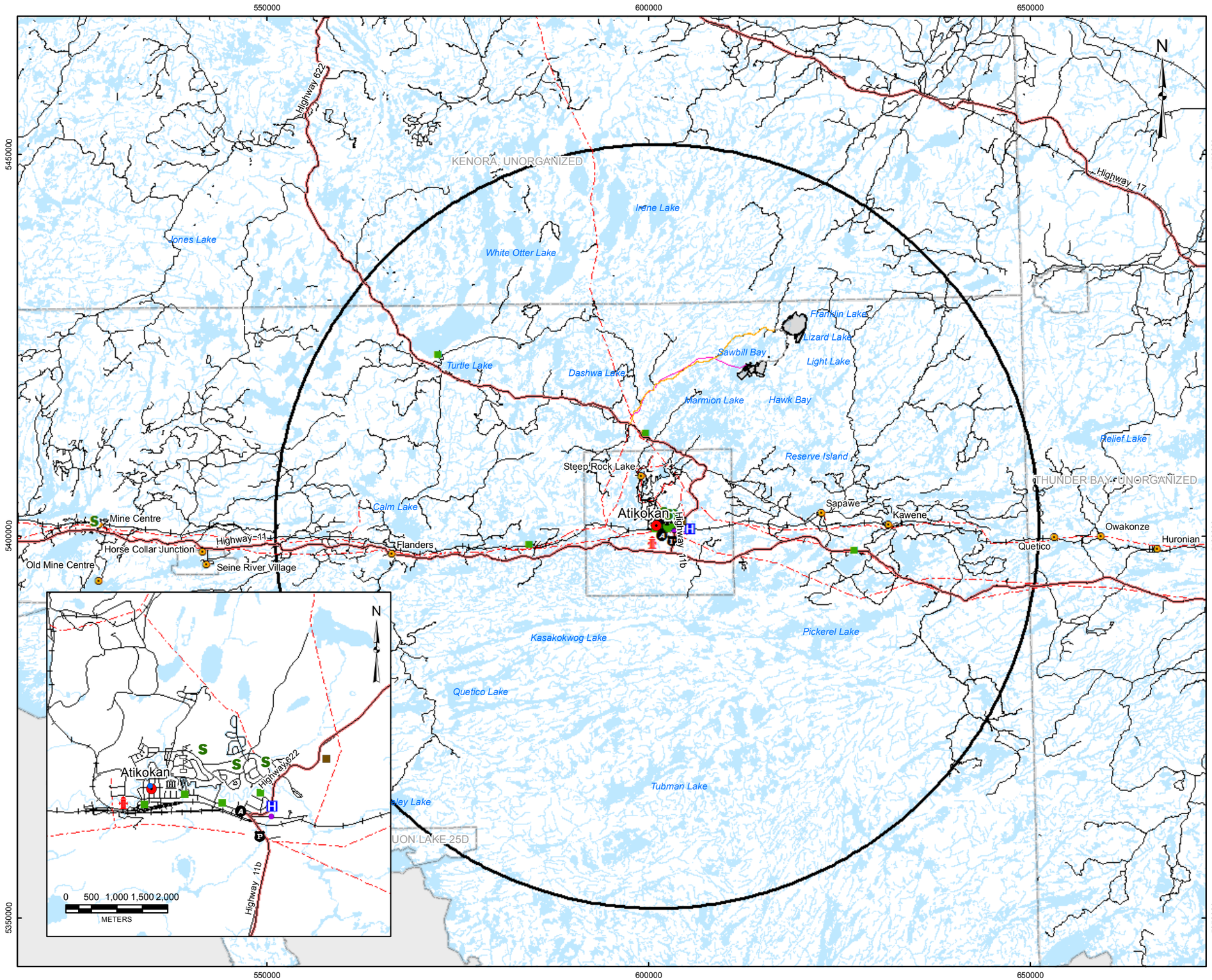
EIS, Chapter 3, Figure 3-48 and section 3.3.4.7 Page 3-155

Response

Figure has been revised to address the comment.

Attachments

Revised EIS Figure 3-48



LEGEND

- Local Study Area City/Town
- Small Community
- Provincial Highway
- Existing Railway
- Power Transmission Line
- River/Stream
- Lake
- Daycare/Pre-School
- Library
- Recreation Facility
- Public Swimming Pool
- Hotel/Lodge
- Waste Disposal Site
- Ambulance
- Fire Station
- Hospital
- Police
- School
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities
- Local Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Waste Disposal Site - Town of Atikokan Official Plan Review Appendix 7.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

5 2.5 0 5 10 15 20 25 30
SCALE 1:500,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
SERVICES AND INFRASTRUCTURE IN THE LOCAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

FIGURE: 3-48

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\EIS\Chapter 3\Services_Infrastructure_LSA.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-39

Source: Ministry of Natural Resources

Summary of Comment

Many of the Airport /Airstrips shown on this figure are located on Crown land and are not maintained locations. They may be operational or they may not. The text of the document section 3.3.6.1 only addresses the Municipal Airport Facilities.

Potential Environmental Effects

Provides inaccurate information

Proposed Action

Remove the Airport/Airstrips that are not associated with Municipal operations.

Reference to EIS

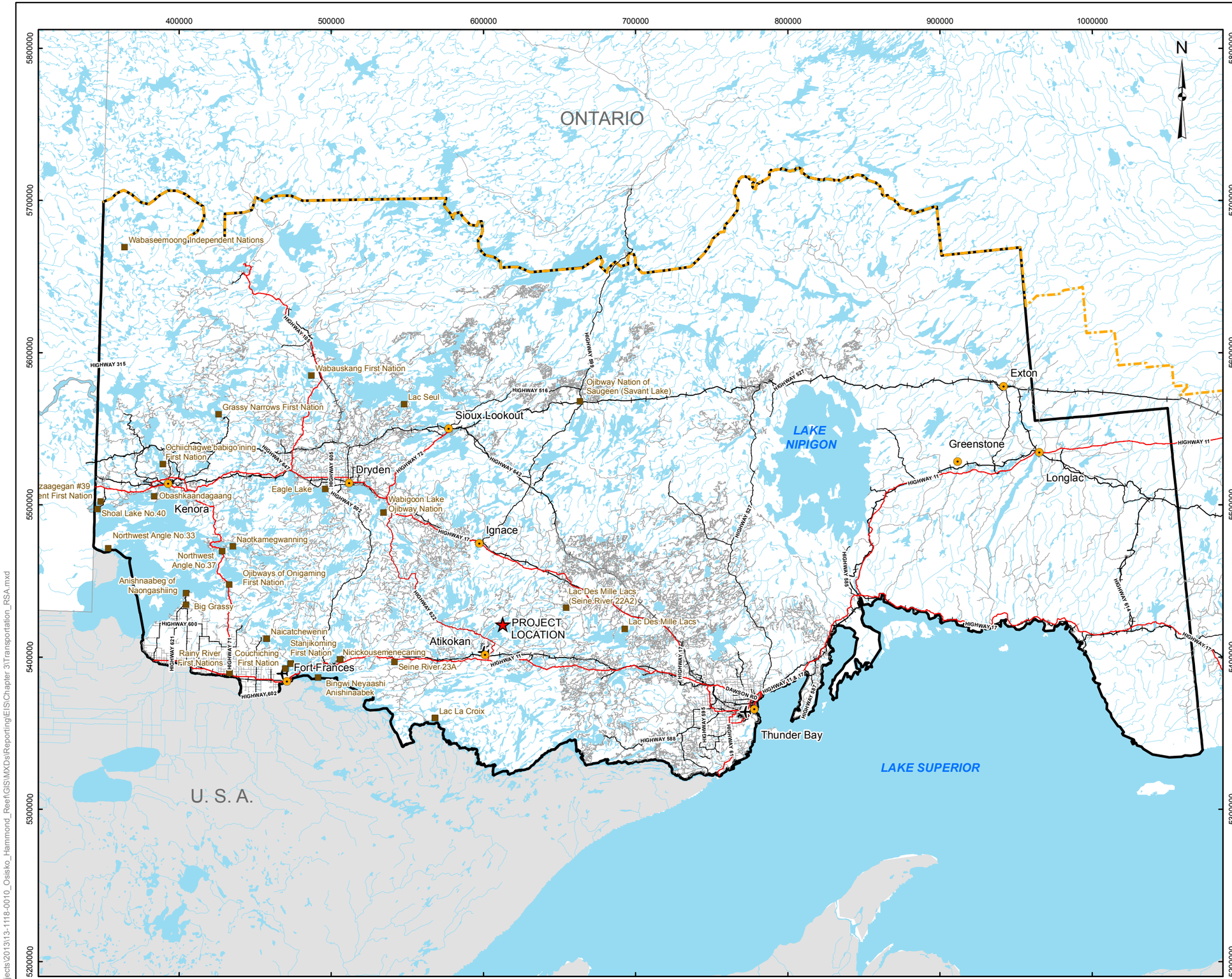
EIS, Chapter 3, Figure 3-49 and section 3.3.4.7 page 3-155

Response

The figure has been revised to address comment.

Attachments

Revised EIS Figure 3-49



LEGEND

- Project Location
- City/Town
- Airport/Airstrip
- First Nation Community
- Provincial Highway
- Regional Road
- Road
- Existing Railway
- Far North Border
- River/Stream
- Lake
- Regional Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

25 0 25 50 75 100 125
SCALE 1:2,500,000 KILOMETERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
TRANSPORTATION IN THE SOCIO-ECONOMIC ENVIRONMENT REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008	FIGURE: 3-49	
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\EIS\Chapter 3\Transportation_RSA.mxd

INFORMATION REQUEST – MNR-40

Source: Ministry of Natural Resources

Summary of Comment

In 3.3.7.1 Paragraph 6 there are quantities of tourism and recreational developments indicated. These are incorrect. There are actually more than 40 cottage lot parcels of which some may not have any buildings on them however there are at least 3 that are used as year round homes and not seasonal cottages. The map does not show all the patent lands within the LSA where recreational activities may be taking place. The scale of the figure 3-53 (Tourism and Recreation) is excessive for accurate reflection of its intent.

Potential Environmental Effects

Provides inaccurate information regarding tourism and recreational devilments in the LSA

Proposed Action

Please amend

Reference to EIS

EIS, Chapter 3, section 3.3.4.7 page 3-15 and Figure 3-53

Response

We have reviewed two data sets from MNR that have the title “Patent Lands” and cannot reconcile this comment with respect to these data sets. The data provided is that which is available publicly (data sets titled: ‘*Patent Lands*’ and ‘*Patent Lands External*’), if we have missed something then we would request that the more appropriate data set be provided by MNR such that we can update our records.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-41

Source: Ministry of Natural Resources

Summary of Comment

This figure indicates the location of Former Designation Camping Sites and Former Tourism Establishments. This section is dedicated to Existing Conditions not Affects to them. The campsites and the tourism establishment are existing therefore should be reflected as such at this point.

Potential Environmental Effects

Provides inaccurate information regarding tourism and recreational developments in the LSA

Proposed Action

Please amend

Reference to EIS

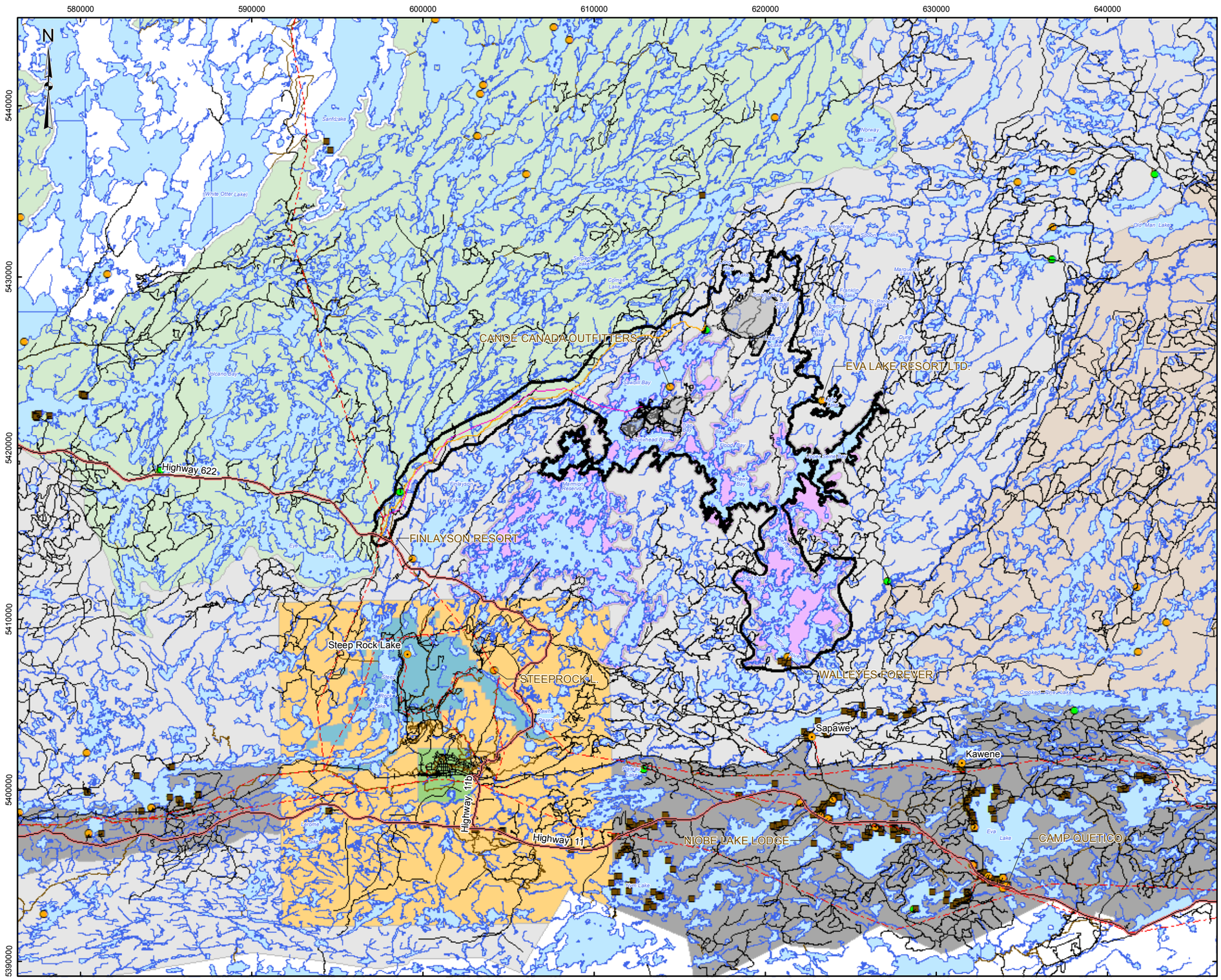
EIS, Chapter 3 (Existing Condition), section 3.3.4.7 Figure 3-53

Response

Figure 3-53 of the EIS has been revised to identify tourism establishment areas to be affected by the Project as part of the existing conditions, and therefore not 'former'. The campsites have been removed from the figure because it had been Osisko's understanding that these camp sites were "designated" (i.e. campers would be assigned locations and amenities were available), however, based on clarification from the MNR we now understand that these are simply suggested areas and just like any other crown land, the area can be used for camping if people so choose to do so.

Attachments

Revised EIS Figure 3-53



LEGEND

- Small Community
- Provincial Highway
- Road
- Existing Railway
- Power Transmission Line
- River/Stream
- Lake
- Cottage
- Tourism Establishment
- Access Point
- Trail
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities
- Local Study Area

General Resource Area

- Finlayson
- Greytrout
- Highway 11
- Marmion
- Mercutio
- Steep Rock
- Township of Atikokan
- Townsite Atikokan

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

4 2 0 4 8 12
SCALE 1:225,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
TOURISM AND RECREATION IN THE SOCIO-ECONOMIC ENVIRONMENT LOCAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

FIGURE: 3-53

G:\Projects\201313-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\EIS\Chapter 3\TourismRecreation_LRU_LSA.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-42

Source: Ministry of Natural Resources

Summary of Comment

These sections and others reflect there will be restrictions to access of lands associated with the project. Where is a written description of these lands and a figure that shows the lands that the access restrictions will apply to?

Potential Environmental Effects

Aboriginal Community members and General Public need to be aware of the land mass that will have access restrictions placed on them.

Proposed Action

Add information - written description of these lands and a figure that clearly illustrates the lands that will have access restriction applied to them.

Reference to EIS

EIS Chapter 6, sections 6.3.1.9, 6.3.1.12, 6.3.2.7, 6.3.2.8, 6.3.3.3, 6.3.3.5, and more

Response

The mitigation measure proposing restriction of access to specific sites has been discussed and amended in the Atmospheric and Human Heath and Ecological Risk Assessment TSD cover letters.

It was Osisko's understanding that the camp sites identified in these documents were "designated" and/or part of a commercial operation (i.e., campers would be assigned locations and amenities were available) however, based on clarification from the MNR we now understand that these are simply suggested areas and just like any other crown land, the area can be used for camping if people so choose to do so.

Based on this new understanding, these specific locations are not considered "points of reception" in accordance with Ontario Ministry of the Environment noise guidelines and therefore do not require assessment in the Atmospheric TSD. Similarly these sites no longer need to be identified in the Human Heath and Ecological Risk Assessment TSD.

Osisko will control access to the peninsula and area immediately adjacent to the mining operations for safety reasons. Signs will be posted advising potential campers of the mine operations and the potential for elevated noise levels.

INFORMATION REQUEST – MNR-44

Source: Ministry of Natural Resources

Summary of Comment

No indication on the significance of the effect of removal and fragmentation of the land and restriction to site access.

Indication that there will be no affect on the harvest volumes, is not correct, the lands taken up in tenured area for the project through the Mining Act will no longer be considered available for harvest by trapping under the registered line system. The provincially set quotas will be adjusted to reflect the Crown land area remaining to be trapped.

Mitigation proposed in this section indicates "relocation based on discussions with MNR and trap line holders" as a possible solution. MNR is not in a position to enter into any such discussions and this should not be indicated as a mitigation measure because it is Osisko's responsibility to mitigate not the provinces.

Potential Environmental Effects

The statements in this section do not provide an accurate reflection of the effect on the trapping community in the area of the mine (4 trap lines).

Proposed Action

Correct the information presented.

Reference to EIS

EIS Chapter 6, Effects Assessment, Section 6.3.1.9 Trapping.

Response

The section has been revised to state: No change is predicted in harvest volumes; however government-set quotas may be adjusted to reflect the lands taken up in tenured area for the Project. The general approach to mitigation is compensation and/or relocation based on negotiation with the trapline holders. Mitigation for adverse effects on trapping will involve negotiated financial settlements between affected trapline holders and OHRG, based on documentation to be provided by the affected individuals. Negotiations will occur upon approval of the EA and a decision to construct. Satisfactory completion of negotiations should fully mitigate this effect.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-45

Source: Ministry of Natural Resources

Summary of Comment

Treaty 3 map - Atikokan and area Metis not interim

Potential Environmental Effects

None

Proposed Action

Correct on figure

Reference to EIS

Chapter 7, Figure 7 - 8 Aboriginal consultation

Response

Figure has been revised to address the comment. It has also been renumbered as Figure 7-12 in the Final EIS/EA Report.

Attachments

EIS Figure 7-12 (Revised from Figure 7-8 in Draft EIS/EA Report)

MANITOBA

ONTARIO

REGION 1

REGION 2

Wabaseemoong Independent Nations

Wabauskang First Nation

Grassy Narrows

Lac Seul

Ojibway Nation of Saugeen

Ochiichagwe'babigo'ining

Kenora

Kenora Métis Council

Dryden

Northwest Métis Nation of Ontario Council

Iskatewizaagegan Independent First Nation

Anishinabe of Wauzhushk Onigum

Obashkaandagaang

Eagle Lake

Wabigoon Lake Ojibway Nation

Shoal Lake No.40

Naotkamegwanning

Northwest Angle No.33

Northwest Angle No.37

Ojibways of Onigaming

Anishnaabeg of Naongashiing

Big Grassy

Naicatchewenin

Nigigoonsiminikaaning

Mitaanjigaming

Rainy River

Couchiching

Fort Frances

Sunset Country Métis Council

Lac La Croix

U. S. A.

PROJECT LOCATION

Atikokan

Atikokan Métis Council

Lac Des Mille Lacs

Seine River

Thunder Bay

Thunder Bay Métis Council

LAKE NIPIGON

LAKE SUPERIOR

N

300000 400000 500000 600000 700000 800000

5800000 5700000 5600000 5500000 5400000

LEGEND

- City/Town
- Road
- Existing Railway
- River
- Waterbody
- First Nation Community
- Canadian Environmental Assessment Agency (CEAA) First Nation Community
- Métis Community Council
- Canadian Environmental Assessement Agency (CEAA) Métis Community Council
- First Nation Reserve
- Métis Nation of Ontario Region
- Aboriginal Treaty 3 1873

Métis Nation of Ontario Region Traditional Harvesting Territories

- Lake of The Woods / Lac Seul
- Lakehead
- Nipigon
- Rainy Lake / Rainy River

INDEX MAP



REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Historical Indian Treaties obtained from Natural Resources Canada,
The Atlas of Canada (2010).
First Nations Communities from Indian and Northern Affairs Canada.
Métis Regional Areas and Communities from MNO Website (www.metisnation.org)
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

25 12.5 0 25 50 75 100
SCALE 1:2,000,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
TREATY 3 AREA BOUNDARY

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008	FIGURE: 7-12	
GIS	JO	2 Dec. 2013		
CHECK	CH	2 Dec. 2013		
REVIEW	CH	2 Dec. 2013		

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-46

Source: Ministry of Natural Resources

Summary of Comment

Information on the Lac Des Mille Lacs dam is not correct

Potential Environmental Effects

Provides incorrect information regarding the reason the dam was put in place.

Proposed Action

Correct details on the LDML Dam installation.

Reference to EIS

Aboriginal Interests TSD Page 35 last paragraph

Response

This is the community description that was received from the Lac de Mille Lacs First Nation and we do not feel that it is appropriate to change it. If MNR would like to provide alternate wording to be used in the TSD, Osisko can send it to LDMLFN for final review and acceptance.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-47

Source: Ministry of Natural Resources

Summary of Comment

Quetico Prov Park is missing from the figure; Campus Lake Conservation Reserve is missing as well.

Potential Environmental Effects

Does not show Quetico Park in relation to the project although many others appear.

Proposed Action

Correct the figure to include Quetico.

Reference to EIS

Cultural Heritage TSD Figure 2-1

Response

The figure has been revised to address comment.

Attachments

Revised Fig. 2-1 (CH TSD)

600000 1100000 1600000

6000000 5500000

MANITOBA

QUÉBEC

U. S. A.

HUDSON BAY

JAMES BAY

LAKE NIPIGON

LAKE SUPERIOR

Fort Severn

Sachigo River

Winisk River

POLAR BEAR PROVINCIAL PARK

OPASQUAB PROVINCIAL PARK

WINISK RIVER PROVINCIAL PARK

Attawapiskat River

Akimiski Island

PIPESTONE RIVER PROVINCIAL PARK

OTOSKWIN-ATTAWAPISKAT RIVER PROVINCIAL PARK

WOODLAND CARIBOU PROVINCIAL PARK

ALBANY RIVER PROVINCIAL PARK

Moosonee

PIPESTONE RIVER PROVINCIAL PARK

Pickle Lake

LITTLE CURRENT RIVER PROVINCIAL PARK

WABAKIMI PROVINCIAL PARK

Savant Lake

Exton

Nakina

Longlac

Kenora

PROJECT LOCATION

CAMPUS LAKE CONSERVATION RESERVE

Nipigon

MATTAGAMI REGION

Timmins

QUETICO PROVINCIAL PARK

Atikokan

Marathon

Thunder Bay

PUKASKWA NATIONAL PARK

TURTLE RIVER PROVINCIAL PARK

Wawa

Capreol

Sudbury

Sault Ste. Marie

N

LEGEND

- Community
- Existing Rail Line
- Exisitng Road
- Waterbody
- Conservation Area
- Provincial Park
- National Park

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone15N

50 0 200
SCALE 1:5,000,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
PROVINCIAL PARKS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	CP	2 Dec. 2013		
REVIEW	CP	2 Dec. 2013		

FIGURE: 2-1

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-48

Source: Ministry of Natural Resources

Summary of Comment

Along with Rainy River Resources Project, there is the Josephine Cone Mine Development project. Other previous activities that have contributed to or have the potential to contribute to cumulative effects are the Dimensional Wood Mill site at Sapawe Lake, the former Atikokan Gold Mine near Osinawi Lake, the Atikokan Renewable Fuels Mill soon to be operational and the future Resolute Forest Products Sawmill in Atikokan.

Potential Environmental Effects

The potential Josephine Cone Mine Project is closer to the Hammond Reef site than the Rainy River Gold Project, it should warrant some mention in this section.

Proposed Action

Inclusion of these other industrial activities needs to be considered.

Reference to EIS

EIS Chapter 6, Section 6.8 Accumulative Effects

Response

The cumulative effects assessment has been revised to include the suggested projects where information is available, the geographic location is appropriate, the suggested project has a potential interaction with Hammond Reef, and the timing of the suggested project is anticipated to overlap with Hammond Reef, as detailed below:

- Josephine Cone Mine – added to assessment;
- Dimensional Wood Mill site at Sapawe Lake – no information available on this project;
- Former Atikokan Gold Mine near Osinawi Lake - past projects not included in assessment;
- Future Atikokan Renewable Fuels Mill – added to assessment; and
- Resolute Forest Products Sawmill in Atikokan – announced in January 2013, added to assessment.

INFORMATION REQUEST – MNR-49

Source: Ministry of Natural Resources

Summary of Comment

Socio-economic regional study area is large and encompasses a great deal of area outside of the area of influence.

Potential Environmental Effects

Clear presentation of the effects and the impacts of the project is fundamental and important part of the environmental assessment.

Proposed Action

The RSA identified in the SEE is too large resulting in a dilution of impacts to values that are more immediate to the area, and would have more direct influence/impacts from the project. A modified RSA should be considered.

Reference to EIS

Socio/Eco Environment (SEE): RSA Figures

Response

The RSA is useful for characterizing socio-economic existing conditions over the broadest area that may experience measurable changes to the economy as a result of the Project in relation to employment, income and government revenues. This is also the area where cumulative effects are likely to occur. Direct socio-economic effects are most likely to occur in the LSA. The LSA is the area most likely to experience changes to service and infrastructure, land and resource use such as hunting, trapping, fishing and forestry. This information is therefore presented at the LSA scale.

INFORMATION REQUEST – MNR-51

Source: Ministry of Natural Resources

Summary of Comment

Air Q and Human Health RSA - this does not include the town of Atikokan or the closest First Nation community.

Potential Environmental Effects

Lac Des Mille Lac and the town of Atikokan should be included.

Proposed Action

The RSA for this VEC should be modified to include communities that would have the highest risk of impact.

Reference to EIS

EIS: Figure 2-3C

Response

The RSA for atmospheric environment encloses the domain of the model used to assess air quality for the Project. The RSA for atmospheric environment is defined by an area 35 km by 35 km in size. The effects of the Project are not expected to be measurable beyond the RSA. The spatial boundaries for the human health and ecological risk assessment were aligned with the spatial boundaries identified by the EA disciplines that will predict potential Project-related changes to environmental quality, or that provided information relevant to human activities, wildlife and aquatic life. The human health assessment did not identify any pathways for the Project to affect the population of Lac des Mille Lacs or the Town of Atikokan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-52

Source: Ministry of Natural Resources

Summary of Comment

What is the purpose of this map, what do the circles indicate?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Modify or clarify map.

Reference to EIS

EIS: Fig 2-3E

Response

Figure 2-3E represents the socio-economic Regional Study Area (RSA). The concentric circles are not discussed in the text and have been removed. The RSA is useful for characterizing socio-economic existing conditions over the broadest area that may experience measurable changes to the economy as a result of the Project in relation to employment, income and government revenues. The RSA includes the Rainy River and Thunder Bay Districts, and that portion of the Kenora District south of the Far North boundary.

Attachment

Revised Figure 2-3E



LEGEND

- Project Location
- City/Town
- Provincial Highway
- Road
- Existing Railway
- Far North Border
- River/Stream
- Lake
- Region of Kenora
- Region of Rainy River
- Region of Thunder Bay
- Socio-Economic Regional Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd (April, 2010)
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

25 0 25 50 75 100 125
SCALE 1:2,500,000 KILOMETERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
SOCIO-ECONOMIC REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

FIGURE: 2-3E

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-53

Source: Ministry of Natural Resources

Summary of Comment

Water Quality LSA and RSA areas - what was used to determine this?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Provide information on how these study areas were determined.

Reference to EIS

EIS: Fig 2-2K and 2-3G

Response

The Water Quality Study Areas were determined by considering planned Project infrastructure and natural linkages.

Local Study Area: The Local Study Area (LSA) is the immediate vicinity of the Project Site that could be directly affected by the Project. Initial water quality modeling shows that outside of the LSA, the downstream water quality during and after project operations would be essentially indistinguishable from baseline water quality. The Water Quality Local Study Area is delineated in Figure 2-2K of the EIS/EA. The LSA includes Lizard Lake, waters in the vicinity of the mine site and Upper Marmion Basin.

Regional Study Area: The Regional Study Area (RSA) (Figure 2-3G) is an area that provides regional context and environmental setting for the assessment. For water quality additional upstream areas are included to define baseline and reference water quality, and the downstream areas are extended to past Atikokan as they are the primary users of the water resource, and it is important to understand from a regional perspective what the downstream uses of the water are.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-54

Source: Ministry of Natural Resources

Summary of Comment

Land Use and Resources - non-traditional. Non Aboriginal is more appropriate. Unless a definition of non-traditional is provided. Fishing - need to address increased harvest.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Amend reference to non-traditional. And provide description of impacts to resources such as fish and wildlife availability to Aboriginal people.

Reference to EIS

EIS: Table 2-3 pg. 2-38

Response

Socio-Economic VEC has been revised to "Land and Resource Use" to remove reference to non traditional. Potential effects Aboriginal land and resource use are captured under the Aboriginal Interests component, and the Traditional Use of Land and Resources VEC which states: The Project may affect plants, animals and fish that have been traditionally harvested and consumed by Aboriginal people.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-55

Source: Ministry of Natural Resources

Summary of Comment

Assessment methodology - "when a likely project effect is judged as being positive it is not assessed further and no evaluation of significance is conducted". How can this be done before consultation? Also, section 11 only describes economics; it does not list the effects which have been deemed to have no further evaluation.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please describe rationale of how the project effect was judged positive before consultation of the EA. And correct reference to section 11.

Reference to EIS

EIS: pg. 2-42

Response

The comment refers to the following statement in Chapter 2: When a likely Project effect is judged as being positive it is not assessed further and no evaluation of significance is conducted. All positive effects are included in Chapter 11 as part of the benefits of the Project. This statement is referring to the purpose of an environmental assessment, which is to identify and evaluate potential negative effects and determine appropriate mitigation measures to assure that the overall effects of the Project are acceptable. An environmental assessment is not required to fully evaluate positive effects in the same way. An example of a positive effect is employment and economics generated from the Project. These effects are discussed in Chapter 11.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-56

Source: Ministry of Natural Resources

Summary of Comment

"Project activities that are not expected to not interact with the environment were not considered further" - what are they? How was it determined they would not interact with the environment?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please provide a description of the project activities that were not expected to interact with the environment, and how they were determined.

Reference to EIS

EIS: Pg. 2-43

Response

Not every project activity interacts with every environmental component or VEC identified. For example, the drainage of Mitta Lake does not interact with the soils component. This approach allows for an assessment that remains focussed on potential effects of the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-58

Source: Ministry of Natural Resources

Summary of Comment

Risk Assessment and Mitigation Measures - the EA identifies that potential effects cannot be anticipated until the effect assessment has been completed. The EA needs to provide an environmental effects monitoring plan.

Potential Environmental Effects

During the development of the ToR, MNR identified a monitoring effects plan should be included in the EIS.

Proposed Action

The Environmental Effects Monitoring Plan should include:

1. a description of the potential negative environmental effect for each criterion;

2. mitigation and protection measures planned for each criterion and performance measures;

3. how the project will be monitored to ensure that mitigation strategies are meeting performance objectives;

4. a contingency plan to be implemented; should monitoring reveal that mitigation measures have failed;

5. a description of frequency and duration of monitoring for each negative impact, for each phase of the project; and

6. a non-compliance strategy that will identify a plan of action for out of compliance situations.

The Environmental Effects Monitoring Plan in the EA should be prepared and approved by all applicable agencies.

Reference to EIS

Pg. 2-50

Response

Section 2.6.3 on page 2-50 that is referenced above is a discussion of the identification of in-design mitigation measures. Wherever possible, potential effects have been anticipated and the Project has been designed to mitigate those effects. The section also states that all effects cannot always be identified prior to the completion of an effects assessment. This discussion is introducing the concept of the necessity for an iterative approach in environmental management planning. Predictions are made based on science and experience; however some flexibility is required to manage environmental effects as site specific experience is gained. For this reason, the environmental monitoring plans that are included at the EIS/EA stage are not considered final. The environmental monitoring plans presented in the Final EIS/EA Report include all components required by the Terms of Reference, as listed above, however they are considered draft as they will continue to be informed by ongoing consultation with government, public and Aboriginal communities. Monitoring plans will also be revised based on the unique situations that are encountered throughout the Project phases.

INFORMATION REQUEST – MNR-59

Source: Ministry of Natural Resources

Summary of Comment

Walleye sport fishery was closed in lower Marmion only.

Potential Environmental Effects

Implies that the Marmion reservoir as a whole had experienced population problems related to walleye which is not the case; was specific to lower Marmion.

Proposed Action

Specify that sport fishery closure was specific to Lower Marmion Reservoir.

Reference to EIS

EIS: Pg 3-97

Response

Updated Section 3.2.9.3.1: The Marmion Reservoir has been a focus of MNR fisheries management over the past two decades and in particular, MNR has been interested in potential impacts on the walleye sports fishery. The Lower Marmion Reservoir was closed in the late 1990's in response to estimates of population declines (MNR, various; Jackson 2007).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-60

Source: Ministry of Natural Resources

Summary of Comment

Forestry - corrections needed. CFSA manages our Crown trees (Crown land not necessarily a trigger). Abitibi is now Resolute.

Potential Environmental Effects

Inaccurate information

Proposed Action

Please amend

Reference to EIS

EIS Pg. 3-173

Response

Updated Section 3.3.3.12.6: The MNR licenses the use of Crown forests through Forest Management Units, two of which fall within the LSA; specifically, the Resolute Forest Management Unit and the Rainy Lake Tribunal Forest Management Unit. The Resolute Forest Management Unit is part of operations licensed to Resolute Forest Products, while Rainy Lake Tribunal Forest is part of operations licensed to Atikokan Forest Products, as shown on Figure 3-59.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-61

Source: Ministry of Natural Resources

Summary of Comment

Fishing - licenses are not issued based on Fishery Management Zones. Licenses authorize anglers to fish anywhere in Ontario in accordance with the Ontario Fish Regulations. The province is divided into fish management zones not units.

Potential Environmental Effects

Inaccurate information

Proposed Action

Please amend

Reference to EIS

EIS Pg. 3-168

Response

Updated Section 3.3.3.12.4: Recreational fishing licenses in the Province are permitted by the MNR. Licenses authorize anglers to fish anywhere in Ontario in accordance with the Ontario Fish Regulations. In 2005, a total of 1,426,384 recreational anglers' licenses were issued: 919,455 for residents and 506,929 for non-residents (Kerr 2010).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-62

Source: Ministry of Natural Resources

Summary of Comment

What is meant by relevant water use?

Potential Environmental Effects

A common understanding of the terminology and references is essential in the delivery of an EA.

Proposed Action

Provide a definition of relevant water use.

Reference to EIS

EIS Pg. 3-175

Response

“Relevant water use” refers to the potential uses available for the waterbodies and watercourses. These will differ among waterbodies, depending on the physical characteristics of each. For example, navigation may be a relevant water use for some streams, but not for others. Since this is a general statement, it does not refer to a specific water use for a specific waterbody, but refers to the waterbodies assessed in a collective sense.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-63

Source: Ministry of Natural Resources

Summary of Comment

What is meant by relevant permits?

Potential Environmental Effects

A common understanding of the terminology and references is essential in the delivery of an EA.

Proposed Action

Provide a definition of relevant permits.

Reference to EIS

EIS pg 5-7

Response

“Relevant permits” refers to those federal and provincial permits required to commence construction.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-64

Source: Ministry of Natural Resources

Summary of Comment

Mitta lake - where is the description of details on how the draining will occur, and what will happen?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Need a clear description of what the plans are for Mitta Lake other than the brief references throughout the report. Needs to have its own section.

Reference to EIS

EIS/ER General

Response

Detailed planning and logistics for the draining of Mitta Lake will take place once EA approval has been received. At this stage, the conceptual plan is detailed in Chapter 5 as follows: The Project will include draining the water from Mitta Lake into the adjacent Marmion Reservoir. A fish salvage and relocation plan will be developed according to DFO guidelines and OHRG's No Net Loss Plan (NNLP) and will incorporate consultation with Aboriginal communities.

INFORMATION REQUEST – MNR-65

Source: Ministry of Natural Resources

Summary of Comment

Assessment alternatives for power supply has selected the Hardtack/Sawbill spanning Sawbill Bay on Upper Marmion as the preferred power supply and fibre optics corridor alternative. There is a separation between the mine facilities and the proposed 1200 person workers camp with no linking corridor between the two areas identified.

Potential Environmental Effects

This component is required to assess effects of the project either based on the corridor to be established or the alternative means that the camp will be run off.

Proposed Action

Identify specifically how the workers camp intends to operate: electricity, diesel generator or other alternative means.

Reference to EIS

EIS: Page 4-9

Response

There is Linear Infrastructure which is included within the Mine Study Area (Figure 1-3 of the EIS/EA). This area includes both the workers camp area and the mine facilities and has been assessed as part of the environmental assessment. The Mine Study area, including both of these facilities, is considered part of the project, and power would be supplied to any required areas within the Mine Study area through appropriate overhead, or over-ground wiring as will be determined in the detailed design stage of the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-66

Source: Ministry of Natural Resources

Summary of Comment

Assessment alternative (Road 1) has 13 water crossings vs. 3 suggested in this section

Potential Environmental Effects

May skew the alternatives assessment considering the number of water crossings formulates a large consideration for final alternative selection.

Proposed Action

Re-assess the alternative based on updated information.

Reference to EIS

EIS: Page 4-11

Response

The existing Hardtack/Sawbill Road (Alternative 1) is continuous and has a total of 14 existing water crossings. The Raft Lake Road (Alternative 2) is not continuous and therefore requires construction of new road sections and new water crossings, including a bridge over the Raft Lake Cut. In total the Raft Lake Road will have a total of 7 water crossings. Section 4.2.7 of the EIS/EA report and the Alternatives Assessment Report has been revised to accurately reflect the correct number of water crossings.

The main rationale for selecting the Hardtack/Sawbill Road as the preferred access road alignment is the limited amount of upgrading that would be required, which implies limited incremental terrestrial and aquatic impacts. The existing Hardtack/Sawbill Road was extensively upgraded in 2010. The main upgrading that would be required for a mine access road would be to widen the road to provide a 10 m running surface. This will be done within the existing road right-of-way as much as possible. No new water crossings will be required; it will only be necessary to lengthen existing culverts. By contrast, the Raft Lake Road would require considerable upgrading, including widening and re-alignment of some sections, and construction of new road sections and water crossings resulting in additional terrestrial and aquatic impacts. For these reasons, the total number of stream crossings will not affect the result of the access road alternatives assessment.

INFORMATION REQUEST – MNR-67

Source: Ministry of Natural Resources

Summary of Comment

Assessment alternative (Road 2) has 7 water crossings vs. 3 suggested in this section.

Potential Environmental Effects

May skew the alternatives assessment considering the number of water crossings formulates a large consideration for final alternative selection.

Proposed Action

Re-assess the alternative based on updated information.

Reference to EIS

EIS: Page 4-11

Response

The existing Hardtack/Sawbill Road (Alternative 1) is continuous and has a total of 14 existing water crossings. The Raft Lake Road (Alternative 2) is not continuous and therefore requires construction of new road sections and new water crossings, including a bridge over the Raft Lake Cut. In total the Raft Lake Road will have a total of 7 water crossings. Section 4.2.7 of the EIS/EA report and the Alternatives Assessment Report has been revised to accurately reflect the correct number of water crossings.

The main rationale for selecting the Hardtack/Sawbill Road as the preferred access road alignment is the limited amount of upgrading that would be required, which implies limited incremental terrestrial and aquatic impacts. The existing Hardtack/Sawbill Road was extensively upgraded in 2010. The main upgrading that would be required for a mine access road would be to widen the road to provide a 10 m running surface. This will be done within the existing road right-of-way as much as possible. No new water crossings will be required; it will only be necessary to lengthen existing culverts. By contrast, the Raft Lake Road would require considerable upgrading, including widening and re-alignment of some sections, and construction of new road sections and water crossings resulting in additional terrestrial and aquatic impacts. For these reasons, the total number of stream crossings will not affect the result of the access road alternatives assessment.

INFORMATION REQUEST – MNR-68

Source: Ministry of Natural Resources

Summary of Comment

Graphic depicts worker camp expansion to the east of current camp. Expansion in this direction towards known spawning habitat is not advised and expansion where necessary should favour a westerly direction.

Potential Environmental Effects

Camp expansion was not part of the ToR and direction and magnitude of expansion needs to be carefully considered to minimize impacts.

Proposed Action

Explore expansion opportunities that minimize the potential for negative impacts.

Reference to EIS

EIS: Page 4-21

Response

The location and layout of the accommodation camp was selected to utilize the existing disturbed exploration camp area as much as possible to minimize terrestrial impact. Outward expansion from this area is constrained by the access road to the north and west and Sawbill Bay to the east. The majority of the expansion (i.e., the main camp area and parking lot) is towards the southwest of the existing exploration camp. Expansion for the accommodation buildings is to the north. All facilities are located outside of the high-water level in Sawbill Bay and a surface water drainage system will be constructed. Sewage and site runoff from the camp will be treated prior to release to upper Sawbill Bay or pumped to the TMF. These mitigation measures will limit the potential for negative environmental impacts.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-69

Source: Ministry of Natural Resources

Summary of Comment

It is not felt that alternatives were selected with input from regulatory agencies. Agencies comments on alternatives were during the review of the ToR.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Correct statement.

Reference to EIS

Alternatives Assessment Report (AAR): Pg. 2 and Pg. 4-4 of EIS

Response

Osisko has actively engaged regulatory agencies throughout the Project planning process. This consultation includes regular meetings with the Ministry of Northern Development and Mines and the two lead agencies on the environmental assessment - Ministry of Environment, Environmental Approvals Branch and Canadian Environmental Assessment Agency. The details of these consultation activities are provided in Chapter 7 of the EIS/EA Report and associated appendices. Meetings with regulatory agencies where alternatives were specifically discussed include: March 9, 2011, May 31, 2012; November 20, 2012; January 8, 2013 and January 25, 2013.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-70A

Source: Ministry of Natural Resources

Summary of Comment

Alternative methods can include consideration of technologies, alternative sites, designs or methods of operations of each alternative. It is felt that these considerations were not adequately considered for all the alternatives, particularly the alternative site method for the worker camp, waste disposal, sewage treatment and roads.

Potential Environmental Effects

The alternative for a submerged cable vs. spanning Sawbill Bay of Upper Marmion is not considered which has the potential to mitigate a number of concerns such as impacts to raptors, viewscape concerns. The transmission corridor in its current configuration does not show if/where it will be linked to the accommodations camp. This corridor has the possibility to impact on viewscape, terrestrial environment depending on its proposed configuration. Not linking the camp to the transmission corridor leads to a number of other questions such as power source, associated noise levels etc.

Proposed Action

The EIS and the ARA needs to include a better description of these components, such as: what if any alternatives were considered, how the preferred alternative was chosen and a map showing all three.

Reference to EIS

AAR: pg. 8

Response

Underwater transmission line construction was not considered a feasible alternative due to technical, cost and biological considerations. The workers accommodation camp is part of the Mine Study Area (Figure 1-3 of the EIS/EA) which includes a linear corridor. Within this study area, power will be run and is required for the water management system, Open Pit, Mine Facilities, Accommodations Complex and near the TMF. Osisko must have the flexibility to supply power throughout the Mine Study Area where required, however until detailed design is completed the specifics of the distribution system have not been stipulated. It is expected that within the mine site area (including the accommodation complex, power may be supplied through poles or through appropriately insulated lines directly over ground, depending on the design requirements and regulations.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-70B

Source: Ministry of Natural Resources

Summary of Comment

The statement that a preliminary screening of alternative means of carrying out the project was included in the ToR for all alternatives is incorrect.

Potential Environmental Effects

The preliminary screening did not include the additional components of the worker camp and the fibre optic/auxiliary line

Proposed Action

The EIS needs to provide more clarity on the two components that were added after the approved Terms of Reference. The report is vague on how this was delivered and a decision made. The report should identify that the proponent committed to addressing any concerns regarding the two added components in the EA.

Reference to EIS

AAR: pg. 8, sect 3.1

Response

An on-site worker accommodation camp alternative was added after the Terms of Reference (ToR) stage and is further discussed in Section 3.8.

The fibre optic communication line was also added after the ToR stage. As discussed in Section 3.7, the selected alignment for the fibre optic communication line follows the auxiliary transmission line along Highway 622 and then uses the same corridor and support structures as the selected project transmission line. This alignment does not result in additional biophysical or socio-economic impact and material and installation costs are minimized. Therefore, other alternatives were not considered.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-71A

Source: Ministry of Natural Resources

Summary of Comment

It is incorrect to say that a preliminary screening of alternatives means of carrying out the Project was included in the ToR. There were components missing in the ToR.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

The EIS needs to provide more clarity on the two components that were added after the approved Terms of Reference. The report is vague on how this was delivered and a decision made. The report should identify that the proponent committed to addressing any concerns regarding the two added components in the EA.

Reference to EIS

AAR: pg. 8

Response

An on-site worker accommodation camp alternative was added after the Terms of Reference stage and is further discussed in Section 3.8. The fibre optic communication line was also added after the ToR stage. As discussed in Section 3.7, the selected alignment for the fibre optic communication line follows the auxiliary transmission line along Highway 622 and then uses the same corridor and support structures as the selected project transmission line. This alignment does not result in additional biophysical or socio-economic impact and material and installation costs are minimized. Therefore, other alternatives were not considered.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-71B

Source: Ministry of Natural Resources

Summary of Comment

Assessment Approach - "step 1 list all potentially available alternatives". This was not done. Table 3-1 should identify all of them. And a more detailed description needs to be included for this statement: "for some components, a single feasible alternative was identified. These preferred alternatives have become part of the Project design and are therefore not assessed further in the AAR".

Potential Environmental Effects

Clarification and a more detailed description is needed. The report include all the alternatives listed together, how they were correctly pre-screened and a description of how conclusions were reached

Proposed Action

Identified in the EA as pre-screened activities and if they were included in the ToR:

Mine development (ToR – open pit identified)

Explosive storage (ToR – no alternatives presented, not listed on the preliminary screening table)

Chemical and fuel storage (ToR – no alternatives presented, details will be determined based on criteria)

Hazardous waste management – (ToR no alternative presented, not listed on the preliminary screening table)

Water sourcing (ToR Marmion Basin was selected) should identify

Water Recycling (ToR Recycle water was selected) should identify

Organic and Solid Waste – (ToR Offsite was selected)

Low-grade Ore stock pile - (ToR alternative locations were supposed to be carried forward)

Reference to EIS

AAR: pg 12

Response

The Alternatives Assessment section (Section 4 of the EIS/EA), and the Alternatives Assessment Report and associated documents have been revised to include more detail based on the comments of the reviewers and the items as identified in the Terms of Reference. Reasonable alternatives that could potentially meet the Project needs include the alternatives carried forward from the ToR preliminary screening process and additional alternatives identified through subsequent advancement of site planning and mine planning work.

INFORMATION REQUEST – MNR-73

Source: Ministry of Natural Resources

Summary of Comment

Potentially Available Alternatives - this section does not adequately identify alternatives. The EIS does not have the required table that clearly summarizes the requirements of the Terms of Reference and a corresponding section in the EIS of where it is addressed.

Potential Environmental Effects

The technical report and the EIS needs to identify alternatives for identifies component and include a wide range of methods.

Proposed Action

Please amend the report so that a clear summary of alternatives is shown (what was screened in the ToR, what was carried forward and what was presented in the EA).

Ore Processing Method

- Use of Cyanide
- Natural Degradation

Preferred: cyanide

Power Supply (Transmission Line)

- Hardtack/Sawbill Road
- Raft Lake Road
- Hardtack/Sawbill Bay

Preferred: Hardtack. Sawbill Bay

Sewage Treatment

- Off site sewage – not feasible ToR (?)
- Site Location 1
- Site Location 2
- Septic Tank and Tile Field
- Septic Package Treatment Plant

Preferred: package treatment technology – but location not clear

Water discharge

- Underwater pipeline to Lynxhead Narrows
- Overland pipeline to Lynxhead Bay
- Overland pipeline to central Sawbill Bay

- Overland pipleline to south end of Sawbill Bay

Preferred: overland to south end of Sawbill Bay

Access Road

- Hardtack/Sawbill Rd
- Raft Lake Rd

Preferred: Hardtack/Sawbill Rd (road use management strategies? The MOU is to be developed during the EA)

Office and Support Facilities (Worker Accommodations)

- On-site camp
- Offsite camp

Preferred: on-site camp (ToR did not identify). Need more alternatives, specifically location alternatives. Pg. 46 states that the alternative is actually a combination of on-site off site worker accommodation?? This is a bit of a stretch. The combination would clearly state that there would be half the… (comment incomplete)

Fibre Optic Line

No alternatives presented and little reference in the ER, until section 5 of the report, where it is lumped in with Power Supply.

Auxiliary transmission line (is there a map showing this?)

No alternatives presented

Waste Rock Disposal

- Site location 1
- Site location 2
- Site location 3

Preferred: site #3

Tailings Management

- Hogarth Pit (ruled out in the ToR)
- Lizard Lake
- NE (ruled out in the ToR)
- Base Case
- Location 2
- Location 3

Preferred: Base Case

Tailings Pipeline (ToR did not screen potential alternatives that included processing to tailings base case, processing to tailings alternative 1, processing to tailings alternative 2) alternative alignments were to be carried forward and it was identified that alternatives would be identified in the EA.

Preferred: based on selected TMF location (follow Reef Road) shortest option, no further assessment.

Tailings Deposition

- Thickened tailings
- Conventional tailings

Preferred: Thickened tailings

Closure and Rehabilitation

No alternatives presented (was identified in the ToR)

Reference to EIS

AAR: Pg. 14

Response

A reference to the Terms of Reference and the work that was done on pre-screening of alternatives should be considered sufficient. Repetition of the information provided in the Terms of Reference is cumbersome and does not add clarity.

The alternatives assessment report for alternative means and mine waste disposal has been revised to provide additional information and clarity where considered necessary based on comments received and discussions with regulators on May 27, 2013 and July 23, 2013. Substantial changes to the Alternatives Assessment Report and Chapter 4 of the EIS/EA Report have been made.

Alternatives considered for closure have been summarized in a memorandum and are included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-76

Source: Ministry of Natural Resources

Summary of Comment

There have been no alternatives presented for the fibre optic line or Waste management – separate section for mine waste disposal, (includes waste rock, tailings) but not solid waste. There are several references to a solid waste landfill being on site (the TMF), where? Needs to be shown and alternatives presented.

There are too few alternatives presented for the worker camp – (restricted to on site and off site). We would expect to see alternative locations and size, combination of onsite/offsite, perhaps a different size of worker camp during construction vs. operations etc.). There is inadequate rationale/explanation of impacts/mitigation.

Potential Environmental Effects

Clear presentation of the project alternatives is a fundamental and important part of the environmental assessment.

Proposed Action

Please provide the required information on these alternatives.

Reference to EIS

ARA: general

Response

The results of the preliminary screening process described in the ToR identified off-site disposal as the only available alternative to management of solid waste during operation. This is further discussed in Section 3.1 of the Alternatives Assessment report.

At closure, solid waste generated during the decommissioning phase will be disposed of in an on-site solid waste management facility within the TMF. This on-site landfill will be sited prior to closure and operated and closed according to the license that is obtained.

The fibre optic communication line was also added after the ToR stage. As discussed in Section 3.7, the selected alignment for the fibre optic communication line follows the auxiliary transmission line along Highway 622 and then uses the same corridor and support structures as the selected project transmission line. This alignment does not result in additional biophysical or socio-economic impact and material and installation costs are minimized. Therefore, other alternatives were not considered.

The alternatives for the workers camp were on-site and off-site. An on-site worker accommodation camp alternative was added after the Terms of Reference (ToR) stage and the assessment of alternatives is further discussed in Section 3.8. The location of the on-site camp was selected because the existing camp was sited there. The location is feasible and logical due to the proximity to the road and the fact that an area has already been cleared. The combination of on-site and off-site accommodation was selected as a means of compromise and willingness to cooperate with the Town. The Town of Atikokan prefers that workers are housed in Town, and Osisko has committed to providing logistical means and incentives for workers to do so.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-77

Source: Ministry of Natural Resources

Summary of Comment

As per the approved and amended ToR, (page 20), "the EA will assess alternative methods for the decommissioning and closure phase which will include a list of activities that are designed to ensure that the project site is closed in a manner that reduces the potential impacts on the social and natural environment". And "The EA will also include a decommissioning assessment that will include alternative methods for decommissioning and planning of future use of the land."

Potential Environmental Effects

Although the tech report identifies some of the activities included in closure, there are no clear alternative methods presented in the EA regarding the above. Unless it is to include things like treatment options identified on page 5-13. If so, it is expected they would be presented as alternatives. Perhaps presenting preferred alternatives for future land use at this time is not realistic (?). Regardless, there needs to be a commitment in the document that a planned approach to consult with applicable agencies, First Nations, and the public in identifying new land use strategies for the site and the area will be in place at closure. (Q for MNDM - who is the lead agency?)

Proposed Action

Please provide the required information on these alternatives.

Reference to EIS

ARA: closure and rehabilitation

Response

In the preparation of the conceptual closure plan, due consideration was given to possible alternative approaches that could be taken to the closure of each element of the project. A Technical Memorandum has been prepared to provide a brief description of the alternatives that were considered for each element of mine closure as well as the rationale that was used to select the preferred alternative. This memorandum will accompany the final response submission.

Closure plans are subject to O.Reg. 240/00 under the Mining Act; thus MNDM is the lead agency. MNDM has suggested that OHRG consult with them about closure issues. (See IR MNDM-7). OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss closure of the Project site prior to the formal submission of the certified closure plan.

INFORMATION REQUEST – MNR-78

Source: Ministry of Natural Resources

Summary of Comment

Osisko has identified that the Upper Marmion is an important fishery for tourism and recreation (CP Pg. 27) and that currently 50% of the fishing pressure is non-residents. This is not discussed in the assessment of alternatives and they have not addressed the impacts to the fishery of over harvest and consequences to tourism industry and local recreation. If they are taking the approach by implementing restrictions, there should be a better description than one line in a table. But it appears that without a legal mechanism for MNR, we would have to assess the potential as we would without the company restrictions.

Potential Environmental Effects

Clear presentation of the project alternatives is a fundamental and important part of the environmental assessment.

Proposed Action

Need more alternatives, specifically location alternatives. Pg. 46 states that the alternative is actually a combination of on site off site worker accommodation? This is a bit of a stretch. The combination would clearly state that there would be a portion of the work force accommodated in town, so the worker camp would be smaller.

Reference to EIS

AAR and Section 4 of EIS: Worker Camp

Response

Potential impacts to the fishery have been assessed. Fishing is a VEC in the socio-economic assessment and an effects assessment is detailed in the Socio-Economic TSD and summarized in Chapter 6, Section 6.3.1. The alternatives for the workers camp were on site and off site. The on site location of the camp was selected because the existing camp was sited there. The location is the only feasible and logical alternative due to the proximity to the road and the fact that an area is already cleared there. The combination of on site and off site accommodation was selected as a means of compromise and willingness to cooperate with the Town. The Town of Atikokan prefers that workers are housed in Town, and Osisko has committed to providing logistical means and incentives for workers to do so.

INFORMATION REQUEST – MNR-79

Source: Ministry of Natural Resources

Summary of Comment

Tailings Pipeline: ToR did not screen potential alternatives that included processing to tailings base case, processing to tailings alternative 1, processing to tailings alternative 2) alternative alignments were to be carried forward and it was identified that alternatives would be identified in the EA.

Referred: Based on selected TMF location (follow Reef Road) shortest option, no further assessment.

Potential Environmental Effects

Clear presentation of the project alternatives is a fundamental and important part of the environmental assessment.

Proposed Action

The tailings pipeline needs to be better addressed in the ARA and in the EIS.

Reference to EIS

AAR: Pg. 77

Response

For the assessment of the tailings pipeline location the results of the preliminary screening process described in the ToR identified that the tailings pipeline alignment will be determined based on the selected TMF location and follow existing road alignments to the maximum extent possible. Given the final location of the processing plant and the selected location of the TMF, the pipeline alignment will follow the upgraded mine site road (Reef Road) alignment. This is the shortest distance between the processing plant and the TMF without interfering with mine site infrastructure or increasing impacts to water bodies. Therefore, no alternative alignments were assessed.

INFORMATION REQUEST – MNR-80

Source: Ministry of Natural Resources

Summary of Comment

Where are the road use management strategies? The ToR committed that a MOU was to be developed during the EA.

Potential Environmental Effects

Section 5 of the EIS talks about Power Supply/Fibre Optics, but no Auxiliary Line, the AAR talks about Power Supply and Auxiliary Line, but no Fibre Optic line. Why is what is said in sect 4.2.10 of the EIS not included in the AAR?

Proposed Action

The AAR should identify alternatives for road management strategies that will presented to the public. The EIS needs to have a section that addresses all planned roads (i.e. to aggregate sources, linear infrastructure, service roads for the tailings pipeline, access roads). There needs to be a map that shows all of the roads that are planned and for what and where there are water crossings. Also, Fig 6-1 of the Closure report, shows the remaining roads at expected long term post closure; will this be in the MOU, or is it too far out to expect that?

Reference to EIS

ARA and EIS: Roads

Response

Two alternative alignments were assessed for the access road and the existing Hardtack/Sawbill road was selected as the preferred alternative. The Hardtack/Sawbill road is the property of the Ministry of Natural Resources (MNR). It will be improved and used by OHRG under the terms of a memorandum of understanding (MOU). However, the Project design has not currently reached the level of detail that is being requested. The environmental assessment is a planning tool that allows government, public, aboriginal and the proponent understand the potential effects and develop broad mitigation measures.

The MOU will include a road use management strategy and specific mitigation measures to ensure that the public can continue to use the road safely during mining operations. OHRG will continue to use the access road after closure for the purpose of monitoring and maintenance. The MOU will be developed in consultation with MNR, the public and interested stakeholders.

Watercourse crossings along the existing Hardtack/Sawbill road have been identified and are included in the draft No Net Loss Plan for the Project. If watercourse crossings are required for future on site roads, the appropriate permitting process will be followed at that time to ensure potential effects are minimized.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-81

Source: Ministry of Natural Resources

Summary of Comment

It is not clearly identified what this includes: i.e. does it include the transmission line, auxiliary line and fibre optic line?

Potential Environmental Effects

The ER needs to identify a complete design of the tailings pipelines alternatives. If the alternatives were tied to the TMF alternatives, then the pipeline should have been included in the assessment. Is the design still going to be an above ground pipeline, with drainage points and spill containment areas located at naturally occurring low points along the route as identified in the ToR?

Proposed Action

The EIS and the AAR needs to include a better description of these components, such as: what if any alternatives were considered, how the preferred alternative was chosen and a map showing all three. Figure 4-2 of the EIS and Fig 3-3 need to show all three.

Reference to EIS

AAR: Power Supply

Response

Yes, the auxiliary power line is included under Transmission line assessment. Figure 3-3 of the Alternative Assessment Report and Figure 4-4 of the EIS/EA Report (formerly Figure 4-2) have been amended to include the auxiliary power line. The auxiliary power line is approximately 10km long and will be constructed adjacent to Highway 622. The purpose of the auxiliary transmission line is to provide electricity required to operate the substation that connects the project transmission line to the provincial electricity grid. The new substation will be constructed near the intersection of Highway 622 and Hardtack Road. The only available alternative for the auxiliary power line is to source the power from Atikokan Generating Station and align the power line with Highway 622.

The fibre optic line does not supply power and has been included under Office and Support Facilities. An alternative alignment was not considered for the fibre optic line because it will use the same alignment and poles as the preferred Transmission Line.

For the assessment of the tailings pipeline location the results of the preliminary screening process described in the ToR identified that the tailings pipeline alignment will be determined based on the selected TMF location and follow existing road alignments to the maximum extent possible. Given the final location of the processing plant and the selected location of the TMF, the pipeline alignment will follow the upgraded mine site road (Reef Road) alignment. This is the shortest distance between the processing plant and the TMF without interfering with mine site infrastructure or increasing impacts to water bodies. Therefore, no alternative alignments were assessed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-82

Source: Ministry of Natural Resources

Summary of Comment

The report does not provide any details on the design and plans for the tailings pipelines. The ER only identifies the selected location. The ER (Pg. 4-34) is also incorrect in identifying the selected alignment is the shortest distance. The TMF alternatives identified that option #2 was the closest to the ore processing plant.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

The design description, planned layout, and detailed map needs to be included. The design, description and map need to clearly show the location, the drainage points, the spill containment and where the effluent discharge point is (currently it shows a parking lot?)

Reference to EIS

AAR: Pg. 25 and 4-34 of the EIS Tailings Pipeline Alternatives

Response

The TMF pipeline will be constructed above ground, with drainage points and spill containment areas located at naturally occurring low points along the route. To the extent possible, the pipeline route will follow the existing on site road alignments; however the construction of new alignment is necessary in some places. Where the pipeline deviates from existing on site roads, a construction access road will be constructed that will also be used as a service road for the pipeline during operations. The pipeline will be protected on the inward side of the road by a berm. Similarly, on the outward side, the road bed will be bermed to contain potential pipeline spills. The twin berms would direct any potential spillage to the constructed containment areas.

For the assessment of the tailings pipeline location the results of the preliminary screening process described in the ToR identified that the tailings pipeline alignment will be determined based on the selected TMF location and will follow existing road alignments to the maximum extent possible. The pipeline alignment will follow the upgraded mine site road (Reef Road) alignment. This is the shortest distance between the processing plant and the selected TMF without interfering with mine site infrastructure or increasing impacts to water bodies. Therefore, no alternative alignments were assessed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-83

Source: Ministry of Natural Resources

Summary of Comment

There is a map showing preferred layout for the project, but no description of if or how there were alternatives. And the map does not include linear infrastructure. There needs to be more detail regarding drainage or water control (ie. culverts/bridges or other), there needs to be more details on proposed road construction, (one, two, three or more lanes, width, points A to B).

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please amend.

Reference to EIS

AAR: Fig 5-1

Response

The preferred site layout shown in Figure 5-1 of the EIS/EA Report presents the conclusion of the alternatives assessment in visual form. These project components were determined to best meet the environmental, social, economic and technical objectives of the Project and are described in further detail and carried forward though an Effects Assessment in the EIS/EA Report. Details regarding drainage or water control and proposed road construction widths will be provided in the detailed design phase of the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-84

Source: Ministry of Natural Resources

Summary of Comment

Need a larger scale map that shows stock pile location. The EIS is missing this map.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Amend.

Reference to EIS

AAR: Fig 3-1

Response

Figure 3-1 is intended to show the location of the stockpile relative to other components of the mine. More detailed figures are provided later in the Alternatives Assessment Report that show specific components, including all stockpiles.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-85

Source: Ministry of Natural Resources

Summary of Comment

The report identifies there will be community feedback through on going public consultation of the conceptual closure/rehab plan, but do not describe how or when. A better description of those opportunities is required.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

The EIS/CPRP needs to identify a conceptual consultation plan for the decommissioning phase. (i.e. list of stakeholders that would be consulted, First Nations, agencies, municipalities, etc) and a schedule of consultation opportunities. Specifically how future land use decisions will be determined.

Reference to EIS

CPRP

Response

Although Osisko has had ongoing discussions with our stakeholders regarding closure, developing a formal consultation plan for the closure phase of the Project is part of the regulated closure planning process and falls under the Ministry of Northern Development and Mines (MNDM) mandate. Under O.Reg. 240/00 as amended by O.Reg. 307/12, the Director of Mine Rehabilitation will provide written direction to Osisko with respect to the requirements for consultation with Aboriginal groups, and such consultation will be a condition for filing the certified closure plan. Osisko is currently reviewing the draft certified closure plan with MNDM. As per the requirements of the Mining Act, the certified closure plan will not be submitted to MNDM until EA Approval has been received.

INFORMATION REQUEST – MNR-86

Source: Ministry of Natural Resources

Summary of Comment

Mine closure is expected to take 12 years. How will the worker camp be used/reduced/decommissioned during this time?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

The EIS/CPRP needs to identify what plan will be in place for the phase out of the worker camp. How many workers will remain using the camp and for how long, how will the buildings be dismantled as staff are reduced etc.

Reference to EIS

CPRP

Response

The figure of 12 years is not correct, because no definitive schedule has yet been developed for the implementation of closure. In general terms, the bulk of the labour intensive construction work related to closure implementation will be completed within 2 years, and pumping of site waters may be redundant within 5 years. After that, the only closure related activities will be related to monitoring and this monitoring would likely be carried out by staff based in Atikokan. On this basis, it is expected that, at closure, the camp will be reduced during the first two years following cessation of operations, and would be further reduced to a capacity of about 5 people after approximately two years. Within 5 years of cessation of operations, the camp would be completely removed.

As stated in Section 4.1 of the Conceptual Closure and Rehabilitation Plan, the Accommodation Camp will be redundant after closure. Portable facilities such as trailers will be removed from the Project Site. Permanent facilities will be decommissioned and demolished. Materials will be salvaged or sold as scrap to the extent possible. Non-hazardous demolition waste will be disposed of in a solid waste landfill to be licensed within the TMF.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-87

Source: Ministry of Natural Resources

Summary of Comment

Aggregates - as mentioned in other sections, need a better description of the plans for aggregate.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Correct reference to the ARA needs to be provided in the CPRP, and some indication of decommissioning plans to the aggregate sources.

Reference to EIS

CPRP

Response

As identified in section 3.0 and 4.1 of the Conceptual Closure and Rehabilitation Plan, the aggregate sites will be progressively rehabilitated when they are no longer needed. The rehabilitation will adhere to the conditions of the permit issued under the Aggregate Recourses Act (ARA). As the conditions of the ARA permit are presently not known, a detailed rehabilitation plan for the aggregate sites cannot be provided at this time. In general, rehabilitation will involve re-vegetation using topsoil or overburden from pre-stripping and ensuring stable excavation slopes and adequate drainage conditions exist at closure.

INFORMATION REQUEST – MNR-88

Source: Ministry of Natural Resources

Summary of Comment

A discharge channel is to be constructed between the west pit and Marmion reservoir. Need a more detailed description of this.

Potential Environmental Effects

It is important to accurately represent permitting and approval requirements as they relate to the project.

Proposed Action

Provide a description and sketch of this concept and timing.

Reference to EIS

CPRP

Response

The closure plan provided as a Technical Supporting Document is conceptual only. The channel will be excavated largely through bedrock between the West pit and the adjacent shore of Marmion Reservoir. The channel entrance will have a sill at Elev. 420 m and it will discharge into Marmion Reservoir at about Elev. 416 m. The channel will be roughly 100 m long and about 5 m in base width. A detailed engineering plan of the channel will be prepared later as part of detailed design.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-89

Source: Ministry of Natural Resources

Summary of Comment

Aggregates - Areas of authorized extraction under the ARA will be through the issuance of permits and not licences as referenced in this section.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Correct reference to the ARA needs to be provided in this section and how it pertains to the specifics of this project proposal.

Reference to EIS

CCRP Page 8

Response

The word "licence", as it pertains to the Aggregate Resources Act, has been changed to "permit" in the Conceptual Closure and Rehabilitation Plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-90

Source: Ministry of Natural Resources

Summary of Comment

Need a description of when closure ends and post closure begins.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Provide definitions of closure and post closure and describe the frame work that will determine initiation of closure, closure and post closure.

Reference to EIS

CPRP

Response

By one definition, the “closure phase” starts when ore processing ceases and continues until practically all of the closure measures have been implemented. The “post-closure phase” follows closure and comprises largely monitoring and some site maintenance activities. For the current purpose, it can be said that the closure stage will be completed when the seepage collection ponds have all been breached, pumping has ceased, and the pumping infrastructure has been removed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-91

Source: Ministry of Natural Resources

Summary of Comment

Runoff and seepage collection ponds, where are these?

Potential Environmental Effects

There needs to be some level of detail to what revegetation will include. What kind of pulp mill sludge will be used, is there testing done before hand, what will be the source, and a description of proven results etc.

Proposed Action

Need a description and map.

Reference to EIS

CPRP page 7

Response

It is currently planned to have a total of 13 Seepage Collection Ponds (SCPs) on the site during operations. The locations of these SCPs and the ditches leading towards them are shown on Figure 6-1 of the Conceptual Closure and Rehabilitation Plan. These SCPs will remain in operation for a period after closure until the water quality in each is deemed to be suitable for discharge. Water collected in SCPS 1 to 5 will continue to be pumped to the TMF and will report to the TMF Reclaim Pond. Water collected in the other 8 SCPs will be pumped directly or indirectly to the Open Pits.

The organic mulch to be used in the direct revegetation of the TMF will likely comprise either pulp mill sludge or stabilized sewage sludge. The decision as to which organic material to use will have to be made a few years prior to closure, considering availability at that time, as well as haul distance and sludge characteristics. It is anticipated that use of a particular sludge will be subject to approval under the site ECA and that this will require characterization testing. It is noted however that there are numerous precedents for using these types of materials on mine sites in Ontario, which implies that such use is both operationally feasible and environmentally acceptable.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-92

Source: Ministry of Natural Resources

Summary of Comment

The EIS indicates that there will be no active revegetation at closure. This contradicts with the CPRP that says the vegetation will be restored. But a complete vegetation management plan is not provided.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

The vegetative management plan needs to be included in the EA and have details that will include the type of plants that will be restored, techniques used for re-vegetation, and definitions of such things as pulp mill sludge.

Reference to EIS

CPRP page 8 and EIS page 1-15

Response

As indicated by the Conceptual Closure and Rehabilitation Plan, active re-vegetation will be carried out at the following facilities: in aggregate sourcing areas (Section 4.1), on the surface of the tailings in the Tailings Management Facility (TMF) (Section 4.2), and on the Overburden Stockpile (Section 4.4). Other site areas will be left to re-vegetate naturally.

At this stage, the re-vegetation plan is conceptual only. The TMF will be directly re-vegetated by placing organic mulch, fertilizer and seeding. In concept, the organic mulch could consist of pulp mill sludge or stabilized sewage sludge, both of which have been used successfully on a number of Ontario mining sites in the past to promote growth. Appropriate permits will have to be obtained to haul and place these materials. Details of seed mix and fertilizers will be determined using test plots on inactive parts of the TMF during production.

Similar techniques and test plotting will be undertaken for the Overburden Stockpile and the aggregate sourcing areas.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-93

Source: Ministry of Natural Resources

Summary of Comment

The CPRP states that transmission lines will be either transferred or taken down. Does this include the Aux line? Will the fibre optic line remain?

Potential Environmental Effects

This is not identified in the EIS or the AAR.

Proposed Action

There needs to be a better description of all the linear infrastructure upon closure.

Reference to EIS

CPRP page 9

Response

The disposition of the Aux line and the fibre optic line will be the same as that of the power transmission lines. The lines will be either transferred or taken down.

INFORMATION REQUEST – MNR-94

Source: Ministry of Natural Resources

Summary of Comment

The report states that non-hazardous demolition waste will be disposed of in a solid waste landfill to be licensed within the TMF.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

This is an important component of the project and needs to be identified in the EIS and details including alternatives and maps are to be included.

Reference to EIS

CPRP Pg. 9

Response

The plan is to establish a facility for non-hazardous solid waste in the TMF at the time of closure. This will be fully licenced under applicable landfill regulations. This facility is intended to deal with the debris that will be generated by the demolition of the site facilities. After demolition is completed, the TMF landfill will be closed following the terms of the licence. This will involve placing a cover over the wastes as well as post-closure monitoring.

INFORMATION REQUEST – MNR-95

Source: Ministry of Natural Resources

Summary of Comment

When referencing roads, there needs to be a tie in with the MOU.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

MOU for roads is required in the EIS, as per the ToR.

Reference to EIS

CPRP Pg. 9

Response

Section 4.1 states: The existing access road (Hardtack/Sawbill) is the property of the Ministry of Natural Resources (MNR). It will be improved and used by OHRG under the terms of a separate agreement. OHRG will continue to use the access road after closure for the purpose of monitoring and maintenance. Such use will follow the terms outlined in the separate agreement. The "separate agreement" referenced within is the MOU.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-96

Source: Ministry of Natural Resources

Summary of Comment

The report makes a statement that says “geochemically, the tailings are expected to be relatively benign and are not expected to generate acid drainage". What does this mean and what was this statement based on?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Provide more rationale, details and reference to the statement. Or amend.

Reference to EIS

CPRP Pg. 13

Response

Both the tailings and the waste rock have been classified as non-acid generating. The metal leaching characteristics are discussed in the Geochemistry, Geology and Soils TSD.

INFORMATION REQUEST – MNR-97

Source: Ministry of Natural Resources

Summary of Comment

Seepage pond dykes will be breached, where are these?

Potential Environmental Effects

It is very likely that topsoil will be needed in areas where organic material is inadequate or absent.

Proposed Action

Need a description of what these are and a map.

Reference to EIS

CPRP page16

Response

The locations of the 13 Seepage Collection Ponds are shown and numbered on Figure 4-1 in the Conceptual Closure and Rehabilitation Plan report.

It is expected that only a small volume of topsoil will be recovered during construction of the project. The available volume will be completely inadequate to, for example, allow coverage of the tailings surface in the Tailings Management Facility. (With an area of 675 ha, about 2.0 Mm3 of topsoil would be required to establish a 0.3 m thick layer.) Consequently, it will be necessary to rely on direct re-vegetation techniques.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-98

Source: Ministry of Natural Resources

Summary of Comment

How can it be assumed that if the overburden is geochemically benign, it will grow something without topsoil?

Potential Environmental Effects

A common understanding of the terminology and references is essential in the delivery of an EA. It is important to accurately represent permitting and approvals as they related to the project, this includes the definitions.

Proposed Action

The report needs to identify, through a re-vegetation plan that there will be a requirement to import a variety of materials such as top soil, seeds, plants etc. to establish the landscape and vegetation to an acceptable level of rehabilitation.

Reference to EIS

CPRP pg 15

Response

Direct revegetation of tailings is common practice and has been very successful at other mine sites, even when surfaces are not geochemically benign, therefore, considering the benign chemistry of the existing tailings, and in consideration of other successful revegetation efforts on closed tailings facilities, direct revegetation is considered feasible, practical and achievable at this site.

As described in the conceptual closure plan, the selected measures for the TMF include using re-vegetation to stabilize the exposed tailings surface against erosion by wind and water. It is not planned to place a layer of topsoil or overburden soil on top of the tailings; rather the tailings will be directly re-vegetated by placing organic mulch, fertilizer and seeding. During operations, test plots will be established on representative areas of the tailings surface. Details of the re-vegetation procedures (i.e., nutrients required, fertilizer, sources and suitability of organic mulch, seed mixes) will be developed and verified.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-99

Source: Ministry of Natural Resources

Summary of Comment

There should be more definitions provided in Table 8 (ie geochemically, waste rock, low grade ore). It is not understood by everyone what these are (me included). And the definitions are different from the glossary in the ER.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Expand on the definitions.

Reference to EIS

CCRP Table 8-1

Response

Table 8-1 of the CCRP TSD has been expanded to include more definitions.

INFORMATION REQUEST – MNR-100

Source: Ministry of Natural Resources

Summary of Comment

The report needs a better description and map showing all the spillways and tailings dams, the perimeter dykes (Pg. 16), water management structures (Pg. 19), communication towers, and the drainage channel. And which ones are to be removed and when and which ones will remain indefinitely. Figure 4-1 does not adequately do this, the map should be broken down to show the west, east and waste rock pits, the road and pipelines and the TMF separately on a larger scale. The legend needs work as well; does each number represent a pumping station?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

The map should be broken down to show the west, east and waste rock pits, the road and pipelines and the TMF separately on a larger scale. The legend needs work as well; does each number represent a pumping station?

Reference to EIS

CPRP - dams and tailings

Response

The features requested are shown on Figure 4-1 (representing 1 year after closure) and on Figure 6-1 (representing the long term post-closure condition).

As per the legend, the numbers represent pumping stations. In the case of Figure 4-1, these stations are active. In the case of Figure 6-1, these are decommissioned.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-101

Source: Ministry of Natural Resources

Summary of Comment

Tailings management, it is not clearly identified where the collected water in the ponds will be released. And we need more to explain why 'geochemically, the tailings are expected to be relatively benign..." at minimum reference to a technical report? And a backup plan as to what if the tailings are not benign. Same for the assumption the rock is NAP and not expected to cause acidic runoff in the event this assumption is wrong.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Provide better details on the tailings management plan.

Reference to EIS

CPRP - Tailings Management

Response

Both the tailings and the waste rock have been classified as non-acid generating. The metal leaching characteristics are discussed in the Geochemistry, Geology and Soils TSD.

The water collected in the seepage collection ponds will be pumped back to the TMF Reclaim Pond until the water quality in the individual ponds becomes acceptable for direct discharge. When the water quality is shown to consistently meet acceptable discharges standards, the pond dykes will be breached and the pumping systems will be removed. Until acceptable water quality standards are met, excess water in the TMF Reclaim Pond will be transferred to and contained within the open pits. If the tailings or waste rock were to generate acid, then by default the runoff and seepage would continue to collected and pumped to the open pits.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-102

Source: Ministry of Natural Resources

Summary of Comment

The report refers to the collected pond water as being good enough to be released, but if not acceptable it will be pumped back into the PPCP or reused in the process or treated and released. How will this happen? What would the water be needed for in closure? How will it be treated?

Potential Environmental Effects

Proper reference to the act.

Proposed Action

Provide more detail on how this will happen, what the water would be used for and how it will be treated.

Reference to EIS

CPRP – Pg. 15

Response

The sections in the CCRP which discuss water management in the TMF, the Waste Rock Stockpile, the Overburden Stockpile and the Low Grade Ore Stockpile each begin with a brief description of water management during operations. Pumping to the PPCP for reuse or for treatment and release only applies during operations. During closure, the water will initially be pumped into the open pits. At that stage it will neither be reused or treated and released.

The water quality in each of the SCPs is expected to improve over time. Initially, water in the TMF Reclaim Pond will be pumped to the Open Pits; however once the water becomes suitable for discharge, the invert of the Reclaim Pond spillway will be lowered, allowing the water to flow through the existing emergency spillway channel into Sawbill Bay. As the water quality in each individual SCP becomes suitable for discharge to the environment, that individual SCP dam will be breached and the pumping infrastructure will be removed. The suitability for direct discharge will be evaluated based on absence of negative impacts in the receiver in comparison with water quality objectives for the protection of aquatic life to be established for each receiver.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-103

Source: Ministry of Natural Resources

Summary of Comment

References the Fish and Conservation Act and should read Fish and Wildlife Conservation Act.

Potential Environmental Effects

Reviewers of the document maybe misled about the visual effects of the landscape features added as a result of the proposed mining activity.

Proposed Action

Simple editorial correction

Reference to EIS

Socio-Economic TSD Page 69

Response

Replaced "Fish and Conservation Act" with "Fish and Wildlife Conservation Act".

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-104

Source: Ministry of Natural Resources

Summary of Comment

Visual simulation maps views 1 and 2 are on Trap Bay of Upper Marmion and not on Lizard Lake as indicated and misleading reference locations from Tourist Outfitter on Light Lake and not Eva Lake as shown on map.

Potential Environmental Effects

Difficult to measure direct effects on Marmion when physically separated bodies are grouped together.

Proposed Action

Adjust the icons and headings to accurately reflect their actual locations.

Reference to EIS

Socio-Economic TSD Appendix 3.1

Response

Figure 1 in Appendix 3.1 of the Socio-Economic TSD has been revised to reflect the correct locations of the visual simulations. The Visual Effects Assessment Appendix, including the labels of Views 1 and 2, has been updated and is included in the Supplemental Information Package of the Socio-economic TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-105

Source: Ministry of Natural Resources

Summary of Comment

Current land use section doesn't distinguish between Upper and Lower Marmion reservoirs and misleads the reader into thinking that Upper Marmion Reservoir is a source of cooling water for the Atikokan Electrical Generating Station.

Potential Environmental Effects

Incomplete information

Proposed Action

Adjust wording to accurately reflect the specific feature being discussed.

Reference to EIS

CCRP TSD page 5

Response

Only Lower Marmion Reservoir is a source of cooling water for the Atikokan Electrical Generating Station. Water in Upper Marmion Reservoir can either flow through the sluiceway into Lower Marmion Reservoir, or it can pass over the Raft Lake Dam.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-106

Source: Ministry of Natural Resources

Summary of Comment

Aggregates - as mentioned in other sections, need a better description of the plans for aggregate and use of proper use of terms.

Potential Environmental Effects

Placement of waste disposal locations need to be identified at this time to allow for the required environmental screening.

Proposed Action

Correct reference to the ARA needs to be provided.

Reference to EIS

CCRP TSD page 6

Response

OHRG has prepared an estimate of aggregate needs associated with the Project. They have also identified prospective sources for some of these requirements. In due course, they will apply for permits for use of aggregate resources. Such applications will be fully compliant with the Aggregate Resources Act. Waste materials generated by stripping will be managed within the individual pits as required by the act.

INFORMATION REQUEST – MNR-107

Source: Ministry of Natural Resources

Summary of Comment

References made to disposal of non-hazardous demolition waste in a licensed landfill located within the tailings management facility. No geographic reference to its proposed location provided.

Potential Environmental Effects

Stronger commitment to re-establish forest cover vs. a grassland monoculture.

Proposed Action

Provide proposed Waste disposal location.

Reference to EIS

CCRP TSD page 7 and 9

Response

The plan is to establish a facility for non-hazardous solid waste in the TMF at the time of closure. This is intended to deal with the debris that will be generated by the demolition of the site facilities. After demolition is completed, the TMF landfill will be closed following the terms of the licence. This will involve placing a cover over the wastes as well as post-closure monitoring.

No decision has yet been made as to where within the TMF the landfill will be located. Such details will be elaborated when the landfill licence is applied for.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-108

Source: Ministry of Natural Resources

Summary of Comment

Heavy reliance on natural succession to revegetate the rehabilitated project area. Although some areas may possess site specific challenges, a more robust vegetative plan that addresses communities and species as described in the ToR should be used to replace what has/will be removed during mine operations.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Additional detail required.

Reference to EIS

CCRP TSD page 26

Response

As indicated by the Conceptual Closure and Rehabilitation Plan, active re-vegetation will be carried out at the following facilities: in aggregate sourcing areas (Section 4.1), on the surface of the tailings in the Tailings Management Facility (TMF) (Section 4.2), and on the Overburden Stockpile (Section 4.4). The seeding will be herbaceous; no tree planting is currently planned. It is expected that tree cover will grow into these areas and will evolve by natural succession. Other disturbed site areas will be left to re-vegetate naturally.

At this stage, the re-vegetation plan is conceptual only. A more robust plan can and will be developed and tested during the operational years. This will address species of herbaceous plantings and also trees. The plan will consider planting of certain tree species in specific areas to accelerate and direct the development of a tree cover.

INFORMATION REQUEST – MNR-109

Source: Ministry of Natural Resources

Summary of Comment

It is not clear what is intended to be the mine site road. Are the multiple lines on the map indicating the road width and layout? If so, why is this not shown for the entire access road?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

A map showing the descriptions of widening, upgrading of roads, i.e. a description of the width and row, sites of water crossings and predicted types (i.e. culvers/bridges) for all the roads is required.

Reference to EIS

EIS: Figure 4-5

Response

The multiple lines indicated the road centreline, shoulders and estimated footprint extent. For clarity, the figure has been revised to show only the proposed road centreline. The road will be upgraded to provide a running surface of about 10 m. An assessment of the water crossings is provided in the No Net Loss Plan for the project included as an addendum to the Aquatic Environment TSD.

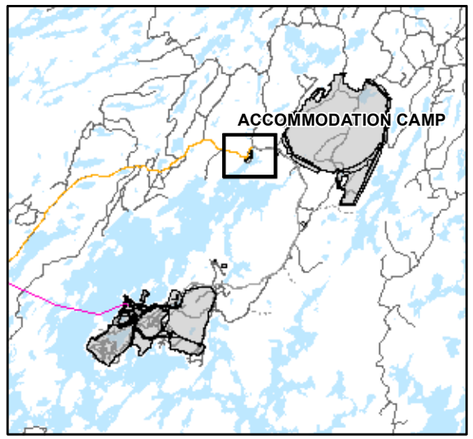
Attachments

Revised Figure 4-5 (EIS)



LEGEND

- Road
- Trail
- Index Contour (5m interval)
- River/Stream
- Lake
- Mine Site Road Centre Line
- Access Road
- Project Facilities



REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

100 0 100 200 300
SCALE 1:5,000 METERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
ON-SITE ACCOMMODATION CAMP LOCATION

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	2 Dec. 2013		
CHECK	SP	2 Dec. 2013		
REVIEW	SP	2 Dec. 2013		

FIGURE: 4-5

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\EIS\Chapter 4\AccomodationCampAlternatives.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-110

Source: Ministry of Natural Resources

Summary of Comment

This is a key map and it needs to be larger to show components at a larger scale. It does not show where the tailings pipeline goes (it looks like it starts at the parking lot?). There are no dams or other infrastructure shown. There is no road shown to the Emulsion plant or the detonator storage, (why is the emulsion plant so far away?) Legend: colours don't match the map, need better visual of all roads).

Potential Environmental Effects

Provides inaccurate information.

Proposed Action

The report needs to describe, how the tailings slurry gets from the processing plant to the pipeline and the TMF. What is the purpose of the pumping stations? What is the design and how are they operated? What is the purpose/description of the emulsion

Reference to EIS

EIS: Fig 5-1

Response

A number of figures have been provided in Chapter 5 that show details of project infrastructure as well as an overview of the entire project area. The project area, including the mine and access road/transmission line, covers an area of over 20 km. It is not possible to show the necessary details for an area this large on a single map. For this reason, some of the details have been omitted from Figure 5-1 for clarity.

The emulsion plant is where the blasting agents are prepared and the plant is located away from the main site for safety reasons. Standard roadways within the Mine Study Area will provide access to the emulsion plant and detonator storage; however these have been omitted from Figure 5-1 for clarity.

The tailings pipeline originates in the processing plant (see footprint on Figure 5-2). Tailings are pumped from the processing plant to the TMF. Booster pumping stations are required to provide the extra head needed to transport the tailings material the full length of the piping alignment. The final design, including the detailed layout of the tailings pipeline across the yard areas, will be provided later in the detailed design phase.

The layout of the tailings facility dams is shown on Figure 5-9 and tailings pipeline were provided, together with detailed figures, in Chapter 5.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-111

Source: Ministry of Natural Resources

Summary of Comment

Aggregates - as mentioned in other sections, need a better description of the plans for aggregate.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Correct reference to the ARA needs to be provided.

Reference to EIS

EIS Page 5-41

Response

It is expected that any existing or new aggregate pits used in connection with the Hammond Reef Gold Project will be Category 9 pits (i.e., an aggregate pit on Crown Land no closer than 1.5 metres above the established groundwater table). When they are no longer required, such pits will be rehabilitated according to the Operating Standards for Category 9 Pits, issued under the Aggregate Resources Act.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-112

Source: Ministry of Natural Resources

Summary of Comment

What do the orange squares and yellow circles represent? Dam symbol absent from legend.

Potential Enviromental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Define.

Reference to EIS

EIS Fig 6-6

Response

A revised figure has been provided. The legend has been modified to include the above noted items.

Attachments

Revised EIS Figure 6-6

610000 612500 615000 617500 620000

5427500 5425000 5422500

Cornell Lake

Sawbill Bay

Lynxhead Bay

TAILINGS MANAGEMENT FACILITY

WASTE ROCK STOCKPILE

EAST PIT

WEST PIT

LOW-GRADE ORE STOCKPILE

OVERBURDEN STOCKPILE

1 2 3 4 5 6 7 8 9 10 11 12 13 14

N

LEGEND

- Index Contour (5m interval)
- Ditch
- Marsh/Swamp
- River/Stream
- Road
- Trail
- Lake
- Wetland
- Groundwater Monitoring Location
- Surface Water Monitoring Locaton
- Decommissioned Pumping Station
- Proposed Ditch
- Pit Spillover Point
- Excavated Channel
- Tailings Drainage Channel Alignment
- Erosion Protected Channel
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Intermediate Collection Pond
- Revegetated Surface
- Open Pit Pond
- Waste Rock Stockpile
- Open Pit
- Tailings Management Facility Reclaim Pond

NOTES

1. Water in Tailings Management Facility Reclaim Pond will be redirected by ditch to Sawbill Bay once water quality is acceptable.

2. When the water quality in individual seepage collection ponds is acceptable for discharge, the ponds will be decommissioned.

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

500 0 500 1,000 1,500 2,000
SCALE 1:40,000 METERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
EXPECTED LONG-TERM POST-CLOSURE SITE CONDITIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	SP	30 May. 2013		
REVIEW	SP	30 May. 2013		

FIGURE: 6-6

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\MNR112\Expected_Longterm_ConditionsClosure.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-113

Source: Ministry of Natural Resources

Summary of Comment

Attraction of Predators - section should be titled Attraction of Wildlife. This section should really address the attraction of wildlife and the potential for them to become a nuisance. Camps can attract all kinds of wildlife including skunks, raccoons, foxes, ravens/crows and sea gulls.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

The ER should have an approach in place in dealing with potential dangerous species such as bears, as well as species that could be listed as species with protection or other legislation (furbearers, migratory birds etc).

Reference to EIS

EIS pg 6-91

Response

It is agreed that the pathway could have been titled “Attraction of Wildlife”. In the assessment, the effects of wildlife attraction to the mine camp will be mitigated through the development and implementation of an industrial and domestic waste management plan from construction through to closure. This plan will include the utilization of appropriate waste receptacles that limit attraction of wildlife. Food wastes will be incinerated regularly and littering and feeding of wildlife will be strictly prohibited.

All workers will be educated on the risk associated with feeding wildlife and careless disposal of food garbage. Proper waste management techniques will be conveyed to all workers and visitors to the site. Periodic, ongoing review of the efficiency of the waste management program and improvement through adaptive management practices.

With diligent application of these mitigation measures, the Project is anticipated to have a negligible effect on the attraction of wildlife.

The proposed project works and activities will be conducted in accordance with the Migratory Birds Convention Act 1994 and the Fish and Wildlife Conservation Act, 1997, in that migratory birds and their nest and eggs and other wildlife shall not be knowingly (or with any intent) killed, harmed or harassed during construction, operations or closure activities.

INFORMATION REQUEST – MNR-114

Source: Ministry of Natural Resources

Summary of Comment

Need to reconsider effects to aquatic biota and terrestrial biota, specifically Marmion Reservoir and impacts from worker camp.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Mitigation should include measures that are focused on impacts to local populations, not just habitat loss.

Reference to EIS

EIS: Pg 6-116, Table 6-49

Response

The effects at construction are largely habitat loss. Throughout operations, effects could extend to longer term impacts to local populations. For example, effects of vibrations to local fish populations are evaluated during the operations phase, as detailed in Table 6-56. Mitigation measures are provided by component in Chapter 8, Environmental and Social Management Planning. Table 8-8 provides mitigation for the biological environment, including local aquatic and terrestrial populations.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-115

Source: Ministry of Natural Resources

Summary of Comment

What are the indicators used to measure magnitude? i.e. how can development of open pit have low magnitude impacts to 'soil'? How can the noise component be low in developing and operations of the open pit (it is stated that noise guidelines will be met at most receptors but not all)? How can operation of the TMF be low for water quality, soils, aquatic biota and hydrogeology (the TMF is 2.5-3km wide)? How is closure of the TMF immediately reversible when the operation of the TMF is not reversible? Not sure I understand what is meant by 'reversibility'.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Tables need to be amended to better describe how the conclusions were reached.

Reference to EIS

EIS: Table 6-49

Response

When considering magnitude of impact of a project it is necessary to place the overall project within the appropriate context and setting. While it can be argued that there will be changes on the site proper, when considering the overall local and regional study area the potential changes and impacts to downstream water quality, local and regional soils, downstream overall aquatic habitat, and current groundwater uses are low. Other than the immediate mine location, current uses of these resources can continue in an unimpeded manner.

More specifically, development of the open pit will involve removal and stockpiling of soils. This will not affect the quality of the soils and they will be suitable for re-use for site rehabilitation.

The noise modeling has indicated that at the regulated receptor points, noise will be low. The assessment of noise is based on accepted measures determine by the MOE.

As noted in the table, the effects of development of the open pits are assessed with respect to potential effects on specific components of the environment. Water from the TMF will be reused in operations, and any discharged water will be treated, the effects of the TMF on water quality will be negligible.

While loss of soils will occur within the TMF footprint, this will not have a significant effect on soils availability in the LSA or RSA and the ability to support vegetation in the local area, since there are large undeveloped areas all around the project site. The importance of soils is primarily with respect to the ability to support vegetation communities, which in turn provide habitat for wildlife. The TMF will be revegetated after closure, so the loss of terrestrial habitat in that area will be temporary. As such, the small area affected, and the soils lost due to the

TMF would have negligible impact on the local availability of habitat. Effects on aquatic biota were noted due to the TMF, but these will be addressed in the fish compensation (offset) plan.

The assessment of reversibility in closure is based on the specific environmental impact identified in the table.

INFORMATION REQUEST – MNR-116

Source: Ministry of Natural Resources

Summary of Comment

How can an open pit mine, with a heavily used corridor for mine equipment, 2-3km tailings pond and a 1200 worker camp not be an impact to socio-economic environment or tourism? The effects are even identified under recreational opportunities.

Potential Environmental Effects

Marmion is particularly known for its wilderness fishing experiences; smb, walleye and np are commonly caught. The lake is utilized by several tourism operators to sustain their business activities and residents for recreation purposes. It is also the sit (comment incomplete)

Proposed Action

There needs to be a more accurate reflection on the impacts to the socio-economics and tourism. The EIS makes reference to the importance of the site, the lakes and the area as highly recreational and an active tourism base. If the proponent has entered into agreements with the directly impacted stakeholders, it should be stated.

Reference to EIS

EIS: pg 6-143

Response

Osisko is confident in the assessment that was carried out on socio-economic and tourism. The assessment was carried out in a transparent and thorough manner, and considered input from local tourist operators. As reflected in the public consultation report, multiple meetings with local tourist operators took place and their feedback was considered. Osisko has not entered into any agreements with tourist operators at this time. An additional mitigation measure was added to the commitments: Osisko will provide capacity for advertisement to promote tourism in the area.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-117

Source: Ministry of Natural Resources

Summary of Comment

Pg 3-168 identifies the importance of the Marmion Reservoir as a recreational and tourism fishery. This information needs to be incorporated in section 6 with the same level of importance.

Potential Environmental Effects

It is important to accurately represent permitting and approval requirements as they relate to the project.

Proposed Action

There needs to be recognition of the fishery as a recreational and tourism value and the ER needs to address the potential impacts. Potential impacts that need to be mentioned and addressed in the report are: physical disturbance from construction and o (comment incomplete)

Reference to EIS

EIS pg 6-144

Response

Fishing was assessed using three indicators: recreational fishing participation; fishing areas, licence sales and harvest volumes; and baitfish areas and harvest volumes.

The Project will not result in the removal of any commonly-used public fishing areas. Furthermore the Project will not restrict access to any of these areas. Osisko has negotiated an agreement with the local baitfish license holder to allow continued access and compensate the license holder where access must be restricted. In addition, Osisko has committed to limiting fishing by camp personnel while on-site to help maintain fish stocks; and promote tourism in the Atikokan area through sponsorships of community events such as the Atikokan Bass Classic.

INFORMATION REQUEST – MNR-118

Source: Ministry of Natural Resources

Summary of Comment

Hunting - the description presented in section 6.3.1.8 is incorrect. Harvest of game is based on a number of factors: only specific species (adult deer and moose, and bear for non-residents are limited by quotas). There are other small game species such as grouse, migratory birds, hare, wolves, coyotes and foxes that will be impacted by easy access and a large number of hunters living at the site.

Potential Environmental Effects

Prevention of fire encroaching to or from infrastructure, to or from surrounding forested area.

Proposed Action

The impacts on large and small game as well as fish should be addressed in the report. It needs to be identified that there will be impacts.

Reference to EIS

EIS pg 6-144

Response

We understand that hunting quotas only apply to some large game. For this reason, potential effects on hunting were assessed based on four indicators: hunting areas; wildlife management areas; license sales; and harvest volumes. The assessment of hunting also took into consideration potential impacts to hunting opportunities and an increased number of hunters living at the site. As stated in Section 6.3.1.2.8, increased pressure on hunting may result from recreational hunting by Project workers residing at the Mine Site camp. These effects represent an adverse effect of the Project and additional assessment and identification of practicable mitigation measures are required to reduce or avoid entirely the effects of reduced hunting opportunities. Osisko has committed to limiting hunting by camp personnel while on-site to help maintain the wildlife population.

INFORMATION REQUEST – MNR-119

Source: Ministry of Natural Resources

Summary of Comment

No mention of requirement for area to be cleared to within 30 m of camp, mine, etc. as per FFPA requirements.

Potential Environmental Effects

Require clarification regarding whether this water contains contaminants that should not be released during fire suppression activities or which may cause damage to suppression equipment.

Proposed Action

Incorporate requirement for area surrounding camp and mine to be cleared of flammable material for a distance of 30 m. Should be considered in Construction Phase design as well as the Operational Phase as a maintenance item. May be covered here or elaborate on in other sections such as 6.5.1 which mention cleared area but does not provide specifics regarding distance and maintenance requirements

Reference to EIS

EIS: 5.5 (Pg. 5-42)

Response

Added in-design mitigation measure to clear flammable material within a 30m buffer of Project infrastructure in Chapter 5, Section 5.5.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-120

Source: Ministry of Natural Resources

Summary of Comment

Section states that water will be available on-site in water storage facilities such as the PPCP. It's unclear whether this water is treated prior to entering the collection pond (ES-2 states water in the PPCP will be supplemented with reclaimed tailings water and any excess is treated in the effluent treatment plant prior to release into the Marmion Reservoir but quality of water before entering the PPCP is unclear.

Potential Environmental Effects

Likelihood of delayed fire protection services from volunteer fire organizations if relied upon for structural fire response.

Proposed Action

Provide clarification on quality of water and whether contaminants are still present in reclaimed tailings water.

Reference to EIS

EIS: 6.5.1 (Pg. 6-169)

Response

Water sent to the PPCP will not be treated. As stated in the site water quality TSD: The proposed surface water drainage plan is divided into two circuits; one which deals with the TMF and the other which handles the remaining mine facilities. Ditches excavated along the downstream toe of the proposed TMF dams will collect seepage and contact runoff in a series of pumping stations, where the collected water will be pumped back into the TMF reclaim pond. Water in the TMF reclaim pond will in turn be pumped to the reclaim tank at a rate dictated by water requirements in the Ore Processing Facility and the TMF reclaim pond water management strategy. While the water quality of pumping stations surrounding the TMF are predicted to reflect that of the process water (Section 4.0), seepage losses to groundwater and the associated impacts are expected to be negligible, as the pumping stations are to be operated at the minimum practical water level and should never accumulate significant pressure head (i.e. all inflow is immediately pumped back to the TMF reclaim pond).

The drainage system surrounding the remaining mine facilities follows the same design principal as the TMF, where all contact water reports to a series of pumping stations located in topographic lows, via a series of ditches excavated in native soil. The pumping stations not associated with the TMF are proposed to report to the PPCP. Water collected in the PPCP will be used directly by the Ore Processing Facility, with excess water being discharged to the environment after treatment at the ETP.

INFORMATION REQUEST – MNR-121

Source: Ministry of Natural Resources

Summary of Comment

The project site falls well outside jurisdictional boundaries for the Town of Atikokan and the Niobe Volunteer Fire Department therefore ongoing dialogue needs to take place with municipal leaders / local fire chiefs to confirm the continued availability of fire protection services as the project progresses throughout the various phases. It is also reasonable to expect that the level of protection may be compromised due to the delayed response time as the distance from both fire halls (Atikokan and Niobe) to the project site is significant.

Potential Environmental Effects

The type of fire will dictate what type of fire fighting equipment and training is required for personnel to safely respond.

Proposed Action

Ensure fire protection agreements are in place and current throughout various phases of the project.

Reference to EIS

EIS: 3.3.4.2.3 (Pg. 3-151)

Response

Yes, Osisko expects to have ongoing discussions with municipal service providers as part of the Atikokan/OHRG Committee. However, as discussed in Chapter 8, Section 8.2.4.1, OHRG will maintain the capability to respond to fires on or near the Project. To achieve this, OHRG will:

- Maintain adequate pumping capacity at all times to meet anticipated fire suppression requirements;
- Develop and implement procedures for making sure that the potential for fires in the vicinity of the Project is minimized on an ongoing basis; and
- Maintain fire-fighting equipment in good working order.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-122

Source: Ministry of Natural Resources

Summary of Comment

Clarify whether "Fires (on-site)" refers to structural fires only, or any type of fire (structural or forest fire) that occurs within the project area

Potential Environmental Effects

If personnel might be relied upon for initial response to forest fires, additional information is required to ensure this can be carried out safely

Proposed Action

If fire response agreements are established with Atikokan or Niobe, include under Implementation, Management or Mitigation column and renewal schedule (e.g. Annually) under Monitoring Objective and Plan.

Reference to EIS

EIS: Table 8-8 Fires (On Site) Pg. 8-28

Response

Yes, fires on-site refers to structural fires only. Forest fires are discussed in the following row. Yes, Osisko intends to develop a fire response agreement with the Town of Atikokan. This intention has been included in the table, along with a plan to review and renew the agreement on an annual basis.

INFORMATION REQUEST – MNR-123

Source: Ministry of Natural Resources

Summary of Comment

Is the intent to have some staff on-site trained to provide initial response to forest fires if conditions are safe for them to do so (the same training that Osisko personnel received during exploration phase in 2011)?

Potential Environmental Effects

The FPPP will provide clear direction on prevention and preparedness activities which include specifics regarding training, communications, equipment, and prevention measures. Consideration should also be given to requirements under the Forest Fires Prevention Act (equipment requirements, open air burning guidelines, etc).

Proposed Action

Implementation, Management or Mitigation - Update the Fire Prevention and Preparedness Plan that was developed in 2011 to capture changes resulting from the transition from exploration to construction and operations. Plan to identify process for monitoring equipment and training requirements. Monitoring Objective Plan - recommend annual review of Fire Prevention and Preparedness Plan and document / analyze fire incidents to improve prevention measures

Reference to EIS

EIS: Table 8-8 Forest Fire (Pg. 8-28)

Response

Table 8-8 (now Table 8-11 in the revised EIS/EA report) has been revised as per proposed action.

INFORMATION REQUEST – MNR-124

Source: Ministry of Natural Resources

Summary of Comment

Lots of good information here however these should be tied together and further elaborated on through the development (or update to) a Fire Prevention and Preparedness Plan. Reference is made to a Fire Safety Plan - suggest using terminology that is consistent with the plan developed previously by Osisko (and other industry) and reference as Fire Prevention and Preparedness Plan.

Potential Environmental Effects

Provides direction for activities including (but not limited to) disposal of refuse on land being cleared; buffer requirements in vicinity of mines; accumulation of flammable refuse; smoking; spark arrestors; open air burning

Proposed Action

Recommend updating FPPP to capture changes resulting from shift to Construction and Operating phases. Provide statement in report that clearly identifies the intent of the Fire Prevention and Preparedness Plan (provides detail on specifics related to training, equipment requirements, communications, prevention).

Reference to EIS

EIS: section 8.2.4.1 (Pg. 8-30)

Response

“Fire Safety Plan" has been replaced with "Fire Prevention and Preparedness Plan". The table and section have been revised to reflect Osisko's intention to update the 2011 plan based on construction, operations and closure activities.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-125

Source: Ministry of Natural Resources

Summary of Comment

Forest Fires Prevention Act is missing from table.

Potential Environmental Effects

None

Proposed Action

Jurisdiction / Department - Ontario Ministry of Natural Resources; Applicable Act or Regulation - Forest Fires Prevention Act and Ontario Reg 207/96; Activities That May Require Permit or Approval - slash pile burning as a result of land clearing if a body other than the SFL carries out this activity (if the SFL conducts slash pile burning, authority falls under the CFSA if it is submitted as part of the Annual Work Schedule).

Reference to EIS

EIS: Table 10.1 (Pg. 10.1)

Response

The Forest Fires Prevention Act has been added to Table 10.1

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-126

Source: Ministry of Natural Resources

Summary of Comment

Footprint for camp expansion will require 30m buffer - need to confirm whether existing authorization / permit for land use allows adequate space to comply with FFPA.

Potential Environmental Effects

The ER needs to address these potential effects.

Proposed Action

None

Reference to EIS

EIS: 4.2.9 (Pg. 4-20)

Response

The exploration camp has been dismantled and is not currently active. Although the footprint of the on-site accommodation camp for the Project will be located in a similar location as the exploration camp, it will include new buildings and infrastructure. All mine site infrastructure will be built with an appropriate cleared buffer as per the Forest Fires Prevention Act to minimize the risk of fire at all times.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-127

Source: Ministry of Natural Resources

Summary of Comment

Fishing - it is incorrect to say there will not be direct effects on fishing and that there will no residual adverse effects. It is expected there would be significant effects on sports fish.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

The potential impacts to fish stocks are completely absent in the ER and the AAR, with exception to one line in Table 9-1 that identifies a measure to maintain fish stocks. 1) the ER needs to better define this potential impact and 2) the suggested measure is not adequate in mitigating the impact (there is no legal mechanism that can be used to enforce a special restriction to anglers for Marmion Reservoir).

Reference to EIS

EIS Pg. 6-145

Response

Fishing was assessed using three indicators: recreational fishing participation; fishing areas, licence sales and harvest volumes; and baitfish areas and harvest volumes.

The Project will not result in the removal of any commonly-used public fishing areas. Furthermore the Project will not restrict access to any of these areas, except to workers staying at camp. Osisko has committed to limiting fishing by camp personnel while on-site to help maintain fish stocks.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-128

Source: Ministry of Natural Resources

Summary of Comment

The MNR will not be issuing tenure under a License of Occupation.

Potential Environmental Effects

Inaccurate information. It is important to accurately represent permitting and approval requirements as they relate to the project.

Proposed Action

The table needs to be amended with the various agencies and corrections made.

Reference to EIS

EIS: Section 10, Table 10-1

Response

All facilities, with the exception of the transmission line right-of-way, are located on lands in which Osisko holds mineral claims and will be administered under the Mining Act. Table 10-1 has been revised to reflect this.

INFORMATION REQUEST – MNR-129

Source: Ministry of Natural Resources

Summary of Comment

Hunting and Fishing - the EIS inadequately addresses these elements of the project. The EIS as well as the Socio Eco/Env report need to address the impacts of predicted increase in hunting and fishing. It also needs to be addressed in the operational phase as well (if not more than) the constructions phase. The report needs to identify the pressure on hunting and fishing that may result from workers residing at the accommodation camp as an adverse effect. As it is partly in the Socio/eco/env report.

Potential Environmental Effects

SAR

Proposed Action

As identified on Pg. 107 of the See TSD, there will be impacts from an increase in pressure to game and fish from the workers residing at the accommodation camp. The report identifies that there will be adverse effect and practical mitigation measures are required but they are not identified.

Reference to EIS

EIS: 6-155 and See TSD: section 3

Response

Hunting and fishing by workers will be restricted through a policy that is included in site training received by all personnel. The policy will clearly state that fishing and hunting is not permitted by workers while they are staying at site. This mitigation measure addresses the potential effects of additional hunting and fishing pressures from workers residing at camp.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-130

Source: Ministry of Natural Resources

Summary of Comment

There is omission of SAR - (Northern Bat- endangered)

Potential Environmental Effects

SAR

Proposed Action

Include in report description 2.2.3.1.4

Reference to EIS

EIS: Pg. 2.2.3.2

Response

Northern brown bat has not been observed in the vicinity of the Project site and was not listed as endangered at the time of baseline studies or report publication. Although the VECs for the Project will not be updated, additional field studies have been undertaken to determine the presence/absence of Northern brown bat and the need to develop mitigation measures. An effects assessment for bats has been completed, and is provided in the Supplemental Information package of the Terrestrial Ecology TSD. Sections of the EIS/EA Report have been updated according to the information in this memorandum.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-131

Source: Ministry of Natural Resources

Summary of Comment

Include endangered bat species in Executive summary. While this species of bat was not observed, there was no attempt to systematically assess them resulting in the author's conclusion in the terrestrial report that there is moderate potential for bats.

Potential Environmental Effects

SAR

Proposed Action

Include in ES as a moderate potential - suggest ecosite and snag density analysis be conducted to evaluate habitat potential and that additional work be undertaken at the abandoned shafts - general evaluation of bat occurrences can be determined though deployment of sound meters to support habitat analysis. As it stands now assessments conducted to date are inconclusive as to whether or not these endangered species are occurring at a site of interest, ubiquitous, or both.

Reference to EIS

ES-8

Response

A bat monitoring program was undertaken in 2013 to define baseline conditions with respect to the bat species and bat habitats in the project study areas. The monitoring program was conducted during both the maternity roosting season and the swarming period prior to hibernation. The survey methods consisted of both acoustic and visual assessments. Through this monitoring program, it was determined that maternity roosting habitat was present in the study areas and there is the potential for hibernacula in the study area. An effects assessment of the project on bats was completed. The detailed results of the monitoring program and effects assessment are provided in the Supplemental Information package of the Terrestrial Ecology TSD. The results of the monitoring program have been summarized in Chapter 3 of the Final EIS/EA Report and the results of the effects assessment have been summarized in Chapter 6.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-132

Source: Ministry of Natural Resources

Summary of Comment

It is difficult to follow the context of the habitat loss for Canada Warbler. Please express as follows: "The footprint of the mine is x ha, of which 465.11 ha (x %) is consistent with Canada Warbler habitat requirements".

Potential Environmental Effects

SAR

Proposed Action

As outlined.

Reference to EIS

EIS: 6.2.1.4

Response

The entire Project footprint will require clearing of approximately 1,240.31 ha of vegetation of which 465.11 ha (37.5 %) is consistent with Canada Warbler habitat requirements.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-133

Source: Ministry of Natural Resources

Summary of Comment

Canada Warbler - to provide context as it relates to impact on individuals - recommend expressing using predicted density extrapolated to the area of impact (465.11 ha).

Potential Environmental Effects

None

Proposed Action

As outlined.

Reference to EIS

EIS: 6.2.1.4

Response

The predicted number of individuals or pairs (Canada Warbler and the 21 BCR 12 priority species) displaced based on the density of bird species per habitat type has been calculated and is in the table attached.

Attachments

Table – Estimated Displacement of BCR Priority Species of Upland Breeding Birds

Attachment

Table: Estimated Displacement of BCR Priority Species of Upland Breeding Birds

Estimated Displacement of BCR Priority Species of Upland Breeding Birds						
BCR 12 Priority Species	**Habitat**	**Total area in Mine Site Area (ha.)**	**Mean Density (+/- SE)**	**Mean Density (birds/ha)**	**Estimated Displacement by Habitat (number of birds)**	**Estimated Total Displacement (number of birds)**
Bay-breasted warbler	dense mixed	150.49	0.03 +/- 0.05	0.03	5	108
	dense coniferous	430.43	0.24 +/- 0.11	0.24	103	
Blackburnian warbler	dense coniferous	430.43	0.07 +/- 0.07	0.07	30	41
	dense mixed	150.49	0.07 +/- 0.07	0.07	11	
Black-throated green warbler	dense coniferous	430.43	0.07 +/- 0.07	0.07	30	35
	dense mixed	150.49	0.03 +/- 0.05	0.03	5	
Canada warbler	dense coniferous	430.43	0.03 +/- 0.05	0.03	13	41
	dense deciduous	191.22	0.07 +-/ 0.1	0.07	13	
	dense mixed	150.49	0.1 +/- 0.1	0.1	15	
Chestnut-sided warbler	dense deciduous	191.22	0.14 +/- 0.13	0.14	27	32
	dense mixed	150.49	0.03 +/- 0.05	0.03	5	
Common yellowthroat	marsh	20.33	0.24 +/- 0.33	0.24	5	18
	open fen	48.52	0.24 +/- 0.21	0.24	12	
	thicket swamp	7.2	0.14 +/- 0.2	0.14	1	
Conneticut warbler	treed bog	16.63	0.36 +/- 0.5	0.36	6	6
Least flycatcher	dense deciduous	191.22	0.65 +/- 0.38	0.65	124	135
	dense mixed	150.49	0.07 +/- 0.07	0.07	11	
Mourning warbler	dense deciduous	191.22	0.07 +/- 0.1	0.07	13	33
	dense mixed	150.49	0.1 +/- 0.08	0.1	15	
	marsh	20.33	0.24 +/- 0.33	0.24	5	
Nashville warbler	conifer swamp	206.87	0.79 +/- 0.15	0.79	163	498
	dense coniferous	430.43	0.31 +/- 0.11	0.31	133	
	dense deciduous	191.22	0.14 +/- 0.13	0.14	27	
	dense mixed	150.49	0.51 +/- 0.18	0.51	77	
	open fen	48.52	0.48 +/- 0.21	0.48	23	
	thicket swamp	7.2	0.72 +/- 0.45	0.72	5	
	treed bog	16.63	0.72 +/- 0	0.72	12	
	treed fen	80.8	0.72 +/- 0.33	0.72	58	
Northern flicker	dense coniferous	430.43	0.03 +/- 0.05	0.03	13	19
	marsh	20.33	0.24 +/- 0.33	0.24	5	
	thicket swamp	7.2	0.14 +/- 0.2	0.14	1	
Purple finch	dense coniferous	430.43	0.03 +/- 0.05	0.03	13	30
	dense mixed	150.49	0.03 +/- 0.05	0.03	5	
	open fen	48.52	0.12 +/- 0.17	0.12	6	
	treed bog	16.63	0.36 +/- 0.5	0.36	6	
Ruffed grouse	dense deciduous	191.22	0.07 +/- 0.1	0.07	13	13
Swamp sparrow	conifer swamp	206.87	0.03 +/- 0.05	0.03	6	58
	dense mixed	150.49	0.03 +/- 0.05	0.03	5	
	marsh	20.33	0.24 +/- 0.33	0.24	5	
	open fen	48.52	0.84 +/- 0.4	0.84	41	
	thicket swamp	7.2	0.14 +/- 0.2	0.14	1	
Veery	dense deciduous	191.22	0.36 +/- 0.17	0.36	69	81
	dense mixed	150.49	0.07 +/- 0.07	0.07	11	
	thicket swamp	7.2	0.14 +/- 0.2	0.14	1	
White-throated sparrow	conifer swamp	206.87	0.51 +/- 0.16	0.51	106	550
	dense coniferous	430.43	0.55 +/- 0.23	0.55	237	
	dense deciduous	191.22	0.22 +/- 0.15	0.22	42	
	dense mixed	150.49	0.41 +/- 0.16	0.41	62	
	marsh	20.33	0.48 +/- 0.33	0.48	10	
	open fen	48.52	0.24 +/- 0.21	0.24	12	
	thicket swamp	7.2	0.72 +/- 0.45	0.72	5	
	treed bog	16.63	0.72 +/- 0	0.72	12	
	treed fen	80.8	0.79 +/- 0.31	0.79	64	
Yellow-bellied sapsucker	dense coniferous	430.43	0.07 +/- 0.07	0.07	30	62
	dense deciduous	191.22	0.14 +/- 0.13	0.14	27	
	dense mixed	150.49	0.03 +/- 0.05	0.03	5	

INFORMATION REQUEST – MNR-134

Source: Ministry of Natural Resources

Summary of Comment

The statement that the Project "is not expected to prevent the establishment of self-sustaining populations of known SAR requires further explanation. The footprint is going to impact habitat in the short term and will require efforts to restore habitat in the longer term to existing condition.

Potential Environmental Effects

SAR

Proposed Action

None

Reference to EIS

EIS: 6.2.1.5

Response

This statement refers to the fact that the removal of a relatively small portion of habitat with respect to the surrounding landscape was assessed as a residual effect on SAR in the area. The displacement of individual SAR from their habitat within the footprint of the mine is not expected to have a measurable impact on the populations of SAR in the vicinity of the project. The SAR that occur on the site do not have specialized habitat requirements that do not occur elsewhere in the MSA, LSA and RSA.

INFORMATION REQUEST –MNR-135

Source: Ministry of Natural Resources

Summary of Comment

The amount of direct habitat loss for Snapping turtle should be provided. It may be approximated as the sum of the small water bodies and wetlands that fall within the project footprint.

Potential Environmental Effects

SAR

Proposed Action

As outlined

Reference to EIS

EIS: 6.2.1.4

Response

Based on the open wetlands (marshes, graminoid fens) and the small open water areas within the footprint of the mine infrastructure, there will be approximately 32.69 hectares lost to the development. This is approximately 12% of the snapping turtle habitat in the LSA. However, this does not take into account the vast amount of snapping turtle habitat in Marmion Reservoir that is not included in the LSA boundaries. The small wetlands that will be impacted by the mine are negligible when compared with the amount of habitat available for snapping turtle in the embayments of the reservoir.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-136

Source: Ministry of Natural Resources

Summary of Comment

Section 6.2.1.4 includes an evaluation of effects for Canada Warbler, Snapping turtle and Bald Eagle but not for …bats, Common Nighthawk or Olive-sided-flycatcher.

Potential Environmental Effects

SAR.

Proposed Action

As outlined

Reference to EIS

EIS: Section 6.2.1.4

Response

The SAR that were taken through the assessment were the species that actually were confirmed using habitat in the LSA during the baseline field investigations. These are bald eagle, common nighthawk, Canada warbler, and snapping turtle. In section 6.2.1.4 of the EIS summarizes the effects assessment of the terrestrial TSD which provides a fulsome assessment of all potential effects on all the aforementioned SAR VECs. Olive-sided flycatcher was not recorded in the study areas during the three years of breeding bird surveys. As such they were not specifically included as a VEC species in the effects assessment. However, as olive-sided flycatcher shares similar habitat requirements, feeding strategies and range as the Canada warbler, the effects assessment for this Canada warbler should be considered relevant to this flycatcher.

Field investigations of bats on site were conducted in 2013 during the maternity roosting and hibernation periods. Habitat assessments, in addition to acoustic and visual surveys at potential key habitat features were carried out. Through this monitoring program, it was determined that maternity roosting and hibernacula habitat were both present in the study area and an effects assessment was completed. The detailed results of the monitoring program and effects assessment are provided in the Supplemental Information Package of the Version 2 Terrestrial Ecology TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-137

Source: Ministry of Natural Resources

Summary of Comment

Table 8.7 outlines the monitoring approach. The types of things discussed under residual effect appear to be more consistent with "harm and harass" rather than habitat loss.

Potential Environmental Effects

SAR

Proposed Action

Please amend

Reference to EIS

EIS: Table 8-7

Response

Table 8-7 in now Table 8-9 in the Final EIS/EA Report.

Table 8-9 has been revised to include the following three columns: parameter, method and frequency. Residual effects assessment is included in Chapter 6.

INFORMATION REQUEST – MNR-138

Source: Ministry of Natural Resources

Summary of Comment

Table 8.7 - Monitoring program Risk of Injury - The objective statement requires fuller consideration/explanation - It is predicted that an increased traffic flow will result in increased incidental mortality on Snapping turtle. The mitigation strategy is to reduce the speed limit and if necessary install passageways. The objective statement might better be expressed as "to assess the frequency and cause of mortality associated with mine activity and to determine areas where additional mitigation is warranted." The cause of mortality is not likely limited to the mine site but could be expect along the corridor that receives significant traffic increases. A more systematic monitoring program is required beyond a log book.

Potential Environmental Effects

SAR

Proposed Action

Amend objectives and provide additional monitoring.

Reference to EIS

EIS: Table 8-7

Response

Chapter 8 has been substantially revised based on comments received on the Draft EIS/EA Report. More detailed planning has been undertaken and tables have been revised to clearly meet requirements of the EIS Guidelines and Terms of Reference. As such, Table 8-8 now provides the Environmental Management Planning, Monitoring and Compliance for the Biological Environment. This table includes the following mitigation measures and monitoring objectives with relation to the potential effect of loss/injury of wildlife through nuisance interactions and/or accidents.

Potential Effect(s)	Potentially Affected VEC(s)	Mitigation Measures	Monitoring Objectives	Contingency / Non-Compliance Strategy
Loss/injury of wildlife through nuisance interactions and/or accidents (i.e., vehicle collisions).	Species at Risk Furbearers Upland breeding birds Moose	Develop and implement an industrial and domestic waste management plan including: ■ Appropriate management of food wastes ■ Use of appropriate waste receptacles to limit attraction of wildlife. ■ Worker education on proper waste management techniques and the risks associated with feeding wildlife and careless disposal of food waste. Worker awareness training of hazards to wildlife, including species at risk Speed limits will be posted and enforced on the access road and mine site road. Animals that become a nuisance will be trapped and moved to remote locations for release.	Ongoing review of the waste management program and improvement through adaptive management. Evaluation of the effectiveness of the wildlife management strategy through recording of losses of wildlife individuals from vehicle collisions	If required, revise the industrial and domestic waste management plan to include additional measures such as the installation of temporary wildlife barriers (fences), more frequent incineration of food wastes and strict enforcement of food waste policies. If required, appropriate signage may be posted to warn drivers of areas were frequent vehicle-wildlife interaction occur If required, install snow fencing or hoarding to re-direct snapping turtles from roads or culverts

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-139

Source: Ministry of Natural Resources

Summary of Comment

Subject to a better understanding of the baseline condition, monitoring for bats should be outlined in the table.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend

Reference to EIS

EIS: Table 8-7.

Response

Field investigations of bats on site were conducted in 2013 during the maternity roosting and swarming/hibernation periods. A supplemental to the Terrestrial TSD has been provided to present the findings of these investigations and assess the effects of the Project on bats. The baseline conditions are summarized in Chapter 3 of the final EIS/EA report and the results of the effects assessment are summarized in Chapter 6. Ongoing bat monitoring, consisting of acoustic and visual surveys at potential key habitat features are proposed in Chapter 8.

INFORMATION REQUEST – MNR-140

Source: Ministry of Natural Resources

Summary of Comment

Need clarification on what is entailed in "restoration". This word is used fairly often throughout this document, particularly when discussing mitigation for habitat losses. It implies to the reader that the affected areas of the landscape will be returned to their natural state. The remaining landscape resulting from mining activities will likely never be what it was, albeit new habitats will be created for wildlife, they will likely not be consistent with what was once there.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Reference to EIS

General comment

Response

The primary aim of restoration, once buildings and infrastructure are removed, is the establishment of a self-sustaining maintenance free vegetation cover. Given the Project climate and setting, natural vegetation will invade readily once impediments are removed. The only exception will be the TMF, where direct seeding will be necessary to promote vegetative growth.

Following mine closure, terrestrial portions of the site area will rapidly develop a renewed grassland cover, which will gradually revert to forest cover through the process of natural succession. Re-vegetation of the site will not include any foreign or introduced species; therefore the terrestrial flora should naturally restore itself back to forest populated by trees such as black spruce, jack pine, trembling aspen, and white birch. It is expected that the land will return to its former land use, including forestry, and recreation activities (hunting and fishing).

To prepare for natural revegetation, the following measures will be implemented, as appropriate:

- Buildings and other structures will be demolished to ground level.
- Concrete floor slabs will be broken in place using a hoe ram, and then covered with gravel or overburden.
- Redundant roadways and yard areas will be scarified.
- The overburden stockpile will be regraded, if necessary, and prepared.

INFORMATION REQUEST – MNR-141A

Source: Ministry of Natural Resources

Summary of Comment

Lakes mentioned in the document need to be labelled. All access Road names should be labelled on all maps; Sawbill, Hardtack, Reef and Premier Lake Roads. The weather station and radio tower should also appear on the maps as infrastructure related to the proposed mine and currently do not.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend names and maps accordingly.

Reference to EIS

Figures general

Response

Unnecessary detail has been removed from individual maps in order to improve readability and reduce clutter. Lakes are identified on the appropriate figures.

The locations of the weather station and radio tower have not been finalized. The location of these facilities will be selected during the detailed design phase of the project and will consider the location of planned and existing infrastructure.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-141b

Source: Ministry of Natural Resources

Summary of Comment

References in this section do not appear to line up.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Clarification required.

Reference to EIS

Terrestrial Ecology TSD Section 1.3

Response

The following sentence has been deleted: Project aspects that influence the terrestrial ecology evaluation are described in Sections 1.3 to 1.8.

INFORMATION REQUEST – MNR-142

Source: Ministry of Natural Resources

Summary of Comment

Premier Lake Road and Hardtack Road are forest access roads.

Potential Environmental Effects

Inaccurate information

Proposed Action

Please correct this in the text

Reference to EIS

Terrestrial Ecology TSD Section 1.3.1, page 7.

Response

Access to the Project Site is presently via two routes: the Premier Lake Road, a gravel forest access road that intersects Highway 623 near Sapawe and the Hardtack-Sawbill Road, a gravel forest access road that intersects Highway 622 northwest of the Town of Atikokan.

This information has been clarified in the Part A of the Terrestrial Ecology TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-143

Source: Ministry of Natural Resources

Summary of Comment

State source for information used to describe climate. Did this information come from the weather station that was installed at the site? The weather station does not appear on any of the maps in this document?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Clarification required.

Reference to EIS

Terrestrial Ecology TSD. Section 1.3.2, page 9.

Response

The source of this information is the Environment Canada National Climate Data and Information Archive for Atikokan Ontario, available on-line at:

http://climate.weatheroffice.gc.ca/climate_normals/results_e.html?stnID=3929&lang=e&dCode=0&StationName=ATI&SearchType=Contains&province=ALL&provBut=&month1=0&month2=12

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-144

Source: Ministry of Natural Resources

Summary of Comment

Would the operations phase also have impacts on terrestrial ecology, particularly wildlife? (i.e. noise from 24hr operations, light pollution)

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

EA Document, page 3-126, 3-127

Reference to EIS

Terrestrial Ecology TSD. Section 1.3.3, page 9

Response

The effects of the Project during the construction and operations phases are considered together, since the removal of habitat and alteration of drainage during construction will not be reversed until the closure phase when site decommissioning commences. Effects during the construction and operation phases are assumed to be similar.

INFORMATION REQUEST – MNR-145

Source: Ministry of Natural Resources

Summary of Comment

Consideration needs to be given for how measurable effects on a species (when specified as an indicator of the VEC) would be monitored and effects mitigated.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology TSD. Section 1.4, page 11.

Response

Section 1.4 (page 11) Incorporation of Traditional Knowledge does not discuss VECs, indicators and measures. It gives an overview of the processes to gather and use the knowledge of traditional use resources.

Table 1-2 Valued Ecosystem Components Selected for Terrestrial Ecology in Section 1.6 of the TSD contains the indicators and measures for each VEC selected. This is the framework for the assessment of effects. While traditional knowledge provides rationale for the selection of VECs (e.g. wetlands support many traditional use plants, furbearers are traditionally hunted and trapped for use by the First Nations and Métis in the area), it is not considered an indicator or measure of the VECs in the Terrestrial Ecology assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-146

Source: Ministry of Natural Resources

Summary of Comment

There appears to be a disconnect between indicators and measures in this table. Measures do not appear to consider the actual presence of the VEC s (identified as the indicator). This is troublesome for the reason that just because a habitat exists, does not mean that it would be used by the VEC (in the case of individual species) for a number of reasons. At this point in the text it is not clear how habitat suitability will be measured, although later in the text it appears that it is measured by ecosite, although this seems to be somewhat inconsistent between species. In the document, it abundance is assessed for only some of the VECs (like breeding birds and furbearers). How does this relate to how magnitude is being assessed?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Measurable effects should be determined by species presence or absence. How level of magnitude will be measured could also be included in this table. Mitigation should also consider individual species, not just habitat.

Reference to EIS

EIS 2-3 (also Terrestrial TSD Table 1-1)

Response

Habitat suitability was measured on a few different levels. Firstly, habitat suitability was measured qualitatively as we did not acquire data on the abundances of all VEC species in the study areas, nor is it possible to do so. Therefore, we used species-specific preferred habitat types and assumed that the VEC species use these habitats. This approach is considered to be conservative. The preferred habitat types are described using vegetation community classification (ecosite types). The ecosites are ranked as being of high, moderate or low suitability for each species based on knowledge of the species habitat requirements, literature review and/or forest land use planning guidance. The changes to habitat suitability are then based on the proportion of high and moderately suitable habitat lost.

Secondly, for those VECs in which relative abundances per habitat type could be measured (e.g. upland breeding birds) or an HSI model based on key life requisites had been developed (e.g. Lake Superior Region moose), a quantitative habitat suitability assessment was undertaken. The habitat suitability calculations were developed and/or modified through review of relevant scientific literature based on species-specific behaviour in relation to anthropogenic disturbances such as roads, edges, increased access for predators, decrease in cover, etc. The changes to habitat suitability were then based upon the existing conditions scenario versus the application of the Project.

To account for individual effects to changes in habitat suitability a scientific literature review was undertaken to understand and evaluate species-specific behaviour changes as a result of sensory disturbances and the habitats within range of those changes (e.g. noise level increases).

Magnitude was then applied to all the changes in the environment that are not fully mitigated. Magnitude was used as one criteria to evaluate the significance of changes in habitat suitability whether it be from loss of high suitable habitat or proportional change to habitat suitability indices or noise level intolerance in key habitat areas. The magnitudes were developed based on scientific literature, professional opinion and conservatism, and considers the normal range of variation in biological systems. Magnitude relates to relative (percentage) or absolute changes that are above or below baseline conditions, guidelines, or threshold values. In ecology, there are no guidelines or criteria with which to compare changes that constitute a low, moderate or high magnitude. Therefore, the measured change relates to the baseline conditions.

Mitigation measures proposed do include protective measures for potential impacts to individuals, such as noise attenuation measures, access road speed limit, predator control, etc.

INFORMATION REQUEST – MNR-147

Source: Ministry of Natural Resources

Summary of Comment

Wetlands also support other organisms such as fish, amphibians and reptiles, non - migratory birds would also use forest cover.

Potential Environmental Effects

It appears that impacts on this species are only assessed by changes in habitat. There doesn't seem to be any weight given to actual use of habitat by this species.

Proposed Action

Please elaborate.

Reference to EIS

EIS 2-3 (also Terrestrial TSD Table 1-1)

Response

The comment is noted. It is unclear what species the comment is referring to. However, the effects assessment provides a fulsome assessment of the proposed Hammond Reef Project on wetlands, fish, amphibians and reptiles, and non-migratory birds based on both species VECs and habitat VECs. The baseline data collected supports the analysis of habitat use by species VECs in the MSA and LSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-148A

Source: Ministry of Natural Resources

Summary of Comment

Why have amphibians and reptiles not been considered as a VEC?

Potential Environmental Effects

Incomplete information.

Proposed Action

Amphibians and reptiles should be assessed as a VEC.

Reference to EIS

EIS 2-3 (also Terrestrial TSD table 1-1)

Response

The snapping turtle has been considered as a VEC and thus acts as a surrogate for herpetofauna reliant on wetland and aquatic features to carry out their life histories.

INFORMATION REQUEST – MNR-148B

Source: Ministry of Natural Resources

Summary of Comment

Is muskrat the best species to choose for a VEC? Is there ample data on species occurrence in the areas that will be impacted from the development of the mine to monitor for effects?

Potential Environmental Effects

Amphibians and reptiles are considered to be key indicators of ecosystem health.

Proposed Action

Please clarify.

Reference to EIS

EIS 2-3 (also Terrestrial TSD Table 1-1)

Response

Muskrat was chosen as it is a common aquatic furbearer which is trapped frequently in the study areas. The selection of VECs was reviewed by MNR, and the VECs proposed were accepted by MNR reviewers.

We did consider a reptile VEC (snapping turtle) in the assessment. The snapping turtle acts as a surrogate for herpetofauna reliant on aquatic features to carry out their life histories.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-149

Source: Ministry of Natural Resources

Summary of Comment

In the text it is not clear what the "zone of influence". If it is discussed later in the text, it should be noted here.

Potential Environmental Effects

Incomplete information.

Proposed Action

Clarification required.

Reference to EIS

Terrestrial Ecology TSD. Section 1.7.2, page 16.

Response

The zone of influence is another way to describe the spatial extent of effects.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-150

Source: Ministry of Natural Resources

Summary of Comment

Red hatched line on map is not in legend.

Potential Environmental Effects

"Baseline" data being considered in this report doesn't really reflect the "baseline" ecological conditions that may have existed prior to project in area.

Proposed Action

Amend

Reference to EIS

Terrestrial Ecology TSD. Figure 1-3

Response

A revised figure has been provided. The red hatched line is a power transmission corridor.

Attachments

Revised Figure 1-3 (Terrestrial Ecology TSD)

600000 700000

5400000

N

Highway 17
Ignace
Raleigh Lake
Stormy Lake
Wawang Lake
Irene Lake
Jones Lake
White Otter Lake
Highway 622
Franklin Lake
Lizard Lake
Sawbill Bay
Light Lake
Turtle Lake
Dashwa Lake
PROJECT LOCATION
Marmion Lake
Hawk Bay
Pipa Lake
Relief Lake
Reserve Island
Steep Rock Lake
Atikokan
Calm Lake
Sapawe
Kawene
Owakonze
Quetico
Huronian
Mine Centre
Horse Collar Junction
Seine River Village
Flanders
Kashabowie
Burchell Lake
Shebandowan
Highway 17
Shabaqua Corners
Shabaqua
Highway 11
Glenwater
Sunshine
Kasakokwog Lake
Pickerel Lake
Quetico Lake
Namakan Lake
Wolseley Lake
Tubman Lake
Jones Lake
U. S. A.

LEGEND

- Project Location
- City/Town
- Small Community
- Power Transmission Line
- Provincial Highway
- Road
- Existing Railway
- River/Stream
- Lake
- Regional Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

5 2.5 0 5 10 15 20 25 30 35
SCALE 1:750,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	AVS	30 May. 2013		
REVIEW	KT	30 May. 2013		

FIGURE: 1-3

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequestsMNR150\TerrestrialRSA.mxd

INFORMATION REQUEST – MNR-151

Source: Ministry of Natural Resources

Summary of Comment

There doesn't seem to be any consideration given to the fact that mineral exploration activities in the area, related to this project prior to 2010, may have already impacted the use of the area by local wildlife.

Potential Environmental Effects

Need to fully consider habitat use to assess habitat losses.

Proposed Action

Please elaborate.

Reference to EIS

Terrestrial Ecology TSD. Section 2.0, page 21

Response

The baseline studies were carried out over a period of three years and are considered appropriate to characterize the existing environment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-152

Source: Ministry of Natural Resources

Summary of Comment

Why was sampling (wildlife inventory) only conducted in the snow free seasons? Habitats may be used differently by different organisms at different times of year in the study areas. There are a number of times in this document where there are statements implying that there is uncertainty related to winter use of a site (ex. page 52 related to moose).

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Need to consider winter uses of habitat features on the MSA, LSA and RSA

Reference to EIS

Terrestrial Ecology TSD. Section 2.0, page 21.

Response

It is understood that species use habitats differently during different time of the year, and in order to apply a conservative approach we focussed on the types of habitats available and assumed that if the habitat was suitable, then the wildlife in the area use it. We were provided with information from the MNR regarding moose overwintering habitat in the MSA or LSA and it was indicated that the study areas did not provide significant habitat in light of the abundance of forested cover surrounding the site.

The habitat suitability model for moose assumes that their annual life history requirements are met based on the four habitat types. In this model it is assumed that winter habitat is a function of coniferous cover. Evaluations that do not contain spruce/fir forests of a sufficient age are assumed to be unsuitable year-round habitat for moose. However, the predominant upland ecosites in the MSA and LSA based on aerial extent are ES-B (Black Spruce-Jack Pine), ES-E (Hardwood-Fir-Spruce Mixedwood), ES-F (Fir- Spruce Mixedwood) and ES-H (Spruce-Pine/Feathermoss), so winter habitat for moose does not appear to be limited in these study areas.

INFORMATION REQUEST – MNR-153

Source: Ministry of Natural Resources

Summary of Comment

Woodland Caribou have been observed in the area in the past, however it has been determined that this is no permanent population known to inhabit the area.

Potential Environmental Effects

Inaccurate information

Proposed Action

Please change the text to reflect this

Reference to EIS

Terrestrial Ecology TSD Section 2.1.1.1.1, page 21.

Response

Through consultation with the MNR in 2010 and 2011, a list of potential SAR was determined. During the initial meeting with the MNR in May 2010, Mr. Brian Jackson noted that the forest-dwelling boreal population of woodland caribou (Rangifer tarandus caribou), a species that is designated as threatened on both Schedule 1 of the Species at Risk Act and the Endangered Species Act was determined not to occur on or in the vicinity of the Project location. Additionally, the Project is located south of the area in which Ontario's Woodland Caribou Conservation Plan (OMNR 2010) is applicable because this species does not inhabit this part of Ontario anymore.

References

Ontario Ministry of Natural Resources 2010. *Ontario's Woodland Caribou Conservation Plan*. 24 pp.

INFORMATION REQUEST – MNR-154

Source: Ministry of Natural Resources

Summary of Comment

Need clarification on this statement: "The results of the wetland evaluations are under separate cover"

Potential Environmental Effects

Incomplete information

Proposed Action

Please provide clear direction on where to find these results.

Reference to EIS

Terrestrial Ecology TSD Section 2.1.1.1.4, page 22.

Response

Four wetland complexes were evaluated using the Northern Ontario Wetlands Data Evaluation and Scoring Record. These evaluations will be submitted to the MNR with the Supplemental Information package.

Attachments

CD containing wetland evaluation results (to accompany Supplemental Information Package).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-155

Source: Ministry of Natural Resources

Summary of Comment

Members from which communities assisted with field work? Is there a list in one of the other documents of communities that participated in these studies?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology TSD Section 2.1.2, page 22.

Response

The individuals were youth from the Fort Frances Chiefs Secretariat communities, Lac de Mille Lacs First Nation and the Metis Nation of Ontario.

INFORMATION REQUEST – MNR-156

Source: Ministry of Natural Resources

Summary of Comment

NRVIS - what about resource users such as Bait harvester, BMA and trapper? What about other tourism values?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology TSD. Section 2.1.3, Page 23.

Response

The comment is relating to information sources that were used in the secondary data review that informed the Terrestrial Ecology TSD. Yes, the NRVIS provides information about resources users and tourism establishments. This information was collected by the socio-economic component. Although changes to the terrestrial environment can affect harvesting, trapping and tourism, the extent of these effects was considered by the socio-economic component through the selection and evaluation of several land and resource use VECs, including: outdoor recreation and tourism, hunting, trapping and fishing.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-157

Source: Ministry of Natural Resources

Summary of Comment

Resource Reports for WMU 12B - why is 12B only being considered for background data?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology TSD. Section 2.1.3, page 23.

Response

Data request from MNR provided resource reports for WMU12b only. WMU 12b is the RSA and contains the MSA and LSA. MNR manages and assesses resources in WMUs and it was thought to be a relevant study area for this reason.

INFORMATION REQUEST – MNR-158

Source: Ministry of Natural Resources

Summary of Comment

Contact with local naturalists and Hunters - was the BMA, BHA and trapper included in this assessment? What about the local conservation officers? May also want to mention here that there is a no hunting zone in this area during hunting season.

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology TSD. Section 2.1.3, page 23

Response

The comment is relating to information sources that were used in the secondary data review that informed the Terrestrial Ecology TSD. Yes, the terrestrial biologists spoke directly with local naturalists and hunters. Other local resources users including holders of bear management, bait harvesting and trappers licenses were contacted through the socio-economic and consultation programs, as were the local conservation officers. A description of the existing land uses, including hunting is provided in the Socio-economic TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-159

Source: Ministry of Natural Resources

Summary of Comment

This section is a bit broad. Why was the Sapawe FMP not reviewed for ecological values, and only the IFA? Likewise, why was the IFA for the Crossroute SFL not reviewed?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology TSD. Section 2.1.3, page 23.

Response

The available on-line information for the Crossroutes Forest and the Sapawe Forest were reviewed to give a regional context for the Project. Portions of both the Sapawe FMP and the Crossroutes FMP were reviewed. Specifically, we reviewed all the natural values maps from both FMPs. In comparison to the data we received from NRVIS, there was no additional information in the FMPs. We also reviewed the Crossroutes Forest Independent Forest Audit and there was no new natural resource values information.

The information contained in these documents would not change the assessment in any way.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-160

Source: Ministry of Natural Resources

Summary of Comment

Another information source that could be used is the online "e-bird" database. (www.e-bird.org).

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.3 page 23.

Response

We did a search of e-bird and did not find any data pertaining to the study areas at that time.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-161

Source: Ministry of Natural Resources

Summary of Comment

Secretive marsh bird surveys - need clarification on sentence "Stations were spread throughout the Project Site". It appears that survey sites were spread about the LSA. Is this correct?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.4. Field Studies

Response

Yes, this statement is misleading. The secretive marsh bird surveys were spread throughout the LSA as depicted on Figure 2-2 of the Terrestrial TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-162A

Source: Ministry of Natural Resources

Summary of Comment

Need clarification - Are the marsh bird monitoring taken at the same locations as the secretive march bird surveys?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please provide more detail in the text.

Reference to EIS

Terrestrial Ecology Technical support Document. Figure 2.2

Response

Yes, they are the same surveys and survey stations.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-162B

Source: Ministry of Natural Resources

Summary of Comment

Potential Bat Habitat shown on this map. These types of locations are considered sensitive information are should not be displayed.

Potential Environmental Effects

Not in compliance.

Proposed Action

Refer to the data share agreement that describes how sensitive information should be recorded and/if displayed.

Reference to EIS

Terrestrial Ecology Technical support Document. Figure 2.2

Response

Figure has been updated, with the potential bat habitat removed. Please see attached figure.

Attachments

Updated Figure 2.2

600000 610000 620000

5430000 5420000

INSET MAP 1

EWPW12/ HRFR19
HRMMP03
EWPW09/ HRFR14
HRMMP04
EWPW11/ HRFR16
EWPW08/ HRFR13
500 0 500
METRES

INSET MAP 2

HRMMP11
EWPW24
HRMMP13
EWPW13/ HRFR17
LAKEWATCH03
HRFR05
EWPW23/ HRFR26
LAKEWATCH02
500 0 500
METRES

INSET MAP 3

LAKEWATCH01
LAKEWATCH04
HRFR01
EWPW20/ HRFR23
EWPW19/ HRFR22
EWPW18
500 0 500
METRES

EWPW14/ HRFR18
HRMMP10
HRMMP12
HRMMP09
EWPW10/ HRFR15
HRMMP05
EWPW01/ HRFR06
HRMMP01
HRMMP02
EWPW22/ HRFR25
HRFR02
HRFR03
EWPW21/ HRFR24
HRMMP14
EWPW02
HRMMP15
Highway 622

Sawbill Bay
Mitta Lake
Lynxhead Bay
Marmion Reservoir

N

LEGEND

- Lakewatch Survey
- Nightjar/Nocturnal Point Count Survey
- Nocturnal Anuran Survey
- Secretive Marsh Bird Survey
- Provincial Highway
- Trail
- Road
- Power Transmission Line
- River/Stream
- Lake
- Wetland
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities
- Local Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000 3,000 4,000
SCALE 1:85,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
MARSH BIRD SURVEY, LAKE WATCH SURVEY, AND CREPUSCULAR/NOCTURNAL BIRD SURVEY STATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	17 Jun. 2013		
CHECK	AVS	17 Jun. 2013		
REVIEW	KT	17 Jun. 2013		

FIGURE: 2.2

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\TerrestrialMarshBirdLakeWatchNocturnalSurveyStations.mxd

INFORMATION REQUEST – MNR-163

Source: Ministry of Natural Resources

Summary of Comment

It doesn't appear that any surveys, aside from breeding bird, occurred in the wetlands that will be covered up by the tailings management facility - why is this? It also appears that some of the wetlands are not mapped (ecosites classed as W19, 18, 22 and 24 - can be seen on the imagery on Figure 13 in Appendix 2.111). How does this relate to the “presence of species" (as the indicator)? Where did the vegetation community surveys occur?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Figure 2.2

Response

In addition to breeding bird point counts within the footprint of the TMF (particularly within the wetland areas), other baseline wildlife surveys included secretive marsh bird surveys, anuran call counts and turtle basking and nesting surveys. Wetland evaluation surveys and detailed vegetation surveys also occurred in the wetlands within the footprint area of the TMF. The wetland evaluation surveys, plant inventory and vegetation community classification field work occurred throughout the MSA and LSA. The wetland communities are all mapped on plates 1-22 in Appendix 2.III.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-164

Source: Ministry of Natural Resources

Summary of Comment

How is "significant habitat" defined?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.4.1 page 27.

Response

“Significant habitat” is defined using the *Significant Wildlife Habitat Technical Guide* (OMNR 2000).

INFORMATION REQUEST – MNR-165

Source: Ministry of Natural Resources

Summary of Comment

Where are the descriptions of the vegetation documented (photos, etc. as mentioned in the text)? It appears that the table in the appendix 2.11 assesses probability of presence, and not actual presence? Where is the information what plant communities were assessed, and where?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.4.1 page 27.

Response

Appendix 2.II Table 2 - Description of Upland and Wetland Ecosite Communities in the Local Study Area provides detailed descriptions of the upland and wetland ecosites found in the MSA and LSA. Photos are stored in Golder files. All plant species contained in Appendix 2.II Table 3 were found in the Local Study Area (see response to MNR-212). The additional part of Table 3 is the occurrence of these species within the given ecosite communities in the LSA. As described in the notes for Table 3, a capital H in the table denotes a high probability of presence/presence confirmed in these vegetation communities.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-166

Source: Ministry of Natural Resources

Summary of Comment

Is the Project area consistent with all 3 study areas in the discussion about secretive marsh bird surveys?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.4.2.1 page 30.

Response

The secretive marsh bird survey stations are depicted on Figure 2-2 of the Terrestrial TSD. They are located throughout the LSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-167

Source: Ministry of Natural Resources

Summary of Comment

Were these surveys mentioned here, with exception to whip-poor-will surveys not conducted to detect all species, and habitat use in area? Therefore, SAR species would be included. I do not think that these surveys were conducted specifically to detect SAR and is a bit misleading to the reader.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please amend.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.1.4.2.5, page 34

Response

The surveys noted in this section are all methods used to detect certain taxa. If species within that taxa are SAR with the potential to be on Site then these are the surveys used to detect them. For example, secretive marsh bird surveys have the potential to detect Yellow Rail and Least Bittern as much as other common species.

INFORMATION REQUEST – MNR-168

Source: Ministry of Natural Resources

Summary of Comment

Need to make some sort of connection to these protected areas and the mine - is it anticipated that they will be impacted? Why is the Side Lake CR, and Campus Lake CR are not mentioned (they are located in the vicinity of Turtle River- White Otter Provincial Park).

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology TSD. Section 2.2, page 34

Response

It is not anticipated that the mine will impact these parks as they are located at least 20 kilometres from the proposed mine facilities. The Side Lake CR and Campus Lake CR were not included as they are located in the vicinity of the Turtle River-White Otter Provincial Park and are located at such a distance from the proposed mine as not to be impacted.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-169

Source: Ministry of Natural Resources

Summary of Comment

Sapawe Forest = Sapawe Forest Management Unit

Potential Environmental Effects

Inaccurate information

Proposed Action

Amend

Reference to EIS

Terrestrial Ecology TSD Section 2.2.2.1.1, Page 36

Response

In Information Request MNR-16, MNR identified that the Crossroute Forest is now under Resolute Forest Products and Sapawe Forest is now under Rainy Lake Tribunal Resource Management Inc. The proper names have been replaced throughout the EIS/EA Report, and have been clarified in the Terrestrial Ecology TSD cover letter.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-170

Source: Ministry of Natural Resources

Summary of Comment

I do not think there should be a small community symbol at the top end of Steep Rock Lake.

Potential Environmental Effects

Inaccurate information

Proposed Action

Amend

Reference to EIS

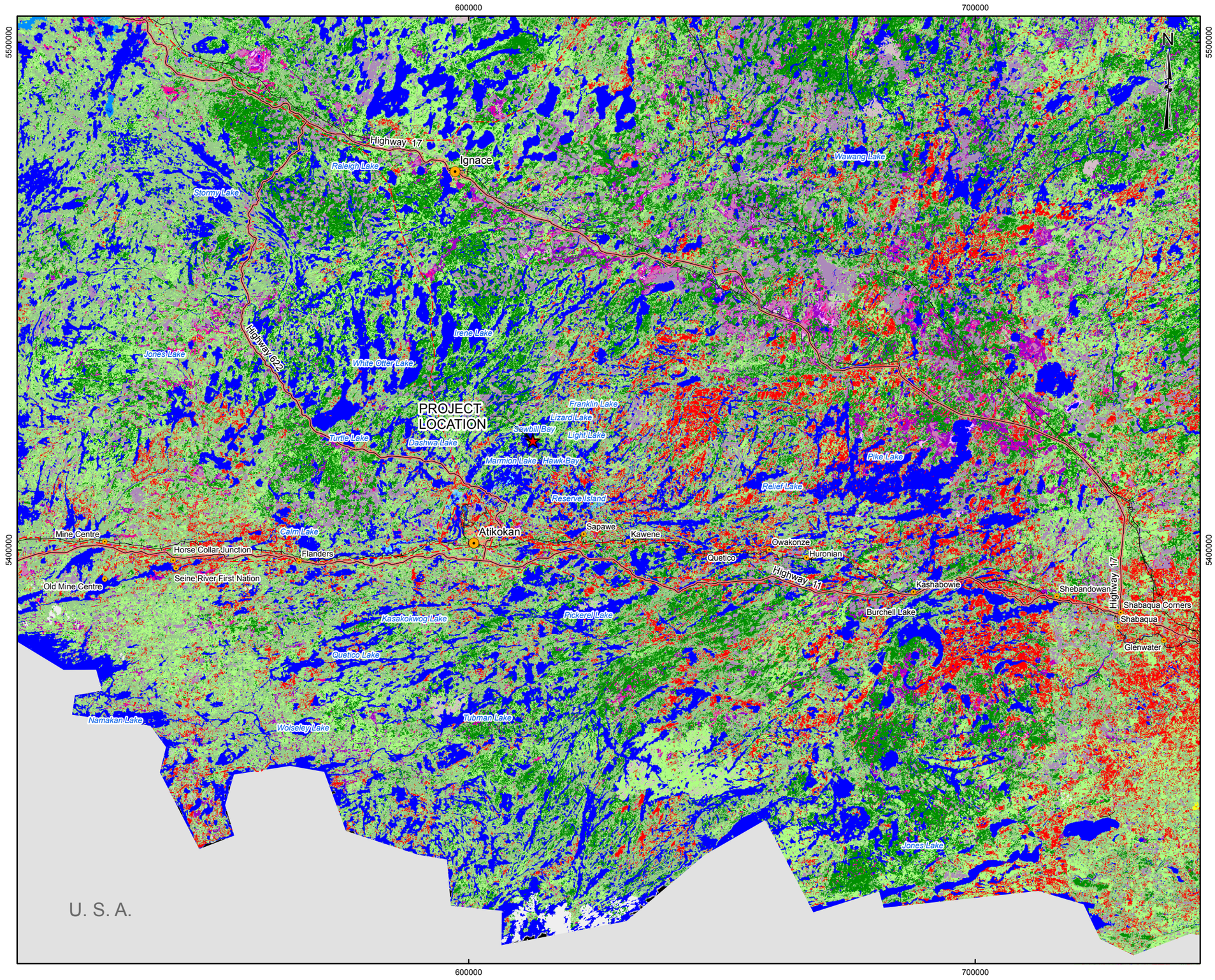
Terrestrial Ecology Technical support Document. Figure 2-5

Response

A revised figure has been provided.

Attachments

Revised Figure 2-5 (Terrestrial Ecology TSD)



LEGEND

- Project Location
- City/Town
- Small Community
- Provincial Highway
- Existing Railway
- Regional Study Area

Land Cover

- Water - deep clear
- Water - shallow / sedimented
- Settlement / Infrastructure
- Sand / Gravel / Mine Tailings
- Bedrock
- Mudflats
- Forest Depletion - cuts
- Forest Depletion - burns
- Forest - regenerating depletion
- Forest - sparse
- Forest - dense deciduous
- Forest - dense mixed
- Forest - dense coniferous
- Marsh - intertidal
- Marsh - supertidal
- Marsh - inland
- Swamp - deciduous
- Swamp - coniferous
- Fen - open
- Fen - treed
- Bog - open
- Bog - treed
- Tundra Heath
- Agriculture - Pasture / abandoned fields
- Agriculture - cropland
- Other - unknown
- Other - cloud / shadow
- Seine River Wetland Mapping

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

5 2.5 0 5 10 15 20 25 30 35
SCALE 1:750,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
LANDCOVER IN THE REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	AVS	30 May. 2013		
REVIEW	KT	30 May. 2013		

FIGURE: 2-5

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-171

Source: Ministry of Natural Resources

Summary of Comment

Seine River Village - Should this be the community of Seine River First Nation?

Potential Environmental Effects

Inaccurate information

Proposed Action

Amend

Reference to EIS

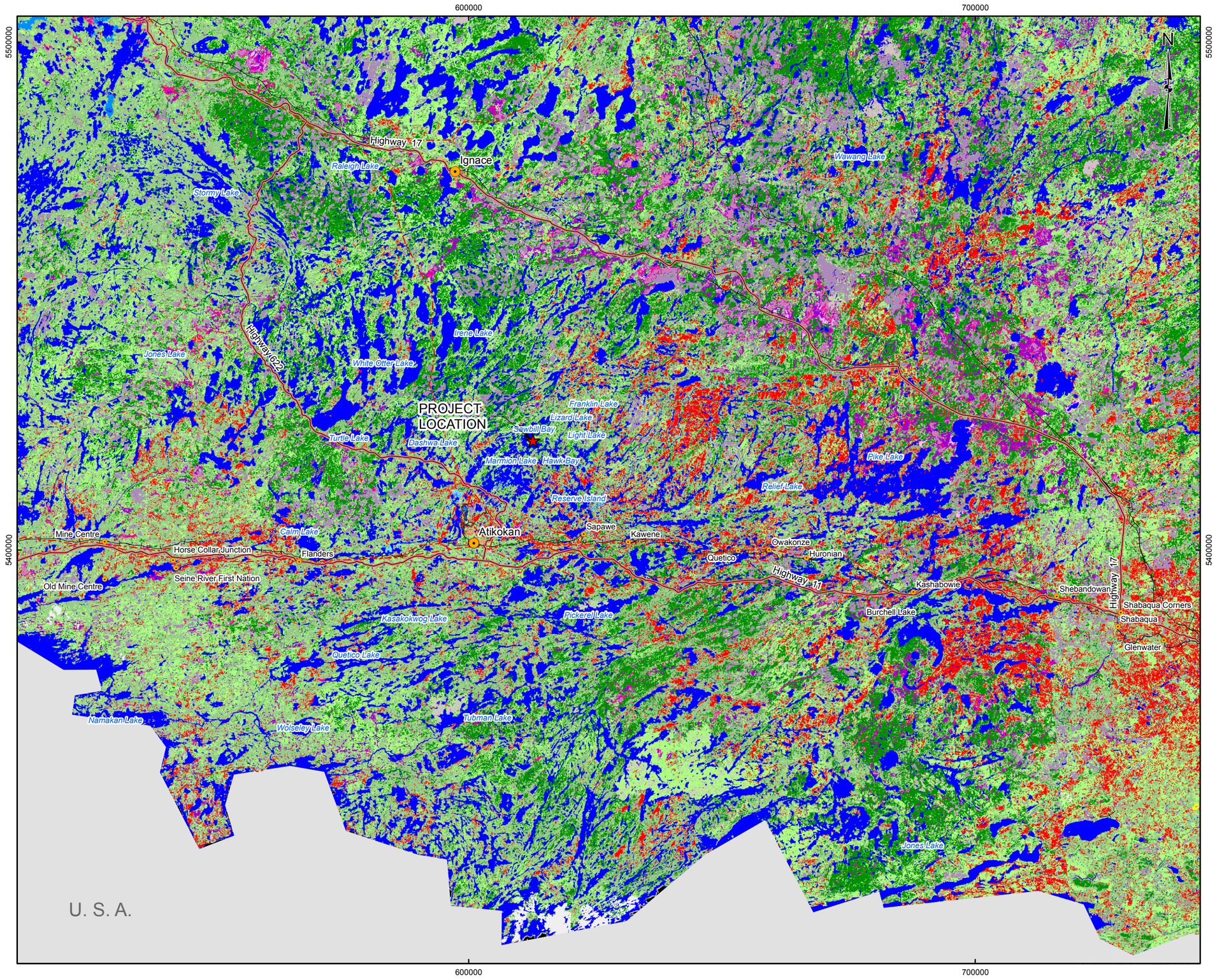
Terrestrial Ecology Technical support Document. Figure 2-5

Response

A revised figure has been provided.

Attachments

Revised Figure 2-5 (Terrestrial Ecology TSD)



LEGEND

- Project Location
- City/Town
- Small Community
- Provincial Highway
- Existing Railway
- Regional Study Area

Land Cover

- Water - deep clear
- Water - shallow / sedimented
- Settlement / Infrastructure
- Sand / Gravel / Mine Tailings
- Bedrock
- Mudflats
- Forest Depletion - cuts
- Forest Depletion - burns
- Forest - regenerating depletion
- Forest - sparse
- Forest - dense deciduous
- Forest - dense mixed
- Forest - dense coniferous
- Marsh - intertidal
- Marsh - supertidal
- Marsh - inland
- Swamp - deciduous
- Swamp - coniferous
- Fen - open
- Fen - treed
- Bog - open
- Bog - treed
- Tundra Heath
- Agriculture - Pasture / abandoned fields
- Agriculture - cropland
- Other - unknown
- Other - cloud / shadow
- Seine River Wetland Mapping

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

5 2.5 0 5 10 15 20 25 30 35
SCALE 1:750,000 KILOMETRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
LANDCOVER IN THE REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	AVS	30 May. 2013		
REVIEW	KT	30 May. 2013		

FIGURE: 2-5

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INFORMATION REQUEST – MNR-172

Source: Ministry of Natural Resources

Summary of Comment

Mining and mineral exploration activities have also been anthropogenic activities that has had some impact on the natural landscape.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please include in the TSD.

Reference to EIS

Terrestrial Ecology TSD. Section 2.2.2.2, page 42

Response

The LSA has been subject to large-scale anthropogenic changes in the past which has had an impact on the some of the natural landscape. Activities such as power generation, logging, mining and mineral exploration, aggregate extraction and other human uses such as campsites and cutovers have created disturbances in vegetation communities which are at varying degrees of naturalization and succession.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-173

Source: Ministry of Natural Resources

Summary of Comment

The text indicates that this figure shows 9 different terrestrial/upland ecosites within the MSA and LSA. The actual figure seems to depict moose habitat, nesting sites and species observations. Please provide a figure of the ecosites.

Potential Environmental Effects

Incomplete information

Proposed Action

Please amend and clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Figure 2-10

Response

The text should not reference Figure 2-10 in this sentence. The figures which depict the ecosites in the MSA and LSA are in Appendix 2.II Map Sheets 1 through 22.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-174

Source: Ministry of Natural Resources

Summary of Comment

Bear Baiting Station = Bear Population Index Line. This appears to be the wrong figure when referenced back to the text.

Potential Environmental Effects

This potential habitat loss needs to be considered in the EA. It is not apparent where this is considered.

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Figure 2-10

Response

It is unclear from the comment what the reviewer is asking. Could the reviewer provide further clarification with respect to their concern?

Attachment

Revised Figure MNR-174 Wildlife Management Units

600000 700000

5500000 5400000

N

LEGEND

- Hammond Reef Gold Project Location
- City/Town
- River/Stream
- Lake
- United States

Wildlife Management Unit

- 12A
- 12B

Ignace

12A

Upsala

Savanne River

HAMMOND REEF
GOLD PROJECT

Seine River

Marmion
Reservoir

12B

Lac Des Mille Lacs

Turtle River

Mine Centre

Atikokan

Sturgeon Falls

Lac la Croix

U. S. A.

REFERENCE

Base Data - Global Dataset, LAND INFO Worldwide Mapping, LLC
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

25 0 25
SCALE 1:725,000 KILOMETERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
WILDLIFE MANAGEMENT UNITS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008	FIGURE: MNR-174	
GIS	SC	15 Nov. 2013		
CHECK	CC	15 Nov. 2013		
REVIEW	THW	15 Nov. 2013		

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\MNR174\WildlifeManagementUnits.mxd

INFORMATION REQUEST – MNR-175

Source: Ministry of Natural Resources

Summary of Comment

Building of the accommodation camp would result in the clearing of some forest cover. The construction of the ore processing facility will also result in clearing an area of forest cover.

Potential Environmental Effects

These potential pathways need to be considered in the EA.

Proposed Action

Please include these effects in the table.

Reference to EIS

Section 3.2.1, Table 3-4

Response

This correction has been identified in the Part A of the Terrestrial Ecology TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-176

Source: Ministry of Natural Resources

Summary of Comment

Initial open pit mining and activities associated with "mine" would impact wildlife in the categories specified in this table (this is a very noisy activity). Could wildlife be drawn to the tailings management pond?

Potential Environmental Effects

These species should be recognised as regionally significant in the EA.

Proposed Action

Please include these effects in the table.

Reference to EIS

Section 3.2.1, Table 3-5

Response

Updated table to include mining activities as having an interaction with wildlife. No, wildlife are not anticipated to be drawn to the tailings management facility.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-177

Source: Ministry of Natural Resources

Summary of Comment

Some of the species documented on the site are considered to be regionally significant species (OWES Northern Manual, 2002); for example greater yellowlegs, connecuit warbler and palm warbler.

Potential Environmental Effects

Need to be consistent with these statements.

Proposed Action

Amend

Reference to EIS

Terrestrial Ecology Technical support Document. Section 2.2.3.2, page 57.

Response

Golder notes that these are regionally significant species as outlined in Northern Ontario Wetland Evaluation System (Appendix 7) for Ecoregion 4. In the TSD, the bird species data was designated by global and provincial rarity, status under SARA and the Ontario ESA.

In addition to these rankings, a full analysis of the bird data according to the Ontario Landbird Conservation Plan was undertaken at the request of Environment Canada. This plan lists priority species within each Bird Conservation Region (BCR) to help guide landbird conservation efforts and ensure that populations of landbirds are sustained within the estimated range of natural variability. The distribution, diversity and abundance of BCR-12 priority landbirds in the LSA is provided in Appendix 2.VI.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-178

Source: Ministry of Natural Resources

Summary of Comment

Closure plan indicated that waste rock management facility (and piles) will not be revegetated as well.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.6.1.1, page 95

Response

The waste rock pile has been taken into consideration in the assessment of loss of natural land cover. This loss has been considered as a residual effect on wetland and forest cover as well as a residual effect on species VECs from habitat loss. Taken through the full impact assessment, the effect of the loss contributed by the waste rock pile and other project infrastructure has been evaluated as being of low significance due to:

- the availability of natural land cover in the surrounding areas of the MSA, LSA and the RSA; and
- re-naturalization of other parts of the Project footprint through progressive rehabilitation during operations and restoration opportunities during the closure and post-closure phases that are both feasible and practical.

INFORMATION REQUEST – MNR-179

Source: Ministry of Natural Resources

Summary of Comment

How can normal runoff flow direction be restored where there are dams in place, and piles from the tailings management facility that will influence surface drainage patterns?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical Support Document. Section 3.6.1.1, page 95

Response

The Tailings Management Facility (TMF) will result in a permanent change to the drainage pattern in that area. The TMF dams must remain in place in perpetuity to contain the tailings. Runoff from the revegetated tailings surface area of 675 ha will continue to collect in the TMF Reclaim Pond. After an initial period of pumping to the Open Pit, when water quality is acceptable for direct discharge, the emergency spillway will be lowered and flow from the TMF will be directed through the spillway channel into Sawbill Bay. This represents a permanent change in drainage because roughly half of the TMF footprint currently drains into Lizard Lake.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-180

Source: Ministry of Natural Resources

Summary of Comment

Which LSA is being referenced? The aquatic study LSA?

Potential Environmental Effects

Does water flow north from TMA? If so, that would impact the wetland being referenced in this discussion.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.3.1.3, page 97.

Response

Water flows south for the areas of the TMF. The water level changes in Sawbill Bay take this change in flows into account. The remaining wetlands downstream of the TMF are hydrologically connected to Sawbill Bay. The effects on these wetlands around Sawbill Bay have been considered with respect to the predicted changes in water level. However, with the current controls in place on water levels by the hydro production facility, the small predicted changes are not anticipated to have a residual effect on the wetlands in this area.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-181

Source: Ministry of Natural Resources

Summary of Comment

What area is being referenced when describing the areas beside the project - please provide clarification. Disruption of surface flows could impact wetlands in the LSA, is the information somewhere else in the text that supports this statement (please reference it here)?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.3.1.4, page 97.

Response

We could not find the word "beside" in this section. The change in surface water flow and water levels have been assessed for their impact on wetlands in the local study area in Sections 3.3.1.2 and 3.3.1.3.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-182

Source: Ministry of Natural Resources

Summary of Comment

If air quality effects can be observed up to 750m away, why isn't this area considered in the local study area (i.e. the area that would be impacted by the development)?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.3.1.5, page 98.

Response

In considering air quality effects, the full extent of changes (up to 750m) was considered. The local study area is based on the connectivity of terrestrial resource such as subwatersheds and the physical barrier between land and water. However, the effects assessment was not limited to those physical boundaries when the assessment of changes for air quality and noise were predicted. Instead these effects were assessed fully to the point where the air quality and noise disturbances went back to baseline.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-183

Source: Ministry of Natural Resources

Summary of Comment

There does not appear to be any plan to "restore" wetlands…this implies that they will be returned to their original state. This section seems to contradict itself, one sentence stated that there will be destruction (permanent) of some wetlands, but the next sentence says that these effects are reversible.

Potential Environmental Effects

Could the duration for this then be assessed as moderate?

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.3.3.6, page 101.

Response

Contingent on engineering constraints and the final topography of the site, every opportunity to restore wetlands and/or replenish the flow to wetlands post closure will be investigated. For example, after closure of the mine, the water quality in the TMF Reclaim Pond will be monitored to determine when it is suitable for direct discharge to the environment. At this point the water retention pond will be decommissioned and will be left in the post-closure state to re-naturalize as wetland. The TMF Reclaim Pond will continue to collect drainage which will eventually flow westward through the emergency spillway drainage channel before ultimately discharging into Sawbill Bay. This entire drainage path will be left to re-naturalize as wetlands in the topographically low lying areas as it makes its way into Sawbill Bay, thereby reinstating some of the wetland lost during construction and operations. Additionally, where it is feasible and practicable by engineering, the post-closure management of drainage off the TMF and the waste rock stockpile will be directed to wetland areas that lost their water supply during the construction and operation of the mine. There are numerous seepage ponds surrounding the waste rock stockpile and the TMF and once water quality is acceptable for discharge directly to the environment, the pumps will be turned off and the water will drain to the environment. As such, the topographical lows (i.e. natural wetland areas that were cut off from flow during the operation of the mine) will intercept drainage. Therefore, during the detailed design phase of the closure plan, feasible opportunities to reinstate wetlands will be further explored.

Another wetland re-naturalization opportunity which is being explored involves the open pits in closure and post closure. As the open pits fill with water, the area around the perimeter of the pits and the channel connecting the two pits are being explored for opportunities to restore/renaturalize wetland. At post-closure, where depths are suitable for wetland development (3 meters depth or less) this opportunity could create about 2.1 ha of wetland.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-184

Source: Ministry of Natural Resources

Summary of Comment

Species composition would vary from the original site. Soil conditions would be altered and may not be able to support what is currently there on the site. The closure plan indicates that sites will revegetate naturally; it would take decades to achieve a mature forest.

Potential Environmental Effects

Invasive species could outcompete native species.

Proposed Action

Please amend

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.4.1.2, page 108

Response

At closure, the Project Site will be rehabilitated as detailed in the Conceptual Closure and Rehabilitation Plan. This will restore some of the drainage, particularly surface runoff that was lost during the construction and operations period. Progressive rehabilitation of the site will take place during the operations of the mine in areas that are no longer in use (e.g. temporary laydown areas for construction, aggregate sites). Post mine closure, the topsoil that was scrapped off the site and stockpiled, will be spread over select site areas that are devoid of organic soils to accelerate re-vegetation. The TMF will be amended with fertilizer and revegetated for erosion protection, and the WRMF will be allowed to naturally revegetated with no soil or fertilizer amendment as is not expected to erode. It is expected that successional ecological processes will lead to the establishment of a community of colonizing species, such as Labrador-tea, white birch and trembling aspen. With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years. The TMF and WRMF will take longer.

To mitigate the transport and introduction of non-native plant species into native plant communities, construction equipment will be regularly cleaned on-site, particularly before moving into sensitive vegetation areas. Areas undergoing natural regeneration may need to be isolated until native vegetation established.

With the implementation of mitigation and environmental design features mentioned, it is anticipated to result in minor changes in the abundance and distribution of wetland plant species relative to baseline conditions. Therefore, the residual effect to the persistence of forest plant populations and communities from the introduction of non-native species is predicted to be negligible.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-185

Source: Ministry of Natural Resources

Summary of Comment

If depending on natural revegetation, this does give invasive species the opportunity to outcompete naturally occurring species. Where can the strategy that is being referred to in this section be referenced?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.3.1.6, page 109

Response

The invasive plant management strategy will be developed by Osisko prior to construction. The plan will be implemented during the construction and operational life of the project when disturbed areas are most susceptible to invasive plants from the activities on site (i.e. trucks and other equipment coming onto site from outside areas). With a diligent program in place during construction and operation which includes controls such as removals of invasive plants and monitoring, it is anticipated that natural regeneration of the site from seed sources in surrounding areas will be successful.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-186

Source: Ministry of Natural Resources

Summary of Comment

Project area on map? Unsuitable habitat mislabelled in legend (if consistent with next figure).

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section Figure 3-2

Response

A revised figure has been provided.

Attachments

Revised Fig 3-2 (Terrestrial Ecology TSD)

550000 600000 650000 700000

5500000 5450000 5400000 5350000

Highway 17
Ignace
Highway 17
Highway 622
Atikokan
Highway 11

N

LEGEND

- City/Town
- Provincial Highway
- Power Transmission Line
- Existing Railway
- Project Facilities
- Lake

Habitat Categories

- Least Suitable Habitat (0 - 0.31)
- Suitable Habitat (0.32 - 66)
- Most Suitable Habitat (0.67-1.0)
- Unstuitable Habitat
- Regional Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

18,000 0 18,000
SCALE 1:750,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
MOOSE HABITAT SUITABILITY INDEX BASE CASE

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	JO	23 Jan. 2013		
GIS	JO	30 May 2013		
CHECK	EG	30 May 2013		
REVIEW	EG	30 May 2013		

FIGURE: 3-2

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\MNR186\MooseHSI_Base_Case.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-187

Source: Ministry of Natural Resources

Summary of Comment

MAFA at the north end of Lizard Lake does not appear in figure 2-10.

Potential Environmental Effects

Incomplete information

Proposed Action

Amend

Reference to EIS

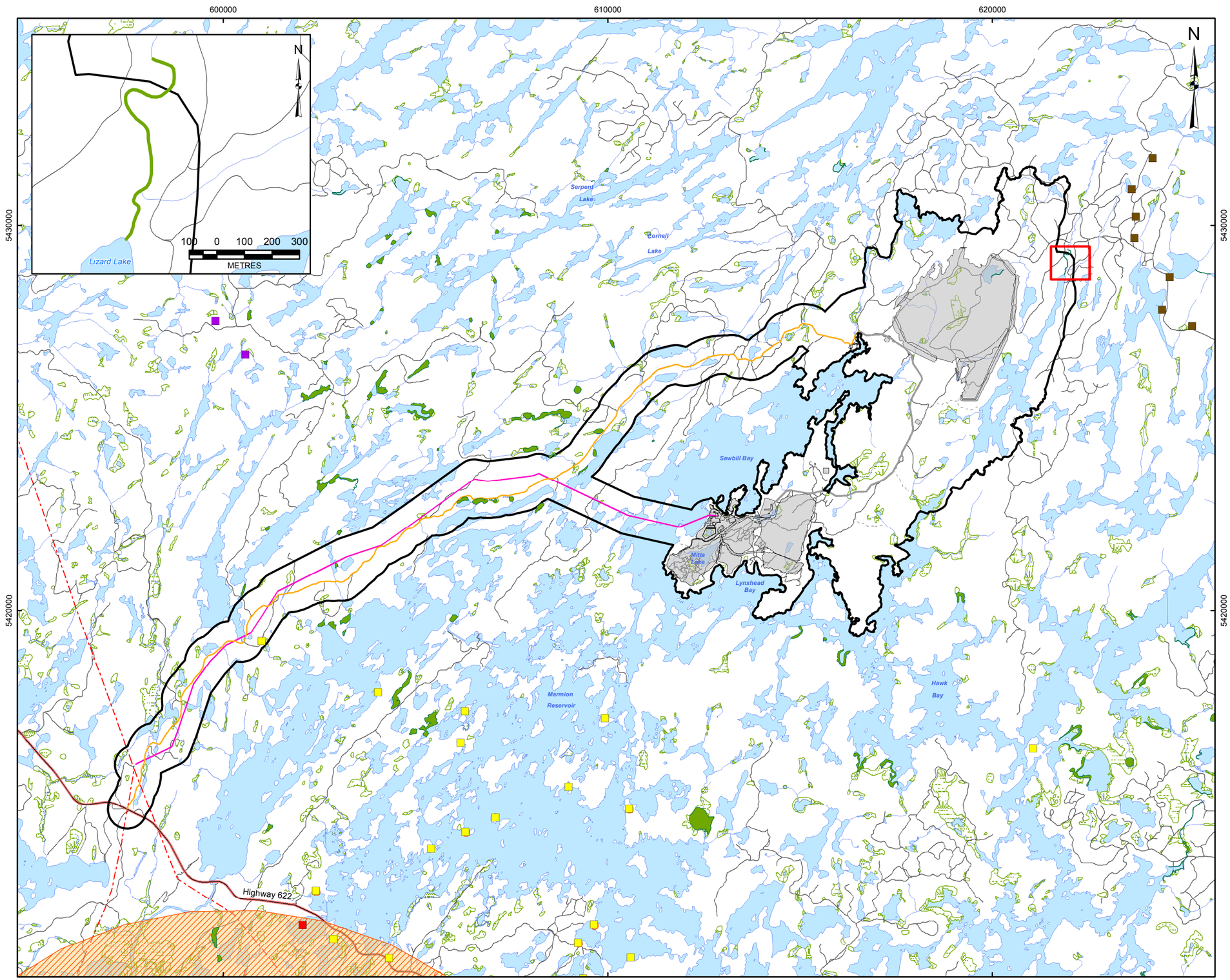
Terrestrial Ecology Technical support Document. Section 3.5.1.3, page 115

Response

The location of the MAFA at the north end of Lizard Lake had been highlighted on Figure 2-10.

Attachments

Revised Figure 2-10 (Terrestrial Ecology TSD)



LEGEND

- Bald Eagle Nesting Site
- Black Tern Nesting Site/Colony
- Great Gray Owl Nesting Site
- Great Blue Heron Nesting Site/Colony
- Osprey Nesting Site
- Bear Baiting Station
- Provincial Highway
- Trail
- Road
- Power Transmission Line
- River/Stream
- Lake
- Wetland
- Moose Aquatic Feeding Site
- Species Occurrence
- Species Observation
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities
- Local Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000 3,000 4,000
SCALE 1:100,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
MOOSE HABITAT, NESTING SITES, AND SPECIES OBSERVATIONS IN THE MINE AND LOCAL STUDY AREAS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	AVS	30 May. 2013		
REVIEW	KT	30 May. 2013		

FIGURE: 2-10

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\MNR187\Moose_Aquatic_Feeding_Sites.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-188

Source: Ministry of Natural Resources

Summary of Comment

When looking at the 0.01% of total area lost - should this be referencing the RSA?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.6.1.1, page 123

Response

Yes, the 0.01% does refer to the percentage of the RSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-189

Source: Ministry of Natural Resources

Summary of Comment

0.03% - referencing RSA?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.6.1.1, page 124

Response

Yes, the 0.03% does refer to the percentage of the RSA.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-190

Source: Ministry of Natural Resources

Summary of Comment

Would the buzz from the hydro line have an impact on species?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.6.1.5, page 127

Response

No, the potential for sound generated from the electrical transmission line is not considered to have a significant impact on wildlife.

INFORMATION REQUEST – MNR-191

Source: Ministry of Natural Resources

Summary of Comment

Habitat types in this section deviate from the eco site type system that is used to assess habitat (and losses) for other species in the LSA? Values for the size of the habitat in Table 2-11 do not appear to be consistent with the values presented in 3-22. The way this information is presented in this report makes it very difficult for the reader to follow along with the concepts presented in the text.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

It is suggested that the corresponding ecosite types be inserted into this table.

Reference to EIS

Terrestrial Ecology Technical support Document. Table 3-21

Response

The ecosite types were not used to analyze the breeding bird information due to the feasibility of having point count data in each ecosite community (or subset of). The broader habitat categories were used as it fits with the data collected and the methodology Environment Canada requested. A table that provides the different ecosites captured within each land cover category is provided in Appendix 2. II (Table 1).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-192

Source: Ministry of Natural Resources

Summary of Comment

Effects from noise assessed in section 3.8.1.2 is the same section that is being referenced. Would "baseline" conditions for birds already be considered lower due to the high levels of industrial activity in the area?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

Terrestrial Ecology Technical support Document. Section 3.8.1.2, page 147

Response

The baseline studies were carried out over a period of three years and are considered appropriate to characterize the existing environment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-193

Source: Ministry of Natural Resources

Summary of Comment

It is assumed that re-forestation will take place via natural succession (as indicated in the closure plan)? The largest habitat loss for birds is in the dense conifer habitats, how long is it anticipated for this habitat to re-grow? Also, there does not appear to be any estimations of what the terrestrial ecosystem will look like post mine closure (what habitat would be available post mine closure).

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Clarify the questions and provide estimations.

Reference to EIS

Terrestrial Ecology TSD. Section 3.8.3, page 152.

Response

Progressive rehabilitation of the site will take place during the operations of the mine in areas that are no longer in use (e.g. temporary laydown areas for construction, aggregate sites). It is expected that successional ecological processes will lead to the establishment of a community of colonizing species, such as Labrador-tea, white birch and trembling aspen. With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-194

Source: Ministry of Natural Resources

Summary of Comment

Will monitoring activities occur at the same stations that have been established in the baseline monitoring? Will all of the same species be monitored? Will this monitoring only occur up until 5 years after closure?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

Terrestrial Ecology Technical support Document. Section 4.0, page 155

Response

Some monitoring activities will occur at the same location established during baseline field surveys. For instance, breeding bird point counts will occur at the undisturbed baseline stations, where feasible. In the preliminary monitoring program developed field monitoring will occur for vegetation, breeding birds and all other incidental observations recorded in a wildlife log. The duration of the monitoring will be outlined in the detailed monitoring plan.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-195

Source: Ministry of Natural Resources

Summary of Comment

Not clear on what the blue dots are on this map - does this accurately reflect the footprint of the water management systems?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

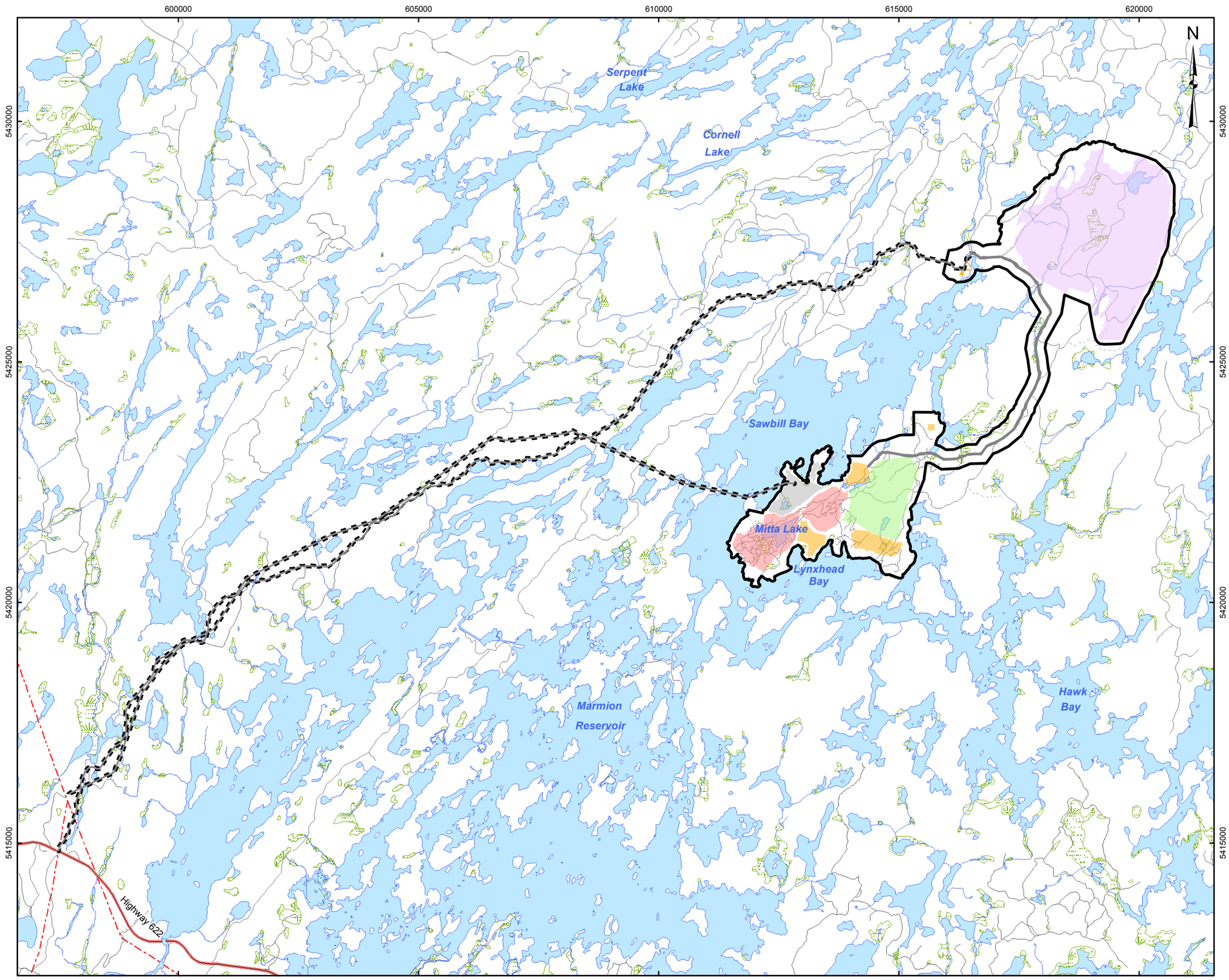
EA document Figure 1-3

Response

This comment also applies to Figure 2-1. Revised figures are provided.

Attachments

Revised EIS Figures 1-3 and 2-1



LEGEND

- Provincial Highway
- Road
- Power Transmission Line
- River/Stream
- Lake
- Wetland
- Linear Infrastructure
- Mine
- Waste Rock Management Facility
- Ore Processing Facility
- Tailings Management Facility
- Support and Ancillary Infrastructure
- Linear Infrastructure Study Area
- Mine Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

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PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

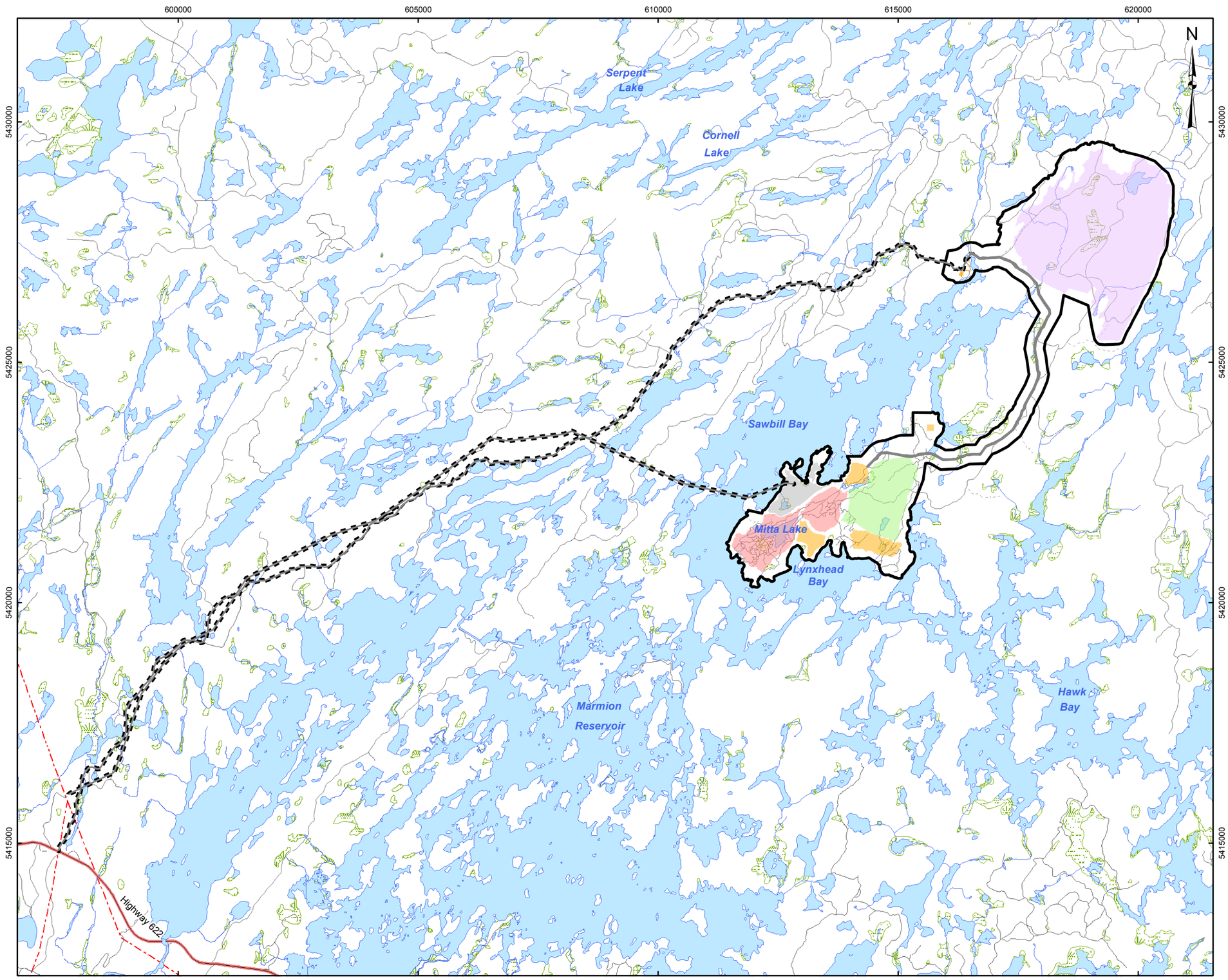
TITLE
MINE STUDY AREA AND LINEAR INFRASTRUCTURE STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	SP	30 May. 2013		
REVIEW	SP	30 May. 2013		

FIGURE: 1-3

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LEGEND

- Provincial Highway
- Road
- Power Transmission Line
- River/Stream
- Lake
- Wetland
- Linear Infrastructure
- Mine
- Waste Rock Management Facility
- Ore Processing Facility
- Tailings Management Facility
- Support and Ancillary Infrastructure
- Linear Infrastructure Study Area
- Mine Study Area

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

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SCALE 1:80,000 METERS

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
MINE STUDY AREA AND LINEAR INFRASTRUCTURE STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	30 May. 2013		
CHECK	SP	30 May. 2013		
REVIEW	SP	30 May. 2013		

FIGURE: 2-1

G:\Projects\2013\13-1118-0010_Osisko_Hammond_ReefGIS\MXDs\Reporting\InformationRequests\MNR195\ProjectComponents_v2.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-196

Source: Ministry of Natural Resources

Summary of Comment

To me, this figure implies that post closure commitments will cease in 2039? To this point in the text it is not clear if there is any type consideration given to monitoring and other maintenance activities that may be required after 2039.

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

EA Document Figure 1-4

Response

The post-closure monitoring programs for surface water and groundwater are summarized in Section 5.2 of the Conceptual Closure and Rehabilitation Plan (CCRP). Table 5-2 in that document provides details of the proposed frequency and minimum period of sampling for each station. In general, sampling will be discontinued 5 years after closure if certain conditions are met. There is also a provision for sampling the Open Pit overflow water for a period of at least 5 years after overflow occurs.

INFORMATION REQUEST – MNR-197

Source: Ministry of Natural Resources

Summary of Comment

There does not seem to be any consideration given to the effects that the water quality of the tailings ponds will have on local wildlife in this document.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please address.

Reference to EIS

EA Document General comment.

Response

In the Terrestrial TSD, the assessment of the effects of surface water and groundwater quality on all wildlife species VECs are considered but generally defer to the Human Health and Ecological Risk Assessment TSD (Section 5.0) for an in-depth assessment of the effects of contaminants in the environment. Specifically, the Ecological Risk Assessment looked at potential effects on wildlife based on water quality in the Tailings Management Facility (TMF) Reclaim Pond as well as seepage from the TMF to Lizard Lake.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-198

Source: Ministry of Natural Resources

Summary of Comment

Throughout the text there is inconsistency when referencing the Crossroute and Sapawe Forest Management Units.

Potential Environmental Effects

Inaccurate information

Proposed Action

Please use the correct terminology - forest management unit when referring to the Crossroute and Sapawe Forest Management Units.

Reference to EIS

EA Document General Comment

Response

Text has been revised and checked for consistency.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-199

Source: Ministry of Natural Resources

Summary of Comment

Fisheries Management Zone 5, not unit 5

Potential Environmental Effects

Inaccurate information

Proposed Action

Please use correct terminology when referencing fisheries management zones in the text.

Reference to EIS

EA Document, page 1-16

Response

Updated section 1.7.5: The Project Site is located within MNR Fisheries Management Unit Zone 5.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-200

Source: Ministry of Natural Resources

Summary of Comment

The number of BHAs will depend on the area being described, from the text it is not clear what area is being assessed when referencing that there are 10 BHAs present in the project area.

Potential Environmental Effects

Displacement of wildlife.

Proposed Action

Please provide the scope of the area.

Reference to EIS

EA Document, page 1-16.

Response

The sentence in the EA indicates that there are 11 Baitfish Harvesting Areas or Blocks within the project area. These blocks are based on a land area and are not specific to individual waterbodies. The reference to project area in this introductory section of the EA actually refers to the regional study area. There are only two blocks or Baitfish Harvesting Areas within the MSA, and these appear to be licensed to one baitfisher.

INFORMATION REQUEST – MNR-201

Source: Ministry of Natural Resources

Summary of Comment

It isn't clear what the exact footprint area of the camp will be, and there doesn't appear to be any mention in the text of anticipated wildlife displacement and impacts from the expansion of this area (i.e. habitat loss, noise, light pollution).

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment. Need to fully consider impacts that operations can have on wildlife in the area.

Proposed Action

Please provide rationale, or assessment in the text.

Reference to EIS

EA Document, page 1-25

Response

The exact footprint of the camp will be 1.58ha including the parking lot, 0.88ha without the parking lot. The assessment of effects includes the following potential pathways of interaction associated with the camp and human accommodation at the camp:

- sensory disturbance (e.g. noise, light, smells, human presence) that can decrease wildlife habitat quality and alter movement and behaviour;
- vehicle injury/mortality;
- dust deposition and air emissions; and
- attraction of wildlife to the camp and the Mine site (e.g. food waste, oil products).

The ecological risk assessment considers the effects of pollutants on plants and wildlife from the project including those emissions/discharges from the camp. The Noise TSD includes an assessment of the noise generating infrastructure at the camp.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-202

Source: Ministry of Natural Resources

Summary of Comment

Concerns with regard to the terrestrial study area boundaries. The text is not clear why the footprint of WMU 12B chosen to represent the regional study area as it may not represent the full extent of effects (i.e. why was not much area considered north of the project as south)? For the local study area, it does not appear that there has been any consideration given to impacts on species that may inhabit the islands that are in close proximity to the mine site (i.e. how noise from the project facilities would or would not affect some avian species that may inhabit these islands). Why do distanced monitored in each direction from the proposed mine site vary between directions?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please provide clarification on why/how these study areas were decided upon.

Reference to EIS

EA Document Figure 2-2J, 2-3F (also Terrestrial Ecology TSD, 1.7.2 page 16)

Response

In some cases, the local study area was selected based on ecological connections of terrestrial resource such as subwatersheds and the physical barrier between land and water rather than the distance to which effects will be experienced. This is not to say that the effects assessment does not take into consideration the spatial extent to which project effects such as noise, dust, etc. will travel. The terrestrial effects assessment does take this into consideration; however it was not felt applicable to choose a study area based on the effects of noise and dust distribution but rather to concentrate on ecological connections and natural movement corridors. The effects to those species inhabiting the islands would have been covered by the assessment of effect on those species and habitats that occur in close proximity to the mine.

The RSA was selected to represent the wildlife management unit as established by the MNR which was assumed to represent the populations of big game species (i.e. those with broad home ranges such as moose). In order to assess the effects of the project at a regional scale, the big game VEC selected was moose. As such, it seemed appropriate to select a regional study area that reflected the population of moose which inhabits the area overlapping the Project (WMU 12b). In Ontario WMUs are "*permanent land base for wildlife research and management. These units have been developed in Ontario based on the environmental requirements of principal wildlife species, ecosystems, and consideration of suitability of boundaries to traditional and future users, landowners, municipalities and other jurisdictions. Boundaries are generally described by rivers, lakes, roads, and other features easily recognised on the ground*" (Ontario 2012).

The terrestrial ecology study areas were presented to the government review team on May 31, 2011 for comment. There were no comments on the study areas raised at that time.

Reference

Ontario, Government of. 2012. Land Information Ontario. Data Description. Wildlife Management Unit.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-203

Source: Ministry of Natural Resources

Summary of Comment

What is the difference between 24 and 25 glaciolacustrine deposits?

Potential Environmental Effects

Incomplete information

Proposed Action

Please include some sort of explanatory note on the map.

Reference to EIS

EA Document, Figure 2-3D

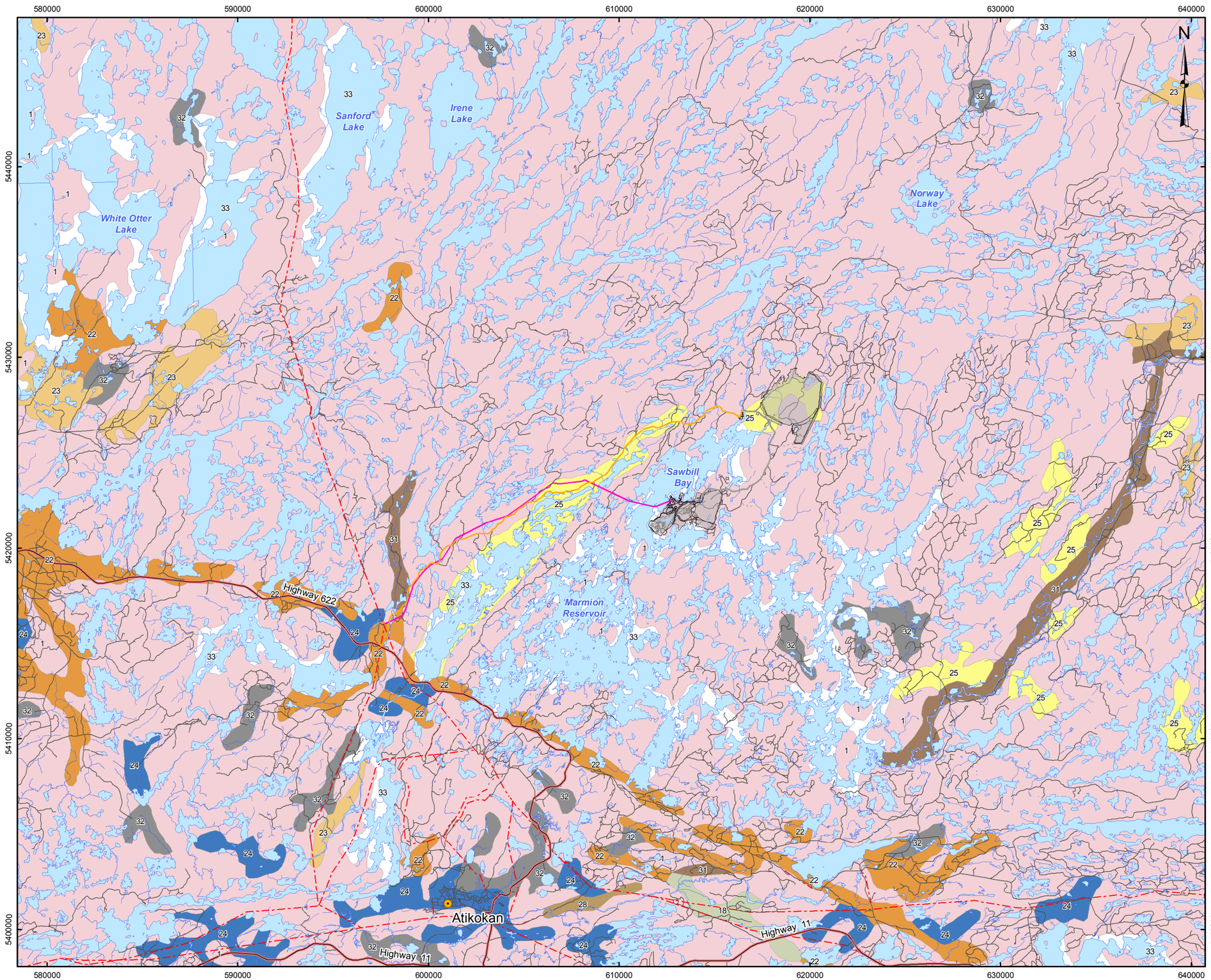
Response

24: Glaciolacustrine deposits: silt and clay, minor sand; basin and quiet water deposits

25: Glaciolacustrine deposits: sand, gravelly sand and gravel; nearshore and beach deposits

Attachments

Updated Figure 2-3 D (EIS).



LEGEND

- City/Town
- Provincial Highway
- Road
- Trail
- Power Transmission Line
- River/Stream
- Lake

Surficial Geology

- 1 — Bedrock: undifferentiated igneous and metamorphic rock exposed at surface or covered by a discontinuous, thin layer of drift
- 18 — Till: undifferentiated, predominantly sand to silty to silt matrix, commonly rich in clasts, often low in matrix carbonate content
- 21 — Glaciofluvial ice-contact deposits: gravel and sand minor till includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits
- 22 — Glaciofluvial outwash deposits: gravel and sand includes proglacial river and deltaic deposits
- 24 — Glaciomarine deposits: silt and clay, minor sand basin and quiet water deposits
- 25 — Glaciomarine deposits: sand, gravelly sand and gravel nearshore and beach deposits
- 28 — Fluvial deposits: gravel, sand, silt and clay deposited on abandoned flood plains, terrace remnants
- 31 — Fluvial deposits: gravel, sand, silt and clay deposited on modern flood plains
- 32 — Organic deposits: peat, muck and marl
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Surficial Geology - Ontario Geological Survey, 1997. Quaternary geology, seamless coverage of the province of Ontario: Ontario Geological Survey, Data Set 14. Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2,500 0 2,500 5,000 7,500
SCALE 1:200,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
GEOLOGY REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	9 Jul. 2013		
CHECK	SP	9 Jul. 2013		
REVIEW	SP	9 Jul. 2013		

FIGURE: 2-3D

G:\Projects\2013\13-1118-0010_Osisko_Hammond_ReefGIS\MXDs\Reporting\EIS\Chapter2\Geology_RSA.mxd

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-204

Source: Ministry of Natural Resources

Summary of Comment

How is the frequency (of effect) not applicable to terrestrial ecology?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please clarify.

Reference to EIS

EA Document, Table 2-4

Response

As habitat loss and alteration are the residual effects of this project and the effects occurs all at one point in time, it was felt that frequency was not appropriate to use as an assessment condition. In other words, it would lessen the weight of this effect as a onetime event while other effects, for example vehicle collisions, would be weighed more heavily on frequency. It was decided that frequency would be entered into the discussion should it help to describe the effect in a unique way, but not as equivalent to the other conditions of the effect. Additionally, duration takes into consideration the length of time that VECs are exposed to the Project effects which is more important to consider then the frequency at which an effect occurs.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-205

Source: Ministry of Natural Resources

Summary of Comment

Has sufficient data been collected to assess these changes? It is not entirely clear what information will be used to determine the "magnitude levels". The measurement of magnitude suggested in this table does not seem to align to what is proposed as indicators and monitoring in the table that describes the VECs.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please clarify.

Reference to EIS

EA Document, Table 2-6

Response

The measures for the VEC are, for instance, areal extent of wetlands, change in hydrological regime in wetlands, changes in habitat suitability and availability for species VECs. During baseline field investigations, data was collected on the extent and character of wetlands, plant community compositions and classifications, as well as habitat characteristics that provide a determination of the habitat suitability for the VEC species. Additionally, abundances of breeding birds in different habitat types were also collected and this data was used to determine changes to the relative abundances of breeding birds for the effects assessment. In these ways, the measures outlined for each VEC has a quantifiable component that allows for the evaluation of effects based on the magnitudes in Table 2-6.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-206

Source: Ministry of Natural Resources

Summary of Comment

Terrestrial environment - reptiles and amphibians are not mentioned here in list of species being monitored.

Potential Environmental Effects

Missing information.

Proposed Action

Reptiles and amphibians should be considered as a VEC.

Reference to EIS

EA Document, section 3.2.8., page 107.

Response

The terrestrial baseline program included surveys for basking and nesting turtles as well as anuran call counts. We considered a reptile VEC (snapping turtle) in the effects assessment. The snapping turtle acts as a surrogate for herpetofauna reliant on aquatic features to carry out their life histories.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-207

Source: Ministry of Natural Resources

Summary of Comment

When discussing anthropogentic influences on the landscape, mining and mineral exploration has influenced this landscape since the 1900's.

Potential Environmental Effects

None

Proposed Action

Please consider.

Reference to EIS

EA Document, Page 3-113

Response

Updated Section 3.2.10.3.1: The LSA has been subject to large-scale anthropogenic changes in the past which has had an impact on some of the natural landscape. Activities such as power generation, logging, mining and mineral exploration, aggregate extraction and other human uses such as campsites and cutovers have created disturbances in vegetation communities which are at varying degrees of naturalization and succession.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-208

Source: Ministry of Natural Resources

Summary of Comment

The EA document should include a map of the mapped ecosites discussed in the text.

Potential Environmental Effects

Missing information.

Proposed Action

Amend

Reference to EIS

EA Document, page 3-114

Response

There are 22 plates displaying the ecosites in the LSA in the Terrestrial TSD (Appendix 2.II). The EA document provides reference to these figures. It is not necessary to include this detail in the EIS.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-209

Source: Ministry of Natural Resources

Summary of Comment

There needs to be consistency between how the data is represented relative to the MSA, LSA or RSA. Some data appears to show the information relative to the RSA, while others show information relative to LSA and MSA.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend.

Reference to EIS

EA Document 3.2.8.

Response

For the most part the existing conditions are related to the MSA and LSA. The descriptions in the RSA are based on available data and include land cover and population data on game species such as black bear and moose. However, the EA process requires the selection of three study areas and a description of each. Thus the description of the existing environment needs to include discussions of the ecological conditions in all three.

In responding to information requests, further clarification was provided as to which of the study areas the information provided was relative (i.e. MNR-188 and MNR-189),

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-210

Source: Ministry of Natural Resources

Summary of Comment

From the information provided in this section, it is not clear what the amount of habitat (identified through terrestrial and wetland ecosites) will be lost through mine development. If this is discussed later in the text it should be specified here.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please clarify

Reference to EIS

EA Document, page 3-115

Response

The aerial extent of wetland and upland communities lost through mine development is presented in the effects assessment Section 6.2.1.1 and 6.2.1.2 of the EIS report and Section 3.3.1.1 (Table 3-9) and 3.4.1.1 (Table 3-11) of the Terrestrial TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-211

Source: Ministry of Natural Resources

Summary of Comment

The richest ecosites, specifically in terms of species richness, make up 51% of the MSA. The soil types associated with these ecosites will likely not be consistent with what conditions are left post mining and likely would not be restored to their state prior to mining when looking at the tailings management area. Therefore, the residual areas left after mining would likely have decreased species diversity.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please elaborate

Reference to EIS

EA Document, 3.2.83.3, page 3-117

Response

We agree that the impacted habitat will have reduced plant species diversity following operation of the mine. This effect has been considered in the pathway of effect-physical loss or alteration of vegetation for wetland and forest VECs. Changes in vegetation communities in terms of areal extent, composition (by rare and traditional use plants) and diversity has been considered a residual effect of the project and evaluated as being of low significance in relation to the extent of wetland and forested habitat in and adjacent to the study areas.

After closure of the mine, soils will build up over time as natural succession takes place in areas such as the TMF. Also, if feasible, the overburden that was stockpiled during construction will be spread over some areas that are being restored. Additionally, the opportunities to restore wetland communities by reinstating drainage post-closure and using decommissioned mine infrastructure (e.g. TMF retention pond) have the potential to develop into rich ecosites. Therefore, it is thought that given time, plant species diversity will increase throughout the post-closure phase through the restoration opportunities on the site.

INFORMATION REQUEST – MNR-212

Source: Ministry of Natural Resources

Summary of Comment

Blue Sedge is a species that is not likely found in this area, was a voucher sample collected so that this species can be verified?

Potential Environmental Effects

Incomplete information

Proposed Action

Text should clearly state what habitat will be destroyed, as it is not easily found, or make reference to the section of the EIS where this is discussed.

Reference to EIS

EA Document, 3.2.83.3, page 3-119.

Response

After further consideration, it is believed that blue sedge (Carex glaucodea) was misidentified in the field. A voucher specimen was not collected. Reference to blue sedge will be removed from the revised EA documentation.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-213

Source: Ministry of Natural Resources

Summary of Comment

The results of the breeding bird survey indicate that there are 82 birds identified in the survey and describe relative abundance in the LSA. There needs to be more of a connection made to which birds depend on this habitat year round, seasonally (migrants) and which ones may be impacted by the proposed activity more than others. Obviously, these species use this area as breeding habitat, but is it more critical for some species than others? Is there sufficient data in the areas that will be impacted by the mining activities the most that these areas can be "restored" as per the executive summary (ES-8)?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please expand and clarify.

Reference to EIS

EA Document, section 3.2.8.4.1

Response

As the majority of birds in Ontario are migratory, surveys for birds focussed on breeding birds. While this type of survey would also identify year round inhabitants on the site, the focus was not to separate the birds into migratory and year round inhabitants for the assessment. As breeding is a critical life history stage and loss of breeding habitat is identified as one of the main threats to migratory bird populations, it was determined to be appropriate to focus on these aspects.

We have analyzed the breeding bird data as a population and then divided it into species densities per habitat type. Furthermore, in response to OHRG IR MNR-133, the predicted number of individuals displaced by the Project was determined and presented in this response. This additional assessment focussed on the conservation priority species in BCR 12 as well as Canada warbler (a species listed as SC in Ontario). These are the species that have been identified as conservation priorities in this part of the province and thus focussing the assessment of impacts to breeding birds on these species was determined to be appropriate.

At this point the details of closure and post-closure are conceptual and will evolve as information about the site and the operation of the mine on the site are identified. Efforts will be made to restore the site to natural vegetation.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-214

Source: Ministry of Natural Resources

Summary of Comment

There does not appear to be any connection made to what species have been identified to use the study areas (MSA and LSA) and what impacts mine development would have on these species, rather just by ecosite and habitat suitability. If this is considered in another section of this document, it should be referenced.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please clarify.

Reference to EIS

EA Document, page 3-126, 3-127

Response

The bird species listed in the tables on these pages noted above have all been either recorded in the MSA or LSA.

The effects assessment which can be found in summary in Section 6 of the EIS and in full in Section 3.7 and 3.8 of the Terrestrial Ecology TSD, considers the impact that the mine will have on upland breeding birds VEC and individual SAR birds VECs: bald eagle, common nighthawk and Canada warbler. In addition to the impacts to habitat extent and habitat suitability, the effects of sensory disturbances, vehicle injury/mortality, the effects of changes to surface water and groundwater quality and noise and air emissions were all considered.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-215

Source: Ministry of Natural Resources

Summary of Comment

It would be helpful to the reader if this information was presented by species order/family and/or subfamily where applicable.

Potential Environmental Effects

None

Proposed Action

Suggestion

Reference to EIS

EA Document, Table 3-44

Response

The table has been revised to include the order/family for each species.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-216

Source: Ministry of Natural Resources

Summary of Comment

Mouse sp, Weasel sp? This doesn't really quantify anything.

Potential Environmental Effects

Incomplete information

Proposed Action

Clarify

Reference to EIS

EA Document, Table 3-44

Response

When referring to an unidentified species, the abbreviation “sp.” is used in the table. This follows basic rules for binomial nomenclature in scientific writing.

Table 3-44 identifies the diversity of mammals occurring or potentially occurring in the MSA and LSA based on field observations and background information. This table does not quantify abundances of species.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-217

Source: Ministry of Natural Resources

Summary of Comment

Heath Vole - is this referring to Heather Vole?

Potential Environmental Effects

Incomplete information

Proposed Action

Clarify

Reference to EIS

EA Document, Table 3-44

Response

Yes, this is referring to Heather vole (*Phenacomys ungava).*

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-218

Source: Ministry of Natural Resources

Summary of Comment

Gray Squirrel and Long-tailed weasel do not occur in the area.

Potential Environmental Effects

Inaccurate information

Proposed Action

Amend

Reference to EIS

EA Document, Table 3-44

Response

These species have been deleted from the table.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-219A

Source: Ministry of Natural Resources

Summary of Comment

Why are the species discussed here considered "important" (i.e. is this for socio-economic reasons, legislative reasons?)

Potential Environmental Effects

There does not appear to be any consideration given to how the development of the mine will affect these species, and their habitats.

Proposed Action

None

Reference to EIS

EA Document, page 3-134

Response

The species discussed here are a subset of wildlife species discussed in the Terrestrial Ecology TSD. They are all species that are either hunted or trapped and thus it was stated that they are species of importance. Their importance is likely based on a variety of perspectives including socio-economic and traditional use.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-219B

Source: Ministry of Natural Resources

Summary of Comment

Northern Bat and Red Bat should be added to this table.

Potential Environmental Effects

Missing information

Proposed Action

Amend

Reference to EIS

EA Document, Table 3-44

Response

These species were added to the Table 3-44.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-220

Source: Ministry of Natural Resources

Summary of Comment

Statement that the number of moose in the area is increasing. The moose population was observed to be somewhat stable in the early 2000s for 12B, however calf proportion was observed to be decreasing. This would indicate that moose may be declining in the area. A survey in 2013 confirmed a decrease in moose in WMU 12B.

Potential Environmental Effects

There does not appear to be any consideration given to how the development of the mine will affect this species, and its habitat

Proposed Action

Please clarify.

Reference to EIS

EA Document, page 3-134

Response

Thank you for this information. The moose information provided for this assessment was based on surveys prior to the 2013 survey.

The effects assessment on moose is contained in section 3.5 of the Terrestrial TSD. There were two residual effects on moose: Habitat loss or fragmentation and change in habitat suitability. While there will be displacement of moose due to factors such as habitat loss and human intrusion, the overall effects to moose were assessed as being of low significance as there are vast expanses of habitat for this species surrounding the site.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-221

Source: Ministry of Natural Resources

Summary of Comment

When study site is referenced - it needs to be clear which area is being referred to (RSA, LSA or MSA).

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Please describe the study area being referenced.

Reference to EIS

EA Document, page 3-134

Response

References on page 3-134 are to the LSA. The page opens with the following statement "A brief discussion of the occurrence of a number of important mammals in the Terrestrial Ecology LSA is provided in the following paragraphs."

INFORMATION REQUEST – MNR-222

Source: Ministry of Natural Resources

Summary of Comment

Black bear section, last sentence. The bear density would likely be greater than those in more disturbed areas, not lower.

Potential Environmental Effects

There does not appear to be any consideration given to how the development of the mine will affect this species, and its habitat.

Proposed Action

A description of impacts to black bear is required.

Reference to EIS

EA Document, Page 3-134

Response

Black bear was not selected as a VEC because it is considered a habitat generalist which uses a broad range of habitat and its survival and reproductive success does not rely on specific habitat types but more so, on the availability of food. As black bears will use forested and open meadow types for foraging plants as well as hunt for prey species such as deer fawns and moose calves, the assessment of other representative species (as food resources for bear) has covered the pathways of effects to black bear. A description of how black bears currently use the site is included in Section 2.2.3.1.2 Large Carnivores and Omnivores of the Terrestrial Ecology TSD as required by the EIS Guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-223

Source: Ministry of Natural Resources

Summary of Comment

There are 5 bat species that likely occur in the study area; little brown myotis, big brown bat, northern bat, hoary bat and red bat.

Potential Environmental Effects

Incomplete information.

Proposed Action

Please include information

Reference to EIS

EA Document, page 3-314 (also Terrestrial Ecology TDS Table 2-7).

Response

The comment is noted. Field investigations of bats on site are being conducted in 2013. An addendum to the TSD will be issued to address the findings of these investigations.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-224

Source: Ministry of Natural Resources

Summary of Comment

It is highly likely that blue spotted salamander and eastern newt also occur within the MSA, LSA and RSA. Red-bellied snakes and red-sided garter snake (*Thamnophis sirtalis parietalis*) have also been documented in the area around Atikokan and may be present in the study area.

Potential Environmental Effects

Incomplete information.

Proposed Action

Please include information

Reference to EIS

EA Document, Table 3-45 (also Terrestrial Ecology TSD Table 2-16)

Response

This information is noted. However, the addition of these species to the species list does not change the conclusions of the impact assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-225

Source: Ministry of Natural Resources

Summary of Comment

Odonata and lepidoptera table would be helpful to the reader if this information was broken down by family (and in the case of odonates subfamily).

Potential Environmental Effects

None

Proposed Action

Suggestion

Reference to EIS

EA Document, Table 3-46 (also Terrestrial Ecology TSD Table 2-17)

Response

This suggestion is noted but changes to the table were not undertaken at this point.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-226

Source: Ministry of Natural Resources

Summary of Comment

Were there no black admirals observed?

Potential Environmental Effects

None

Proposed Action

Confirm presence or absence.

Reference to EIS

EA Document, Table 3-46

Response

No. There were no black admirals observed.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-227

Source: Ministry of Natural Resources

Summary of Comment

There does not seem to be any link between this information and habitat in the study areas. What is the significance of this information?

Potential Environmental Effects

Incomplete information.

Proposed Action

Please provide details.

Reference to EIS

EA Document, Table 3-46

Response

Table 3-46 *Dragonfly and Butterfly Species Recorded during 2010-2012 field surveys in the Mine Study Area and Local Study Area* are the results of incidental observation recorded during field work in the study areas. This provides additional information on the existing conditions in the MSA and LSA.

INFORMATION REQUEST –MNR-229

Source: Ministry of Natural Resources

Summary of Comment

Will there be any infrastructure in place that will keep wildlife out of the tailings ponds? It is not clear in the text if any measures will be taken to mitigate this.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Consideration should be given to mitigating this potential hazard to wildlife.

Reference to EIS

EA Document, Section 5.2.5, page 5-29

Response

There will not be any measures in place to keep wildlife out of the tailings pond. However, during the Ecological Risk Assessment, the potential pathway of effect on wildlife drinking from the TMF reclaim pond was considered and no unacceptable risks were predicted.

INFORMATION REQUEST –MNR-231

Source: Ministry of Natural Resources

Summary of Comment

In section 3 (Table 3-35), ecosites are identified and their respective areas identified relative to the MSA and LSA, however when looking at the loss or alteration of these areas in the effects assessment, these ecosites are lumped and their respective areas (lost) are identified relative to the RSA.

Potential Environmental Effects

Need to consider impact (i.e. habitat lost or altered in the form of upland/forest ecosites and wetland ecosites) in the areas where there will be development of mine infrastructure. This will play into rehabilitation measures addressed in the closure plan.

Proposed Action

Please include information.

Reference to EIS

6-84, Table 6-47

Response

In the Terrestrial TSD, Table 3-9 and Table 3-11 in the effects assessment provide detailed habitat losses based on each ecosite for the MSA and LSA. Please refer to these tables for the comparison.

INFORMATION REQUEST –MNR-232

Source: Ministry of Natural Resources

Summary of Comment

There does not seem to be any consideration given to what ecosites identified in the baseline studies will be post mining.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

There needs to be clear statements that demonstrate these losses. Suggest a breakdown to be provided of mine development areas (i.e. infrastructure as shown in Figure 2-1) and habitat that currently exists there and will be lost.

Reference to EIS

Section 6

Response

In the Terrestrial TSD, Table 3-9 and Table 3-11 in the effects assessment provide detailed habitat losses based on each ecosite for the MSA and LSA. Please refer to these tables for the comparison between spatial extent of ecosites at baseline and those at post-mining. Additionally, the mine infrastructure (i.e. waste rock, open pits, etc.) footprints and the associates ecosites and areas lost of each are displayed in the attached table (Table MNR 232).

In post-closure, all the cleared areas will be left to undergo natural regeneration through successional processes. It is expected that successional ecological processes will lead to the establishment of a community of colonizing species, such as fireweed (*Epilobium angustifolium*), Labrador-tea, white birch and trembling aspen. With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. Because of the elevation of the tailings and waste rock storage areas, no development of wetlands is expected in these reclaimed areas.

Attachments

Table: MNR 232

Attachment: Table MNR 232

	Type	Area (ha)
TMF	ES-B	158.00
	ES-B	28.14
	ES-C	13.72
	ES-E	102.43
	ES-F	15.57
	ES-G	29.58
	ES-H	14.42
	ES-I	53.35
	Open Water	13.02
	Other	0.33
	W12	2.22
	W13	6.12
	W16	10.45
	W18	49.13
	W19	26.72
	W20	14.42
	W22	16.85
	W25	16.63
	W27	16.69
	W28	12.00
	W29	39.35
	W3	2.36
	W30	1.70
	W31	75.93
	W32	32.41
	W33	0.87
	W35	2.30
	W36	4.02
	W4	2.77
	W5	1.46
		762.97

	Type	Area (ha)
Waste Rock	ES-B	12.24
	ES-E	49.94
	ES-F	17.48
	ES-H	65.27
	Other	1.89
	W14	1.21
	W29	6.85
	W30	1.19
	W31	6.56
	W32	0.49
	Open Water	2.77
		165.89

	Type	Area (ha)
Low Grade Ore	ES-A	0.08
	ES-B - Disturbed	1.32
	ES-B - Disturbed	1.32
	ES-E	13.65
	ES-F	19.00
	ES-H	21.96
		57.33

	Type	Area (ha)
Overburden	W13	1.56
	W30	0.19
	W32	1.35
	ES-H	21.96
	ES-B	18.08
	ES-F	19.00
		62.14

	Type	Area (ha)
Open Pits	ES-A	0.08
	ES-B	16.46
	ES-B - Disturbed	39.49
	ES-C	3.87
	ES-E	5.87
	ES-F	8.31
	ES-H	34.84
	ES-I - Disturbed	4.21
	ES-J - Disturbed	0.81
	Other	2.64
	W12	0.61
	W14	1.94
	W22	4.29
	W27	0.81
	W28	0.22
	W3	1.22
	W31	6.70
	W32	0.90
	W35	0.88
	W4	0.26
	ES-I	2.05
	W15	1.22
	Open Water	17.28
		154.94

	Type	Area (ha)
Ore Processing	ES-E	9.39
	ES-F	4.77
	ES-H	31.38
	Other	0.10
	W28	1.03
	W5	1.20
	W15	1.81
	Open Water	2.14
		51.81

	Type	Area (ha)
Other	Other	0.91
	W14	1.12
	ES-E	11.73
	ES-F	4.85
	ES-H	1.53

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-233

Source: Ministry of Natural Resources

Summary of Comment

"developed areas will be revegetated to the extent practical (re-graded, re-planted and re-seeded)" - It is indicated here that trees will be planted, the closure plan does not mention planting of trees

Potential Environmental Effects

None

Proposed Action

Closure Rehab plan should be consistent with EA document.

Reference to EIS

EA Document, 6.2.1.1.2, page 6-85

Response

The statement quoted from the EA document is incorrect and will be revised. As indicated by the Conceptual Closure and Rehabilitation Plan, active re-vegetation will be carried out at the following facilities: in aggregate sourcing areas (Section 4.1), on the surface of the tailings in the Tailings Management Facility (TMF) (Section 4.2), and on the Overburden Stockpile (Section 4.4). Other site areas will be left to re-vegetate naturally. The seeding will be herbaceous; no tree planting is currently planned. It is expected that tree cover will grow into these areas and will evolve by natural succession.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST –MNR-234

Source: Ministry of Natural Resources

Summary of Comment

Terrestrial monitoring program doesn't appear to be consistent with the measures outlined in the VECs (Table 1-1 in the EA). It does not appear that there is any intent to monitor the rehabilitation of these areas that will be impacted by the mine for actual use by wildlife (not just by habitat suitability). Section 4 of the Terrestrial Ecosystem TSD describes as post closure monitoring program.

Potential Environmental Effects

Incomplete information.

Proposed Action

Please provide more details and more information.

Reference to EIS

Closure Plan - general comment.

Response

The monitoring program is designed to confirm the predictions of the effects assessment. As such, one of the predicted residual effects is the loss and alteration of vegetation communities. The proposed vegetation monitoring program for plant communities in the LSA is intended to confirm the species composition and diversity of plant communities as well as determine the health of the community. The vegetation monitoring will also include monitoring of reclaimed areas to observe the re-vegetation process as well as determine if they are free of invasive plant species. During all follow up site work, observation of wildlife use in these areas will also be recorded.

To maintain a consistent methodology for monitoring use by wildlife, the follow-up program was designed to determine the continued use of the MSA and LSA by wildlife through various survey types. Breeding bird point counts will be conducted according to the protocols and data analysis methodology of the baseline field surveys to maintain consistency and compare results from pre-construction through to post-closure. As mentioned all wildlife observations made during site work in the construction, operations and follow-up monitoring period will be recorded and kept in a wildlife database for comparison with baseline data. Additionally, wildlife use of the study area will be monitored through the review of available MNR hunting and trapping records from the area.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-235

Source: Ministry of Natural Resources

Summary of Comment

How will re-growth be accelerated as suggested in the EIS and TDS documents? It would appear that revegetation is relying on natural revegetation. This document does not detail replanting of vegetation as suggested in the Terrestrial Ecosystem TDS.

Potential Environmental Effects

Incomplete information

Proposed Action

Please provide more details and more information.

Reference to EIS

Closure Plan - section 6.5, page 26

Response

As indicated by Section 4.0 of the Conceptual Closure and Rehabilitation Plan, active re-vegetation will be carried out at the following facilities: in aggregate sourcing areas (Section 4.1), on the surface of the tailings in the Tailings Management Facility (TMF) (Section 4.2), and on the Overburden Stockpile (Section 4.4). The seeding will be herbaceous; no tree planting is currently planned. It is expected that tree cover will grow into these areas and will evolve by natural succession. Other disturbed site areas will be left to re-vegetate naturally.

The active revegetation of the three areas listed above will accelerate re-growth in these areas, which together represent about half of the total area that will be disturbed by the Project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-236

Source: Ministry of Natural Resources

Summary of Comment

Need clarification on what is meant by "revegetating" This does not seem to align with measures described in the effects assessment in the EA document.

Potential Environmental Effects

As described, will not allow assessment of project on recreational or tourism fishery (MNR CULPA requirement)

Proposed Action

Please provide more details and more information.

Reference to EIS

Closure Plan - section 6.5, page 26

Response

As indicated by the Conceptual Closure and Rehabilitation Plan (CCRP), active re-vegetation will be carried out at the following facilities: in aggregate sourcing areas (Section 4.1), on the surface of the tailings in the Tailings Management Facility (TMF) (Section 4.2), and on the Overburden Stockpile (Section 4.4). The aggregate sourcing areas will probably be hydro-seeded. In the TMF, the re-vegetation will involve application of organic mulch, fertilizer and a seed mix. In the Overburden Stockpile, it will probably only be necessary to fertilize and seed. The seeding will be herbaceous; no tree planting is currently planned. It is expected that tree cover will grow into these areas and will evolve by natural succession. Other disturbed site areas will be left to re-vegetate naturally.

More detailed planning and testing for revegetation (e.g. test plots) will occur during operations to ensure closure objectives are met. Given the regulatory requirements for closure and rehabilitation under Ontario Reg 240/00, it is required that suitable closure measures be implemented. As such, it is considered that the conceptual closure plan as presented provides suitable information to allow appropriate assessment of potential impacts on recreation or tourism.

The certified closure plan will provide more details than the CCRP. A draft of the certified closure plan has been prepared and is currently under review. OHRG participated in a teleconference with MNDM on July 29, 2013 to discuss closure of the Project site prior to the formal submission of the certified closure plan.

INFORMATION REQUEST – MNR-237

Source: Ministry of Natural Resources

Summary of Comment

Indicators will not allow determination of impact of project on recreational fishing in Upper Marmion or Lizard Lake; need to use changes in angling effort on Upper Marmion and Lizard Lake as indicators of impacts on fishing.

Potential Environmental Effects

How magnitude level of project is being assessed is not clear and transparent in this table.

Proposed Action

Add angling effort survey to fishing VEC indicator.

Reference to EIS

EIS/EA-Table 2-3, page 2-38

Response

The potential for increased angling as a result of the Project workforce can be managed through restrictive fishing policies implemented by Osisko for staff while at camp, and by controlling access into the MSA. Once the mine closes, it is expected that any increased fishing pressure would stop and access would fall under the jurisdiction of MNR.

Irrespective of this, there is potential for workforce staff to access Upper Marmion Lake or Lizard Lake from other access points.

MNR supports access to fishing in Upper Marmion and Lizard Lakes and controls harvest of fish with fishing regulations, which limit catches by individual fishermen, and currently MNR has not identified that any fisheries in Upper Marmion and Lizard Lakes are overfished.

There are two ways to monitor angling pressure from the project on fisheries resources here: 1) conduct a biannual census of angling activity at the nearest access point to Upper Marmion Lake from the MSA, likely on the Sawbill/Hardtack Road; and 2) complete a fishing survey questionnaire to be filled by the workforce (biannually) to collect information on fish and fishing. The latter method would likely provide a better estimate of fishing pressure from the workforce.

We will add as an indicator: conduct a biannual fishing questionnaire of the project workforce to estimate the level of fishing pressure resulting from the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-238

Source: Ministry of Natural Resources

Summary of Comment

Unclear in some cases how measuring magnitude of impact. For example, how do you measure a 10% change in fish community?

Potential Environmental Effects

How magnitude level of project is being assessed is not clear and transparent in this table.

Proposed Action

Identify specific targets for indicators.

Reference to EIS

EIS/EA-Table 2-5, page 2-48

Response

Because of the difficulty in reliably measuring population change, magnitude was measured using loss of habitat as a surrogate for population loss. The EEM program will also measure potential for any chronic/acute effects of the effluent on fish that can be used to assess potential effects on fish populations.

INFORMATION REQUEST –MNR-239

Source: Ministry of Natural Resources

Summary of Comment

Unclear in some cases how measuring magnitude of impact. For example, how do you measure a 10% change in moose presence/persistence in area? Also, how is VEC relevant spatial area being determined/justified?

Potential Environmental Effects

The presence of the overhead lines across Sawbill Bay may impact tourism use of facility and present an aircraft hazard would be avoided with underwater cables.

Proposed Action

Identify specific targets for indicators and rationale for relevant spatial area.

Reference to EIS

EIS/EA-Table 2-6, page 2-49

Response

To measure magnitude we are focussing on the change in the habitat suitability for moose. A change in the presence of moose in the area as a result of the project was a qualitative assessment that relied upon the latest scientific research of moose behaviour as a result of changes in the environment.

The VEC relevant study areas are spatial extents at which a healthy population of the VEC species can be supported. Just as the home range of an individual is the spatial extent which contains the resources necessary for an animal's survival, the VEC relevant spatial extent for a population contains the resources to support the population.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-240

Source: Ministry of Natural Resources

Summary of Comment

Is an underwater power line a viable alternative for crossing Sawbill Bay and why was this not considered?

Potential Environmental Effects

Increased ecological and social impacts on Marmion from the infilling of the lake to accommodate the processing facility and associated buildings/stockpiles.

Proposed Action

Consider the alternative of underwater cables for crossing Sawbill Bay.

Reference to EIS

EIS/EA-4.2.4

Response

Underwater transmission line construction was not considered a feasible alternative due to technical, cost and biological constraints.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-241

Source: Ministry of Natural Resources

Summary of Comment

Were there not alternatives considered for the location of mine buildings and processing facilities including live ore stockpile, specifically were options not considered that prevented impacts on Sawbill Bay of Marmion Lake including the infilling of 0.8ha as well as shoreline impacts?

Potential Environmental Effects

Will result in a change of the bio-physical environment and wildlife species that rely on it.

Proposed Action

Consider alternate locations for the processing facility and associated buildings/stockpiles that reduce impacts to Marmion

Reference to EIS

EIS/EA-4.2.5

Response

The infrastructure locations are selected to minimize the footprint and to be located close to the pit/processing plant.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-242

Source: Ministry of Natural Resources

Summary of Comment

It states that here and in the Conceptual Closure and Rehabilitation Plan that the TMF facility will be revegetated by seeding which implies a grass/forb cover. Yet, in the Closure Plan (pg 5) that the objective is to restore the site to its former use...to the extent possible and in the conclusion of the Executive Summary (pg ES-13) that "there is no significant residual impact to the biophysical environment". How can the conversion of ~813 ha from forested cover to grassland be considered restoration or an insignificant impact?? The same concern exists for the waste rock pile (where you indicate you will not be revegetating the site) and other impacted areas of the Mine Site Area.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Either indicate how you intend to restore the site to the extent possible and indicate where and what changes will result in the future environment as a result of the mine or change your conclusion about no significant impact to biophysical environment.

Reference to EIS

EIS/EA-5.1.3 page 5-12

Response

The loss of the native land cover as a result of the footprint of the project was assessed to be an overall residual effect of low significance as there are extensive areas of natural wetland and upland vegetation throughout the LSA and RSA. As such, at post closure, when the site is left to naturalize or seeded with grass and forbs, these areas will eventually be invaded by native trees and shrubs that are growing within the surrounding forest and wetland areas. Typically the first native plants to colonize are those with seeds that are spread by wind (e.g. birch and poplar). With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-243

Source: Ministry of Natural Resources

Summary of Comment

It states that the pits will take 78 years to fill and then will discharge to Marmion if water quality is of sufficient quality. If not, the water will be treated prior to discharge to Marmion. What infrastructure will be required to be maintained to allow assessment of water quality and permit the water treatment in the event it is required (you suggest that the water treatment facilities will be dismantled within 12 years post closure).

Potential Environmental Effects

Incomplete information.

Proposed Action

Indicate what infrastructure is planned to be maintained (roads, etc.?) in the event that the pit effluent needs to be maintained.

Reference to EIS

EIS/EA-5.1.3 page 5-13

Response

Modifications to the pit flooding model subsequent to the submittal of the EIS/EA report have resulted in a revised pit filling duration. The revised pit filling duration is about 218 years. When the Open Pits begin to overflow at Elev. 420, they will together contain about 178 Mm^3 of water. By comparison, the annual overflow will average about 0.25 Mm^3/year. It is expected that the water in the flooded Open Pits will be highly stratified and that the surficial water which overflows will largely reflect the chemistry of precipitation and recent local runoff. This is supported by literature studies such as Boehrer and Schulteze (2006) and Stevens and Lawrence (1998).

Because of the stratification, it is expected that the overflow water will be suitable for discharge to Marmion Reservoir. As a contingency, if it is not suitable then additional treatment options will be considered. Such treatment would have to address whatever specific water quality parameter was unsuitable for discharge. It is unlikely that the Effluent Treatment Facility (ETF) from operations would match the specific requirements for any such contingency treatment in terms of flow capacity or parameter removal. It would not be sensible to mothball the ETF for a period of over 200 years, especially considering technology changes that will occur in that period. It is speculated that the contingency treatment could be addressed by either in-pit treatment or by wetland polishing. In-pit treatment could involve dosing the water with a chemical to remove a specific parameter (e.g. lime to precipitate metals) or adding fertilizer to promote algae growth, which has been shown to be effective in removing certain metals (Nordin, 2010).

References

Boehrer, Bertram and Martin Schulteze. 2006. On the Relevance of Meromixis in Mine Pit Lakes. 7th International Conference on Acid Rock Drainage (ICARD), March 26-30, 2006, St. Louis MO. R.I. Barnhisel (ed.)

Published by the American Society of Mining and Reclamation (ASMR), 3134 Montavesta Road, Lexington, KY 40502.

Nordin, Ken. 2010. Evaluation of the Effectiveness of Biological Treatment of Mine Waters. MPERG Report 2010-4. Prepared for and published by: Yukon Mine and Petroleum Environment Research Group. Whitehorse, Yukon. http://www.geology.gov.yk.ca

Stevens, C.L. and G.A. Lawrence. 1998. Stability and meromixis in a water-filled mine pit. Limnol. Oceanogr., 43(5), 1998, 946-954.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-244

Source: Ministry of Natural Resources

Summary of Comment

It states the water from the TMF pond is to be pumped into the pits. Is this water to be treated to ensure contaminated water is not being moved into the pits?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify

Reference to EIS

EIS/EA-5.1.3 page 5-13

Response

The open pits will be considered part of the site until such a time as the water overflowing the open pit is suitable for the protection of the aquatic environment in Marmion Basin; therefore water pumped into, or runoff flowing into the open pits will not be treated.

It should be noted that, at 3.02 Mm3, one average year's worth year of transfer from the TMF represents only 1.7% of the total volume of the Open Pits at overflow (i.e. 178.0 Mm3 at Elev. 420 m.). It is expected that the water in the flooded Open Pits will be highly stratified and that the surficial water which will eventually overflow will largely reflect the chemistry of precipitation and recent local runoff. Thus the chemistry of the water transferred from the TMF in the initial 1 to 4 years at the start of flooding will have virtually no impact on the quality of the water that eventually overflows into Marmion Reservoir. In any case, as indicated in Information Request Response MNR – 252, water quality modeling predicts that the TMF water will actually meet PWQO at closure. There are not expected to be any negative impacts resulting from placement of site water or TMF water into the Open Pit at closure. Using the Open Pit as part of the water management system at closure allows time to conduct monitoring of the TMF water, site water, and open pit water to confirm that they are suitable for release to the Marmion Reservoir, and allows for mitigation measures to take place if necessary.

Additional details regarding the Pit Lake water quality calculations are presented in Section 4.2 of the Site Water Quality TSD. Water quality modelling of the pit at closure has been conducted over time (Appendix 4.III of the Site Water Quality TSD) for both a stratified condition and conservatively for an unstratified condition. All inputs contributing to the pit water have been presented. The tailings and other rock types contributing runoff are non-acid generating and leach low metal concentrations as demonstrated within the Geochemistry, Geology and Soils TSD. For the inputs the worst case water quality has been predicted, and conservative input parameters have been used as identified in the documentation provided.

Monitoring of water quality within the pit will occur prior to any overflow discharge from the pit. If, as a contingency, it becomes necessary to improve the quality of the overflow water, then mitigation within the pit, or for any overflow from the pit, would be implemented.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-245

Source: Ministry of Natural Resources

Summary of Comment

It states the water quality in the TMF pond is expected to improve within a couple of years. Where is the information on the water quality in the TMF pond and the information to support the prediction of its improvement found?

Potential Environmental Effects

Incomplete information.

Proposed Action

Indicate where the information that provides TMF water quality and predictions for improvement over time are found.

Reference to EIS

EIS/EA-5.1.3 page 5-13

Response

Given that the overall deposit and the tailings are non-acid generating, (as indicated in the Geochemistry, Geology and Soils TSD), it is expected that the water quality from the TMF and TMF reclaim pond will improve over time at closure. Conservatively, TMF water quality after closure is the same as the predicted TMF water quality results as summarized in Table 4-14 of the Geochemistry Geology and Soils TSD. At closure processing will cease, therefore there will be no ongoing addition of cyanide or ammonia to the TMF, however natural removal of these compounds will continue. This is supported by the humidity cell testing of the tailings (Section 3.5.2.6 of the Geochemistry Geology and Soils TSD), and by typical cyanide and ammonia degradation processes in the natural environment (e.g. through oxidation, volatilization, photolysis and hydrolysis reactions). These processes are well understood and documented (Botz and Mudder, 2001; NRC, 1979; Simovic, 1984).

Implementation of revegetation on the tailings surface will significantly reduce the loadings of total suspended solids (TSS) into the TMF Reclaim Pond. A smaller residual pond will remain after the TMF Reclaim Pond spillway is lowered, and it is expected that this residual pond will be effective in removing TSS by sedimentation processes.

The TMF Reclaim Pond will remain as part of the water management system for the site into post closure until such a time as the water is suitable for direct release to Sawbill Bay. Under current predictions, TMF water after closure was applied steady state concentrations measured during humidity cell testing of tailings, which is the same as the predicted TMF water quality results as summarized in Table 4-14 of the Geochemistry Geology and Soils TSD. These values will be protective of aquatic life. Furthermore, it is conservatively assumed that these values will remain constant (i.e. they are not assigned decreasing values over time), whereas it is expected that natural processes (flushing of tailings with clean precipitation, chemical precipitation and adsorption) will actually result in improvements over time.

References

Botz, Mike,and Terry Mudder. Modelling of Natural Cyanide Attenuation in Tailings Impoundments, *Mineral and Metallurgical Processing*, Vol. 17, No. 4, pp. 228-233,. November 2000.

NRC (National Research Council). 1979. Ammonia. Committee on Medical and Biological Effects of Environmental Pollutants, Division of Medical Sciences, Assembly of Life Sciences. University Park Press, Baltimore, Maryland.

Simovic, Ljubica, "Kinetics of natural degradation of cyanide from gold mill effluents" (1984). *Open Access Dissertations and Theses.* Paper 7009. McMaster University. 1984. Available from DigitalCommons@McMaster.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-246

Source: Ministry of Natural Resources

Summary of Comment

What are the water quality objectives to be used to assess whether the water from the TMF pond, PPCP or the pits can be discharged into the environment?

Potential Environmental Effects

Incomplete information.

Proposed Action

Indicate the water quality objectives to be used to consider water is sufficient for discharge into the environment

Reference to EIS

EIS/EA-5.1.3 page 5-13

Response

It is not possible to predict in advance the water quality objectives that will apply more than 20 years after the mine begins operation. Therefore, the EIS notes that the discharge will be to a level that is protective of aquatic life. This is the same objective that the PWQOs and CWQGs have been developed to achieve.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-247

Source: Ministry of Natural Resources

Summary of Comment

What is the footprint of the entire Ore Processing Facility?

Potential Environmental Effects

Incomplete information.

Proposed Action

Indicate footprint area of Ore processing facility.

Reference to EIS

EIS/EA-5.2.4 page 5-22

Response

The total footprint of the Ore Processing Facility, including laydown areas is 51.7 ha.

INFORMATION REQUEST – MNR-248

Source: Ministry of Natural Resources

Summary of Comment

What is the area, average and maximum depth of the TMF pond at stage 4 and post closure?

Potential Environmental Effects

Incomplete information.

Proposed Action

Provide physical information on the TMF pond (area, depth, etc)

Reference to EIS

EIS/EA-5.2.5 page 5-22

Response

In Stage 4, the TMF Reclaim Pond will have a maximum operating water level of 441.2 m. At that water level, the pond area will be 70.8 ha and the maximum pond volume will be 4.3 Mm3. The average depth will be about 6 m. Initially after closure, the TMF Reclaim Pond will remain the same and water will be pumped to the Open Pits. When the water quality is acceptable for discharge to the environment, the emergency spillway invert will be lowered to Elev. 440 m. From that time on, the residual pond will have a surface area of 65 ha, a volume of 3.4 Mm3 and an average depth of about 5 m.

INFORMATION REQUEST – MNR-249

Source: Ministry of Natural Resources

Summary of Comment

It is indicated that the sewage effluent from the camp will be discharged into the lower end of Sawbill Creek (no map reference provided here to indicate where). Given the presence of known critical fish habitat in that area, (walleye spawning and nursery habitat), the discharge will have to be located elsewhere to avoid this critical habitat.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Move camp sewage discharge to avoid critical fish spawning and nursery habitat located at the lower end and mouth of Sawbill Creek.

Reference to EIS

EIS/EA-6.1.3.1.2 page 6-25

Response

Although no impacts are predicted for the current configuration, in response to these information requests, and in deference to public perception, the location of the treated effluent discharge from site has been relocated to an area where there is no perceived influence on the spawning habitat or other environmental impacts. This new location does not change the results of the impact assessment and is shown in Figure 5-1.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-250

Source: Ministry of Natural Resources

Summary of Comment

It is indicated the physical effects of changes of watershed area to stream flow patterns in this sections; the EA needs to discuss and assess the ecological impacts of these changes such as changes to wetland area and type, impacts to fish habitat, etc. I have been unable to find a discussion of these impacts to areas such as API 38, 39 and 37, all of which potentially affect receiving water bodies with identified sport fisheries (i.e. Lizard Lake and Marmion Lake).

Potential Environmental Effects

Loss of recreational and tourism industry angling opportunities due to reduced access to Upper Marmion and increased costs to other industry to provide alternative access as required by Navigable Waters.

Proposed Action

Describe and assess ecological impacts of loss of watershed areas including impacts to wetland areas and impacts on fish habitat.

Reference to EIS

EIS/EA-6.1.3.1.2 pg 6-24

Response

Direct losses of habitat were measured in inflowing streams down to the average Upper Marmion Lake level, which incorporates loss of habitat within the "flooded" mouths of these inflowing tributaries, as well as the lower reaches of tributaries accessible to Lizard Lake fish. In this way they have been considered part of the direct habitat loss calculations. These were assessed in the EIS, and described in detail in the Aquatic Environment TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-251

Source: Ministry of Natural Resources

Summary of Comment

Declines in water levels of up to 9 cm during the month of May could have significant impacts on the achievement of objectives in the SRWMP, specifically the objective to have the sluiceway between Lower and Upper Marmion open to navigation as required under the Navigable Waters Act starting in May. This issue was raised previously (Osisko/Golder call in January 2013) and we had requested an assessment of impacts based on the past 10 years of annual water level data and in particular low spring flow years such as 2010 to allow a determination of how the presence of the mine would affect achievement of this objective. This has not been provided to date or included in the EA document.

Potential Enviromental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Provide assessment of impacts based on past 10 years of annual water level data to allow a determination of how the presence of the mine would affect navigation through Marmion Sluiceway (SRWMP objective) and identify mitigative actions to prevent negative impacts.

Reference to EIS

EIA/EA Report, Ver. 1, Chapter 6-Effects Assessment, Section 6.1.3.1.3-Changes in Water Levels, page 6-38

Response

A maximum potential change of -9.0 cm in monthly mean water levels in Upper Marmion Reservoir (Table 6-26) is predicted based on single-year lake water balance modelling, which assumed that reservoir outflows under existing conditions would remain unchanged (i.e. water taking as a result of the Project is entirely from lake storage). This represents a worst case scenario since outflows from the reservoir will be managed on a day-to-day basis to achieve water levels specified in the operating plan for Raft Lake Dam notwithstanding the Project. Because of this assumption, the value of -9.0 cm represents the cumulative change in lake water level over the 12-month period that was modelled. Modelling was completed for the water year June to May, and so this change in water level corresponded to the month of May.

A maximum potential change of -6.8 cm in monthly mean water levels (Table 6-27) is predicted based on continuous lake water balance modelling, which assumed that there would be incremental adjustments in existing reservoir outflows (i.e. water taking as a result of the Project is from lake storage and reservoir outflows). This is a more realistic scenario than the one assumed above. Continuous lake water balance modelling was carried out on a monthly basis using 27 years of historic (recorded and synthetic) hydrologic data (rain, snowmelt, lake evaporation and flow) from 1984 to 2010, which covers the past 10 years. The value of -6.8 cm occurred in January 1999, during the winter, for the scenario in which estimates of Project water taking and effluent discharges corresponding to a dry year with a return period of 100 years were used throughout.

Potential changes in water levels ranging from 0.0 cm to -1.4 cm in May were predicted based on continuous lake water balance modelling. Potential changes in water levels ranging from 0.0 cm to -4.1 cm throughout the remainder of the open water season were predicted. Changes of this magnitude occurring in a worst case scenario (i.e, Project water taking and effluent discharges corresponding to a dry year with a return period of 100 years) are not expected to impact the objective to have the sluiceway between Lower and Upper Marmion Reservoirs open for navigation starting in May.

It was suggested at the meeting on January 28, 2013, between Osisko/Golder, H2O Power LP, Brookfield Renewable Energy Group, OPG and MNR, that potential changes in Marmion Reservoir outflows and water levels, as a result of the Project, be assessed for the years 1998 and 2010, which were dry years (refer to meeting minutes). Osisko provided information with respect to the year 2010 by email to Brookfield Renewable Energy Group, H2O Power, OPG and MNR on February 28, 2013; the assessment was based on actual recorded lake water levels in Upper Marmion Reservoir. A similar assessment for the year 1998 cannot be carried out due to the lack of actual recorded data.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-252

Source: Ministry of Natural Resources

Summary of Comment

From the data provided, I was unable to determine the water quality in the TMF reclaim pond, post closure, how it is expected to change over time and predicted water quality at time of overflow. This information is required both determine the contaminant potential of the water body for wildlife that may access it after closure as well as the potential of the resulting water body to support aquatic life including fish at time of overflow.

Potential Enviromental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Provide data on predicted water quality of TMF pond at time of discharge.

Reference to EIS

EIS/EA-6.1.5.3 pg 6-69

Response

Given that the overall deposit and the tailings are non-acid generating as indicated in the Geochemistry, Geology and Soils TSD it is expected that the water quality from the TMF and TMF recaim pond will improve over time at closure. This is supported by the humidity cell testing of the tailings (Section 3.5.2.6 of the Geochemistry Geology and Soils TSD).

The TMF reclaim pond will remain as part of the water management system for the site into post closure until such a time as the water is suitable for direct release to the environment. Under current predictions TMF water after closure was applied steady state concentrations measured during humidity cell testing of tailings, which is the same as the predicted TMF seepage water quality results which will be collected in the seepage collection pond as summarized in Table 4-14, of the Geochemistry Geology and Soils TSD. The values meet PWQO and are conservatively assumed to remain constant (i.e. they are not assigned decreasing values over time) and will meet PWQO at the time of overflow.

There will not be any measures in place to keep wildlife out of the tailings pond. However, during the Ecological Risk Assessment, the potential pathway of effect on wildlife drinking from the TMF reclaim pond was considered and no unacceptable risks were predicted. The TMF reclaim pond is not proposed to become aquatic habitat at any time.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-253

Source: Ministry of Natural Resources

Summary of Comment

It states that at time of closure, the TMF water will be pumped into the pit lakes. Will this water be tested to ensure contaminated water is not being pumped into the pits? If it does not meet PWQO's, will it be treated to reduce the potential of the pit lakes from being filled with contaminated tailings pond water? If the water being pumped into the lakes is contaminated, how will this contribute to creating the stratified condition that is stated as being expected at the time of outflow? This may also impact the ability of the pit lakes to support aquatic life over the long term.

Potential Environmental Effects

Incomplete information

Proposed Action

Clarify conditions on when TMF pond water will be pumped into pit lakes and how potential negative impacts will be mitigated.

Reference to EIS

EIS/EA-6.1.5.3 Pg. 6-69

Response

As indicated in Information Request Response MNR – 252 it is expected that the TMF water will meet PWQO at closure. There are not expected to be any negative impacts resulting from placement of site water or TMF water into the Open Pit at closure. Using the Open Pit as part of the water management system at closure allows time to conduct monitoring of the TMF water, and the site water to confirm that it is suitable for release to the Marmion Reservoir, and allows for mitigation measures to take place if necessary.

Water quality modelling of the pit at closure has been conducted over time (Appendix 4.III of the Site Water Quality TSD) for both a stratified and unstratified condition. In both cases the upper waters of the open pits, and any discharge meets PWQO. Should the pit become stratified then the lower pit waters would be unsuitable for release, however these lower waters would be segregated and they would not mix with the upper waters due to development of a strong chemocline over time (Boehrer and Schulteze, 2006; Stevens and Lawrence, 1998).

It is anticipated that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m2. This is not being proposed as a potential habitat offset project because of the significant time lag for its creation (about 220 years), however, this modification will allow a littoral habitat area to develop naturally over time.

References

Boehrer, Bertram and Martin Schulteze. 2006. On the Relevance of Meromixis in Mine Pit Lakes. 7th International Conference on Acid Rock Drainage (ICARD), March 26-30, 2006, St. Louis MO. R.I. Barnhisel (ed.) Published by the American Society of Mining and Reclamation (ASMR), 3134 Montavesta Road, Lexington, KY 40502.

Stevens, C.L. and G.A. Lawrence. 1998. Stability and meromixis in a water-filled mine pit. Limnol. Oceanogr., 43(5), 1998, 946-954.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-254

Source: Ministry of Natural Resources

Summary of Comment

From the data provided, I was unable to determine the water quality in the pit lakes post closure, how it is expected to change over time and predicted water quality at time of overflow. This information is required both determine the contaminant potential of the water body for wildlife that may access it after closure as well as the potential of the resulting water body to support aquatic life including fish at time of overflow.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Provide data on predicted water quality of pit lakes as they fill and at time of discharge.

Reference to EIS

EIS/EA-6.1.5.3.1 pg 6-69

Response

The information requested is presented in Section 4.3.2 of the Site Water Quality TSD and in Appendix 4.III and Appendix 4.IV of the Site Water Quality TSD. As discussed in Section 4.1 of the Site Water Quality TSD, two models were run to predict the water quality of open pit lakes after closure and during pit flooding. The water qualities of both the east and west pits were calculated. The scenarios include the following:

- **Stratified Pit Lake**: This scenario was run to model open pit water quality assuming the pit lake is stratified and does not mix completely. A stratified pit model assumes variable water quality at different depths within the pit.
- **Mixed Pit Lake**: This scenario was run to model open pit water quality assuming complete mixing of the pit lake during and after flooding.

Each model was run once assuming flow was diverted from the TMF to the open pits for the first five years post-closure (Table 4-15) and once assuming no water was diverted from the TMF to the pits after closure (Table 4-16). The detailed results of geochemical modeling of pit flooding are reported in Appendix 4.IV and shown in figure form in Appendix 4.III.

The water quality model does not predict any parameter concentrations greater than applicable receiving water or site discharge regulations in the flooded pits. Generally, the west pit reports higher concentrations of key parameters than those reported in the east pit both when flow is diverted to the pits from the TMF and when TMF flow is not pumped to the pits.

The stratified pit lake surface of the east pit is predicted to reach steady state conditions after approximately 8 assuming water from the TMF is deposited in the open pit, and in approximately 24 years when no water is diverted from the TMF to the pits. The surface of the west pit is predicted to reach steady state conditions after

approximately 30 years when flow is diverted from the TMF, and in approximately 81 years when no water is diverted from the TMF to the pits.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-255

Source: Ministry of Natural Resources

Summary of Comment

Need to also consider the impact of access of wildlife (eg. waterfowl, shorebirds, aquatic mammals) to potentially contaminated water bodies including the TMF pond, PPCP and pit lakes.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Assess the potential and significance of impacts to wildlife from access to potentially contaminated water bodies on site including TMF pond, PPCP and pit lakes.

Reference to EIS

EIS/EA-6.2.1 pg 6-82

Response

The EA considered potential access to the TMF reclaim pond by wildlife during operations (the TMF pond will be eliminated at closure), and risk calculations were included in the Human Health and Ecological Risk Assessment TSD and the results were summarized in the EIS. The assessment found no risks to wildlife from exposure to the water in the TMF reclaim pond.

Risks due to exposure to the PPCP were not determined. The PPCP is located close to the processing plant, and is in an area of high human activity, which would preclude wildlife from frequenting this area.

Risks to wildlife were also considered for the pit lakes in closure, and no risks were predicted for wildlife.

INFORMATION REQUEST –MNR-256

Source: Ministry of Natural Resources

Summary of Comment

Need to also assess the loss of wetlands due to alteration of flow patterns. For example, wetlands associated with streams that have had a significant portion of their watershed area removed or altered will have less water and presumably less fluctuation between seasonal high and low levels that maintain current wetlands.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Assess the potential and significance of the loss of wetlands from loss or alteration of upstream watershed area and ecological impacts of this (fish habitat, etc).

Reference to EIS

EIS/EA-6.2.1.1.1 page 6-83

Response

The loss or alteration of drainage patterns and flows on wetlands had been assessed in the Terrestrial TSD in Section 3.3.1.2 and summarized in the EIS in Section 6.2.1.1.3. The effects of changes in water levels as a result of the Project are assessed in the Terrestrial TSD in Section 3.3.1.3 and summarized in Section 6.2.1.1.5 of the EIS. The assessments of these same effects on fish and fish habitat are provided in the Aquatic Environment TSD. Wetland features that provide fish habitat that will be lost as a result of the project are included in the calculations of habitat losses and are addressed as part of the No Net Loss Plan/Habitat Offset Plan for the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-257

Source: Ministry of Natural Resources

Summary of Comment

As part of the mitigation of wetland area loss, it is identified the pit lakes will provide future wetland area. Often pit lakes are left with very little shallow areas to allow wetland communities to be established. How much shallow area is predicted to be in the pits at final elevation? As part of the closure/rehabilitation of the site, is the company proposing to place material or design pit walls to create shallow areas suitable for wetland establishment to mitigate the loss of wetland area?

Potential Environmental Effects

Incomplete information.

Proposed Action

Identify how much shallow area is predicted suitable for wetland plants at final pit elevation and/or measures taken during closure such as the placement of waste rock to create areas suitable for wetland plant communities.

Reference to EIS

EIS/EA-6.2.1.1.1 Pg. 6-84

Response

After closure, dewatering of the Open Pits will cease and they will be allowed to flood back, until they eventually overflow through an excavated channel into Marmion Reservoir. The channel will be constructed with an invert elevation of 420 m. Modeling suggests that overflow will occur about 218 years after closure. From that time on, a stable water level of 420 m will exist and wetland habitat could develop around the perimeter of the Open Pits above benches where the water depth is appropriately shallow. For the current mining plan, the area of appropriate depth would be about 1,250 m^2 (which is the approximate area of the proposed connecting channel between the flooded pits). It is anticipated that this shallow area would naturally develop into wetland habitat over the long term, through colonization by emergent/submergent aquatic plants, facilitated by dispersion of seed/plant sources into the flooded pits by wind, surface runoff, avifauna, etc.

There exists the potential to modify the elevations of selected benches (during operations), and widen excavated channels to increase the area of wetland habitat. However, changing the pit design to accommodate benching at this level may have significant ramifications with respect to mine planning and costs. Additionally, undertaking works and encouraging recreational fishing within the post-closure flooded pits may be contrary to safety considerations as indicated in the closure and reclamation guidelines (O.Reg. 240/00). For these reasons, modification to the pit design to increase fish habitat potential is currently not planned or reflected in the habitat offset plan and further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-258

Source: Ministry of Natural Resources

Summary of Comment

The EA fails to address the impact of the loss of the API 1 watershed on the wetlands and potential spawning areas for northern pike and potentially white sucker in the upper reaches API 37. It is my understanding that YOY pike have been caught in this area indicating that this area is used for spawning and, as discussed with you previously, the importance of stream flow in allowing pike to access suitable spawning habitat at a time when Sawbill Bay levels are typically very low.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Assess the loss of the API 1 watershed on wetlands and spawning habitat at the upper reaches of API 37 and include this in Habitat accounting in No Net Loss Plan for fish habitat.

Reference to EIS

EIS/EA-6.2.2.1 pg 6-103

Response

The calculation of habitat loss of API #1 considered the stream habitat down to the normal elevation of Marmion Lake and considered this as a direct loss of pike habitat. The details were provided in the Aquatic Environment TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-259

Source: Ministry of Natural Resources

Summary of Comment

Although annual fluctuation on Marmion is in the range of 1.5 m, much of this occurs during the winter; fluctuation during the open water season/growing season is much less and the addition of up to 9 cm reduced water levels needs to be assessed in the context of a cumulative impact during the open water season/growing season.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Assess water level impacts on a seasonal basis and assess the significance of the cumulative impacts of lower water levels on a seasonal basis.

Reference to EIS

EIS/EA Report, Ver. 1, Chapter 6 – Effects Assessment, Section 6.2.2.1, 3rd and 4th paragraphs on page 6-105

Response

The predicted changes in water levels in Upper Marmion Reservoir, have been assessed on a seasonal basis, and are presented in the following locations:

- EIS/EA Report, Ver. 1, Chapter 6 – Effects Assessment, Section 6.1.3.1.3, Table 6-26 on pages 6-36 and 6-37, and in Table 6-27 on pages 6-37 and 6-38;
- Hydrology TSD, Ver. 1, Section 6.2.2.3, in Table 6-21 on page 161 and in Table 6-22 on page 162.

A maximum potential change of -9.0 cm in monthly mean water levels in May is predicted based on single-year lake water balance modelling, which assumed that reservoir outflows under existing conditions would remain unchanged (i.e. water taking as a result of the Project is entirely from lake storage). This value represents a worst case scenario since the reservoir will be managed to achieve water levels specified in the operating plan for Raft Lake Dam notwithstanding the Project. Potential changes in monthly mean water levels for the remainder of the open-water season range from -0.8 cm (June) to -3.9 cm (November).

A maximum potential change of -6.8 cm in monthly mean water levels is predicted based on continuous lake water balance modelling, which assumed that there would be incremental adjustments in existing reservoir outflows (i.e. water taking as a result of the Project is from lake storage and reservoir outflows). Continuous lake water balance modelling was carried out on a monthly basis using 27 years of historic (recorded and synthetic) hydrologic data (rain, snowmelt, lake evaporation and flow) from 1984 to 2010. The value of -6.8 cm occurred in January 1999, during the winter, for the scenario in which estimates of Project water taking and effluent discharges corresponding to a dry year with a return period of 100 years were used throughout. The maximum

potential changes in monthly mean water levels during the open-water season ranged from 0.0 cm (all months) to -4.8 cm (November).

The assessment of changes in water levels in Upper Marmion Reservoir in the context of a cumulative impact will be addressed in Section 6.8 – Cumulative Environment Effects, pages 179 to 181, in accordance with Information Request MNR-266.

The potential effects of these changes were considered in the assessment of effects on the aquatic environment. The changes in water level in Upper Marmion Reservoir were considered to be insignificant with respect to fish and fish habitat.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-260

Source: Ministry of Natural Resources

Summary of Comment

Statement that pit lakes will be steep-sided with limited potential for development of littoral areas contradicts statement found on 6.2.1.1.1 Pg 6-84 that establishment of wetlands in pit lakes will provide mitigation of wetland loss.

Potential Environmental Effects

Conflicting information

Proposed Action

Please clarify

Reference to EIS

EIS/EA-6.2.2.1.3 pg 6-110

Response

At this time the flooded pits are not considered part of habitat gains accounted for to offset the habitat losses in the No Net Loss Plan/Habitat Offset Plan. The pits will generally be steep sided, with limited potential for development of littoral habitat or wetlands. It is possible that with some minor modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of a shallow littoral bench with an area of about 21,000 m^2. While not currently reflected in the habitat offset plan, further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application. Feasibility of cutting a channel, pit stability and public safety concerns under the Mining Act (O. Reg 240/00) would however need to be addressed. This is not currently considered as part of closure and would be addressed at an appropriate time prior to final closure.

INFORMATION REQUEST – MNR-261

Source: Ministry of Natural Resources

Summary of Comment

The EA suggests that water quality in pit lakes will support aquatic life at time of overflow but there is no plan to establish aquatic communities in the pits. Given previous statements around "restore to extent possible" and "no significant biophysical impacts from the project", it is unacceptable to leave a significant sized water body (200+ha) without attempting to restore it as a functioning aquatic ecosystem as you state in this section. It would appear that there are abundant opportunities to ensure that the water quality is capable of supporting life and to create littoral zone habitat either through design of pit walls and/or placement of material to create littoral zone habitat. In addition, indicate how the outflow channel from the pit lakes will be designed to provide fish habitat.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment. Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Indicate how the pit lakes and outflow channel will be restored to support aquatic life or remove statements that the company intends to restore project site to extent possible and indicate that it is the intent of Osisko to leave a 200+ ha water body without an aquatic community as a significant residual impact of the project.

Reference to EIS

EIS/EA-6.2.2.1.3 Pg. 6-110

Response

This comment is addressed in the responses to DFO-15 and CEAA-17. At this time the flooded pits are not considered part habitat gains accounted for to offset the habitat losses in of the No Net Loss Plan/Habitat Offset Plan. The pits will be steep sided with limited potential for littoral habitat. There exists the potential to modify the elevations of selected benches (during operations), and widen excavated channels to increase the area of wetland habitat. However, changing the pit design to accommodate benching at this level may have significant ramifications with respect to mine planning and costs. Additionally, undertaking works and encouraging recreational fishing within the post-closure flooded pits may be contrary to safety considerations as indicated in the closure and reclamation guidelines (O.Reg. 240/00). For these reasons, modification to the pit design to increase fish habitat potential is currently not planned or reflected in the habitat offset plan and further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-262

Source: Ministry of Natural Resources

Summary of Comment

Environmental Impacts assessments tables will need to be modified to address concerns raised as part of the EA review.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Adjust Environmental Impact tables to address comments raised as part of review and carry forward revised impact assessment into executive summary and conclusions.

Reference to EIS

EIS/EA-6.2.3 page 6-111 - 131

Response

The Environmental Impact Matrix tables have been revised to reflect the comments received.

INFORMATION REQUEST – MNR-263

Source: Ministry of Natural Resources

Summary of Comment

Fishing activity and success needs to be assessed by measurements of angling effort in impacted water bodies (i.e. Marmion Lake and Lizard Lake). Indicators suggested are inadequate to measure any changes at the LSA level.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Include assessment of angling effort and angling success on Marmion and Lizard Lake as indicator for fishing.

Reference to EIS

EIS/EA-6.3.1.10 page 6-145

Response

The potential for increased angling as a result of the Project workforce can be managed through restrictive fishing policies implemented by Osisko for staff while at camp, and by controlling access into the MSA. Once the mine closes, it is expected that any increased fishing pressure would stop and access would fall under the jurisdiction of MNR.

Irrespective of this, there is potential for workforce staff to access Upper Marmion Lake or Lizard Lake from other access points.

MNR supports access to fishing in Upper Marmion and Lizard Lakes and controls harvest of fish with fishing regulations, which limit catches by individual fishermen, and currently MNR has not identified that any fisheries in Upper Marmion and Lizard Lakes are overfished.

There are two ways to monitor angling pressure from the project on fisheries resources here: 1) conduct a biannual census of angling activity at the nearest access point to Upper Marmion Lake from the MSA, likely on the Sawbill/Hardtack Road; and 2) complete a fishing survey questionnaire to be filled by the workforce (biannually) to collect information on fish and fishing. The latter method would likely provide a better estimate of fishing pressure from the workforce.

We will add as an indicator: conduct a biannual fishing questionnaire of the project workforce to estimate the level of fishing pressure resulting from the project.

INFORMATION REQUEST – MNR-264

Source: Ministry of Natural Resources

Summary of Comment

Potential impacts to fishing on Marmion include the presence of a 1200 person camp on the shore of the lake which could result declines of fish populations from overfishing or unacceptable levels of crowding resulting in displacement of anglers to other water bodies; displacement of angling activities due to negative visual or noise impacts from the mining activity and, as discussed previously, potential impacts on access to through the Marmion sluiceway to Upper Marmion from water level changes. These need to be assessed and significance determined.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Reassess potential impacts to fishing and significance of impact.

Reference to EIS

EIS/EA-6.3.1.10 page 6-145

Response

Potential impacts to the fishery have been assessed. Fishing is a VEC in the socio-economic assessment and an effects assessment is detailed in the Socio-Economic TSD and summarized in Chapter 6, Section 6.3.1. The alternatives for the workers camp were on site and off site. The on-site location of the camp was selected because the existing camp was sited there. The location is the only feasible and logical alternative due to the proximity to the road and the fact that an area is already cleared there. The combination of on-site and off-site accommodation was selected as a means of compromise and willingness to cooperate with the Town. The Town of Atikokan prefers that workers are housed in Town, and Osisko has committed to providing logistical means and incentives for workers to do so.

INFORMATION REQUEST – MNR-265

Source: Ministry of Natural Resources

Summary of Comment

What restrictions will be placed on fishermen and hunters at the camp to prevent over harvest? How will they be enforced?

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Indicate mitigation measures proposed to prevent overharvest of resources by mine personnel staying at camp.

Reference to EIS

EIS/EA-6.7 page 6-178

Response

The restriction on hunting and fishing will be implemented through a policy that is included in site training received by all personnel. The policy will clearly state that fishing and hunting is not permitted by workers while they are staying at site. The policy will be enforced by Osisko following appropriate human resource management disciplinary action.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-266

Source: Ministry of Natural Resources

Summary of Comment

As discussed in comments for section 6.1.3.1.4, water level changes due to the project could have impacts on the ability to achieve Seine River Water Management Plan objectives. These need to be considered in a cumulative effects context.

Potential Enviromental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend.

Reference to EIS

EIS/EA Report, Ver. 1, Section 6 – Effects Assessment, Section 6.8.3.2, page 6-179

Response

The comments on Section 6.1.3.1.3 – Changes in Lake Water Levels, in Information Request MNR-251, refer specifically to the objective to have the sluiceway between Lower Marmion Reservoir and Upper Marmion Reservoir open to navigation starting in May, as required under the Navigable Waters Act.

Changes in lake water levels are assessed as direct effects on downstream water uses, rather than cumulative effects. There are no other projects in the area that could interact with the OHRG Project. Rather, the assessment considers whether the OHRG Project could directly affect downstream water uses.

There are three existing hydro-electric facilities on the Seine River downstream of the Project; the Valerie Falls Generating Station is the nearest to the Project, located downstream of the outlet from Finlayson Lake. In addition, cooling water is withdrawn from the river system for the coal-fired Atikokan Generating Station. The Seine River is managed under the 2004 to 2014 Seine River Water Management Plan to satisfy the requirements of these facilities along its length, while at the same time ensuring that other riverine interests (environmental, social and economic) are met. The Upper and Lower Marmion Reservoirs are two of three reservoirs in the river system that are managed under the Plan; water levels in and outflows from Upper Marmion Reservoir are controlled at the Raft Lake Dam, and water levels in and outflows from Lower Marmion Reservoir are controlled at the Lower Marmion Sluiceway. Plan objectives for the management of these two reservoirs are shown in the table below, weighted to develop operational priorities for the control structures.

Table 1: Weighted Plan Objectives

Plan Objective	Weighting[1]	
	Raft Lake Dam	Lower Marmion Sluiceway
Optimize power generation values from the system	5	4
Maintain or improve aquatic health of the system	4	3
Maintain navigational, recreational and social opportunities throughout the system	4	2
Address public safety and property damage by minimizing flooding throughout the system	3	1

[1] 1 = Low priority, 5 = High priority

The Project is located mainly on a peninsula of land extending into the northwestern end of the Upper Marmion Reservoir, and could potentially result in changes in the regulated outflows from and water levels in the reservoir. These in turn could have an effect on the ability of existing water management practices to meet the Plan objectives for Raft Lake Dam. Changes in reservoir outflows and water levels could result from the interception of runoff from areas within the Project footprint by the water collection system; water taking for potable and process water supply to the Project; discharges of treated sewage and wastewater effluent from the Project, and mine dewatering due to the seepage of water from the reservoir into the open pit.

Predicted changes in monthly mean outflows from Upper Marmion Reservoir, as a result of the Project, range from -4.90% to +0.30%, and are within the generally accepted accuracy limits (±10%) of flow measurements in natural rivers and streams. Predicted changes in monthly mean water levels, as a result of the Project, range from -9.0 cm to 0.0 cm, and represent less than 6% of the average annual range in monthly mean water levels (1.58 m). Given the magnitude of these changes, and the fact that the Project influences will decrease with distance downstream of Raft Lake Dam as the drainage area tributary to the Seine River increases, it is not expected that Project operations will have a significant effect on the ability of existing water management practices to meet the Plan objectives for Raft Lake Dam.

The Lower Marmion Reservoir conjoins the Upper Marmion Reservoir to the south of the Project. It is managed independently of the Upper Marmion Reservoir by closing the Lower Marmion Sluiceway during the winter months, and periods of low flow during the open-water season, in order to maintain suction head for cooling water pumps for the Atikokan Generating Station. Changes in the water levels in this reservoir are only possible over the limited period of time (a maximum of six months during the open water season) when the Upper and Lower Marmion Reservoirs are operated as a single water body.

Predicted changes in water levels in the reservoirs during the open water season range from 0.0 cm to -4.1 cm, and represent less than 9% of the average annual range in monthly mean water levels in the Lower Marmion Reservoir (0.45 m). Given the magnitude of these changes, and the option to close the Lower Marmion Sluiceway, it is not expected that Project operations will have a significant effect on the ability of existing water management practices to meet the Plan objectives for the Lower Marmion Sluiceway.

These predicted changes are sufficiently minor that no effects are predicted downstream on either terrestrial or aquatic habitats.

INFORMATION REQUEST – MNR-267

Source: Ministry of Natural Resources

Summary of Comment

The ecological impact of the changes in water levels resulting from the mine operation need to be considered in a cumulative effects context on a seasonal basis with the existing water level changes resulting from the use of the lake by the hydro-electric industry.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend.

Reference to EIS

EIS/EA-6.8.3.2 page 6-180

Response

The ecological changes downstream in the Upper Marmion Reservoir/Seine River system from operation of the mine were considered in the impact assessment section since this represents a direct impact rather than a cumulative impact. The current operating rules for the Raft Lake Dam take into consideration the aquatic habitat needs downstream in the Seine River. The predicted changes were considered to be minor within the current changes in water level, and were not predicted to affect aquatic habitat.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-268

Source: Ministry of Natural Resources

Summary of Comment

Need to consider impact of forestry operations (road construction, forest harvesting) in context of cumulative effects. The deforestation resulting from the project has potential impacts on forestry operations as well as cumulative ecological impacts such as forest fragmentation.

Potential Environmental Effects

A clear presentation of the project impacts is a fundamental and important part of the environmental assessment.

Proposed Action

Amend

Reference to EIS

EIS/EA-6.8.1 page 6-179

Response

Cumulative effects assessments are conducted against "reasonably foreseeable" projects. It is not possible to predict future forest access road construction. Furthermore, the assessment has shown that the effects of land clearance associated with the Project are confined to the Project footprint, and will have minimal effect on terrestrial fauna.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-269

Source: Ministry of Natural Resources

Summary of Comment

Conclusions of the project need to be reconsidered in light of the comments received as part of the EA review.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Amend

Reference to EIS

EIS/EA-12.0 pages12-1 to 12-7

Response

We are confident in our conclusions. Based on the findings of the environmental assessment and planned mitigation measures, as documented in this EIS/EA Report, the Hammond Reef Gold Project can be developed such that there is no significant residual impact to the biophysical environment. Furthermore, it is considered that the Project provides substantial socio-economic benefits to Aboriginal people, the local community and the region and has garnered significant community support through ongoing partnerships and information sharing.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-270

Source: Ministry of Natural Resources

Summary of Comment

Based on the review of the information provided in this document including but not limited to 1) 800+ ha tailings management facility which has no plan to restore to its previous forested condition or ensure water quality from the remaining water body will support aquatic life; 2) 200+ ha pit lake in which Osisko states it does not intend to restore an aquatic community; 3) ~150 ha waste rock pile which will not be revegetated resulting in permanent alteration to the landscape; 4) permanent changes to water flow patterns, wetlands, wildlife habitat, etc.; I find no evidence to support the stated conclusion that the project will have "no significant residual impact to the biophysical environment". This must be changed to reflect the real impacts of the project on the environment.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Revise conclusion to identify actual changes to biophysical environment.

Reference to EIS

ES-13

Response

We are confident in our conclusions. Based on the findings of the environmental assessment and planned mitigation measures, as documented in this EIS/EA Report, the Hammond Reef Gold Project can be developed such that there is no significant residual impact to the biophysical environment. Furthermore, it is considered that the Project provides substantial socio-economic benefits to Aboriginal people, the local community and the region and has garnered significant community support through ongoing partnerships and information sharing.

INFORMATION REQUEST – MNR-271

Source: Ministry of Natural Resources

Summary of Comment

Were fishless lakes assessed for our aquatic community species such as amphibians? Fishless lakes have often supported high densities of amphibians such as red spotted newts not found in water bodies with fish species. Given your proposal to introduce fish into these water bodies as fish habitat offsets, it is important to know what other species may be negatively impacted from this activity.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Describe communities found in fishless lakes and how they differ from fish lakes so impact of fish introductions can be assessed.

Reference to EIS

Aquatic TSD section Pg. 64

Response

Extensive netting and minnow trapping, which is also effective in trapping amphibians, resulted in the capture of only a few specimens, and as a result, it is concluded that these waterbodies do not represent significant habitats for species that thrive in fishless environments.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-272

Source: Ministry of Natural Resources

Summary of Comment

Fish population status was not selected as an indicator of project impact. Aspects of the project (e.g. potential of increased harvest due to accommodation camp on lake) have the potential to directly affect population status and population status could also determine impacts that are missed during habitat assessments.

Potential Environmental Effects

Clear presentation of the proposed measures is a fundamental and important part of the environmental assessment.

Proposed Action

Add fish population status as indicator for walleye, pike and smallmouth bass.

Reference to EIS

Aquatic TSD section Table 1-2

Response

The habitat and population effects on fish populations are primarily losses to isolated populations in headwater waterbodies that are not directly contributing to Upper Marmion Lake. The primary effects on fish populations in Upper Marmion Lake are very minor habitat losses within the lake drawdown zone where some of the mine facilities meet the shoreline of the peninsula; minor habitat losses in several small inflowing streams; and potential for water quality impairment in a small mixing zone around the mine discharge. These effects cannot be measured by population studies, but can be assessed by monitoring success of compensation measures and through the EEM program.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-273

Source: Ministry of Natural Resources

Summary of Comment

Why does the project site extend into Sawbill Bay? Were other options considered? What is the extent of the elevation that the proposed infilling extends to?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please clarify.

Reference to EIS

Aquatic TSD section Table 3.2.1 Pg. 84

Response

Localized filling within the drawdown zone along Hammond Reef peninsula is required to provide adequate space for Mine buildings, parking, etc.; approximately 0.8 ha of seasonal habitat within the drawdown zone will be destroyed. The area provides seasonal nursery/foraging habitat for baitfish species, northern pike, smallmouth bass and as such has been included in the habitat losses detailed in the Aquatic TSD. As per that TSD, about 0.8 ha of the drawdown zone along the Hammond Reef peninsula shoreline will be destroyed. Resulting loss of about 1200 HU of useable habitat destroyed.

Another option considered was to build a retaining wall. The design indicated the need for a 25 m high wall which was deemed a less desirable alternative due to the close proximity of the pits and the regular frequency of vibrations due to blasting.

Where the toe of the fill lies below the high water elevation (about 416 masl) granular material from a clean aggregate source will be used. Most of the proposed infilling extends to elevations above 415. At its lowest point, the fill extends to a minimum elevation of about 414 masl.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-274

Source: Ministry of Natural Resources

Summary of Comment

Under the "Other Mine Facilities", explain how the proposed infilling affects bass and pike habitat but not walleye habitat? Where is the description of the proposed infilled habitat (depth, substrate, etc.)

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please provide the required information.

Reference to EIS

Aquatic TSD Table 3.5 page 98

Response

There is a small (less than 0.8 ha) area of habitat between the Upper Marmion Lake level (416 masl) and the normal lake level (415.2 masl) in an embayment along the northerly shore of Hammond peninsula that is required for some mine facilities. This was considered to represent potential seasonal habitat for smallmouth bass and northern pike (primarily foraging habitat) but is too shallow to be utilized by walleye. Regardless, the habitat lost is reflected in estimate of overall habitat losses to the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-275

Source: Ministry of Natural Resources

Summary of Comment

No mention of impact of loss of API-1 watershed on API-37 during periods of low reservoir levels and potential impact on pike spawning habitat.

Potential Environmental Effects

Missing information.

Proposed Action

Please include this information.

Reference to EIS

Aquatic TSD Table 3.5 page 99

Response

The calculation of habitat loss of API #1 considered the stream habitat down to the normal elevation of Marmion Lake and considered this as a direct loss of pike habitat. A No Net Loss Plan/Habitat Offset Plan was developed in consultation with MNR, which resulted in the concurrence of these agencies on the habitats lost to the project and the suite of Habitat Offset Projects to be implemented.

These habitat offsets were discussed in several meetings with DFO/MNR following submission of the EA and on May 29, 2013, DFO stated that “This should be enough direction as to what habitat gains will be created to offset the losses for the EIS phase”. Additional details of these projects will be included in the Section 35 and MMER Schedule 2 approvals for the project.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-276

Source: Ministry of Natural Resources

Summary of Comment

How will the indirect impacts identified in Table 3-6 (e.g. API-8) be addressed in the NNLP?

Potential Environmental Effects

Missing information.

Proposed Action

Please include this information.

Reference to EIS

Aquatic TSD Table 3-6 page 102

Response

Indirect effects that are considered to be significant have been accounted for in the compensation plan that continues to be developed and finalized in the NNLP/Habitat Offset Plan. These indirect effects were the lower reaches of several drainage features that will have portions of their upstream drainages eliminated by the TMF. These were included in the calculations of direct losses. The small reductions in the levels of Upper Marmion Lake are accommodated within the existing water level/flow rule curves for the Lake and the Trap Lake Dam. The small water level reductions in API#8 and Lizard Lake (less than 5 cm) were considered insignificant.

INFORMATION REQUEST – MNR-277

Source: Ministry of Natural Resources

Summary of Comment

The lowered levels need to be considered as a cumulative impact, especially during periods of low levels during the spring. The current water management strategy balances a number of objectives and actions to address water management in the entire system. If actions are taken to that only address lower levels in Marmion without regard to the rest of the system, as the proposals in the EA seems to be implying, this may result in more negative impacts downstream

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please include impacts of lowered water levels.

Reference to EIS

Aquatic TSD section 3.5.1 page 103

Response

The modeling reported in the EIS predicted that during low flow periods the additional water taking for the Project would result in a predicted decrease in flows at the Raft Lake Dam of 0.19 m^3/s or less than 1% of the current flows at the dam. The maximum decrease in flows (-3.1%) was predicted to occur in May. These changes were assessed as direct impacts on downstream uses in Chapter 6 of the EIS and were considered in terms of effects on downstream habitats. Changes in flows were considered to potentially directly affect existing water uses, and therefore it is not appropriate to consider these as cumulative effects.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-278

Source: Ministry of Natural Resources

Summary of Comment

What water quality objectives will be used to assess whether TMF water is of suitable quality to be released back to environment? If TMF water does not meet these objectives, what measures will be in place to ensure it meets objectives before being released in Marmion?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please provide the required information.

Reference to EIS

Aquatic TSD section 3.2.4 page 95

Response

Water quality objectives that are protective of aquatic life, consistent with the management goals of the PWQOs/CWQGs, will be used to determine when it is suitable to release water from the TMF to local receivers. These objectives would be expected to include established guidelines and site-specific water quality objectives, as appropriate. Specific parameters to be addressed will be determined on the basis of water quality monitoring prior to release. Therefore, the EIS notes that criteria that are protective of aquatic life will be used and within the EIS and TSD documents references are made to current guidelines.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-279

Source: Ministry of Natural Resources

Summary of Comment

Given the unclear statements about rehabilitating and restoring site to the extent possible, why is it stated there will be no intent to restore the pit lakes as fish habitat?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Either indicate measures planned to restore an aquatic community to the pit lakes or identify the pit lakes as a long term loss to fish habitat.

Reference to EIS

Aquatic TSD section 3.7 page 106

Response

At this time the flooded pits are not considered part of habitat gains accounted for to offset the habitat losses in the No Net Loss Plan/Habitat Offset Plan since the pits will be steep sided with limited litorral habitat. There exists the potential to modify the elevations of selected benches (during operations), and widen excavated channels to increase the area of wetland habitat. However, changing the pit design to accommodate benching at this level may have significant ramifications with respect to mine planning and costs. Additionally, undertaking works and encouraging recreational fishing within the post-closure flooded pits may be contrary to safety considerations as indicated in the closure and reclamation guidelines (O.Reg. 240/00). For these reasons, modification to the pit design to increase fish habitat potential is currently not planned or reflected in the habitat offset plan and further discussion with MNR, DFO and Osisko is proposed prior to the final submission of the Section 35 Authorization application.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-280

Source: Ministry of Natural Resources

Summary of Comment

Some of the compensation projects presented in this section have not been discussed with MNR and seem to provide questionable benefits and risk to the current habitat.

Potential Environmental Effects

Clear presentation of examples being referenced is a fundamental and important part of the environmental assessment.

Proposed Action

Please provide better references and justification of these compensation projects. Or only present projects that have been discussed with the applicable agencies.

Reference to EIS

Aquatic TSD section 3.8.4 page 115

Response

A series of meetings, workshops and teleconferences with DFO and MNR were held on April 16 2013, May 9 2013 and May 27 2013 to discuss in detail the compensation projects presented. The revised DRAFT No Net Loss Plan or Habitat Offset Plan reflects the projects that were agreed upon, in concept, throughout these meetings.

A draft No Net Loss Plan or Habitat Offset Plan is provided in the Aquatic TSD, which describes in detail how the aquatic habitat losses from the project will be offset. The following provides a summary of the habitat losses and proposed offsets for both the MMER listed waterbodies and the Section 35 offsets.

Habitat Losses

Using the Habitat Accounting Model developed for the project, habitat losses were as follows:

- Total Habitat losses: approximately 34,000 Habitat Units;
- Habitat Losses requiring MMER listing (approximately 22 000 HUs):
  - Losses associated with the Waste Rock Management Facility: 5 features representing 1,977 HUs
  - Losses associated with the Tailings Management Facility: 10 features representing 20,211 HUs
- Habitat Losses requiring Section 35 Fisheries Act Authorization: 7 features representing 11,989 HU.

MMER Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (API#2) that supports northern pike and there are the lower reaches of two headwater drainage

features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake and API#8).

The following habitat offset projects are proposed to address these MMER Listed losses (totaling 24,000 HUs):

- A floodplain area at the mouth of Sawbill Creek;
- An area at the mouth of API#1; and
- Snail Bay.

Each of these projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in “mounds” throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake

Section 35 Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (Mitta Lake) that is considered to have potential as a baitfish resource and there are the lower reaches of several headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake).

The following habitat offset projects are proposed to address these Section 35 listed losses (totaling approximately 12,000 HUs):

- Stocking of several headwater waterbodies that are currently fishless;
- The upper part of Trap Bay;
- An area at the mouth of Lumby Creek;
- Microhabitat features adjacent to an area of filling of a portion of the drawdown zone of Upper Marmion Lake; and
- Microhabitat features associated with the construction of the minewater discharge.

Several fishless ponds will be stocked with fish from Mitta Lake and API#2 to create a potential baitfish resource and also to preserve a remnant fish community representative of Mitta Lake, which will preserve an opportunity to restock these fish in the flooded pits post closure. The Trap Bay and Lumby Creek projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in “mounds” throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion

Lake. The Microhabitat features will include installation of partially submerged logs and felled cedar trees, rocky shoals and other features that will provide shallow water cover for fish species in Upper Marmion Lake.

It is anticipated that with some modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of additional shallow littoral area. This is not currently reflected in the habitat offset plan due to reasons noted in the response to MNR-257. Further discussion with MNR, DFO and Osisko is proposed on this matter prior to the final submission of the Section 35 Authorization application.

These habitat offsets were discussed in several meetings with DFO/MNR following submission of the EA and on May 29, 2013, DFO stated that “This should be enough direction as to what habitat gains will be created to offset the losses for the EIS phase”.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-281

Source: Ministry of Natural Resources

Summary of Comment

The EA fails to identify habitat projects that will replace the lost aquatic habitat with equivalent or more valued habitat in the Marmion Reservoir. The result of the loss of fish habitat from the mine project; the lack of projects that will significantly enhance the fishery and the stated intent of Osisko not to restore the pit lake or the tailings management pond to support aquatic life will mean that there is significant residual impacts from this projects on the aquatic environment.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Either indicate measures planned to restore the aquatic community to the mine project area or indicate the extent of significant residual impacts that will remain following closure.

Reference to EIS

Aquatic TSD section 3.9 page 117

Response

A draft No Net Loss Plan or Habitat Offset Plan is provided in the Aquatic TSD, which describes in detail how the aquatic habitat losses from the project will be offset. The following provides a summary of the habitat losses and proposed offsets for both the MMER listed waterbodies and the Section 35 offsets.

Habitat Losses

Using the Habitat Accounting Model developed for the project, habitat losses were as follows:

- Total Habitat losses: approximately 34,000 Habitat Units;
- Habitat Losses requiring MMER listing (approximately 22 000 HUs):
  - Losses associated with the Waste Rock Management Facility: 5 features representing 1,977 HUs;
  - Losses associated with the Tailings Management Facility: 10 features representing 20,211 HUs;
- Habitat Losses requiring Section 35 Fisheries Act Authorization: 7 features representing 11,989 HUs.

MMER Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (API#2) that supports northern pike and there are the lower reaches of two headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake and API#8).

The following habitat offset projects are proposed to address these MMER Listed losses (totaling 24,000 HUs):

- A floodplain area at the mouth of Sawbill Creek;
- An area at the mouth of API#1; and
- Snail Bay.

Each of these projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in "mounds" throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake

Section 35 Listed Habitat Offsets

While the majority of the habitat losses are habitat for baitfish and other small bodied fish, there is one waterbody (Mitta Lake) that is considered to have potential as a baitfish resource and there are the lower reaches of several headwater drainage features that provide some spawning/nursery habitat for northern pike in the receiving waterbodies (Upper Marmion Lake).

The following habitat offset projects are proposed to address these Section 35 listed losses (totaling approximately 12,000 HUs):

- Stocking of several headwater waterbodies that are currently fishless;
- The upper part of Trap Bay;
- An area at the mouth of Lumby Creek;
- Microhabitat features adjacent to an area of filling of a portion of the drawdown zone of Upper Marmion Lake; and
- Microhabitat features associated with the construction of the minewater discharge.

Several fishless ponds will be stocked with fish from Mitta Lake and API#2 to create a potential baitfish resource and also to preserve a remnant fish community representative of Mitta Lake, which will preserve an opportunity to restock these fish in the flooded pits post closure. The Trap Bay and Lumby Creek projects will involve a shallow excavation of an area of about 1.5 ha to establish littoral habitat within the current drawdown zone of Upper Marmion Lake. The existing area will be excavated to an elevation of about 413.2 masl which will ensure that the substrates are flooded in early spring, prior to reservoir filling. A series of shallow, branching trenches will be cut into the excavation to provide additional access to the area for fish and wetland materials will be placed in "mounds" throughout the excavated area to promote wetland development. These areas will provide spawning and nursery habitat for a variety of species including important recreational fisheries of Upper Marmion Lake. The Microhabitat features will include installation of partially submerged logs and felled cedar trees, rocky shoals and other features that will provide shallow water cover for fish species in Upper Marmion Lake.

It is anticipated that with some modifications to the configuration of the bench elevations of the initial lifts around the pit perimeters during operations and construction of a broad, shallow, interconnecting channel at approximately elevation 417 - 418 masl that the flooded pits will offer potential fish habitat (both littoral and open water habitat) and will contribute to the productive capacity of the Upper Marmion Lake, replacing some of the habitat lost in Mitta Lake. This modification would result in the creation of additional shallow littoral area. This is not currently reflected in the habitat offset plan due to reasons noted in the response to MNR-257. Further discussion with MNR, DFO and Osisko is proposed on this matter prior to the final submission of the Section 35 Authorization application.

These habitat offsets were discussed in several meetings with DFO/MNR following submission of the EA and on May 29, 2013, DFO stated that “This should be enough direction as to what habitat gains will be created to offset the losses for the EIS phase”.

INFORMATION REQUEST – MNR-282

Source: Ministry of Natural Resources

Summary of Comment

It needs to be identified through a monitoring plan how Osisko intends to monitor potential fish population changes as a result of the mine project in the event that OMNR does not monitor fish populations in Marmion.

Potential Environmental Effects

Missing information.

Proposed Action

Please include fish populations as an indicator and how it will be measured and monitored.

Reference to EIS

Aquatic TSD section 4.1 page 118

Response

The MMER under the Fisheries Act directs metal mines to conduct Environment Effects Monitoring (EEM) as a condition governing the authority to deposit effluent. EEM studies are designed to detect and measure changes in aquatic ecosystems (i.e., receiving environments). The metal mining EEM program is an iterative system of monitoring and interpretation phases that is used to assess the effectiveness of environmental management measures, by evaluating the effects of effluents on fish, fish habitat and the use of fisheries resources by humans. Long-term effects are assessed using regular cyclical monitoring and interpretation phases designed to investigate the impacts on the same parameters and locations. In this way, both a spatial and temporal characterization of potential effects to assess changes in receiving environments are obtained. Study elements include fish population and fish habitat assessments, benthic invertebrate surveys, fish tissue analyses, effluent characterization, sub-lethal toxicity and water quality monitoring.

The first EEM study design must be submitted not later than 12 months after the day on which the mine becomes subject to the Regulations. The first interpretative report must be submitted not later than 30 months after the date on which the mine becomes subject to the Regulations or not later than 42 months after the date on which it becomes subject to the Regulations, if the mine has submitted a report utilizing historical biological monitoring information. Subsequent interpretative reports are submitted 36 or 72 months after the day on which the most recent interpretative report was required to be submitted, depending on the results of the previous interpretative report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-283

Source: Ministry of Natural Resources

Summary of Comment

It is stated that the TMF will be revegetated. What is the plan for revegetation? Given the statement in 2.1 to restore the site, is the intent to actively reforest the TMF? How will this be done (organic material, etc.)? What will the soil conditions and contaminant levels be like in the TMF and how will these affect revegetation?

Potential Environmental Effects

Missing information.

Proposed Action

Provide details on revegetation of TMF land.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 2.3 page 6

Response

As described in the conceptual closure plan, the TMF will be re-vegetated to stabilize the exposed tailings surface against erosion by wind and water. It is not planned to place a layer of topsoil or overburden soil on top of the tailings; rather the tailings will be directly revegetated by placing organic mulch, fertilizer and seeding with a mixture of grasses. Erosion protected channels will be constructed to convey surface runoff where concentrated flows could occur. It is not intended to plant trees on the tailings surface; however trees will be allowed to invade naturally and will not be removed. Once the vegetation is established, there should be little or no requirement for ongoing maintenance on the tailings surface itself, and it will eventually return to a forested landscape.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-284

Source: Ministry of Natural Resources

Summary of Comment

Indicate objectives used to assess whether water will be considered acceptable quality to be released to Marmion. What treatment options will be available if water quality does not meet objectives?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Provide water quality objectives that will be achieved before release into Marmion Lake.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 2.3 page 6

Response

It is currently anticipated that water discharged from the open pit will meet anticipated project specific guidelines or objectives at closure. We cannot anticipate the water quality objectives that will be in place 218 years from now, however the commitment as stated is that the discharge will be protective of aquatic life.

Monitoring data will be available for several years prior to potential discharge. Although not currently anticipated based on the water quality predictions, treatment options will be developed if needed based on the monitoring data. Several treatment contingencies are available should they be required and might include batch treatment of waters within the pit(s), portable treatment facilities and/or permanent treatment facilities if necessary.

INFORMATION REQUEST – MNR-285

Source: Ministry of Natural Resources

Summary of Comment

Need to report areas (ha) for the changed areas left at closure (e.g. TMF land, TMF pond, WRMF, Pit lakes, etc.)

Potential Environmental Effects

Missing information.

Proposed Action

Include areas (ha) for impacted areas at closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 2.4 page 7 and 6.3 page 25

Response

The TMF land area will be about 763 ha, comprising about 675 ha of revegetated tailings and 23 ha of other land (i.e. dam crests, downstream faces of dams and exposed soil around the Reclaim Pond). The residual pond in the TMF will have a water level of 440 m and a corresponding area of about 65 ha.

At closure, the Waste Rock Management Facility will contain about 215 M tonnes of rock and the pile will have a surface area of about 166 ha.

The Open Pits will be flooded to a final water level of 420 m, and will have a total flooded area of 133 ha.

INFORMATION REQUEST – MNR-286

Source: Ministry of Natural Resources

Summary of Comment

For each site, need to indicate the amount of area being rehabilitated, type of rehabilitation, and change in ecological condition from pre-mine (e.g. For TMF, indicate ecosite type prior to mine and future condition post closure.)

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Please include the required information.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 2.4 pg. 7

Response

The existing vegetation communities within the footprint of the Tailings Management Facility (TMF) are a mix of 30 different wetland and upland ecosite types (Table 1). After mine development the TMF will have a tailings surface area of 675 ha that will be directly revegetated with grasses. It is not planned to plant trees; however it is expected that the area will eventually be covered with trees following natural succession. The TMF will also include a post-closure residual pond with an area of about 65 ha that will replace some of the lost wetland areas. The remaining 23 ha is the area occupied by the dams around the TMF which will remain in post-closure.

The Waste Rock Management Facility (WRMF), under existing conditions is composed of dense coniferous and dense deciduous forest with some smaller extents of mixed forest and wetland. The WRMF will have a surface area of about 166 ha. It will not be deliberately seeded, so it will initially be exposed rock material with eventual sparse ingrowth of vegetation in the long term.

The footprint area of the overburden stockpile currently contains mainly dense coniferous forest with smaller spatial coverage of mixed forest and wetland communities. At the end of operations, the Overburden Stockpile will contain about 4.5 Mm3 of overburden from the Open Pit stripping. The foot print area will be about 37 ha. Some of the overburden will be used for site grading at closure. The remaining overburden will be regraded to flat slopes and the pile will then be revegetated by direct application of fertilizer and grass seeds. No tree planting is planned; however it is expected that trees will overgrow the site by natural succession.

Under existing conditions, the area in which the Low Grade Ore stockpile will be located contains mostly dense coniferous forest with smaller spatial extents of deciduous and mixed forest (Table 4). It is planned that the Low Grade Ore will be milled before the end of operations. As a result, the Low Grade Ore Stockpile will likely not exist after closure. The site, which will have an area of about 23 ha, will not be deliberately revegetated; however it is expected that trees will eventually grow into the area and will eventually become a forest.

The Open Pits will be allowed to flood to a final water level of 420 m. This will result in a final pond area of about 138 ha.

The Project facilities (e.g. the Processing Plant and equipment, the maintenance shops, the accommodation camp, the Effluent Treatment Plant, etc.) will all be redundant at closure. Portable facilities such as trailers will be removed from the site. Permanent facilities will be decommissioned and demolished. These areas will be regraded if necessary and any exposed slabs will be punctured and covered over with overburden. On-site access roads and haul roads not required for post-closure monitoring and maintenance will be scarified and culverts will be removed to restore natural drainage conditions. It is not planned to deliberately revegetate these infrastructure areas; however it is expected that trees will over grow the area by natural succession. Based on the mine study area of 2062 ha, the infrastructure area involved is estimated at about 905 ha.

Attachments

Tables

Table 1: Ecosite Types and Spatial Coverage in the TMF

	Type	Area (ha)
TMF	ES-B	158.00
	ES-B	28.14
	ES-C	13.72
	ES-E	102.43
	ES-F	15.57
	ES-G	29.58
	ES-H	14.42
	ES-I	53.35
	Open Water	13.02
	Other	0.33
	W12	2.22
	W13	6.12
	W16	10.45
	W18	49.13
	W19	26.72
	W20	14.42
	W22	16.85
	W25	16.63
	W27	16.69
	W28	12.00
	W29	39.35
	W3	2.36
	W30	1.70
	W31	75.93
	W32	32.41
	W33	0.87
	W35	2.30
	W36	4.02
	W4	2.77
	W5	1.46
Total Area		***762.97***

Table 2: Ecosite Types and Spatial Coverage in the WRMF

	Type	Area (ha)
Waste Rock	ES-B	12.24
	ES-E	49.94
	ES-F	17.48
	ES-H	65.27
	Other	1.89
	W14	1.21
	W29	6.85
	W30	1.19
	W31	6.56
	W32	0.49
	Open Water	2.77
Total Area		***165. 89***

Table 3: Ecosite Types and Spatial Coverage in the Overburden Stockpile

	Type	Area (ha)
Overburden	W13	1.56
	W30	0.19
	W32	1.35
	ES-H	6.37
	ES-B	18.08
	ES-F	9.22
Total Area		***36.78***

Table 4: Ecosite Types and Spatial Coverage in the Low Grade Ore Stockpile

	Type	Area (ha)
Low Grade Ore	ES-A	0.08
	ES-B - Disturbed	0.65
	ES-B - Disturbed	0.66
	ES-E	1.92
	ES-F	4.93
	ES-H	14.06
Total Area		***22.31***

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-287

Source: Ministry of Natural Resources

Summary of Comment

Indicate the predicted water quality; area and bathymetry of TMF reclaim pond post closure.

Potential Environmental Effects

Tailings pond presents a potential environmental hazard to wildlife depending on size and water quality. Unable to assess significance and need for mitigative action without this information.

Proposed Action

Provide details on the water quality, area and bathymetry of the TMF pond post closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 4.2 page 13

Response

TMF water quality after closure is the same as the predicted TMF seepage water quality results as summarized in Table 4-14 of the Geochemistry Geology and Soils TSD.

In Stage 4, the TMF Reclaim Pond will have a maximum operating water level of 441.2 m. At that water level, the pond area will be 70.8 ha and the maximum pond volume will be 4.3 Mm3. Initially after closure, the TMF Reclaim Pond will remain the same and water will be pumped to the Open Pits. When the water quality is acceptable for discharge to the environment, the emergency spillway invert will be lowered to Elev. 440 m. From that time on, the residual pond will have a surface area of 65 ha and a volume of 3.4 Mm3.

Since solids will be deposited within the TMF during operations the bathymetry of the TMF pond will change over time and it will not be possible to understand the final bathymetry at closure until the mine is closed. The conceptual closure plan for the TMF pond calls for confirmation that water quality from this pond and from TMF runoff will not cause impact to the aquatic health of Marmion basin. Once this is confirmed through monitoring, the spillway will be lowered to Elev. 440 m and flow will be allowed to pass through the former emergency spillway channel into Sawbill Bay.

All inputs contributing to the TMF water quality predictions have been presented in the Site Water Quality TSD. The tailings and other rock types contributing runoff are non-acid generating and leach low metal concentrations as demonstrated within the Geochemistry, Geology and Soils TSD, as such the water quality is expected to improve over time. For the inputs the worst case water quality has been predicted, and conservative input parameters have been used as identified in the documentation provided. In the case of the TMF runoff in post-closure, the water quality was conservatively assigned steady-state concentrations that do not decrease over time.

As indicated in Information Request Response MNR – 252, it is expected that the TMF water will be protective of aquatic life. There are not expected to be any negative impacts resulting from placement of site water or TMF water into the Sawbill Bay or Marmion Basin at closure. Furthermore, using the Open Pit as part of the water

management system at closure allows time to conduct monitoring of the TMF water, site water, and open pit water to confirm that they are suitable for release to the Marmion Reservoir, and allows for mitigation measures to take place if necessary.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-288

Source: Ministry of Natural Resources

Summary of Comment

Are there water quality requirements/objectives before water will be pumped from the TMF pond to the pit lakes? If the water is contaminated, why would it be put into the pit lakes where it may eventually be released into Marmion?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Provide details on the water quality, area and bathymetry of the TMF pond post closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 4.2 page 14

Response

Although it is expected that water discharged from the open pit will meet guidelines or objectives at closure we cannot anticipate the water quality objectives that will be in place 218 years from now, however the commitment as stated is that the discharge will be protective of aquatic life.

There are several benefits to using the open pits to store waters from the site that act to improve overall site water quality over time (regardless of whether the values are above or below discharge guidelines) such as:

- Increase settling time: The expected volume of water in the pit (about 220 Mm^3) is such that the long residence time of water in the pit will allow for settling of sediments and improved water quality;
- Adsorption and chemical reactions: Many dissolved metals (if present) will tend to adsorb onto sediment and settle to the bottom of the pit where they are unavailable for further transport or release to the natural environment; and
- Possible thermocline or picnocliene development: In deep open pit mines or deep lakes in the factors such as temperature differences and groundwater salinity typically result in stratification within the water column (Boehrer and Schultze, 2008) of an open pit once it is flooded (regardless of the input waters used to flood the pit). Development of this stratification or layering tends to segregate high salinity groundwater waters at depths, isolating them from the surface water system. The small surface area relative to depth serves to minimize potential for mixing of the water column.
- Time for chemical reactions to occur:
  - Using the open pit to capture and store water initially allows time to confirm that the materials will behave as predicted (i.e. remain non-acid generating with low potential for metal leaching); and

- Some chemicals reactions over time tend to improve water quality such as removal of nitrate, ammonia, and cyanide through hydrolysis or volatilization, use of the open pit allows these reactions to proceed naturally to a greater extent than could be achieved through active treatment.

Monitoring data will be available for several years prior to potential discharge. Although not currently anticipated based on the water quality predictions, treatment options will be developed if needed based on the monitoring data. Several treatment contingencies are available should they be required and might include batch treatment of pit waters, portable treatment facilities and/or permanent treatment facilities if necessary.

Reference

Bertram Boehrer[1] and Martin Schultze. Stratification of Lakes. Reviews of Geophysics, 46. RG2005 / 2008. 27pp. American Geophysical Union. 2008.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-289

Source: Ministry of Natural Resources

Summary of Comment

The plan indicates that the waste rock pile will not be revegetated – this needs to be indicated as a change to the biophysical environment.

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Indicate the loss of this area as a significant residual biophysical impact that will remain following closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 4.3 page 14

Response

The waste rock pile has been taken into consideration in the assessment of loss of natural land cover. This loss has been considered as a residual effect on wetland and forest cover as well as a residual effect on species VECs from habitat loss. Taken through the full impact assessment, the effect of the loss contributed by the waste rock pile and other project infrastructure has been evaluated as being of low significance due to:

- the availability of natural land cover in the surrounding areas of the MSA, LSA and the RSA; and
- re-naturalization of other parts of the Project footprint through progressive rehabilitation during operations and restoration opportunities during the closure and post-closure phases that are both feasible and practical.

INFORMATION REQUEST – MNR-290

Source: Ministry of Natural Resources

Summary of Comment

The first line "confirm no changes on number, diversity, density, richness, type and relative abundance of taxa" is a very broad sweeping statement. It is questionable if it is possible to do all this implies. Will need more baseline monitoring to actually accomplish this.

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

It is suggested the proponent re-consider the commitments in this statement.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 5.3 page 24

Response

To clarify, biological monitoring will be conducted throughout operations, closure and post-closure, in order to confirm predictions of the EA, confirm the effectiveness of mitigation measures and, in doing so, determine if alternate mitigation measures are needed. The details of the proposed biological monitoring plan are provided in Chapter 8.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-291

Source: Ministry of Natural Resources

Summary of Comment

The plan states that the project site will be returned to mixed forest. Will the TMF support a mixed forest and how does Osisko intend to ensure that this forest condition will result? Also, it is indicated that other than the pits, the site will be returned to condition to allow tourism/recreational fishing, hunting and trapping. How does Osisko intend to rehabilitate the TMF pond to support these activities?

Potential Environmental Effects

Conclusions on the residual effects of the project must be defensible such that these conclusions accurately portray the real consequences of the project.

Proposed Action

Either indicate measures planned to rehabilitate the aquatic community to the TMF pond to support tourism/recreational fishing, hunting and trapping or indicate the loss of this area as a significant residual impacts that will remain following closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 6.1 page 25

Response

Re-naturalization of the TMF

During operations, the tailings surfaces will be tested to determine what nutrients are lacking. Depending on the test results, organic mulch, such as pulp mill sludge, may be required to develop appropriate growing substrates. Details of the re-vegetation (i.e., seed mixture, fertilizer, mulch) will be verified prior to closure using test plots on inactive parts of the TMF surface. At closure, the entire exposed tailings surfaces will be re-vegetated (with emphasis on use of native species) following the developed procedures. Once short-lived herbaceous species are growing on the TMF, seeds from other native plants that are distributed by wind (e.g. birch and poplar) will begin to invade the area and grow in this area. With time, as the organic content of the soil increases and seeds from nearby conifers are blown onto the Site, it is expected that conifers will also become established, leading to the development of a mixedwoods forest stand. A typical time frame for the return of a former industrial site to a mixedwood forest has been estimated as 40-50 years. These are the initial steps in the re-establishment of a forest on the TMF and other areas of the site.

As the native land cover becomes established, a variety of wildlife will begin to use the area and tourism, hunting and trapping can occur within the re-naturalized habitat.

Assessment of effects of loss of native land cover

The loss of the native land cover as a result of the footprint of the project was assessed to be an overall residual effect of low significance as there are extensive areas of natural wetland and upland vegetation throughout the LSA and RSA.

The waterbodies lost as a result of creation of the TMF and Reclaim Pond will be compensated by the creation of new aquatic habitat, consisting of littoral zone enhancements along the shore of Sawbill Bay which are outlined in the No Net Loss Plan. These projects will contribute to both recreational fishing and the existing bait fishery.

TMF Reclaim Pond

At closure, the Reclaim Pond will be integrated with the surface water/seepage collection system that initially will drain to the pits. It is anticipated that the Reclaim Pond will gradually drain (by breaching the containment berm) and naturally re-vegetate with a combination of upland and wetland species. Depending on its final state, it will eventually succeed to a combination of native wetland, wet meadow and mixed forest. In its final state, it would not support fish habitat, however, site drainage will support fish habitat downstream in Sawbill Bay once it meets SSWQO's.

INFORMATION REQUEST – MNR-292

Source: Ministry of Natural Resources

Summary of Comment

If the intent is to restore the TMF and other disturbed areas to productive condition as soon as possible, why would Osisko not plan to actively reforest disturbed sites?

Potential Environmental Effects

Clear presentation of the project is a fundamental and important part of the environmental assessment.

Proposed Action

Either indicate measures planned to restore the forest community to the mine project area including the TMF land or indicate the extent of significant residual impacts that will remain following closure.

Reference to EIS

Conceptual Closure and Rehabilitation Plan section 6.5 page 26

Response

The active reforestation of a site this large would be cost prohibitive for Osisko. Natural succession has established extensive forested areas in this part of northern Ontario. The change in the areal extent of vegetation communities and natural habitats has been assessed in the EA and determined to be a residual effect on all the VECs. When determining the significance, the availability of natural vegetation communities and habitats within the LSA and RSA resulted in an effect of low significance to the VECs.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MNR-293

Source: Ministry of Natural Resources

Summary of Comment

Under the discussion of effluent discharge into Marmion, it is indicated there are PWQO for cyanide and a discussion around impacts on aquatic life. However under the TMF reclaim pond, it is stated there are no guidelines. Are cyanide levels in the TMF pond predicted to be above PWQO's and levels impacting aquatic life during operations and post closure?

Potential Environmental Effects

Incomplete information

Proposed Action

Please clarify and provide more details.

Reference to EIS

HHERA section 5.2.1.1.2 pg 74-75

Response

Revised concentrations of cyanide in the TMF reclaim pond are expected to be between 0.19 mg/L and 0.22 mg/L during operations decreasing to below detection at some time after closure (Section 4.3 of the Site Water Quality TSD). The TMF reclaim pond is an active part of the plant site during operations; as such this pond is not a receiving water for which guidelines such as PWQO would apply.

The HHERA refers to wildlife exposure to water in the TMF reclaim pond, and is based on the assumption that wildlife may occasionally drink from the pond. While there are guidelines (PWQOs, CWQGs) for the protection of aquatic life, there are no guidelines for wildlife exposure to cyanide in surface water (PWQOs and CWQGs do not apply to wildlife; these are developed for protection of aquatic life). As a result, a risk assessment was conducted for exposure of wildlife drinking from the TMF reclaim pond during operations, and the results predicted no effects on wildlife. The details of the risk assessment were described in the HHERA TSD.

The HHERA does not assess risks to aquatic life in the TMF reclaim pond, since there will be no aquatic life in the TMF reclaim pond.

INFORMATION REQUEST – MNR-294

Source: Ministry of Natural Resources

Summary of Comment

As indicated in the ecological effects section, three conditions must exist to cause adverse ecological impacts in an ecological risk assessment. The TMF area and pond clearly has two of the conditions; receptors such as terrestrial wildlife, waterfowl and shorebirds are all 1) present in the area and 2) can access the large tailings waterbody. I am unclear from the analysis of whether there exists substances at harmful levels in the TMF area and whether the ERA was completed for TMF area (statement on pg 78 that it was only completed for Upper Marmion, Lizard and pit lakes but doesn't mention TMF pond). At the very least, from the discussion provided, cyanide levels appear to be well above levels expected to cause toxic effects during mine operation. How long is the TMF pond expected to be toxic? Also, you indicate a list of substances that are above PWQO's (copper, cobalt, molybdenum, uranium) in addition to high cyanide levels. Have the cumulative effects of these high levels been evaluated for adverse ecological affects?

Potential Environmental Effects

Incomplete information. Clear presentation of the project and the data is a fundamental and important part of the environmental assessment

Proposed Action

Clarify that an ecological risk assessment was completed for the TMF pond and what the results of this assessment were.

Reference to EIS

HHERA section 5.2.1.1.2 page 78

Response

Water quality of the TMF reclaim pond is the water pumped to the reclaim tank and recycled within the process. The water quality of this water is provided in the Site Water Quality TSD, in Tables 4-10 to 4-12 labeled “Reclaim Tank (Final Discharge)”.

The TMF reclaim pond is not considered to be part of the natural environment and thus the PWQO or CCME guidelines do not apply. Nonetheless, the EIS acknowledged that wildlife could access the pond for drinking water. The details of the results of predicted exposure of wildlife to water in the TMF reclaim pond were provided in the HHERA TSD. The results showed there were no predicted adverse effects on wildlife.

Since there would be no aquatic life in the TMF reclaim pond (the pond is part of the mine infrastructure, and not a natural waterbody), risks to aquatic life were not predicted.

Ministry of Environment

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-1

Source: Ministry of Environment

Summary of Comment

It is not clear what effluent discharge is identified in the most northern extremity of Sawbill Bay. It is assumed that this is the discharge for the RBC rather than from treated effluent from the TMF.

Potential Environmental Effects

None

Proposed Action

Label the diagram accordingly.

Reference to EIS

Pg. 14. Figure 1-6. Model Compartments

Response

This referenced location is the discharge for water from the accommodation complex.

Based on consultation conducted since the submission of the Draft EIS/EA Report, the accommodation camp effluent discharge and freshwater intake locations have been revised. Figure 5-1 of the EIS/EA Report shows the revised accommodation camp effluent discharge and freshwater intake locations.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-2

Source: Ministry of Environment

Summary of Comment

The figure provides an overview of the various area under study. Although welcomed, it is quite difficult to follow.

Potential Environmental Effects

The areas of potential impact should be included on different

Proposed Action

Reference to other figures

Reference to EIS

Pg. 30. Figure 2-1. Areas of Potential Impact

Response

The purpose of Figure 2-1 is to provide a high level overview of the area. Additional figures are provided in Appendix 2.II of the Aquatic Environment TSD that provide more detail on the specific areas of potential impact (API).

INFORMATION REQUEST – ENVIRONMENT-SURFACE WATER-3

Source: Ministry of Environment

Summary of Comment

Baseline data was collected over a three year period between 2010 and 2012. Table 2-2 identifies that a benthic survey was undertaken only once to determine baseline conditions. A single sampling event does not adequately evaluate potential inter-year variability.

Potential Environmental Effects

As indicated on Pg. 72 of this TSD, benthic invertebrate densities are naturally variable. Benthic community structure is a key tool in assessing the long term impact of mine discharges on the water quality. A thorough understanding of the existing community and the natural variability associated with this structure is needed to separate differences that can be attributed to natural variability and those induced by mining.

Proposed Action

An additional benthic survey at key locations is needed prior to mine development.

Reference to EIS

Pg. 28. Sec. 2.1.4.

Response

The sampling of benthic invertebrates was undertaken to establish general baseline conditions in support of the EA. Additional and more detailed baseline benthic studies will be undertaken as part of the EEM study.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-4

Source: Ministry of Environment

Summary of Comment

It is encouraging that fish are being collected to establish baseline body burdens; however, further information is needed to better understand these existing conditions.

Potential Environmental Effects

Baseline body burdens have not been fully defined. In order to better understand the potential for the mine to impact on fish body burdens a more robust baseline should be developed. Some of the concentrations for walleye in Lizard Lake and Sawbill Bay are quite elevated.

Proposed Action

Future sampling should ensure that a minimum of 10 individuals per species is collected. To explain the variability in body burdens, other fish metrics need to be provided such as fish length, weight and age. A standardized size needs to be developed for each of the species of concern. For example, a standardized walleye is generally 40 cm.

Reference to EIS

Table 2-8. Total Mercury Levels in Fish

Response

There is no “guideline” for how to complete a baseline fish tissue collection and analysis program to establish a baseline for a mining EA. Typically, the baseline data collection (for all disciplines) is based on establishing what the current conditions are, with an emphasis on what the predicted impacts of the mine are anticipated to be, and in some cases, to better characterize existing impacts that may exist in the existing environment.

Fish tissue contaminant analyses are typically collected for an EA, when there is concern that impacts from the mine might result in release of contaminants that could bioaccumulate in fish tissue and subsequently pose either a human health or an environmental risk (for example result in mortality to fish eating birds) – in our case, mercury is really the only metal that could potentially bioaccumulate (most metals do not) **and the project is not predicted to cause an incremental increase in release of mercury to the environment.**

In terms of looking at potential impacts to fish (and other wildlife), water and sediment quality are typically collected and analysed because, in the case of metals, the main concern with metals is that they reach concentrations in water and sediment that may pose a threat (chronic or acute toxicity) to fish – we have sampled water and sediment quite extensively in our EA work.

Fish tissue samples were collected to identify whether there were existing concerns with fish tissue accumulation of contaminants, specifically mercury. The baseline data indicates that some fish have elevated concentrations that could be a concern for consumption by sensitive groups. Summary data for metals was presented in the EA and Table 2-8 of the Aquatic TSD (provided below) and data on individual fish was provided to those expressing interest (see attached Table 1 and Attachments A, B, C).

The water quality predictions indicated that mercury would not be a concern at the site due to low concentrations in the rock samples, negligible leaching of mercury in the geochemical tests, and no use of mercury anywhere in the production circuits. Similarly, the water quality predictions showed that there would be no measurable increase in other metals in the receiving waters. Therefore, there was no reason to continue fish tissue residue sampling.

Osisko and Golder believe sufficient information on fish contaminants has been collected (see the Table 2-8 from the Aquatic TSD below for the actual numbers) from both sport and non-sport fish to sufficiently characterize tissue contaminant levels. We believe that our fish tissue collection meets both the EIS guidelines and the ToR for the project. We have also collected extensive water and sediment quality data, which is equally, if not more important, in terms of predicting potential impacts of the project on the environment. Detailed measurements of individual fish were collected (except blacknose shiner) in order that more detailed analyses of this data could be completed if necessary, however this was not done as the project is not predicted to cause an incremental increase in release of mercury to the environment.

Notwithstanding the fact that OHRG believes that the fish tissue sampling undertaken for the EA was sufficient for EA purposes, as a result of these comments OHRG has committed to providing capacity support to SRFN to collect additional fish tissue and benthic samples in the Spring of 2014 in conjunction with an environmental study being undertaken with their community.

We are also aware that, in 2010, MNR submitted fish tissue samples from Upper Marmion Lake to be analysed in the MOE sportfish contaminant monitoring program and we are planning to obtain this additional data.

Table 2-8: Total Mercury Levels in Fish Tissue Samples (µg/g wet weight; Detection Limit 0.050 µg/g)

Water Body	Species	Average	Maximum	Minimum
Turtle Bay (Marmion)	Blacknose Shiner (n= 1)	0.083	0.083	0.083
	Lake Whitefish (n=8)	0.241	0.329	0.135
	Walleye (n=8)	0.461	0.935	0.267
	White Sucker (n= 5)	0.185	0.301	0.072
Sawbill Bay (Marmion)	Blacknose Shiner (n=1)	0.066	0.066	0.066
	Lake Whitefish (n=14)	0.214	0.335	0.102
	Walleye (n=18)	0.523	1.660	0.232
	White Sucker (n= 11)	0.244	0.374	0.124
Lizard Lake	Cisco (n=8)	0.155	0.178	0.140
	Walleye (n= 8)	1.210	1.730	0.796
	White Sucker (n= 6)	0.239	0.408	0.140

Once a decision is made to proceed with the project, an Environmental Effects Monitoring Program would be set up, which also collects baseline data; and establishes a reference location in order to monitor potential operations effects in a more quantitative way. The EEM program includes sampling of water, sediment, fish tissue and benthic invertebrates.

Attachments

Table 1 and Attachments A, B, C

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Table 1: Fish Length and Weight Data Associated with Tissue Submitted For Metals Analysis - Osisko

Date sampled	Sample #	Location	Species	Fish Fork Length (mm)	Fish Weight (g)	Sex	Life stage
24-AUG-10	BHRI0UR6LKWH051	Turtle Bay	Lake Whitefish	520	2600	F	A
24-AUG-10	BHRI0UR6LKWH022	Turtle Bay	Lake Whitefish	545	2590	F	A
24-AUG-10	BHRI0UR6LKWH052	Turtle Bay	Lake Whitefish	493	1760	F	A
25-AUG-10	BHRI0UTBLKWH062	Turtle Bay	Lake Whitefish	547	2600	F	A
25-AUG-10	BHRI0UTBLKWH063	Turtle Bay	Lake Whitefish	545	2315	F	A
25-AUG-10	BHRI0UTBLKWH066	Turtle Bay	Lake Whitefish	515	2360	M	A
25-AUG-10	BHRI0UR6LKWH166	Turtle Bay	Lake Whitefish	510	2110	M	A
26-AUG-10	BHRI0UTBLKWH167	Turtle Bay	Lake Whitefish	500	1270	F	A
26-AUG-10	BHRI0UR6WALL021	Turtle Bay	Walleye	328	390	n/a	n/a
24-AUG-10	BHRI0UR6WALL023	Turtle Bay	Walleye	470	1245	M	A
24-AUG-10	BHRI0UR6WALL035	Turtle Bay	Walleye	258	185	F	J
25-AUG-10	BHRU0UR6WALL054	Turtle Bay	Walleye	318	325	F	J
25-AUG-10	BHRI0UTBWALL059	Turtle Bay	Walleye	332	395	M	J
26-AUG-10	BHRI0UTBWALL079	Turtle Bay	Walleye	286	250	M	J
26-AUG-10	BHRI0UTBWALL170	Turtle Bay	Walleye	434	860	M	A
26-AUG-10	BHRI0UTBWALL171	Turtle Bay	Walleye	371	510	M	-
22-AUG-10	BHRI0UTBWALL054	Turtle Bay	Walleye	476	n/a	n/a	n/a
26-AUG-10	BHRI0UTBWHSC169	Turtle Bay	White Sucker	493	1830	F	A
25-SEP-10	BHRIOUTBWHSC 001	Turtle Bay	White Sucker	483	1850	F	A
25-SEP-10	BHRIOUTBWHSC 006	Turtle Bay	White Sucker	474	1750	F	A
25-SEP-10	BHRIOUTBWHSC 007	Turtle Bay	White Sucker	464	1600	F	A
25-SEP-10	BHRIOUTBWHSC 009	Turtle Bay	White Sucker	365	650	F	J
25-AUG-10	BHRIOUR5BNSH118,R6BNSH183,BNSH	Turtle Bay	Blacknose Shiner	composite sample	n/a	n/a	n/a
22-AUG-10	BHRI0UR1WALL033	Lizard Lake	Walleye	539	975	F	A

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Table 1: Fish Length and Weight Data Associated with Tissue Submitted For Metals Analysis – Osisko (continued)

Date sampled	Sample #	Location	Species	Fish Fork Length (mm)	Fish Weight (g)	Sex	Life stage
22-AUG-10	BHRI0UR1WALL041	Lizard Lake	Walleye	653	3450	M	A
22-AUG-10	BHRI0UR1WALL042	Lizard Lake	Walleye	515	1550	M	A
22-AUG-10	BHRI0UR1WALL046	Lizard Lake	Walleye	530	1680	M	A
22-AUG-10	BHRI0UR1WALL047	Lizard Lake	Walleye	334	425	M	J
22-AUG-10	BHRI0UR1WALL055	Lizard Lake	Walleye	456	1025	M	A
22-AUG-10	BHRI0UR1WALL056	Lizard Lake	Walleye	542	2025	M	A
21-AUG-10	BHRI0UR1WHSC032	Lizard Lake	White Sucker	482	1650	F	A
22-AUG-10	BHRI0UR1WHSC034	Lizard Lake	White Sucker	440	1420	M	A
22-AUG-10	BHRI0UR1WHSC043	Lizard Lake	White Sucker	414	1200	M	A
22-AUG-10	BHRI0UR1WHSC044	Lizard Lake	White Sucker	462	1525	F	A
22-AUG-10	BHRI0UR1WHSC045	Lizard Lake	White Sucker	463	1450	F	A
22-AUG-10	BHRI0UR1WHSC051	Lizard Lake	White Sucker	505	1800	F	A
21-AUG-10	BHRI0URICISC031	Lizard Lake	Cisco	273	330	M	A
22-AUG-10	BHRI0URICISC035	Lizard Lake	Cisco	269	280	F	A
22-AUG-10	BHRI0URICISC036	Lizard Lake	Cisco	253	255	M	J
22-AUG-10	BHRI0URICISC037	Lizard Lake	Cisco	245	230	n/a	M
22-AUG-10	BHRI0URICISC038	Lizard Lake	Cisco	243	200	M	J
22-AUG-10	BHRI0URICISC048	Lizard Lake	Cisco	245	225	n/a	n/a
22-AUG-10	BHRI0URICISC049	Lizard Lake	Cisco	255	250	F	A
22-AUG-10	BHRI0URICISC050	Lizard Lake	Cisco	257	250	n/a	n/a
19-AUG-10	BHR10U13WALL009	Sawbill Bay	Walleye	389	610	M	A
19-AUG-10	BHR10U13WALL010	Sawbill Bay	Walleye	330	390	F	J
19-AUG-10	BHR10U13WALL012	Sawbill Bay	Walleye	306	330	M	J
19-AUG-10	BHR10U13WALL013	Sawbill Bay	Walleye	380	570	F	A
19-AUG-10	BHR10U13WALL014	Sawbill Bay	Walleye	343	450	F	A
19-AUG-10	BHR10U13WALL018	Sawbill Bay	Walleye	515	1600	F	A
20-AUG-10	BHR10U12WALL005	Sawbill Bay	Walleye	489	325	M	A
20-AUG-10	BHR10U12WALL006	Sawbill Bay	Walleye	430	845	M	A
19-AUG-10	BHR10U13WHSC016	Sawbill Bay	White Sucker	519	2350	F	A

Table 1: Fish Length and Weight Data Associated with Tissue Submitted For Metals Analysis – Osisko (continued)

Date sampled	Sample #	Location	Species	Fish Fork Length (mm)	Fish Weight (g)	Sex	Life stage
19-AUG-10	BHR10U13WHSC017	Sawbill Bay	White Sucker	440	1300	F	A
19-AUG-10	BHR10U13WHSC020	Sawbill Bay	White Sucker	462	1640	M	A
19-AUG-10	BHR10U13WHSC021	Sawbill Bay	White Sucker	505	2225	F	A
20-AUG-10	BHR10U13WHSC030	Sawbill Bay	White Sucker	495	1840	F	A
27-AUG-10	BHR10U13WHSC038	Sawbill Bay	White Sucker	n/a	n/a	n/a	n/a
28-AUG-10	BHR10U13WHSC039	Sawbill Bay	White Sucker	n/a	n/a	n/a	n/a
28-AUG-10	BHR10U13WHSC040	Sawbill Bay	White Sucker	n/a	n/a	n/a	n/a
19-AUG-10	BHR10U13LKWH019	Sawbill Bay	Lake Whitefish	496	2250	M	A
28-AUG-10	BHR10U13LKWH041	Sawbill Bay	Lake Whitefish	n/a	n/a	n/a	n/a
28-AUG-10	BHR10U13LKWH042	Sawbill Bay	Lake Whitefish	n/a	n/a	n/a	n/a
28-AUG-10	BHR10U13LKWH043	Sawbill Bay	Lake Whitefish	n/a	n/a	n/a	n/a
18-AUG-10	BHR10U15BNSH005	Sawbill Bay	Blacknose Shiner	composite sample	n/a	n/a	n/a
21-SEP-11	OHR11FSBLKWH001	Sawbill Bay	Lake Whitefish	496	1550	F	A
21-SEP-11	OHR11FSBLKWH002	Sawbill Bay	Lake Whitefish	540	2350	F	A
21-SEP-11	OHR11FSBWALL003	Sawbill Bay	Walleye	387	650	M	A
21-SEP-11	OHR11FSBLKWH004	Sawbill Bay	Lake Whitefish	491	2025	F	A
21-SEP-11	OHR11FSBWALL005	Sawbill Bay	Walleye	405	800	M	A
21-SEP-11	OHR11FSBWALL006	Sawbill Bay	Walleye	346	450	M	A
21-SEP-11	OHR11FSBLKWH007	Sawbill Bay	Lake Whitefish	508	2450	M	A
21-SEP-11	OHR11FSBLKWH008	Sawbill Bay	Lake Whitefish	478	1900	M	A
21-SEP-11	OHR11FSBWALL009	Sawbill Bay	Walleye	346	400	M	A
21-SEP-11	OHR11FSBWALL010	Sawbill Bay	Walleye	389	615	M	A
21-SEP-11	OHR11FSBWHSC011	Sawbill Bay	White Sucker	505	2000	M	A

Table 1: Fish Length and Weight Data Associated with Tissue Submitted For Metals Analysis – Osisko (continued)

Date sampled	Sample #	Location	Species	Fish Fork Length (mm)	Fish Weight (g)	Sex	Life stage
21-SEP-11	OHR11FSBLKWH012	Sawbill Bay	Lake Whitefish	432	1200	M	A
21-SEP-11	OHR11FSBWALL013	Sawbill Bay	Walleye	450	1025	F	A
23-SEP-11	OHR11FSBWALL014	Sawbill Bay	Walleye	270	210	M	J
23-SEP-11	OHR11FSBWHSC015	Sawbill Bay	White Sucker	490	1900	M	A
23-SEP-11	OHR11FSBLKWH016	Sawbill Bay	Lake Whitefish	470	1650	F	A
23-SEP-11	OHR11FSBLKWH017	Sawbill Bay	Lake Whitefish	465	1850	F	A
23-SEP-11	OHR11FSBWALL018	Sawbill Bay	Walleye	350	465	M	J
24-SEP-11	OHR11FSBLKWH019	Sawbill Bay	Lake Whitefish	n/a	n/a	F	A
24-SEP-11	OHR11FSBLKWH020	Sawbill Bay	Lake Whitefish	466	1600	F	A
24-SEP-11	OHR11FSBWALL021	Sawbill Bay	Walleye	561	2000	F	A
24-SEP-11	OHR11FSBWHSC022	Sawbill Bay	White Sucker	464	1600	M	A
24-SEP-11	OHR11FSBWALL023	Sawbill Bay	Walleye	330	420	M	J

ATTACHMENT A

GOLDER PASTE TECHNOLOGY
ATTN: JOHN SEYLER
1010 LORNE ST.
SUDBURY ON P3C 4R9

Date Received: 30-SEP-11
Report Date: 07-OCT-11 14:17 (MT)
Version: FINAL

Client Phone: 705-524-6861

Certificate of Analysis

Lab Work Order #: L1066235

Project P.O. #: NOT SUBMITTED
Job Reference: 10-1118-0020
C of C Numbers: L1066235
Legal Site Desc:

<Original signed by>

Karen Rutledge
Account Manager

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Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1066235-1	L1066235-2	L1066235-3	L1066235-4	L1066235-5
Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11
Sampled Time					
Client ID	OHR11FSBLKWH001	OHR11FSBLKWH002	OHR11FSBWALL003	OHR11FSBLKWH004	OHR11FSBWALL005
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	<0.10	<0.10	<0.10	<0.10	<0.10

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1066235-6	L1066235-7	L1066235-8	L1066235-9	L1066235-10
Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11
Sampled Time					
Client ID	OHR11FSBWALL006	OHR11FSBLKWH007	OHR11FSBLKWH008	OHR11FSBWALL009	OHR11FSBWALL010
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	<0.10	<0.10	<0.10	<0.10	<0.10

Submitted as part of the Version 3 HRGP Amendment Application Documentation
January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1066235-11	L1066235-12	L1066235-13	L1066235-14	L1066235-15
Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	23-SEP-11	23-SEP-11
Sampled Time					
Client ID	OHR11FSBWHSC011	OHR11FSBLKWH012	OHR11FSBWALL013	OHR11FSBWALL014	OHR11FSBWHSC015
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	<0.10	<0.10	<0.10	<0.10	<0.10

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1066235-16	L1066235-17	L1066235-18	L1066235-19	L1066235-20
Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
Sampled Date	23-SEP-11	23-SEP-11	23-SEP-11	24-SEP-11	24-SEP-11
Sampled Time					
Client ID	OHR11FSBLKWH016	OHR11FSBLKWH017	OHR11FSBWALL018	OHR11FSBLKWH019	OHR11FSBLKWH020
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	<0.10	<0.10	<0.10	<0.10	<0.10

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1066235-21	L1066235-22	L1066235-23		
Description	FISH TISSUE	FISH TISSUE	FISH TISSUE		
Sampled Date	24-SEP-11	24-SEP-11	24-SEP-11		
Sampled Time					
Client ID	OHR11FSBWALL021	OHR11FSBWHSC022	OHR11FSBWALL023		
Grouping **Analyte**					
SOIL					
Physical Tests % Moisture (%)	<0.10	<0.10	<0.10		

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1066235-1	L1066235-2	L1066235-3	L1066235-4	L1066235-5
	Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
	Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11
	Sampled Time					
	Client ID	OHR11FSBLKWH001	OHR11FSBLKWH002	OHR11FSBWALL003	OHR11FSBLKWH004	OHR11FSBWALL005
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	8.8	7.7	7.4	12.5	18.5
	Antimony (Sb) (mg/kg wwt)	1.1	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	74	89	204	130	58
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	50	26
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	183	266	293	330	314
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.197	0.235	0.402	0.113	0.317
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	1800	2300	2390	2840	2520
	Potassium (K) (mg/kg wwt)	3410	4390	4540	5200	5020
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	643	297	289	280	234
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	2.3	2.0	1.8	1.7	1.8
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	1.2	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1066235-6	L1066235-7	L1066235-8	L1066235-9	L1066235-10
	Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
	Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11	21-SEP-11
	Sampled Time					
	Client ID	OHR11FSBWALL006	OHR11FSBLKWH007	OHR11FSBLKWH008	OHR11FSBWALL009	OHR11FSBWALL010
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	5.9	<5.0	6.5	9.9	55.6
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	1.6
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	91	71	85	81	1570
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	10	174
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	2.0
	Magnesium (Mg) (mg/kg wwt)	301	297	279	339	2270
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.393	0.229	0.147	0.362	0.469
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2450	2820	2330	2390	18600
	Potassium (K) (mg/kg wwt)	4900	4700	4560	4600	37300
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	1.7
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	292	270	247	308	1610
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.8	1.5	1.7	1.7	12.2
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	12	37
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	1.0

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1066235-11	L1066235-12	L1066235-13	L1066235-14	L1066235-15
	Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE
	Sampled Date	21-SEP-11	21-SEP-11	21-SEP-11	23-SEP-11	23-SEP-11
	Sampled Time					
	Client ID	OHR11FSBWHSC011	OHR11FSBLKWH012	OHR11FSBWALL013	OHR11FSBWALL014	OHR11FSBWHSC015
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	10.3	<5.0	<5.0	<5.0	8.9
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	96	95	42	95	108
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	29	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	303	254	310	311	262
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.356	0.102	0.446	0.273	0.374
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2500	2370	2440	2230	2050
	Potassium (K) (mg/kg wwt)	4850	4330	5060	4600	3970
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	275	194	266	254	286
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.5	1.7	1.7	1.6	1.4
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1066235-16 FISH TISSUE 23-SEP-11 OHR11FSBLKWH016	L1066235-17 FISH TISSUE 23-SEP-11 OHR11FSBLKWH017	L1066235-18 FISH TISSUE 23-SEP-11 OHR11FSBWALL018	L1066235-19 FISH TISSUE 24-SEP-11 OHR11FSBLKWH019	L1066235-20 FISH TISSUE 24-SEP-11 OHR11FSBLKWH020
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	8.1	6.6	6.3	5.8	<5.0
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	67	61	72	74	54
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	266	255	284	270	245
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.119	0.176	0.342	0.324	0.264
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2350	2340	2190	2510	2340
	Potassium (K) (mg/kg wwt)	4140	4160	4600	4610	4400
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	187	201	251	376	360
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.5	1.5	1.6	1.7	1.8
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amendment Application January 2018 - 1656263

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1066235-21	L1066235-22	L1066235-23		
	Description	FISH TISSUE	FISH TISSUE	FISH TISSUE		
	Sampled Date	24-SEP-11	24-SEP-11	24-SEP-11		
	Sampled Time					
	Client ID	OHR11FSBWALL021	OHR11FSBWHSC022	OHR11FSBWALL023		
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	<5.0	<5.0	6.4		
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20		
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0		
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20		
	Calcium (Ca) (mg/kg wwt)	79	65	61		
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Iron (Fe) (mg/kg wwt)	<10	<10	<10		
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Magnesium (Mg) (mg/kg wwt)	285	255	322		
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20		
	Mercury (Hg) (mg/kg wwt)	1.66	0.320	0.339		
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Phosphorus (P) (mg/kg wwt)	2350	2190	2520		
	Potassium (K) (mg/kg wwt)	4710	4570	5170		
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20		
	Sodium (Na) (mg/kg wwt)	278	248	255		
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20		
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0		
	Tin (Sn) (mg/kg wwt)	1.5	1.5	1.6		
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0		
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0		
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0		
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10		
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0		

Submitted as part of the Version 3 HRGP Amendment EA Documentation
January 2018 1656263

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AS,SB,SE-MS-WT	Tissue	As, Sb, Se in Tissue by ICP/MS	EPA 200.3/6020
HG-WT	Tissue	Mercury by CVAA	SW846 7470A
MET-ICP-WT	Tissue	Metals in Tissue by ICP	EPA 200.3/6020
MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

L1066235

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Submitted as part of the Version 3 submission documentation

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

L1066235

Page 1 of 2

L1066235-COFC

Report To

Company: Golder Associates Ltd

Contact: John Seyler

Address: 1010 Lorne St.
Sudbury ON

Phone: 705 524 6861 Fax:

Invoice To Same as Report? (Yes) No

THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)

Are any samples taken from a regulated DW System? Yes No

If yes, an authorized Drinking Water COC MUST be used for this submission.

Is the water sampled intended to be potable for human consumption? Yes No

Report Format / Distribution

Standard Other (specify):

(PDF) (Excel) Digital Fax

Email 1: jseyler@golder.com

Email 2: jdickison@golder.com

Client / Project Information

Job #: 10-1118-0020

PO / AFE:

LSD:

Quote #:

Service Requested (Rush for routine analysis subject to availability)

(Regular) (Default)

Priority (Specify Date Required → →) Surcharges apply

Emergency (1 Business Day) - 100% Surcharge

For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Lab Work Order # (lab use only)

ALS Contact: K. Rutledge

Sampler: JD

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals incl. Hg	Number of Containers
1	OHR11FSBLKWH001	21/09/11		Fish tissue	✓	
2	OHR11FSBLKWH002				✓	
3	OHR11FSBWALL003				✓	
4	OHR11FSBLKWH004				✓	
5	OHR11FSBWALL005				✓	
6	OHR11FSBWALL006				✓	
7	OHR11FSBLKWH007				✓	
8	OHR11FSBLKWH008				✓	
9	OHR11FSBWALL009				✓	
10	OHR11FSBWALL010				✓	
11	OHR11FSBWHSC011				✓	
12	OHR11FSBLKWH012				✓	

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<Original signed by>	30/09/11		<Original signed by>	30Sept11	13:45	4.5 °C				

1.6-7.3

TYFM014 26-Mar-10

Submitted as part of the Physical 3 Year Amendment application 2018 652633

ALS

* L 1 0 6 6 2 3 5 - C O F C *

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

L1066235

Page 2 of 2

Report To	**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company: Golder Associates Ltd.	Standard Other (specify):	(Regular (Default))
Contact: John Seyler	(PDF) (Excel) Digital Fax	Priority (Specify Date Required → →) Surcharges apply
Address: 1010 Lorne St. Sudbury, ON	Email 1: jseyler@golder.com	Emergency (1 Business Day) - 100% Surcharge
Phone: 705 524-6861 Fax:	Email 2: jdickison@golder.com	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? (Yes) No	**Client / Project Information**	**Analysis Request**
THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)	Job #: 10-1118-0020	Please indicate below Filtered, Preserved or both (F, P, F/P)
Are any samples taken from a regulated DW System? Yes No	PO / AFE:	
If yes, an authorized Drinking Water COC MUST be used for this submission.	LSD:	
Is the water sampled intended to be potable for human consumption? Yes No	Quote #:	
Lab Work Order # (lab use only)	ALS Contact: Karen Rutledge	Sampler: JD

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals incl. Hg	Number of Containers
13	OHR11FSBWALL013	21/SEP/11		Fish Tissue	✓	
14	OHR11FSBWALL014	23/SEP/11			✓	
15	OHR11FSBWHSC015				✓	
16	OHR11FSBLKWH016				✓	
17	OHR11FSBLKWH017				✓	
18	OHR11FSBWALL018				✓	
19	OHR11FSBLKWH019	24/SEP/11			✓	
20	OHR11FSBLKWH020				✓	
21	OHR11FSBWALL021				✓	
22	OHR11FSBWHSC022				✓	
23	OHR11FSBWALL023				✓	

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<Original signed by>	30/SEP/11		<Original signed by>	30 Sept 11	13:45	4.5 °C				

TYFM014 26-Mar-10

ATTACHMENT B

GOLDER PASTE TECHNOLOGY
ATTN: JOHN SEYLER
1010 LORNE ST.
SUDBURY ON P3C 4R9
Phone: 705-524-6861

Date Received: 30-AUG-10
Report Date: 12-OCT-10 11:37 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L925877
Project P.O. #: NOT SUBMITTED
Job Reference: 10-1118-0020
Legal Site Desc:
C of C Numbers: L925877

<Original signed by>

Karen Rutledge
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

Submitted as part of the Version 3 HRGP Amended Application January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-1 FILLET 24-AUG-10 BHRI0UR6LKWH051	L925877-2 FILLET 24-AUG-10 BHRI0UR6LKWH022	L925877-3 FILLET 24-AUG-10 BHRI0UR6LKWH052	L925877-4 FILLET 25-AUG-10 BHRI0UTBLKWH062	L925877-5 FILLET 25-AUG-10 BHRI0UTBLKWH063
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	12.5	10.2	8.4	7.7	7.6
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	148	2910	135	79	132
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	12	12	14	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	254	274	237	222	261
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.214	0.292	0.250	0.237	0.214
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2190	3350	2190	2230	2200
	Potassium (K) (mg/kg wwt)	3280	3260	3120	3420	3410
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	475	613	627	413	405
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amended Application January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-6 FILLET 25-AUG-10 BHRI0UTBLKWH066	L925877-7 FILLET 25-AUG-10 BHRI0UR6LKWH166	L925877-8 FILLET 26-AUG-10 BHRI0UTBLKWH167	L925877-9 FILLET 26-AUG-10 BHRI0UR6WALL021	L925877-10 FILLET 24-AUG-10 BHRI0UR6WALL023
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	25.3	20.7	<5.0	15.5	9.8
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	1.3	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	113	131	209	183	116
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	14	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	232	243	240	328	296
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.135	0.260	0.329	0.292	0.935
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2010	2020	2050	2080	2200
	Potassium (K) (mg/kg wwt)	2860	3230	3120	3800	3930
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	305	384	566	452	298
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID / Description / Sampled Date / Sampled Time / Client ID				
		L925877-11 FILLET 24-AUG-10 BHRI0UR6WALL035	L925877-12 FILLET 25-AUG-10 BHRU0UR6WALL054	L925877-13 FILLET 25-AUG-10 BHRI0UTBWALL059	L925877-14 FILLET 26-AUG-10 BHRI0UTBWALL079	L925877-15 FILLET 26-AUG-10 BHRI0UTBWALL170
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	6.5	19.7	30.1	9.3	19.7
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	121	373	208	508	135
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	280	342	315	323	287
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.366	0.267	0.289	0.290	0.542
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2240	2300	2220	2400	2060
	Potassium (K) (mg/kg wwt)	4010	4000	3860	3920	3610
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	329	360	404	350	360
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-16 FILLET 26-AUG-10 BHRI0UTBWALL171	L925877-17 FILLET 26-AUG-10 BHRI0UTBWHSC169	L925877-18 WHOLE 25-AUG-10 BHRIOUR5BNSH118,R6BNSH183,BNSH	L925877-19 FILLET 22-AUG-10 BHRI0UR1WALL033	L925877-20 FILLET 22-AUG-10 BHRI0UR1WALL041
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	17.5	17.8	33.7	14.6	14.0
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	281	623	5850	96	89
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	10	14	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	302	187	271	247	244
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.432	0.193	0.083	1.30	1.73
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2330	1950	4260	2000	2140
	Potassium (K) (mg/kg wwt)	3890	1800	1570	1950	3330
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	372	296	596	347	346
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	1.5	1.3	1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	40	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID Description Sampled Date Sampled Time Client ID	L925877-21 FILLET 22-AUG-10 BHRI0UR1WALL042	L925877-22 FILLET 22-AUG-10 BHRI0UR1WALL046	L925877-23 FILLET 22-AUG-10 BHRI0UR1WALL047	L925877-24 FILLET 22-AUG-10 BHRI0UTBWALL054	L925877-25 FILLET 22-AUG-10 BHRI0UR1WALL055
TISSUE							
Metals	Aluminum (Al) (mg/kg wwt)		26.1	24.9	33.5	19.6	7.2
	Antimony (Sb) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)		<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)		<1.0	<1.0	<1.0	1.9	<1.0
	Boron (B) (mg/kg wwt)		<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)		<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)		379	81	107	94	69
	Chromium (Cr) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)		<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)		304	206	233	230	227
	Manganese (Mn) (mg/kg wwt)		<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)		1.20	1.51	0.921	0.736	0.796
	Molybdenum (Mo) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)		2280	1900	1860	1780	1910
	Potassium (K) (mg/kg wwt)		3750	1990	2210	1910	1890
	Selenium (Se) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)		<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)		436	368	392	388	307
	Strontium (Sr) (mg/kg wwt)		<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)		<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)		<1.0	1.4	1.6	1.1	<1.0
	Titanium (Ti) (mg/kg wwt)		<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)		<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)		<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)		<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L925877-26	L925877-27	L925877-28	L925877-29	L925877-30
	Description	FILLET	FILLET	FILLET	FILLET	FILLET
	Sampled Date	22-AUG-10	21-AUG-10	22-AUG-10	22-AUG-10	22-AUG-10
	Sampled Time					
	Client ID	BHRI0UR1WALL056	BHRI0UR1WHSC032	BHRI0UR1WHSC034	BHRI0UR1WHSC043	BHRI0UR1WHSC044
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	17.4	29.0	30.2	10.0	49.1
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	8.3
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	209	779	82	102	192
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	21	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	215	319	214	288	251
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	1.01	0.190	0.408	0.187	0.140
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	1920	2590	1970	2140	2080
	Potassium (K) (mg/kg wwt)	1850	3940	2030	2300	2200
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	325	376	393	349	435
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.2	<1.0	1.6	1.9	1.5
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-31 FILLET 22-AUG-10 BHRI0UR1WHSC045	L925877-32 FILLET 22-AUG-10 BHRI0UR1WHSC051	L925877-33 FILLET 21-AUG-10 BHRI0URICISC031	L925877-34 FILLET 22-AUG-10 BHRI0URICISC035	L925877-35 FILLET 22-AUG-10 BHRI0URICISC036
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	14.0	12.3	20.8	22.1	27.3
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	101	83	211	139	364
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	1.2	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	19	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	259	191	317	227	283
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.234	0.277	0.178	0.166	0.142
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2060	2060	2500	2190	2240
	Potassium (K) (mg/kg wwt)	2240	2180	4040	2180	2210
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	352	565	344	482	436
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.5	2.0	<1.0	1.6	1.6
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-36 FILLET 22-AUG-10 BHRI0URICISC037	L925877-37 FILLET 22-AUG-10 BHRI0URICISC038	L925877-38 FILLET 22-AUG-10 BHRI0URICISC048	L925877-39 FILLET 22-AUG-10 BHRI0URICISC049	L925877-40 FILLET 22-AUG-10 BHRI0URICISC050
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	6.1	10.2	26.0	23.2	32.9
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	2.3	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	324	160	529	159	178
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	264	311	338	265	311
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.155	0.146	0.166	0.149	0.140
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2320	2640	2330	1910	2310
	Potassium (K) (mg/kg wwt)	2210	3970	3460	2060	3880
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	340	336	421	422	494
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.4	<1.0	<1.0	1.8	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amended Application January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-41 FILLET 19-AUG-10 BHR10U13WALL009	L925877-42 FILLET 19-AUG-10 BHR10U13WALL010	L925877-43 FILLET 19-AUG-10 BHR10U13WALL012	L925877-44 FILLET 19-AUG-10 BHR10U13WALL013	L925877-45 FILLET 19-AUG-10 BHR10U13WALL014
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	23.5	18.6	10.9	33.0	18.7
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	128	153	290	488	129
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	314	277	328	291	298
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.588	0.310	0.232	0.383	0.385
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2210	2300	2460	2360	2170
	Potassium (K) (mg/kg wwt)	3920	3820	3990	3890	3690
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	368	500	379	428	470
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-46 FILLET 19-AUG-10 BHR10U13WALL018	L925877-47 FILLET 20-AUG-10 BHR10U12WALL005	L925877-48 FILLET 20-AUG-10 BHR10U12WALL006	L925877-49 FILLET 19-AUG-10 BHR10U13WHSC016	L925877-50 FILLET 19-AUG-10 BHR10U13WHSC017
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	14.4	<5.0	5.2	8.2	10.8
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	97	1900	603	3140	132
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	1.8
	Magnesium (Mg) (mg/kg wwt)	281	285	311	293	286
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	1.35	0.354	0.810	0.208	0.124
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2100	3160	2510	3290	2170
	Potassium (K) (mg/kg wwt)	3620	3680	3800	3360	3710
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	403	314	498	463	405
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-51 FILLET 19-AUG-10 BHR10U13WHSC020	L925877-52 FILLET 19-AUG-10 BHR10U13WHSC021	L925877-53 FILLET 20-AUG-10 BHR10U13WHSC030	L925877-54 FILLET 27-AUG-10 BHR10U13WHSC038	L925877-55 FILLET 28-AUG-10 BHR10U13WHSC039
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	7.0	28.4	10.2	<5.0	18.9
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	103	303	313	237	83
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	298	251	251	257	229
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.231	0.217	0.286	0.161	0.255
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	2160	1930	2060	2120	2070
	Potassium (K) (mg/kg wwt)	3630	2030	2100	2010	1890
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	313	310	342	322	422
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	<1.0	1.7	1.4	1.1	1.3
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amended Application January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L925877-56 FILLET 28-AUG-10 BHR10U13WHSC040	L925877-57 FILLET 19-AUG-10 BHR10U13LKWH019	L925877-58 FILLET 28-AUG-10 BHR10U13LKWH041	L925877-59 FILLET 28-AUG-10 BHR10U13LKWH042	L925877-60 FILLET 28-AUG-10 BHR10U13LKWH043
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	12.2	11.7	40.2	6.0	7.2
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Boron (B) (mg/kg wwt)	<5.0	<5.0	5.9	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Calcium (Ca) (mg/kg wwt)	281	83	131	81	113
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Iron (Fe) (mg/kg wwt)	<10	12	<10	<10	<10
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Magnesium (Mg) (mg/kg wwt)	238	215	240	236	250
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	<20
	Mercury (Hg) (mg/kg wwt)	0.156	0.335	0.257	0.185	0.312
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Phosphorus (P) (mg/kg wwt)	1960	2130	1850	2090	2190
	Potassium (K) (mg/kg wwt)	2020	1920	2110	3350	3200
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Sodium (Na) (mg/kg wwt)	267	404	450	517	529
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	<20
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Tin (Sn) (mg/kg wwt)	1.3	1.4	1.7	<1.0	<1.0
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	<10
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	<1.0

Submitted as part of the Version 3 HRGP Amended Application January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L925877-61				
		Description	WHOLE				
		Sampled Date	18-AUG-10				
		Sampled Time					
		Client ID	BHR10U15BNSH005				
Grouping	**Analyte**						
TISSUE							
Metals	Aluminum (Al) (mg/kg wwt)		14.7				
	Antimony (Sb) (mg/kg wwt)		<1.0				
	Arsenic (As) (mg/kg wwt)		<1.0				
	Barium (Ba) (mg/kg wwt)		1.3				
	Beryllium (Be) (mg/kg wwt)		<0.20				
	Bismuth (Bi) (mg/kg wwt)		<1.0				
	Boron (B) (mg/kg wwt)		<5.0				
	Cadmium (Cd) (mg/kg wwt)		<0.20				
	Calcium (Ca) (mg/kg wwt)		7970				
	Chromium (Cr) (mg/kg wwt)		<1.0				
	Cobalt (Co) (mg/kg wwt)		<1.0				
	Copper (Cu) (mg/kg wwt)		<1.0				
	Iron (Fe) (mg/kg wwt)		13				
	Lead (Pb) (mg/kg wwt)		<1.0				
	Magnesium (Mg) (mg/kg wwt)		285				
	Manganese (Mn) (mg/kg wwt)		<20				
	Mercury (Hg) (mg/kg wwt)		0.066				
	Molybdenum (Mo) (mg/kg wwt)		<1.0				
	Nickel (Ni) (mg/kg wwt)		<1.0				
	Phosphorus (P) (mg/kg wwt)		4800				
	Potassium (K) (mg/kg wwt)		1580				
	Selenium (Se) (mg/kg wwt)		<1.0				
	Silver (Ag) (mg/kg wwt)		<0.20				
	Sodium (Na) (mg/kg wwt)		532				
	Strontium (Sr) (mg/kg wwt)		<20				
	Thallium (Tl) (mg/kg wwt)		<5.0				
	Tin (Sn) (mg/kg wwt)		1.7				
	Titanium (Ti) (mg/kg wwt)		<5.0				
	Uranium (U) (mg/kg wwt)		<5.0				
	Vanadium (V) (mg/kg wwt)		<1.0				
	Zinc (Zn) (mg/kg wwt)		53				
	Zirconium (Zr) (mg/kg wwt)		<1.0				

Submitted as part of the Version 3 HRGP Amendment EA Documentation
January 2018 1656263

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AS,SB,SE-MS-WT	Tissue	As, Sb, Se in Tissue by ICP/MS	EPA 200.3/6020
HG-WT	Tissue	Mercury by CVAA	SW846 7470A
MET-ICP-WT	Tissue	Metals in Tissue by ICP	EPA 200.3/6020

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS LABORATORY GROUP - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

L925877

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Submitted as part of the Verification Process for Laboratories Applying for Accreditation Jan 2003

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # L925877
Page 1 of 6

Report To
Company: Golder Associates Ltd
Contact: John Seyler
Address: 1010 Lorne Street
Sudbury Ontario P3C 4R9
Phone: 705-524-6861 Fax: 705-524-1984

Report Format / Distribution
Standard: (PDF) Other (specify): (Excel) Digital Fax
Email 1: jseyler@golder.com
Email 2: tcalverley@golder.com

Service Requested (Rush for routine analysis subject to availability)
(Regular (Default))
Priority (Specify Date Required → →) Surcharges apply
Emergency (1 Business Day) - 100% Surcharge
For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Invoice To Same as Report ? (Yes) No

THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)
Are any samples taken from a regulated DW System? Yes (No)
If yes, an authorized Drinking Water COC MUST be used for this submission.
Is the water sampled intended to be potable for human consumption? Yes (No)

Client / Project Information
Job #: 10-1118-0020
PO / AFE:
LSD:
Quote #:

Lab Work Order # (lab use only):

ALS Contact:
Sampler: TONY Calverley

Analysis Request
Please indicate below Filtered, Preserved or both (F, P, F/P)

See attached

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
1	1	BHR10UR6LKWH051	as per bag	—	Fillet	1
2	1	BHR10UR6LKWH022				1
3	1	BHR10UR6LKWH052				1
4	1	BHR10UR6LKWH062				1
5	1	BHR10UR6LKWH063				1
6	1	BHR10UR6LKWH066				1
7	1	BHR10UR6LKWH166				1
8	1	BHR10UTBLKWH167				1
9	1	BHR10UR6WALL021				1
10	1	BHR10UR6WALL023				1
11	1	BHR10UR6WALL035				1
12	1	BHR10UR6WALL054				1

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			
Relinquished by: <Original signed by>	Date: Aug 30/10	Time: 15:30	Received by: <Original signed by>	Date: 30-Aug-10	Time: 15:10	Temperature: 1.2 °C	Verified by: RFD	Date: Aug 30/10	Time: 16:15	Observations: Yes / No ? If Yes add SIF

TYFM014 26-Mar-10

Submitted as part of the Verification Sampling Request (VSR) Application
January 2013

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # L925877

Report To	Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Standard Other (specify):	Regular (Default)
Contact:	PDF Excel Digital Fax	Priority (Specify Date Required → →) Surcharges apply
Address:	Email 1:	Emergency (1 Business Day) - 100% Surcharge
Phone: Fax:	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Invoice To Same as Report ? Yes No	Client / Project Information	Analysis Request
THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Are any samples taken from a regulated DW System? Yes (No)	PO / AFE:	
If yes, an authorized Drinking Water COC MUST be used for this submission.	LSD:	
Is the water sampled intended to be potable for human consumption? Yes (No)	Quote #:	
Lab Work Order # (lab use only)	ALS Contact: / Sampler:	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
13 1	BHR10UR6WALL059	05-per bag	—	Fillet	
14 1	BHR10UR6WALL079				
15 1	BHR10UTBWALL170				
16 1	BHR10UTBWALL171				
17 1	BHR10UTBWHSC169				
1	BHR10UR5BNSH118 } combine				
18 1	BHR10UR6BNSH183 } into one			Whole	
1	BHR10UR6BNSH145 } sample				
19 1	BHR10UR1WALL033			Fillet	
20 1	BHR10UR1WALL041				
21 1	BHR10UR1WALL042				
22 1	BHR10UR1WALL046				

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<Original signed by>	Aug 30/10	15:30	<Original signed by>	BG 06.10	15:10	-1.2°C	REB	Aug 30	16:15	

Submitted as part of the Vendor Qualification Process - Documentation January 2010

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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COC # L925877
Page 3 of 6

Report To
Company:
Contact:
Address:
Phone: Fax:

Report Format / Distribution
Standard Other (specify):
PDF Excel Digital Fax
Email 1:
Email 2:

Service Requested (Rush for routine analysis subject to availability)
Regular (Default)
Priority (Specify Date Required → →) Surcharges apply
Emergency (1 Business Day) - 100% Surcharge
For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Invoice To Same as Report ? Yes No

THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)
Are any samples taken from a regulated DW System? Yes No
If yes, an authorized Drinking Water COC MUST be used for this submission.
Is the water sampled intended to be potable for human consumption? Yes No

Client / Project Information
Job #:
PO / AFE:
LSD:
Quote #:

Analysis Request
Please indicate below Filtered, Preserved or both (F, P, F/P)

Lab Work Order # (lab use only)

ALS Contact: **Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
23	1 BHR10uRIWALL047	as per bag	—	Fillet	
24	1 BHR10uRIWALL054				
25	1 BHR10uRIWALL055				
26	1 BHR10uRIWALL056				
27	1 ~~BHR10uRIWALL057~~				
28	1 BHR10uRIWHSC032				
28	1 BHR10uRIWHSC034				
29	1 BHR10uRIWHSC043				
30	1 BHR10uRIWHSC044				
31	1 BHR10uRIWHSC045				
32	1 BHR10uRIWHSC051				
33	1 BHR10uRICISC031				

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
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Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<Original signed by>	Aug 30/10	15:30	<Original signed by>	30-Aug-10	13:10	1.2 °C	REB	Aug 30	16:15	

TYFM014 26-Mar-10

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COC # L925877
Page 4 of 6

Submitted as part of the Validation Report for Jacobs Project 3... Revision 1 - 2013

Report To	**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Standard Other (specify):	Regular (Default)
Contact:	PDF Excel Digital Fax	Priority (Specify Date Required → →) Surcharges apply
Address:	Email 1:	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: Fax:		
Invoice To Same as Report ? Yes No	**Client / Project Information**	**Analysis Request**
THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Are any samples taken from a regulated DW System? Yes No	PO / AFE:	
If yes, an authorized Drinking Water COC MUST be used for this submission.	LSD:	
Is the water sampled intended to be potable for human consumption? Yes No		
Lab Work Order # (lab use only)	Quote #:	
	ALS Contact: **Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
34 1	BHR10U RIC15C035	as per bag	—	Fillet	
35 1	BHR10U RIC15C036				
36 1	BHR10U RIC15C037				
39 1	BHR10U RIC15C038				
38 1	BHR10U RIC15C048				
39 1	BHR10U RIC15C049				
40 1	BHR10U RIC15C050				
42 1	BHR10U13 WALL009				
43 1	BHR10U13 WALL010				
44 1	BHR10U13 WALL012				
45 1	BHR10U13 WALL013				
46 1	BHR10U13 WALL014				

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			
Released by: <Original signed by>	Date: Aug 30/10	Time: 15:30	Received by: <Original signed by>	Date: 3-Sep-10	Time: 15:30	Temperature: 1.2 °C	Verified by: Aug 30/10	Date: 16:15	Time:	Observations: Yes / No ? If Yes add SIF

TYFM014 26-Mar-10

Submitted as part of the Version 3.0 Amendment to the ESE Convention
Effective January 1, 2010 (05209)

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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COC # L925877
Page 5 of 6

Report To	**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Standard Other (specify):	Regular (Default)
Contact:	PDF Excel Digital Fax	Priority (Specify Date Required → →) Surcharges apply
Address:	Email 1:	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: Fax:		**Analysis Request**
Invoice To Same as Report ? Yes No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)	Job #:	
Are any samples taken from a regulated DW System? Yes No	PO / AFE:	
If yes, an authorized Drinking Water COC MUST be used for this submission.	LSD:	
Is the water sampled intended to be potable for human consumption? Yes No		
	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** **Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
46	BHR10U13WALL018	as per bag	—	Fillet	
47	BHR10U12WALL005				
48	BHR10U12WALL006				
49	BHR10U13WHSC016				
50	BHR10U13WHSC017				
51	BHR10U13WHSC020				
52	BHR10U13WHSC021				
53	BHR10U13WHSC030				
54	BHR10U10WHSC038				
55	BHR10U13WHSC039				
56	BHR10U13WHSC040				
57	BHR10U13LKWH019				

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			
Released by: <Original signed by>	Date: 30Aug/10	Time: 15:30	Received by: <Original signed by>	Date: 30-AUG10	Time: 15:30	Temperature: 1.2 °C	Verified by: RES	Date: Aug 30/10	Time: 16:15	Observations: Yes / No ? If Yes add SIF

TYFM014 26-Mar-10

Submitted as part of the Vessel SHRP Reporting Requirements January 1st 2010 to December 31st 2013

ALS Environmental

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Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # L925877
Page 6 of 6

Report To	**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Standard Other (specify):	Regular (Default)
Contact:	PDF Excel Digital Fax	Priority (Specify Date Required → →) Surcharges apply
Address:	Email 1:	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: Fax:		**Analysis Request**
Invoice To Same as Report ? Yes No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)	Job #:	
Are any samples taken from a regulated DW System? Yes No	PO / AFE:	
If yes, an authorized Drinking Water COC MUST be used for this submission.	LSD:	
Is the water sampled intended to be potable for human consumption? Yes No	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** **Sampler:**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
58	BHR10U13LKWH041	as per bag	—	Fillet	
59	BHR10U13LKWH042	↓	↓	↓	
60	BHR10U13LKWH043	↓	↓	↓	
61	BHR10U15BNSH005	↓	↓	Whole	

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<Original signed by>	Aug 30/10	15:30	<Original signed by>	30-Aug-10	15:30	1.2°C		Aug 30/10	16:15	

ATTACHMENT C

GOLDER PASTE TECHNOLOGY
ATTN: JOHN SEYLER
1010 LORNE ST.
SUDBURY ON P3C 4R9
Phone: 705-524-6861

Date Received: 01-OCT-10
Report Date: 13-OCT-10 14:26 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L938749
Project P.O. #: NOT SUBMITTED
Job Reference: 10-1118-0020
Legal Site Desc:
C of C Numbers: L938749

<Original signed by>

Richard Clara
General Manager, Thunder Bay

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

Submitted as part of the Version 3 HRGP Amended Application Information
January 2018 - 1656263

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L938749-1	L938749-2	L938749-3	L938749-4	
	Description	FISH TISSUE	FISH TISSUE	FISH TISSUE	FISH TISSUE	
	Sampled Date	25-SEP-10	25-SEP-10	25-SEP-10	25-SEP-10	
	Sampled Time					
	Client ID	BHRIOUTBWHSC 001	BHRIOUTBWHSC 006	BHRIOUTBWHSC 007	BHRIOUTBWHSC 009	
Grouping	**Analyte**					
TISSUE						
Metals	Aluminum (Al) (mg/kg wwt)	10.6	18.9	9.8	6.1	
	Antimony (Sb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Arsenic (As) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Barium (Ba) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Beryllium (Be) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	
	Bismuth (Bi) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	
	Cadmium (Cd) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	
	Calcium (Ca) (mg/kg wwt)	115	148	90	552	
	Chromium (Cr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Cobalt (Co) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Copper (Cu) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Iron (Fe) (mg/kg wwt)	<10	<10	<10	<10	
	Lead (Pb) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Magnesium (Mg) (mg/kg wwt)	251	249	260	222	
	Manganese (Mn) (mg/kg wwt)	<20	<20	<20	<20	
	Mercury (Hg) (mg/kg wwt)	0.301	0.162	0.198	0.072	
	Molybdenum (Mo) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Nickel (Ni) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Phosphorus (P) (mg/kg wwt)	2010	1700	1850	1840	
	Potassium (K) (mg/kg wwt)	3690	3020	3320	2970	
	Selenium (Se) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Silver (Ag) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	
	Sodium (Na) (mg/kg wwt)	470	262	342	271	
	Strontium (Sr) (mg/kg wwt)	<20	<20	<20	<20	
	Thallium (Tl) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	
	Tin (Sn) (mg/kg wwt)	1.8	1.6	1.4	1.3	
	Titanium (Ti) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	
	Uranium (U) (mg/kg wwt)	<5.0	<5.0	<5.0	<5.0	
	Vanadium (V) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	
	Zinc (Zn) (mg/kg wwt)	<10	<10	<10	<10	
	Zirconium (Zr) (mg/kg wwt)	<1.0	<1.0	<1.0	<1.0	

Submitted as part of the Version 3 HRGP Amendment EEM Documentation
January 2018 - 1656263

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AS,SB,SE-MS-WT	Tissue	As, Sb, Se in Tissue by ICP/MS	EPA 200.3/6020
HG-WT	Tissue	Mercury by CVAA	SW846 7470A
MET-ICP-WT	Tissue	Metals in Tissue by ICP	EPA 200.3/6020

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS LABORATORY GROUP - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

L938749

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as receieved by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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COC # L938749 Page 1 of 1

Report To	Golder Associates Ltd.
Company:	Golder Associates Ltd.
Contact:	John Seyler
Address:	1010 Lorne St. Sudbury ON
Phone:	705 524 6861 Fax: 705 524 1984
Invoice To	Same as Report ? (Yes) No

Report Format / Distribution
Standard Other (specify):
(PDF) (Excel) Digital Fax
Email 1: jseyler@golder.com
Email 2: jdickison@golder.com

Service Requested (Rush for routine analysis subject to availability)
(Regular) (Default)
Priority (Specify Date Required → →) Surcharges apply
Emergency (1 Business Day) - 100% Surcharge
For Emergency < 1 Day, ASAP or Weekend - Contact ALS

THE QUESTIONS BELOW MUST BE ANSWERED FOR WATER SAMPLES (circle Yes or No)
Are any samples taken from a regulated DW System? Yes No
If yes, an authorized Drinking Water COC MUST be used for this submission.
Is the water sampled intended to be potable for human consumption? Yes No

Client / Project Information
Job #: 10-1118-0020
PO / AFE:
LSD:
Quote #: Q25939
ALS Contact: Karen Rutledge Sampler: JD

Analysis Request
Please indicate below Filtered, Preserved or both (F, P, F/P)

Lab Work Order # (lab use only)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	As per previous fish tissue samples under this Quote #	Number of Containers
1	BHR 10U TB WHSC 001	25 SEP 10	—	Fish tissue		1
2	BHR 10U TB WHSC 006	25 SEP 10	—	Fish tissue		1
3	BHR 10U TB WHSC 007	25 SEP 10	—	Fish tissue		1
4	BHR 10U TB WHSC 009	25 SEP 10	—	Fish tissue		1

Special Instructions / Regulations / Hazardous Details

Reg 153 Table 1 2 3 TCLP MISA PWQO OTHER (please specify):
Circle one - Note drinking water samples MUST USE DW Chain of Custody

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Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / (No) ? If Yes add SIF
<Original signed by>	01 OCT 10		<Original signed by>	Oct 1/10	3:25	4.9°C	KM	Oct. 4/10	10:45	

TYFM014 26-Mar-10

Submitted as part of the Version 3 RFP Approved as to Form and Content Jan 2010

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-5

Source: Ministry of Environment

Summary of Comment

Runoff collected from the TMF, waste rock piles, low-grade ore stockpile and overburden stockpile will be directed to the open pit. When water quality meets an acceptable criteria (based on effects to aquatic life) runoff from these facilities will be directly discharged to Marmion Lake. The open pit is predicted to overflow to Marmion Lake in 78 years.

Potential Environmental Effects

Directing all runoff of unknown quality to the open pit and deferring the need for management and/or treatment for an extended time period does not seem prudent and requires further assessment to determine this plan's suitability. The potential impact of on-site water discharges to Marmion Lake is underestimated.

Proposed Action

Further evaluation is needed to determine the suitability of this closure proposal.

Reference to EIS

Pg. 94. Sec 3.3. Assessment of Effects on VECs. Post Closure.

Response

Water quality from these facilities has been predicted based on geochemical testing and is provided in Sections 4.2 and 4.3 of the Site Water Quality TSD. Possible impacts have been evaluated based on discharge of these waters to the environment as described in the EIS/EA, Aquatic Environment TSD and HHERA TSD under both operational and closure conditions. Direct discharge of water from any or all of the facilities under the criteria stipulated would not result in a change to the impact assessment results.

It is currently anticipated that the waters from site locations will be suitable for direct discharge upon closure of the mine and monitoring will be conducted. Use of the open pit allows for confirmation that waters will be suitable for discharge, by monitoring over a long period of time before an actual release of water occurs. It is possible to treat the pit water in situ if needed or to treat the pit overflow if needed based on monitoring results.

It is considered that the closure proposal is reasonable, prudent and conservative and that suitable evaluation regarding discharge waters to the environment has been provided in the appropriate TSD documents and EIS/EA.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-6

Source: Ministry of Environment

Summary of Comment

The temporal boundary for assessing effects was limited to 10 years post closure. However, it has been my experience that water quality is impacted for a much greater time period. This is particularly relevant to closure of the TMF and the proposal to direct all drainage to the open pits. It is estimated that it will take 78 years to fill the open pit and overflow to Marmion Lake.

Potential Environmental Effects

The impact of site activities on the water quality of Marmion Lake has the potential to be for much longer term than identified and therefore are currently underestimated.

Proposed Action

The requirements for site remediation and management at the time of closure will be more accurately detailed over time in the Mine's Closure Plan pursuant to the Ontario Mining Act. Future monitoring will be needed to better understand water quality impacts from the site and the need, if any, for remedial efforts both on-site and in lake.

Reference to EIS

Pg. 8. Sec. 1.8.1. Temporal Boundaries

Response

Water quality from these facilities has been predicted based on geochemical testing and is provided in Sections 4.2 and 4.3 of the Site Water Quality TSD. Possible impacts have been evaluated based on discharge of these waters to the environment as described in the EIS/EA, Aquatic Environment TSD and HHERA TSD under both operational and closure conditions. Direct discharge of water from any or all of the facilities under the criteria stipulated would not result in a change to the impact assessment results.

It is currently anticipated that the waters from site locations will be suitable for direct discharge upon closure of the mine, it is understood that monitoring will be conducted. Use of the open pit allows for confirmation that waters will be suitable for discharge, by monitoring over a long period of time before an actual release of water occurs. It is possible to treat the pit water in situ if needed or to treat the pit overflow if needed based on monitoring results. Monitoring and management at closure for all site areas will be described in a formal closure plan to be submitted to MNDM.

It is considered that the closure proposal is suitable, reasonable, prudent and conservative and that suitable evaluation regarding discharge waters to the environment has been provided in the appropriate TSD documents and EIS/EA. Additional detail will be provided in the Closure Plan pursuant to the Ontario Mining Act to be submitted to MNDM as part of the permitting process after the EIS/EA process.

The estimated pit flooding duration has changed since the submittal of the EIS/EA to approximately 218 years. The rationale for this change and details of the pit flooding model have been summarized in a technical

memorandum and are included in the Supplemental Information package of the Conceptual Closure and Rehabilitation Plan.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-7

Source: Ministry of Environment

Summary of Comment

Marmion Lake water quality is summarized in these tables; however, the suitability of the data cannot be determined because the sample size is unknown.

Potential Environmental Effects

An appropriate sample size is needed to adequately evaluate baseline water quality.

Proposed Action

Please provide the dataset size.

Reference to EIS

Pg. 77. Table 5-4 and 5-5. Scenario 1 - Average Case

Response

The statistical summary of Marmion Reservoir baseline data was based on a total of 77 samples collected over 6 sampling periods (as discussed in Section 3.1.3 and Appendix 2.III of the Water and Sediment TSD).

The reader is directed to the Water and Sediment Quality TSD for details of baseline data collection and analysis in Section 2.2 (Concentration Estimates) of the Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - 8

Source: Ministry of Environment

Summary of Comment

Free cyanide is as dismissed for further analysis in the COPC in the ERA even though concentrations in Sawbill Bay and south to the Raft Lake dam are predicted to range between 0.012 mg/L and 0.016 mg/L. Concentrations of this magnitude with a prolonged exposure have the potential to induce chronic effects on some fish species such as yellow perch.

Potential Environmental Effects

The potential impact of cyanide discharges on the water quality of Marmion Lake is under predicted.

Proposed Action

Additional analysis be provided that includes the details of the end of pipe concentrations based on BATEA, the company's proposal to enhance dispersion (i.e. the use of a diffuser), the mixing characteristics of the effluent plume and the point at which PWQO (or other relevant objective) or background is met. The analysis should include both total, free and weak-acid-dissociable cyanide and should consider the effects of temperature the potential toxicity of cyanide. Since toxicity of cyanide is linked with exposure to sunlight and dissolved oxygen, monitoring programs should include secchi disc readings and dissolved oxygen concentrations. Taking this information into consideration, the company should identify locations of greatest risk.

Reference to EIS

Pg. 74. Total cyanide not retained as a COPC

Response

As a result of ongoing project advancement and engineering, the output cyanide concentration from the cyanide destruction circuit has been revised from 20 mg/L to 5 mg/L since the draft EIS/EA Report was submitted, therefore, the predicted worst case values quoted above have been reduced by the same proportion. In addition, baseline cyanide concentrations in Sawbill Bay under average conditions are predicted to be 0.001 mg/L, and would meet the PWQO. The revised baseline cyanide concentration was derived based on the following assumptions:

- All cyanide concentrations were below detection for all sampling time period throughout the baseline program for total cyanide (<0.002 mg/L) and free cyanide (<0.005 mg/L);
- Estimated cyanide concentrations are based on values assigned half of the value of the total cyanide detection limit (<0.002 mg/L) at a value of 0.001 mg/L for both total cyanide and free cyanide (which is a component of total cyanide).

The resultant predicted concentrations of total and free cyanide meet the PWQO (0.005 mg/L) and are presented in a revised table which replaces the Appendix 2.III table of the Lake Water Quality TSD (Part B of Version 2). All relevant tables and appendices for the Site Water Quality and Lake Water Quality TSDs (e.g. calculated concentrations of cyanide in reclaim tank water; calculated concentrations of cyanide from TMF seepage; and resultant summary tables for water quality prediction input data) can be found in Part B of

Version 2 for each respective TSD. Specifically, this is Appendix 4.II and Tables 4-10 to 4-13 (Site Water Quality TSD), and Appendix 2.II and Tables 4-5, 4-6, 7-3, 7-4, and 9-1 (Lake Water Quality TSD). Concentrations at the discharge and in the immediate vicinity of the diffuser are provided in Section 6.1.3 of the EIS/EA Table 6-33b and Figure 6-5b.

Osisko continues to pursue methods to reduce cyanide use in their operations and has committed to a reduction in cyanide concentration in their cyanide discharge, after mixing through a diffuser, to values at or below the SSWQO for cyanide of 0.01 mg/L (details on the derivation of the SSWQO were provided in the HHERA TSD), which are only slightly higher than the PWQO. A conceptual diffuser design has been developed and a preliminary mixing-zone assessment has been completed to evaluate effluent mixing at the discharge location. Based on this mixing-zone assessment (see response to OHRG IR MOE-20), the SSWQO for cyanide is expected to be reached within 30 m of the diffuser under worst case conditions. As a result, adverse effects on aquatic life are not predicted to occur due to cyanide.

Ongoing monitoring will be undertaken as the project proceeds.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - 9

Source: Ministry of Environment

Summary of Comment

Although the number of sampling locations is extensive, it may be prudent to include an additional sampling location between HRWQP-7 and HRWQP-13. This additional site would enable the company to track water quality over time at stations that would be representative of near-field, mid-field and far-field from the point of discharge.

Potential Environmental Effects

None

Proposed Action

Include a station that would be in close proximity to the proposed discharge location.

Reference to EIS

Page 13 Section 2.2.1 Sampling Locations.

Response

Additional sampling stations (HRWQP9 and HRWQ40) have been added near the proposed discharge locations in 2013 and will be included in future sampling campaigns. Attached is a figure showing the new discharge locations.

Attachments

Figure 1: Water Quality, Sediment and Profile Sample Locations

610000 620000 630000

5430000 5420000

N

Serpent Lake
Cornell Lake
Sawbill Bay
Mitta Lake
Marmion Reservoir
Light Lake
Upper Seine Bay
Hawk Bay

HRWQ28
HRWQ35
HRWQ11
HRWQ36
HRWQ1
HRWQ37
HRWQ40
HRWQ4
HRWQ7
HRWQ8
HRWQP3
HRWQ9
HRWQ5
HRWQP10
HRWQP2
HRWQ6
HRWQ10
HRWQ32
HRWQ31
HRWQ20
HRWQ25
HRWQ3
HRWQ21
HRWQ17
HRWQ2
HRWQP6
HRWQ34
HRWQ33
HRWQP9
HRWQP1
HRWQ14
HRWQP7
HRWQ15
HRWQ16
HRWQP6
HRWQ22
HRWQ13
HRWQP5

LEGEND

- New Surface Water Sample Location
- New Profile Sample Location
- Surface Water Sample Location
- Surface Water and Sediment Sample Location
- Profile Sample Location (Surface Water and Sediment)
- Raft Lake Cut Location
- Road
- Trail
- River/Stream
- Lake
- Wetland
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities

SAMPLE LABELS

HRWQx, HRWQPx — 2013 Sample Location (New)

HRWQx, HRWQPx — 2013 Sample Location (Existing)

HRWQx — 2010 - 2012 Sample Location

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000 3,000
SCALE 1:80,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
WATER QUALITY, SEDIMENT AND PROFILE SAMPLE LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	11 Sep. 2013		
CHECK	REJ	11 Sep. 2013		
REVIEW	KJD	11 Sep. 2013		

FIGURE: 1

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\WaterQuality\Sediment_ProfileLocations.mxd

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - 10

Source: Ministry of Environment

Summary of Comment

Aerial deposition is generally not considered in evaluating direct discharges to surface water features and is considered neglible in comparison to the direct discharge of an effluent and is not used in the determination of a mixing zone. However, should the potential impact of aerial deposition on overall lake quality be considered significant, then a second dispersion model needs to be developed and the cumulative impact of seepages, direct discharges and aerial deposition evaluated. You have identified that Golder has undertaken this analysis but it is not clear how it was undertaken nor is there clear linkage between the reports with supported conclusions.

Potential Environmental Effects

The inclusion of aerial deposition in the impacts to water quality are confounding and need to be clarified and supported.

Proposed Action

The proponent needs to clearly differentiate between the impacts of their proposed direct discharges and those through aerial deposition.

Reference to EIS

Page 73. Aerial deposition of chemicals.

Response

The influence of aerial deposition on lake water quality was considered in the Lake Water Quality TSD (Section 4.4.2; Table 4-8; and Section 4.4.3 of the Lake Water Quality TSD) wherein they were applied in modelling the water quality predictions for Upper Marmion Reservoir, and were carried forward in the prediction of impact for the EIS/EA document and HHERA TSD.

To summarize, the maximum predicted particulate deposition rate as determined by atmospheric modelling (Atmospheric TSD as provided of Appendix 3.IV) was assigned over the estimated surface area of water downwind of the project site (1/4 of Upper Marmion Basin) and mixed with the flow rate though the basin for the same period of time. Due to the fine particulate nature of the deposition and the relatively large flow rate of the receiving water settling of the particulate was not considered.

The calculation used the estimated chemical parameter breakdown of the particulate matter to determine the increase in each chemical parameter that would be expected in the water due to the deposition, and this was added to the dissolved concentrations as predicted from the site water quality model. Total suspended solids form the site discharge were also added to develop an estimate of “total concentrations” in the receiving water.

Due to the low predicted air deposition load relative to dissolved load, the change in water quality of the basin due to inclusion of these components does not result in a measurable difference (or calculated difference when factoring in significant figures) in water quality as a result of air deposition due to site activities.

Direct deposition on water is also presented in the Atmospheric TSD as part of Appendix 3.IV. Other aerial emissions and potential for impact from these emissions are described in the Atmospheric TSD.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-11

Source: Ministry of Environment

Summary of Comment

Results of predicted metal concentrations are provided as dissolved values and then compared to federal and provincial water quality objectives.

Potential Environmental Effects

The water quality guidelines are representative of preferred total metal concentrations.

Proposed Action

Please adjust the analysis to include predicted total metal concentrations.

Reference to EIS

Pg. 59. Table 4-5. Predicted Average Water Quality

Response

It is noted that the water quality guidelines are representative of preferred total metal concentrations, however dissolved metal concentrations were required for modelling the water quality predictions for Upper Marmion Reservoir. Total predicted metal concentrations were considered separately in the Lake Water Quality TSD (Section 4.4.2; Table 4-8; and Section 4.4.3 of the Lake Water Quality TSD) wherein they were applied in modelling the water quality predictions for Upper Marmion Reservoir, and were carried forward in the prediction of impact for the EIS/EA document and HHERA TSD.

Due to the low predicted TSS and air deposition load relative to dissolved load, the change in water quality of the basin due to inclusion of these components does not result in a measurable difference (or calculated difference when factoring in significant figures) in water quality as a result of TSS or air deposition due to site activities.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - #12

Source: Ministry of Environment

Summary of Comment

Effluent limits required as part of Ontario Regulation 560/94 are identified as receiving water quality guidelines such as PWQOS and the CCME WQGs. These effluent criteria are considered minimum values that must be supported by the derivation of receiving water based criteria.

Potential Environmental Effects

None

Proposed Action

Remove the MISA effluent criteria from the tables or properly identify their intended use.

Reference to EIS

Pg. 77. Table 5-4 and 5-5. Scenario 1 - Average Case (Lake Water Quality TSD)

Response

It has been documented in the notes of Tables 5-4 and 5-5 that guideline values are provided for reference and relative comparison purposes only. These updated Tables are provided in the Supplemental Information Package of the Lake Water Quality TSD. The EIS/EA and subsequent documents should be consulted for further discussion of appropriate guideline values.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER -13

Source: Ministry of Environment

Summary of Comment

Baseline values for free cyanide are reported to be 0.005 mg/L.

Potential Environmental Effects

Although baseline values can vary over time this concentration is relatively elevated as compared to other watersheds with no industrial inputs.

Proposed Action

Additional sampling should include total and free cyanide to ensure that a statistically defendable baseline can be provided.

Reference to EIS

Page 60. Section 4.3.1. Scenario 1 - Average Case

Water and Sediment Quality TSD Appendix 2.III.

Response

The baseline monitoring program reported all free cyanide in concentrations below the analytical detection limit of 0.005 mg/L (i.e. < 0.005 mg/L). Baseline data was summarized in Appendix 2.III of the Water and Sediment TSD using descriptive statistical analysis (e.g. minimum, maximum, average, median, 95th percentile) assuming all values below detection were equal to the detection limit. Total cyanide (which includes free cyancide) concentrations analysed using a different method showed values typically <0.001 mg/L.

The use of average baseline concentrations assuming values below detection limit are equal to the detection limit is considered suitable as it provides a high level of conservatism in predictive modeling and calculations.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-14

Source: Ministry of Environment

Summary of Comment

The report identifies that DO is 7.5 mg/L at surface, increases to 11.3 mg/L at 4 m but then declines to 1.6 mg/L at a depth of 6m. This type of DO profile is atypical and needs explanation as to the cause of the condition.

Potential Environmental Effects

This atypical DO profile and occurrence of hypoxia at a depth of 6m has the potential to affect cyanide toxicity.

Proposed Action

The report needs to include more details on the DO profiles collected to date. It is encouraged that the company collect additional profiles on a more frequent basis to better understand the DO regimes within the lake. The implications of hypoxia need to be included in the evaluation of the impact of mine discharges on water quality.

Reference to EIS

Pg. 12. Sec. 2.1. Secondary Data Review

Response

The profile describes DO concentrations in Mitta Lake in late summer. It is agreed that this type of profile is atypical, and is what would be referred to as a positive heterograde curve. This condition can occur as a result of an increase in summer temperature in the surface waters (epilimnion) that reduces the solubility of oxygen and hence, oxygen concentrations in the upper layers of the epilimnion decrease. At the same time, oxygen concentrations in the hypolimnion decrease as a result of oxygen consumption in the deeper waters. The oxygen concentrations at the thermocline are least affected by these changes, and the result is that DO levels at these depths appear to increase when in fact the effect is produced by decreased oxygen levels in the epilimnion above and the hypolimnion below.

The decrease in DO in the hypolimnion could affect toxicity of cyanide, but since DO levels are below the concentrations that would be required to sustain aquatic life, aquatic species would be absent from this depth. Finally, Mitta Lake would be eliminated during development of the mine, and the question is therefore academic.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - #15

Source: Ministry of Environment

Summary of Comment

The report predicts that concentrations of all parameters will be below their respective PWQO and will not represent a significant water quality risk after site closure as pit water is predicted not to require treatment once the pit lake overflows (estimated time frame of 78 years).

Potential Environmental Effects

The potential for water quality in the pits (both in a stratified and mixed condition) to be degraded appears to be under estimated and cannot be clearly understood/followed.

Proposed Action

Although the consultant provides the results of a predictive water quality model, additional supporting documentation is needed to better understand the accuracy of the model and understand the assumptions and inherent errors associated with this prediction.

Reference to EIS

Pg. 75. Pit Lake Water

Response

Additional details regarding the Pit Lake water quality calculations are presented in Section 4.2 of the Site Water Quality TSD. All inputs contributing to the pit water have been presented. The rock types expected to be exposed to water from runoff are non-acid generating and leach low metal concentrations as demonstrated within the Geochemistry, Geology and Soils TSD. For the inputs the worst case water quality has been predicted, and conservative input parameters have been used as identified in the documentation provided.

Modifications to the pit flooding model subsequent to the submittal of the EIS/EA report have resulted in a revised pit filling duration. The revised fit filling duration is about 218 years. The basis and results of the revised pit flooding model are provided in an addendum to the Conceptual Closure and Rehabilitation Plan TSD. The change in duration of pit flooding does not materially influence the conservative input water quality values used in the model, thus the resulting predicted water quality and governing factors influencing the water quality do not change.

It is considered that the water quality predictions for the open pit under either stratified or mixed conditions are appropriate, and conservative in nature. Where assumptions or inherent errors are present they are clearly documented in Section 4.2 and 4.3 of the Site Water Quality TSD, and the more conservative approach or value for water quality is taken as the input.

Modelling methods are consistent with industry standards. As documented in Boehrer and Schulteze (2006) when it occurs, pit stratification excludes the lower waters from seasonal overturn, thus the approach of modelling a stratified case and an unstratified case in order to determine the “bounding” conditions for the pit water quality is reasonable and appropriate in this instance. As demonstrated in Stevens and Lawrence (1998)

development of a stratified pit can lead to stable upper layer waters suitable for direct discharge, furthermore, batch treatment can be used to further improve upper layer water quality prior to pit overflow, if necessary.

References

Boehrer, Bertram and Martin Schulteze. 2006. On the Relevance of Meromixis in Mine Pit Lakes. 7th International Conference on Acid Rock Drainage (ICARD), March 26-30, 2006, St. Louis MO. R.I. Barnhisel (ed.) Published by the American Society of Mining and Reclamation (ASMR), 3134 Montavesta Road, Lexington, KY 40502.

Stevens, C.L. and G.A. Lawrence. 1998. Stability and meromixis in a water-filled mine pit. Limnol. Oceanogr., 43(5), 1998, 946-954.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-16

Source: Ministry of Environment

Summary of Comment

The frequency of water quality sampling was variable (3 to 7 times over a three year period). It was not clear what conditions sampling was intended to quantify.

Potential Environmental Effects

Future sampling should take into consideration seasonal variation and conditions of stratification. Should stratification occur, samples should be taken from the epi, meta and hypolimnion.

Proposed Action

Baseline conditions need to be defined under a stratified condition so that a more fulsome understanding of basin mixing is gained. This is of particular concern when the effluent is elevated in TDS and may act as a sinking plume.

Reference to EIS

Page 28. Section 2.1.4. Table 2-3.

Response

It is considered that the baseline date collected is suitable and appropriate for decision making purposes related to this EIS/EA. Additional sample collection and analysis programs are underway. These ongoing programs will include deeper sampling stations and will continue through permitting and operations phase of the project. A new profile sampling station has also been included, beginning in the fall of 2013, to evaluate the potential for thermal stratification in the area of Marmion Basin where effluent discharge is proposed. This data will confirm if thermal stratification occurs at the effluent discharge site and will aid the design and optimization of an effluent differ.

Subsequent to the submittal of the draft EIS/EA, a conceptual effluent diffuser design and preliminary mixing assessment was completed in response to several information requests. This assessment considered potential density differences between the effluent and the receiving water and the potential for stratification in the receiving water based on available monitoring data and the effluent water quality estimates. Although a sinking plume is expected most of the time due to moderately elevated effluent TDS concentrations, the absolute density difference between the effluent and the receiving water is relatively small and is only expected to have a minor influence on the plume behaviour since it is expected to dissipate rapidly due the initial turbulent mixing and dilution generated by the high diffuser port velocities. Additionally, the diffuser ports will be positioned above the thermocline and oriented to upwards to direct effluent into the fully mixed surface layer of the receiving water. For these reasons, the potential for effluent accumulation below a thermocline is expected to be minimal if not negligible.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - 17

Source: Ministry of Environment

Summary of Comment

Figure 3-11 identifies a small lake in close proximity of the TMF. There appears to be hydraulic connection between this lake, an upstream lake that will be covered by the TMF and downstream Lizard Lake. Nothing is mentioned within the narrative as to the potential for this lake to be impacted by mine related seepages/drainages.

Potential Environmental Effects

Given the close proximity of this lake to the TMF, the water quality of the lake could be impacted by contaminated seepage. Potential contaminant pathways should be assessed.

Proposed Action

A more detailed discussion of the potential for seepages from the TMF to impact lake water quality needs to be included in this TSD.

Reference to EIS

Pg. 42. Figure 3-11. Site Layout Model Compartments.

Response

Figure 2-11 of the Hydrogeology TSD indicates that the primary migration of groundwater flow from the proposed TMF will be in a southeasterly direction, reporting to Lizard Lake. It appears that a small portion of groundwater could migrate in an easterly direction and report to a small unnamed pond located east of the proposed TMF. Surface runoff from, and seepage through the surface of the TMF, will be collected in perimeter seepage collection ditches. Thus, only a small amount of deeper groundwater flow from the TMF could come in contact with the unnamed pond. Furthermore, the unnamed pond is part of a surface water stream system, receiving drainage from the north of the TMF with hydraulic connection to Lizard Lake.

Table 4-10 of the Version 2 Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase. The predicted TMF groundwater concentrations of cyanide, cobalt, copper, molybdenum and uranium are greater than the PWQO protection for aquatic life regulatory guidelines. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04, with the exception of copper which at 0.11 mg/L exceeds the target GW3 value of 0.069 mg/L. The proposed SSWQO for copper developed as part of the risk assessment carried out for the Project is 0.0079 mg/L. Therefore, copper concentrations in downstream receiving waters could exceed the proposed SSWQO should water from the TMF directly enter receiving waters through groundwater flow paths.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Parameter	Units	Guidelines				Groundwater Quality reporting from TMF
		CCME CWQG[(a)]	PWQO[(b)]	MISA[(c)]	GW3[(d)]	
Total Cyanide	**mg/L**	0.005	-	-	0.05	***0.03***[(e)]
Co	**mg/L**	-	0.0009	-	0.052	**0.003**
Cu	**mg/L**	0.002	0.001	0.6	0.069	***0.11***
Mo	**mg/L**	-	0.04	-	**-**	**0.08**
U	**mg/L**	-	0.005	-	0.33	**0.007**

Notes:

(a) Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines (CCME CWQG) for the protection of freshwater aquatic life. Values greater than the CCME CWQG are in *italic font*.

(b) Provincial Water Quality Objectives (PWQO). Values greater than the PWQO are in **bold font**.

(c) Municipal/Industrial Strategy for Abatement (MISA). Values greater than the MISA are underlined.

(d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

(e) Assuming treatment efficiency of 5 ppm and natural degradation of cyanide as described in Section 4.2.3.

The prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path. Attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers. “Under most conditions, copper is present in aqueous solution as the divalent cation, Cu2+, or as Cu(II) hydroxide or carbonate complexes. However, copper is not especially mobile in aquatic environments due to the relatively low solubility of Cu(II)-bearing solids and high affinity of copper for mineral and organic surfaces.” (U.S. EPA, 2007).

As a result of the predicted copper concentrations, the potential effects of copper at 0.011 mg/L on aquatic life were considered with respect to published toxicity data to determine whether there could be an adverse effect on aquatic life should groundwater with this concentration of copper enter receiving waters. The U.S. EPA ECOTOX database was accessed to obtain toxicity data for copper. The Aquatic Ecology TSD has noted that the fish fauna in the vicinity of the TMF are characterized by small-bodied forage fish. Therefore, toxicity data for fathead minnow, a typical test species in toxicity tests, was used to predict the potential for adverse effects on fish species. The potential effects on invertebrates were also assessed through a review of the available toxicity data.

The lowest reported effects concentration for the fathead minnow reported in the database was a MATC (calculated as the geometric mean of the NOEC and LOEC) of 0.016 mg/L during a 7 day exposure. Reported no effects concentrations (NOECs) for the amphipod *Hyalella azteca* ranged from 0.013 mg/L to 0.05 mg/L. The results indicate that should water at the predicted TMF concentration reach the downstream waters, there would be no anticipated adverse effect on aquatic life.

Reference

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-18

Source: Ministry of Environment

Summary of Comment

The report dismisses sulphate for future consideration to impair water quality because it is predicted to be found at concentrations < 10 mg/L (maximum concentration predicted to be 3.261 mg/L) within the Upper Marmion Reservoir. This statement is not supported by a mixing zone analysis which clearly details the effluent concentration at the end of pipe and the mixing characteristics of this contaminant with Marmion Lake.

Potential Environmental Effects

The potential impact of sulphates on the water quality of Marmion Lake appear to be under predicted.

Proposed Action

Additional analysis be provided that includes the details of the end of pipe concentrations based on BATEA, the company's proposal to enhance dispersion (i.e. the use of a diffuser), the mixing characteristics of the effluent plume and the point at which PWQO (or other relevant objective) or background is met. Baseline water chemistry is defined by the 75th percentile for each parameter of concern.

Reference to EIS

Page 74. Sulphate not retained as a COPC.

Response

There is no PWQO or CWQG for sulphate. British Columbia has recommended a guideline of 100 mg/L for the protection of aquatic life. The State of Minnesota recommended a guideline of 10 mg/L specifically for the protection of wild rice plants. Outside of a small mixing-zone near the effluent discharge location, predicted concentrations in Upper Marmion Reservoir are well below these values during both average and worst case conditions, and hence no further assessment of sulphate is required. Baseline water quality is defined by the maximum concentration measured. It does not make sense to exclude concentrations above the 75th percentile of the measured baseline concentrations, since these concentrations occur naturally. Using the 75th percentile erroneously implies that naturally occurring concentrations above this value are not normal.

A mixing zone analyses has been conducted subsequent to Osisko's receipt of this information request. Predicted sulphate concentration at end-of-pipe was 168 mg/L under average steady-state conditions. Effluent dispersion will be enhanced through the construction and operation of a diffuser. A conceptual diffuser design and preliminary mixing zone assessment was performed for the full range of anticipated discharge rates (as predicted in the Site Water Quality TSD) to evaluate the mixing conditions within Marmion Reservoir. This assessment estimated that a dilution ratio of 20:1 will be achieved within about 20 m of the discharge location during the peak design discharge. This dilution ratio is equivalent to a sulphate concentration of 8.4 mg/L based on the average steady-state end-of-pipe concentration. The results of the preliminary mixing assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD. Beyond the near-field mixing zone, mixing is evaluated using a basin-wide mixing model. The results of the basin-wide mixing model are provided in the Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-19

Source: Ministry of Environment

Summary of Comment

One of the objectives of the water and sediment quality sampling was to evaluate seasonal variability. Although the program is extensive, additional sampling would provide a better understanding of baseline water quality.

Potential Environmental Effects

To gain a better understanding of lake mixing and the potential impact of mine discharges to Marmion Lake, baseline conditions need to be defined under a full range of existing conditions.

Proposed Action

Additional sampling is needed to more fully evaluate baseline water chemistry. Samples should be collected so that summer stratification, fall and spring turnover (full mixing) are captured.

Reference to EIS

Pg. 12. Sec. 2.2. Primary Data Collection

Response

As stated in the summary of comment above, an extensive monitoring program has been undertaken. It is Osisko's intention to continue to monitor the lake water and evaluate seasonal variability throughout the permitting, operations, and closure stages of the project.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-20

Source: Ministry of Environment

Summary of Comment

The report indicates that total ammonia will not exceed 1.27 mg/L in the upper Marmion reservoir. It is not clear how this was calculated. Does this value represent instantaneous mixing or is it the concentration to be expected after full basin mixing?

Potential Environmental Effects

The potential impact of ammonia discharges (both total and free) on the water quality of Marmion Lake appears to be under predicted.

Proposed Action

Additional analysis be provided that includes the details of the end of pipe concentrations based on BATEA, the company's proposal to enhance dispersion (i.e. the use of a diffuser), the mixing characteristics of the effluent plume and the point at which PWQO (or other relevant objective) or background is met.

Reference to EIS

Page 74. Total ammonia not retained as a COPC.

Response

Assuming no oxidation of ammonia to nitrate, ammonia in the discharge line during operations is conservatively expected to range from 15 to 16 mg/L. It is expected that oxidation of ammonia to nitrate, and volatilization of ammonia will reduce these numbers substantially; however operational monitoring will be required to determine the extent of reduction. A conceptual diffuser design has been developed and a preliminary mixing-zone assessment has been completed to evaluate effluent at the discharge location. The results of this assessment predict that a dilution of 20:1 (equivalent to an ammonia concentration of 0.8 mg/L) will be achieved within 30 m of the diffuser (located within Basin 6 of Sawbill Bay). These results are provided in a technical memorandum as part of the Supplemental Information Package of the Lake Water Quality TSD. Based on the volume of flow though basin Basin 6, the average steady state concentration expected within this basin will be about 0.04 mg/L.

Figure 1-6 of the Lake Water Quality TSD shows the model compartments used. The divisions between the basins were based on lake bathymetry and were positioned at locations where shallow depths would tend to hydraulically separate the compartments. Each basin in the model was assumed to be well-mixed with no vertical stratification. This is considered reasonable and appropriate for the site discharge location (Basin 6).

Construction of a diffuser is indicated in project activities as specified in Table 5-1 (Water Management System) of the EIS/EA report. Diffuser design will be finalized as part of the detailed design work.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 21

Source: Ministry of Environment

Summary of Comment

The boundary of the effluent mixing zone is defined as background concentration or the PWQO for the contaminant of concern. Should the proponent want to use another criteria to define this boundary, then it needs to be clearly defined with extensive documentation. The proponent needs to clearly provide the details of their BLM exercise, supporting documentation from the primary literature and supporting field verification on the suitability of the criteria proposed.

Potential Environmental Effects

The potential impacts of discharges with elevated concentration of copper are under-estimated. The results of any confirmatory sampling have not been included.

Proposed Action

Although the Biotic Ligand Model is an accepted protocol in some circumstances, the reported claim of no effect is not supported by any supporting documentation.

Reference to EIS

Pg. 75. SSWQO for Copper [HHERA TSD]

Response

The details of the BLM calculation were provided in the HHERA TSD (Section 5.2.1.1.2 and Appendix 4.II). The predicted worst case concentration of copper in Sawbill Bay is 2.8 μg/L with a water hardness of 21 mg $CaCO_3$/L. Since the PWQO for copper at water hardness of >20 mg $CaCO_3$/L is 5 μg/L, the predicted concentrations are below the PWQO. Similarly in Lizard Lake, under worst case conditions, a predicted copper concentration of 2.4 μg/L at a water hardness of 30 mg CaCO3/L was reported, which is also below the PWQO of 5 μg/L for waters of this hardness.

The BLM was calculated, since under the CWQGs, waters of the hardness reported for Sawbill Bay and Lizard Lake resulted in a hardness-adjusted CWQG of 2 μg/L. Under worst case conditions, the predicted concentrations in Sawbill Bay and Lizard Lake were slightly above this guideline.

The BLM was used to demonstrate that in these receiving waters, hardness, DOC and sulphate all act to modify the toxicity of copper, and that concentrations up to 7.9 μg/L would be predicted to not result in adverse effects on aquatic life. The predicted worst case concentrations are much lower than this site-specific water quality objective (SSWQO).

The US EPA has done extensive testing of the BLM for copper, and this is documented on their website. The EPA provides a calculator for deriving a chronic aquatic protection value for copper, which was used in deriving the SSWQO for copper for the Hammond Reef project.

CCME in their guidance also endorses the use of the BLM:

"The next step entails quantifying, where possible, the influence of the most pertinent ETMFs identified. This can be done through either the use of simple equations and/or matrices or the use of complex equations or models (e.g., Biotic Ligand Model), where appropriate. The extent and magnitude of influence that the selected parameters will have on the final guideline values depends on the amount and depth of data available and the level of understanding of the interaction between these factors and the substance. The Biotic Ligand Model (BLM) (Paquin et al. 2002) is a tool used to evaluate quantitatively the manner in which several water chemistry parameters affect the speciation and bioavailability of metals in aquatic systems. In this, it is a promising approach in the derivation of CWQGs-PAL for metals, especially of acute guidelines. So far, it is validated for a small but growing number of metals. While initially developed only for freshwater systems and acute toxicity, it is now expanding to chronic toxicity and marine waters. The BLM can be used in the standardization of the data before a guideline is derived and in the expansion and application of the guideline to specific environmental conditions. (Canadian Council of Ministers of the Environment. 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life 2007. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, 1999), Winnipeg."

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-22

Source: Ministry of Environment

Summary of Comment

It is indicated that seepage from the TMF during the operational phase would be lower than effluent criteria specified by MISA.

Potential Environmental Effects

The discharge of water that is degraded to the level of MISA can be acutely toxic if not associated with the elevated hardness values encountered in a mine effluent. More restrictive criteria for seepage will need to be evaluated.

Proposed Action

The analysis needs to be expanded to assess the suitability of the proposed criteria for seepage.

Reference to EIS

Page 90. 3.2.2. Operational Phase

Response

There will be a seepage collection system installed down gradient of the TMF where collected water will be pumped back to the TMF. In order to be conservative in our EIS/EA evaluation and approach, we assumed that some deeper groundwater flow could by-pass the collection system, and the potential impacts were assessed in the EIS. The predicted concentration of free cyanide in the TMF water is 0.11 mg/L which is below the concentrations reported in the literature (Water Environment Research Foundation (WERF) 2007, Scientific Review of Cyanide Ecotoxicology and Evaluation of Ambient Water Quality Criteria) that would be acutely lethal to aquatic life.

Under this scenario: water within the management system it is not expected to be acutely toxic; and, the associated concentrations in Lizard Lake that were conservatively evaluated within the HHERA TSD for the purposes of the EIS/EA evaluation indicate that there will be no impact to downstream water bodies.

Based on the above additional analyses of potential acute toxicity, when coupled with the analyses as provided in the EIS/EA HHERA TSD, it is considered that the criteria used for evaluation within the EIS/EA (including comparisons to MISA PWQO and SSWQO) are suitable at this stage of project development and are appropriately conservative for estimation of project impacts as part of the EIS/EA.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER - 23

Source: Ministry of Environment

Summary of Comment

The proponent is overly dismissive and several statements contradictory on the potential for impact to water quality and aquatic biota as a result of altering whole basin water chemistry. Changing entire lake water chemistry is not consistent with this Ministry's Water Quality Policy 1 (i.e. maintaining water quality at or above PWQO) or Policy #5; a mixing zone cannot be an alternative to reasonable and practical treatment. The proposal to change whole lake basin water chemistry to a free cyanide level that would range between 0.012 mg/L and 0.016 mg/L has the potential to impact various life stages of fish and other aquatic life when subjected to prolonged exposure.

Potential Environmental Effects

The report predicts that free cyanide values under the upper-bound condition ranged up to 0.016 mg/L in Sawbill Bay and up to 0.012 mg/L at the Raft Lake dam. These concentrations are significantly greater than typical for background values measured by the company for Marmion Lake (0.005 mg/L) and those typical of those of other baseline values for non-impacted watersheds (<0.002 mg/L). USEPA water quality criteria (1985g), identifies that freshwater aquatic organisms and their uses should not be affected unacceptably if the 4-day average concentration of cyanide does not exceed 0.0052 mg/L more than once every three years, on the average, and the 1-h average concentration does not exceed 0.022 mg/L, more than once every three years, on the average.

Proposed Action

More discussion is needed on the potential for elevated free cyanide concentrations to persist on a whole basin basis. Stringent effluent criteria for cyanide needed to be developed and a mixing zone to be assessed that restricts the impact of this contaminant to as small a zone as possible.

Reference to EIS

Pg. 75. Free Cyanide not included as a COPC

Response

As a result of ongoing project advancement and engineering, the output cyanide concentration from the cyanide destruction circuit has been revised from 20 mg/L to 5 mg/L since the draft EIS/EA Report was submitted, therefore, the predicted worst case values quoted above have been reduced by the same proportion. In addition, baseline cyanide concentrations in Sawbill Bay under average conditions are predicted to be 0.001 mg/L, and would meet the PWQO. The revised baseline cyanide concentration was derived based on the following assumptions:

- All cyanide concentrations were below detection for all sampling time period throughout the baseline program for total cyanide (<0.002 mg/L) and free cyanide (<0.005 mg/L); and
- Estimated cyanide concentrations are based on values assigned half of the value of the total cyanide detection limit (<0.002 mg/L) at a value of 0.001 mg/L for both total cyanide and free cyanide (which is a component of total cyanide).

The resultant predicted concentrations of total and free cyanide meet the PWQO (0.005 mg/L) and are presented in a revised table which replaces the Appendix 2.III table of the Lake Water Quality TSD (Part B of Version 2). All relevant tables and appendices for the Site Water Quality and Lake Water Quality TSDs (e.g. calculated concentrations of cyanide in reclaim tank water; calculated concentrations of cyanide from TMF seepage; and resultant summary tables for water quality prediction input data) can be found in Part B of Version 2 for each respective TSD. Specifically, this is Appendix 4.II and Tables 4-10 to 4-13 (Site Water Quality TSD), and Appendix 2.II and Tables 4-5, 4-6, 7-3, 7-4, and 9-1 (Lake Water Quality TSD). Concentrations at the discharge and in the immediate vicinity of the diffuser are provided in Section 6.1.3 of the EIS/EA Table 6-33b and Figure 6-5b.

Osisko continues to pursue methods to reduce cyanide use in their operations and has committed to a reduction in cyanide concentration in their cyanide discharge, after mixing through a diffuser, to values at or below the SSWQO for cyanide of 0.01 mg/L (details on the derivation of the SSWQO were provided in the HHERA TSD), which are only slightly higher than the PWQO. A conceptual diffuser design has been developed and a preliminary mixing-zone assessment has been completed to evaluate effluent mixing at the discharge location. Based on this mixing-zone assessment (see response to OHRG IR MOE-20), the SSWQO for cyanide is expected to be reached within 30 m of the diffuser under worst case conditions. As a result, adverse effects on aquatic life are not predicted to occur due to cyanide.

Ongoing monitoring will be undertaken as the project proceeds.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER -24

Source: Ministry of Environment

Summary of Comment

The model provides four different options for the discharge of effluent. The narrative does not clearly describe the suitability of each of these options and how the preferred discharge site was determined.

Potential Environmental Effects

The impact of the mine's final effluent on lake water quality needs to be clearly defined. More details are required to better understand the potential impact of the various options for the location of the final discharge.

Proposed Action

The impact of the mine's final effluent on lake water quality needs to be clearly defined. More details are required to better understand the potential impact of the various options for the location of the final discharge.

Reference to EIS

Page 22. Figure 3-1. Box Model for Upper Marmion Lake

Response

The alternatives with respect to site discharge locations are provided in Section 4 (Alternatives Assessment) of the EIS/EA and in Section 3.5 (Water Discharge) of the Alternatives Assessment Report submitted as an attachment to the EIS/EA. The Alternatives Assessment Report has been significantly revised for clarity and to provide more detail on the comparative evaluations for the alternatives considered.

Section 3.5.3 of the Alternative Assessment Report provides a comparative evaluation of these locations and the preferred location is discussed in Section 3.5.4 of the Alternative Assessment report. Factors considered in selecting the preferred alternative include practical engineering considerations such as pipeline operation and maintenance requirements under freezing conditions, environmental considerations such as mixing capacity of the receiving waters and public or potential stakeholder concerns related to water quality and aquatic habitat.

As stated in Section 3.5.4 “The selected water discharge location alternative is the South end of Sawbill Bay (Alternative 4). The use of the South end of Sawbill Bay at the Alternative 4 location provides favourable mixing conditions with a reduce potential to effect identified fish spawning habitat and decreased potential to effect the local fishing resource.”

Alternative 4 (South End of Sawbill Bay) is selected as the preferred discharge location. Alternative 4 is located within Basin 6 of the lake mixing model (Lake Water Quality TSD) where it is exposed to the part of the main flow path of water from the Upper Siene River watershed, thereby providing suitable mixing conditions downstream of the effluent diffuser. The impact of the mine effluent on the lake water quality is assessed in the Version 2 Lake Water Quality TSD and 6.1.3 of the EIS/EA report.

The results of a preliminary mixing-zone assessment indicate that a dilution sufficient to meet and SSWQO for cyanide and copper, is expected to be achieved within 30 m of the diffuser location. The results of this

assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-25

Source: Ministry of Environment

Summary of Comment

It is indicated that effluent mixing was predicted under a worst-case scenario using average baseline water quality data , maximum predicted lab data for site discharge and low flow conditions.

Potential Environmental Effects

The determination of the proposed mixing zone was not clearly presented. The extent of the mixing zone should be determined using the 75th percentile of baseline water quality (MOE, 2004).

Proposed Action

The predicted mixing zone needs to be clearly presented so that the reader can understand the lateral and vertical extent of mixing and the concentration gradient found within the mixing zone until background or PWQO values are met.

Reference to EIS

Page 90. 3.2.2. Operational Phase

Response

The reference to the EIS is unclear. Please clarify which document Page 90. 3.2.2 refers to, we were unable to find it in EIS/EA report or in the TSD documents provided. Please also provide a full reference for the MOE, 2004 document as it is unclear which document is being referred to.

To clarify, several model scenarios were run to determine potential for impact to the environment. Given the flow characteristics and residence time of Basin 6 (12 days) it is considered that full mixing will occur within this basin over a very short period of time and that the water from this basin will be flushed on a continual basis, therefore the entirety of Basin 6 is considered in the basin-wide mixing scenarios. Furthermore, considering the high flow through Basin 6 and the large upstream catchment for the basin it is considered more reasonable and appropriate to use the average baseline data to represent the baseline water quality in this basin.

In response to information requests received on the DRAFT EIS/EA report, a preliminary mixing zone assessment was performed for the full range of anticipated discharge rates (as predicted in the Site Water Quality TSD) to estimate the potential extent and anticipated concentration gradients within the mixing zone. This assessment estimated that SSWQO for cyanide and copper will be met within 30 m of the discharge location. The results of this assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-26

Source: Ministry of Environment

Summary of Comment

The approach taken to assess potential mixing scenarios within Marmion Lake is confounding. Mixing estimates assume instantaneous and complete mixing of mine discharges with whole lake basins. The model does not provide concentration gradients as mine effluents mix with lake water (i.e. defining a mixing zone). The mixing zone is not defined either spatially or over time. There should be a schematic that shows the extent of the mixing zone. The diagram should also provide and overlay of the mixing zone with any VECs.

Potential Environmental Effects

The impact of site activities on the water quality of Marmion Lake appears to be under-predicted and needs to be clearly presented.

Proposed Action

A more detailed mixing model is needed to provide concentration gradients within the main basins of Marmion Lake. Mixing of the effluent needs to be defined both vertically and laterally.

Reference to EIS

Page 15 Section 2.1 Hydrodynamic Models

Response

It is considered that the lake-wide mixing model as presented is suitable for predictions of the environmental effects of the proposed project, given the large flow through Basin 6 of the study area, and the relatively benign nature of the geochemical conditions and water discharged from the site. However, to address this and other comments, a preliminary mixing zone assessment was performed for the full range of anticipated discharge rates (as predicted in the Site Water Quality TSD) to estimate the potential extent and anticipated concentration gradients within the mixing zone. This assessment estimated that SSWQO for cyanide and copper will be met within 30 m of the discharge location. The results of this assessment, including a figure showing the concentration gradients and extent of the mixing zone, are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 27

Source: Ministry of Environment

Summary of Comment

The mixing model assumed that there was no vertical stratification. Although this assumption may be suitable for portions of the lake that are <5m in depth, it is likely that stratification occurs where water depths are greater. The hydrology of the Marmion Lake is complex and mixing will be a function of the characteristics of the effluent (i.e. specific gravity >1 or < 1); wind speed and direction; and flow of the Seine River.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Pg. 20. Section 3.1.2. Mixing Model

Response

As indicated in response to IR - Environment – Surface Water 26, it is considered that the lake-wide mixing model as presented is suitable for predictions of the environmental effects of the proposed project, given the large flow through Basin 6 of the study area, and the relatively benign nature of the geochemical conditions and water discharged from the site.

Temperature profiles collected between September 2010 and August 2012 indicate that the minimum thermocline depth is approximately 8 m in Sawbill and Lynxhead Bays. Only three of the modelled basins have large volumes below the thermocline; Sawbill Bay, Lynxhead Bay, and Basin #8.

Sawbill Bay is the largest basin with a residence time of approximately 2.5 years and is expected to turn over (mix) twice each year. The lake-wide mixing model indicates that effluent is expected to accumulate over a long period of time (e.g. years) and that the spring and fall mixing events distribute the effluent between surface and bottom waters.

A conceptual diffuser design and preliminary mixing zone assessment was performed in response to several information requests. The diffuser design considered the potential for thermal stratifaction at the discharge location and the diffuser ports were positioned above the maximum elevation of the thermocline (based on monitoring data in Sawbill Bay) to prevent the accumulation of effluent below the thermocline and angled upwards to maximize the initial mixing of the effluent this is predominantly denser than the receiving water.

The effluent is expected to be predominantly slightly negatively buoyant due to a higher concentration of total dissolved solids compared to the receiving water; however, the effect of buoyancy on the behavior of the effluent plume will be limited to a small area in close proximity to the diffuser given the effectiveness of the diffuser to provide initial mixing.

The results of the conceptual diffuser design and preliminary mixing zone assessment are provided in a technical memorandum included as an addendum to the Lake Water Quality TSD.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 28

Source: Ministry of Environment

Summary of Comment

The use of drogues and a Doppler current profiler to better understand the hydrology of the Marmion reservoir is a much needed (and recommended) field protocol. However, this information needs to be collected on multiple dates under various conditions to understand water velocity and direction and how these factors may affect basin retention time and effluent mixing.

Potential Environmental Effects

The impact of site activities on the water quality of Marmion Lake appears to be under-predicted and needs to be clearly presented.

Proposed Action

A more detailed mixing model is needed to provide concentration gradients within the main basins of Marmion Lake. Mixing of the effluent needs to be defined both vertically and laterally.

Reference to EIS

Page 20 Section 3.1.2

Response

In response to several information requests received as part of the review of the draft EIS/EA report, a preliminary mixing zone assessment was performed for the full range of anticipated discharge rates (as predicted in the Site Water Quality TSD) to estimate the potential extent and anticipated concentration gradients within the mixing zone. This assessment estimated that SSWQO for cyanide and copper will be met within 30 m of the discharge location and PWQO will be met within 50 m. Within this range, natural currents within Marmion Basin will have very little influence on effluent mixing because the behaviour of the effluent plume will be dominated by the high exit velocity from the diffuser port. The results of the preliminary mixing zone assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD.

Outside of this near-field mixing zone, the lake-wide mixing model (i.e., box model – see Lake Water Quality TSD) predicts mixing via normal water movement within the basin. As indicated in Section 3 of the Lake Water Quality TSD drogues have been used to characterize the hydrology of the basin. It is considered that information gathered coupled with flow data, catchment areas, and meteorology, when combined provides ample information to adequately characterize the hydrology of the basin at a level suitable for assessment of environmental impacts from the proposed project. The level of uncertainty related to the hydrological aspects of the projects is relatively minor when compared to other inherent uncertainties in a project of this nature.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 29

Source: Ministry of Environment

Summary of Comment

The drogue information suggests that flow direction in this portion of the bay (Basin 7c) is towards the northeast. I understand that the TMF discharge is proposed to be located at far end of this embayment and that this portion of the bay is shallow (approximately 4m). The onshore flow direction would infer that the effluent would be more confined and/or concentrated in this shallow basin.

Potential Environmental Effects

The impact of site activities on the water quality of Marmion Lake needs to be clearly presented in order to better understand the potential impacts of mine discharges on the water quality of Marmion Lake.

Proposed Action

A more detailed mixing model is needed to provide concentration gradients within the main basins of Marmion Lake. Mixing of the effluent needs to be defined both vertically and laterally.

Reference to EIS

Page 26. Figure 3-2. Drogue Tracks Sawbill Bay

Response

The movement of the drogues presented on Figure 3-2 are representative of the surface currents on October 7, 2010. The current data collected by the Acoustic Doppler Current Profiler (ADCP, location shown on Figure 1-6) are representative of the long-term variations expected to occur in Sawbill Bay. The ADCP data suggests that the predominant current direction is to the southwest at depths greater than 4 m. Near the surface (at depths less than 4 m that would be measured by drogues) the currents are driven by wind events. In general, the ADCP data suggests that there are large exchange currents between the central and northern areas of Sawbill Bay and that the mine effluent in not expected to accumulate in the northern basin.

During operations there will be no direct discharge of water from the TMF, rather the water will be recycled back to the process plant for use in processing and/or discharge via the PPCP with other site waters after treatment if necessary. In response to several information requests received as part of the review of the DRAFT EIS/EA report, a preliminary mixing assessment has been carried out to evaluate and describe the initial effluent mixing at the discharge location. The results of this assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD. At closure water would only be discharged once it meets appropriate site specific discharge criteria as defined during the permitting phase, following approval of the EIS/EA.

An operational and closure monitoring plan will be implemented to ensure that and TMF water discharged is of suitable quality and that there are no impacts to Sawbill Bay. Should the monitoring program indicate water is not suitable for discharge then it would be directed to the PPCP or to the open pit for treatment prior to release if necessary.

It is considered that there is suitable and adequate hydrological data and analyses of Sawbill Bay to reasonably determine the potential for environmental impact as a result of this project.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 30

Source: Ministry of Environment

Summary of Comment

The hydrology of Sawbill Bay/Upper Marmion Lake is complex and there remains significant uncertainty as to the actual mixing dynamics of the TMF discharge at the proposed location. It appears that surficial mixing (0 to 4 m depth) may be more influenced by wind direction while mixing at depth (4+ to 22 m) may be influenced by Seine River currents. Mixing properties are further confounded since mine effluents tend to be high in TDS making them a sinking plume and the proponent has not identified if they are going to have a diffuser to enhance mixing at their point of discharge.

Potential Environmental Effects

Given the complexity of basin hydrology and the unknown mixing properties of the mine effluent, the impact of the TMF discharge and other mine related discharges is not clearly understood.

Proposed Action

A more detailed mixing model is needed to provide concentration gradients within the main basins of Marmion Lake. Mixing of the effluent needs to be defined both vertically and laterally.

Reference to EIS

Page 29 Section 3.1.3.2.2 Continuous and Vertical Profile Current Data

Response

During operations there will be no direct discharge of water from the TMF, rather the water will be recycled back to the process plant for use in processing and/or discharge via the PPCP with other site waters after treatment if necessary. At closure water would only be discharged once it meets appropriate site specific discharge criteria as defined during the permitting phase, following approval of the EIS/EA.

An operational and closure monitoring plan will be implemented to ensure that TMF water discharged is of suitable quality and that there are no impacts to Sawbill Bay. Should the monitoring program indicate water is not suitable for discharge then it would be directed to the PPCP or to the open pit for treatment prior to release if necessary.

A diffuser will be constructed to enhance mixing at the discharge location and a conceptual diffuser design and preliminary mixing zone was performed in response to several information requests. The results of the preliminary mixing assessment are provided in a technical memorandum as part of the Supplemental Information Package of the Version 2 Lake Water Quality TSD. The diffuser design considered the potential for thermal stratification at the discharge location and buoyancy effects on effluent mixing. The effluent is expected to be slightly negatively buoyant due to a higher concentration of total dissolved solids compared to the receiving water, however, the effect of buoyancy on the behavior of the effluent plume will be limited to a small area in close proximity to the diffuser because rapid dilution will neutralize buoyancy effects after discharge.

The mixing assessment estimated that SSWQO for cyanide and copper will be met within 30 m of the discharge location. Within this range, natural currents due to wind and water flows within Marmion Basin will have very

little influence on effluent mixing because the behaviour of the effluent plume will be dominated by the high exit velocity from the diffuser port. Outside of the near-field mixing zone, the lake-wide mixing model (i.e., box model – see Lake Water Quality TSD) predicts mixing via normal water movement within the basin. It is considered that information gathered coupled with flow data, catchment areas, and meteorology, when combined, provides ample information to adequately characterize the hydrology of the basin at a level suitable for assessment of environmental impacts from the proposed project. The level of uncertainty related to the hydrological aspects of the projects is relatively minor when compared to other inherent uncertainties in a project of this nature. Given the inherent complexity of the project, geochemistry, geology, and overall water management system, it is considered that reducing the uncertainty of this one aspect of the project with not significantly contribute to a greater understanding of the potential environmental impact, and that the information provided is suitable and appropriate to make decisions related to potential overall environmental impacts of the project.

It is considered that there is suitable and adequate hydrological data and analyses of Sawbill Bay to reasonably determine the potential for environmental impact as a result of this project.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 31

Source: Ministry of Environment

Summary of Comment

The residence time for the central and northern basins for Sawbill Bay are estimated to be <10 days given the estimated exchange flow between the two basins that range between 1,000,000 m3/d and 20,000,000 m3/d (dependant on wind speed). However, Table 3-4 indicates that residence time is 910 days. Please clarify

Potential Environmental Effects

The residence time of the bays is an important factor in determining mixing of seepages and effluent. The impact of these discharges cannot be clearly understood without them.

Proposed Action

Clarify the retention time of the identified basins.

Reference to EIS

Page 36 Section 3.1.3.4 Estimation of Sawbill Bay Exchange Flows.

Response

Table 3-4 is referring to the overall expected residence time of waters in the basin. Exchange flows as indicated in Section 3.1.3.4 of the Lake Water Quality TSD refer to the “interflow” of water within the northern and central portions of the basin (i.e. water not leaving the basin). That is to say, the mixing between the different portions of the basin, rather than the flow out of the main and central portions of the basin. As stated in this section, the exchange flows within the basin show that the northern and central basin are not hydraulically separated and can be represented as a single basin with a residence time of approximately 910 days. These basins are isolated by bathymetry from Southern Sawbill Bay.

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 32

Source: Ministry of Environment

Summary of Comment

The report identifies locations where pH decreases at depth from 8.4 at surface to 6.5 at the lake bottom. The consultant should clarify the location of this occurrence and predict the implication of this decreased pH value on contaminant bioavailability (i.e. free cyanide).

Potential Environmental Effects

A more fulsome understanding of water chemistry at depth is needed to better understand the potential impacts of mine discharges.

Proposed Action

The consultant should provide the location of these sampling locations and include pH on their evaluation of potential impacts to water quality.

Reference to EIS

Page 12 Section 2.1 Secondary Data Review

Response

Water quality estimates include evaluation of pH as provided in the Site Water Quality TSD and in the Lake Water Quality TSD. The data presented on page 12 of the Water and Sediment Quality TSD refers to a limnological vertical profile assessment of Mitta Lake. The decrease in pH at the lake bottom (approximately 12 m) could affect toxicity of cyanide, but since DO levels at depths from 8 to 10 m (0.056 mg/L to 2.2 mg/L for four seasons from 2010 to 2012) are below the concentrations that would be required to sustain aquatic life, aquatic species would be absent. Finally, Mitta Lake would be eliminated during development of the mine, and the question is therefore academic.

The site discharge is expected to be near neutral and is not expected to influence the natural pH conditions of the lake water within the Marmion Basin.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER - 33

Source: Ministry of Environment

Summary of Comment

The use of the Biotic Ligand model is an accepted practice to determine site specific discharge criteria.

Potential Environmental Effects

Further evaluation is needed to better understand the impact of this whole basin criteria.

Proposed Action

Further comments to be provided in the Human Health and Ecological Risk Assessment TSD.

Reference to EIS

Pg. 104. Sec. 3.5.2. SSWQO for Copper

Response

The details of the BLM calculation were provided in the HHERA TSD (Section 5.2.1.1.2 and Appendix 4.II). The predicted worst case concentration of copper in Sawbill Bay is 2.8 μg/L with a water hardness of 21 mg CaCO3/L. Since the PWQO for copper at water hardness of >20 mg CaCO3/L is 5 μg/L, the predicted concentrations are below the PWQO. Similarly in Lizard Lake, under worst case conditions, a predicted copper concentration of 2.4 μg/L at a water hardness of 30 mg CaCO3/L was reported, which is also below the PWQO of 5 μg/L for waters of this hardness.

The BLM was calculated, since under the CWQGs, waters of the hardness reported for Sawbill Bay and Lizard Lake resulted in a hardness-adjusted CWQG of 2 μg/L. Under worst case conditions, the predicted concentrations in Sawbill Bay and Lizard Lake were slightly above this guideline.

The BLM was used to demonstrate that in these receiving waters, hardness, DOC and sulphate all act to modify the toxicity of copper, and that concentrations up to 7.9 μg/L would be predicted to not result in adverse effects on aquatic life. The predicted worst case concentrations are much lower than this site-specific water quality objective (SSWQO).

The US EPA has done extensive testing of the BLM for copper prior to recommending its use in deriving water quality criteria, and this is documented on their website. The EPA provides a calculator for deriving a chronic aquatic protection value for copper, which was used in deriving the SSWQO for copper for the Hammond Reef project.

CCME in their guidance also endorses the use of the BLM:

"The next step entails quantifying, where possible, the influence of the most pertinent ETMFs identified. This can be done through either the use of simple equations and/or matrices or the use of complex equations or models (e.g., Biotic Ligand Model), where appropriate. The extent and magnitude of influence that the selected parameters will have on the final guideline values depends on the amount and depth of data available and the level of understanding of the interaction between these factors and the substance. The Biotic Ligand Model (BLM) (Paquin et al. 2002) is a tool used to evaluate quantitatively the manner in which several water chemistry

parameters affect the speciation and bioavailability of metals in aquatic systems. In this, it is a promising approach in the derivation of CWQGs-PAL for metals, especially of acute guidelines. So far, it is validated for a small but growing number of metals. While initially developed only for freshwater systems and acute toxicity, it is now expanding to chronic toxicity and marine waters. The BLM can be used in the standardization of the data before a guideline is derived and in the expansion and application of the guideline to specific environmental conditions. (Canadian Council of Ministers of the Environment. 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life 2007. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, 1999), Winnipeg."

INFORMATION REQUEST – ENVIRONMENT – SURFACE WATER-34

Source: Ministry of Environment

Summary of Comment

The development of site specific criteria is an accepted practice; however, general practice is to develop receiving water based discharge criteria rather than a value to alter an entire lake basin.

Potential Environmental Effects

Further evaluation is needed to better understand the impact of this whole basin criteria.

Proposed Action

Further comments to be provided in the Human Health and Ecological Risk Assessment TSD.

Reference to EIS

Pg. 104. Sec. 3.5.2. SSWQO for Cyanide

Response

The criteria are receiving water based. The selection of a SSWQO for cyanide was based on toxicity data that take into account the aquatic fauna of Upper Marmion Reservoir. Specifically, the SSWQO of 10 ug/L is based on the lack of salmonid species in the lake, which are the most sensitive to the effects of free cyanide, but still ensures that the SSWQO is below the chronic effects levels for other invertebrate and fish species. The details of the derivation were provided in the HHERA TSD.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-35

Source: Ministry of Environment

Summary of Comment

This portion of the report was not reviewed and is beyond the scope of the Surface Water reviewer.

Potential Environmental Effects

None

Proposed Action

None

Reference to EIS

Page 1 -71. Human Health Risk Assessment

Response

Thank you for your comment. We understand that review of the human health risk assessment is the responsibility of Health Canada.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-36

Source: Ministry of Environment

Summary of Comment

The discharge of effluent from mine operations and sewage effluent from on-site infrastructure is classified as an indirect interaction

Potential Environmental Effects

The description of possible impacts appears to be minimalized. The direct discharge of mine impacted water is considered to be a direct interaction with lake water quality.

Proposed Action

Change the interaction to direct.

Reference to EIS

Aquatic Environment TSD, Page 93. Table 3-4. Operational Phase Activities and Interaction with Aquatic Environment

Response

Changes in water quality are considered to be indirect interactions with the health of the aquatic ecosystem. Water quality parameters are part of the physical environment. The modelled predictions of changes to water quality are provided by the water quality component to the aquatic biology component. Therefore the interaction should remain indirect. An example of a direct interaction is the direct loss of fish habitat that will occur from the draining of Mitta Lake.

Yes, the mine discharge is considered to be a direct interaction with lake water quality, and is reflected as such in the Lake Water Quality TSD. The potential impact on water quality was assessed by predicting both the discharge volume as well as the concentration of potential contaminants in the discharge.

The description of possible impacts to aquatic life from the Project was not intended to be minimized at any point during the assessment. The assessment is considered fulsome and precautionary, and includes mitigation measures to ensure that aquatic health is protected to the extent possible.

In addition to a water quality assessment, and an aquatic biology assessment, a full toxicological assessment of the effects of discharges from the Project were undertaken with respect to potential risks to fish, the results of which are provided in the Human and Ecological Risk Assessment TSD and which conclude that there will be no significant increase risk to aquatic health due to the Project.

INFORMATION REQUEST – ENVIRONMENT - SURFACE WATER-37

Source: Ministry of Environment

Summary of Comment

There is confusion as to the suitability of the location of the freshwater intake. Visually, it would appear that flow is from basin 7C to 7B to 7A. This flow path would result in potential interference with the freshwater intake. However, drogue information suggests that flow paths may be to the north. Please clarify.

Potential Environmental Effects

The suitability of the location for the freshwater intake is in question.

Proposed Action

Move the location of the freshwater intake should there be a potential for it to be impacted by the effluent from the on-site sewage treatment plant.

Reference to EIS

Page 14. Figure 1-6. Model Compartments

Response

Management of water levels in Marmion Reservoir at the Raft Lake Dam cause flows to travel both into Sawbill Bay (i.e., from basin 7A to 7C) and out of Sawbill Bay (i.e., from basin 7C to 7A) depending on the time of year.

The current data collected during the drogue studies are representative of the wind-driven surface currents (e.g. top 1 m) under specific wind conditions. Full-depth currents are better represented by Acoustic Doppler Current Profiler (ADCP) data which is discussed in Section 3.1.3.2.2 of the Lake Water Quality TSD. The ADCP suggests that the currents at depths below 4 m are predominantly to the southwest.

The discharge location for the effluent from the accommodation camp has been moved to avoid sensitive fish habitat in the northern part of Sawbill Bay. To accommodate this move, the intake location has also been moved to a location where it is upstream from the effluent discharge location (relative to a local inflowing creek). The revised locations for the camp intake and discharge are provided in the response to OHRG IR_EC-19 and in Figure 5-1 or the revised EA/EIS report.

Effluent dilution will be enhanced through the construction and operation of an effluent diffuser such that water quality objectives (e.g., PWQO or SSWQO) are met within a short distance from the diffuser (the results from a preliminary mixing assessment for mine site effluent is provided in the response to OHRG IR_MOE-SW-20). Dilution of the effluent to concentrations similar to the basin wide concentrations is expected to be achieved within 500 m of the diffuser. Beyond this distance, there is expected to minimal difference in effluent concentration within the basin. As the intake locations are both located more than 500 m from the nearest effluent discharge location, local effluent concentrations are not expected to be higher at the intake locations.

INFORMATION REQUEST – MOE – ATMOSPH 1

Source: Ministry of Environment

Summary of Comment

90th percentile data presented as the baseline data does not match the data in Tables 3 through 9 in Appendix 3.III. Baseline concentrations are higher than maximum concentrations for some of the sites used.

Potential Environmental Effects

Baseline concentrations are in some cases elevated relative to the concentrations at some of the stations used to develop the data set. Minimizes the impact of the undertaking if the existing air quality is poorer than it actually is.

Proposed Action

Correct the tables.

Reference to EIS

Table 3-17 of EIS and Table 14 in Appendix 3.III

Response

The values presented in Table 3-13 of the Atmospheric Environment TSD are presented in different units than the data presented in Tables 3 through 9 of Appendix 3.III. The units of Table 3-13 in the Atmospheric Environment TSD have been converted to µg/m³ which is consistent with the reported units from the dispersion modelling assessment. Tables 3 through 9 in Appendix 3.III of the Atmospheric Environment TSD are in ppb or ppm, consistent with the reported units from the monitoring stations. The data in the two sets of tables do match each other. For clarity, we have provided an updated version of Table 3-13, which explicitly displays the units.

Attachments

Updated Table 3-13 Existing Air Quality

Table 3-13: Existing Air Quality for the Local and Regional Study Areas

Compound	Ave. Period	90th Percentile of Monitored Data (µg/m³)							
		Fort Liard	Fort Chipewyan	La Loche	Brandon	Pickle Lake	Thunder Bay	Fraserdale	Senneterre
PM_{10}	24-hour	17.81	—	102.09	47.44	—	—	—	—
$PM_{2.5}$	24-hour	6.77	4.93	8.86	—	—	8.50	—	8.21
SO_2	1-hour	3.19	2.62	2.62	2.62	—	—	—	—
	24-hour	3.21	2.73	1.77	2.73	—	—	—	—
NO_2	1-hour	2.32	5.64	11.29	22.57	—	33.86	—	—
	24-hour	2.32	5.32	9.48	18.73	—	28.29	—	—
CO	1-hour	—	—	1.15	—	—	—	—	—
	8-hour	—	—	1.16	—	—	—	—	—
O_3	1-hour	76.79	76.54	74.57	78.50	84.39	78.50	80.46	—
	8-hour	75.75	75.80	74.57	74.57	83.65	75.55	78.99	—
	24-hour	73.22	74.66	72.68	70.20	82.01	69.18	75.51	—

Notes:

Data considered in the Human Health Risk Assessment and noted in Appendix 3.III.

— = Data not available.

INFORMATION REQUEST – MOE – ATMOSPH-2

Source: Ministry of Environment

Summary of Comment

Baseline data has not been compared to limits

Potential Environmental Effects

Requirement in Guidelines: Pg. 33 Section 9 "…The EIS shall compare baseline data, in areas on which the assessment will focus, with applicable federal, provincial, municipal or other legislative requirements, standards, guidelines or objectives."

Proposed Action

Compare the baseline data to applicable limits as required by EIS guidelines.

Reference to EIS

Chapter 3 Existing Conditions as well as Atmospheric Environment Technical Support Document Version 1 and Appendix 3.III of AE TSD.

Response

Chapter 3 of the Atmospheric Environment TSD provides a listing of the existing air quality levels presented by the 90th percentile of the available monitoring data. A more complete listing of the available monitoring data, including a comparison to applicable limits was provided in Appendix 3.III. Tables 3 through 13 in Appendix 3.III display the baseline data and the applicable CWS and/or AAQC for each parameter that was measured. Shaded italic values indicate data over the applicable standard.

INFORMATION REQUEST – MOE – ATMOSPH-3

Source: Ministry of Environment

Summary of Comment

An assessment of dustfall deposition rate along with predicted metals concentrations in the dustfall has not been included in the EIS. Please note that the MOE does not have any standards, guidelines or criteria for metals in dustfall and prefers to see metals in particulate as presented in Section 3.2.3 of the Atmospheric Environment TSD.

Potential Environmental Effects

Unable to assess impact of undertaking on dustfall deposition. The EIS Guideline requires predictions of dustfall and metals in dustfall

Proposed Action

Provide prediction of dustfall.

Reference to EIS

Chapter 6.1.2 Atmospheric Environment.

Response

The primary focus in the Atmospheric Environment TSD was to describe the potential air quality effects in a manner that was consistent with the regulatory framework the Project will need to operate under, should it proceed (i.e., O. Reg. 419/05). As noted in the question, dustfall is not regulated in Ontario. However, the EIS recognizes that changes in air quality and the resulting particle deposition (dustfall) could affect the receiving environment. Therefore the Atmospheric Environment TSD described predictions of the particle deposition from all sources in Appendix 3.IV.

Predictions of deposition from the Project were passed along to other disciplines to be incorporated into the appropriate assessments. The EIS documents discuss dust deposition, and metals deposition, in the following sections:

- Section 5.2.1.1.1 of the Human Health and Ecological Risk Assessment TSD discusses the deposition values in the assessment of soil quality.
- Section 4.4.2.2 of the Lake Water Quality TSD discusses deposition in the assessment of lake water quality
- The Site Water Quality TSD does not identify atmospheric deposition as a significant contributor to the water quality on the site.
- Section 3.0 of the Terrestrial Ecology TSD discusses the effects of deposition on each of the Terrestrial VECs.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE – ATMOSPH-4

Source: Ministry of Environment

Summary of Comment

The EIS does not include a discussion of cumulative air quality concentrations or impact.

Potential Environmental Effects

The EIS should also include a discussion of the following: combined predicted cumulative air quality concentrations during the various Project phases with suitably conservative estimates of background concentrations to arrive at the worst-case cumulative air quality concentrations, predicted cumulative air quality concentrations compared with the national ambient air quality objectives and Canada wide standards for air quality and any applicable provincial ambient AQ criteria.

Proposed Action

The ministry of the environment typically does not assess cumulative impacts as part approval applications, but it is an EA requirement. Please include cumulative effects discussion.

Reference to EIS

Chapter 6.1.2 Atmospheric Environment.

Response

The potential cumulative effects of the Project are discussed in Chapter 6.8 of the main EIS document. Table 6-64 of this section states that there are no cumulative effects with respect to the atmospheric components of the Project and the possible existing or reasonable future projects or activities that could potentially interact with the Project.

The air quality assessment was concluded using two separate approaches. The first approach focussed on demonstrating that the Project would be capable of meeting the regulatory permitting requirements in Ontario (i.e., O.Reg. 419/05). Should the EIS be approved, and the Project proceeds, O.Reg. 419/05 would be the legislative vehicle under which the air emissions from the facility would be regulated. In addition to the regulatory review, all of the emissions and sources of emissions at the Project, whether regulated under O.Reg. 419/05 or not, were used as inputs to the AERMOD dispersion model and the results provided to other disciplines that assessed the effects of changes in air quality on the receiving environment (e.g., Human Health). The assessments of the combined effects of all emission sources on the receiving environment are presented in the respective sections of the EIS (e.g., Human Health and Ecological Risk Assessment TSD, Lake Water Quality TSD, etc.).

INFORMATION REQUEST – MOE – ATMOSPH-5

Source: Ministry of Environment

Summary of Comment

The proponent has chosen to only include emissions determined under what they have self identified as the worst case scenario, that is the operations phase (Section 6.1.2.1.1).

Potential Environmental Effects

Requirement in Guidelines: Pg. 48 Section 10.2.1 Atmospheric Environment Criteria Air Contaminants "The EIS will identify potential effects on air quality associated with all project phases, including point and mobile sources.

Proposed Action

The ministry of the environment typically assesses only the worst case scenario of maximum emissions for permit application purposes. The authors of the Guideline document should determine whether this is adequate given the requirements.

Reference to EIS

Chapter 6.1.2 Atmospheric Environment.

Response

Section 3.1.1.1 of the Atmospheric Environment TSD identifies the Operations Phase of the Project to be the bounding assessment for air quality, when emissions and associated effects will be highest. The Construction Phase of the Project will involve the same types of emission sources as the Operations Phase (e.g. emissions from diesel engines, fugitive dust, etc.). However, the Construction Phase would involve less equipment for a shorter duration of time. Based on feedback received from Environment Canada during a meeting held on October 10, 2013 and email correspondence subsequent to this meeting, an additional investigation was performed to compare the potential emissions during both the Operations and Construction phases. The results of this investigation are provided in a technical memorandum included in the Supplemental Information Package of the Atmospheric Environment TSD and conclude that the peak annual vehicle distance traveled and diesel fuel consumption (considering primary power generation during the construction phase only) will be higher during the operations phase. Thus, the emissions from the Project will be higher during the Operations Phase. Assessing the emissions from the Operations Phase captures the effects of the Construction Phase since the types of emission sources are the same but the actual emissions and associated effects will be greater during the Operations Phase than during the Construction Phase. This also means that if the Construction Phase was assessed separately, the predicted impacts would be less than the Operations Phase.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE – FERID CHABCHOUB

Source: Ministry of Environment

Summary of Comment

Comments pertained to providing supporting documentation for the following assumptions and methodology:

1. Assumption that roadway dust contains 10% ore as outlined in Table 7
2. Control efficiencies ranging from 75% to 99.5% to estimate emissions from ore crushing and screening
3. The emission factors used that were based on Golder's past experience for ore processing and refining

Response

1. The 10% ore concentration in the silt on the site roads is based on Golder's professional judgement and past experience in completing emissions estimates on other gold mining operations in Ontario using actual metal concentrations in silt. Data on silt loading and metal concentrations in silt are provided in the "Literature Review of Current Fugitive Dust Control Practices within the Mining Industry" prepared by Golder for the Centre for Excellence in Mining Innovation in August 2010. There are no published data available to provide an estimate of metals content in road silt therefore a conservative composite of numerous sampling campaigns completed at various mining operations in Ontario was used to estimate the metal concentrations that correspond to approximately 10% ore concentration in the silt. This number will be validated through site specific road dust sampling once the site is in operation as outlined in Section 3.3 of the Atmosheric Environment TSD.

2. The control efficiencies for ore crushing and screening are based on typical dust collectors or scrubbers for these operations. The actual make and model of the dust collectors or scrubbers to be used at the site have not been confirm yet however these control efficiencies are considered to be "in-design" mitigation measures and Osisko will ensure that dust collectors or scrubbers that can achieve these efficiencies will be put in place at the site when in operation.

3. There are no published data available for some emission factors from the ore processing facility. Therefore, Golder relied upon professional and judgement and past experience on other gold mining operations and estimated emissions based on this judgement and experience. These emisions estimates will be validated by site specific source testing once the site is in operation.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE – SANDRA AUSMA

Source: Ministry of Environment

Summary of Comment

Detailed comments are grouped in two areas:

1. Background air quality stations – applicability of station data and comparison to legislative requirements
2. Phase of the Project assessed
3. Cumulative Effects
4. Dustfall

Response

1. The existing air quality levels presented in the Atmospheric Environment TSD are considered representative of the conditions for the Project. The Project is located in an area of northern Canada not immediately near to any large industrial sources. The air quality monitoring stations used when describing existing air quality include a series of stations across northern Canada running from the west (Fort Liard) through to the east (Senneterre), consistent with the general air flow from the west to the east. In some cases, the effect of local activities can be seen to be present in the available data (e.g., PM_{10} levels in La Loche and Brandon). However, the data from most of the stations show a consistent pattern across the country (e.g., $PM_{2.5}$ in Fort Liard: 6.77 µg/m^3; $PM_{2.5}$ in Fort Chipewyan: 4.93 µg/m^3; $PM_{2.5}$ in La Loche: 8.66 µg/m^3; $PM_{2.5}$ in Thunder Bay: 8.50 µg/m^3; $PM_{2.5}$ in Senneterre: 8.21 µg/m^3). The similarity in these reading suggest there is a consistent “background” level across these northern Canadian sites that is appropriate for use at the Project.

   Professional judgment was used as the basis for selecting the lowest values from the station data as representing the background air quality as opposed to the average values. The actual background values are not used in the Atmospheric Environment TSD. The background values were passed on to the human health and ecological risk team for use in their TSD.

   In the inhalation assessment of the human health risk assessment, predicted air concentrations were compared to chronic and acute health-based thresholds, which represent safe concentrations from a human exposure perspective. All of the predicted acute concentrations were less than acute thresholds. All of the predicted chronic concentrations were less than chronic thresholds except for acrolein and nitrogen dioxide. A risk assessment was carried out for acrolein and nitrogen dioxide to evaluate risk for the human health VECs at the Site. Risks were compared to MOE target levels and found to indicate safe levels of exposure. The inhalation assessment did not include comparison of predicted air concentrations to background, the assessment focused on potential effects from predicted concentrations only.

   In the multimedia assessment, predicted soil and surface water concentrations were compared to baseline concentrations, but these baseline concentrations were measured at the Site, and they are not associated with the uncertainty and variability that the background air concentrations have, which were not measured at the Site.

Same response as MOE – Atmosph 1 – The values presented in Table 3-13 of the Atmospheric Environment TSD are presented in different units than the data presented in Tables 3 through 9 of Appendix 3.III. The units of Table 3-13 in the Atmospheric Environment TSD have been converted to µg/m³ which is consistent with the reported units from the dispersion modelling assessment. Tables 3 through 9 in Appendix 3.III of the Atmospheric Environment TSD are in ppb or ppm, consistent with the reported units from the monitoring stations. The data in the two sets of tables do match each other. For clarity, we have provided an updated version of Table 3-13, which explicitly displays the units.

Same response as MOE – Atmosph 2 – Chapter 3 of the Atmospheric Environment TSD provides a listing of the existing air quality levels presented by the 90th percentile of the available monitoring data. A more complete listing of the available monitoring data, including a comparison to applicable limits was provided in Appendix 3.III. Tables 3 through 13 in Appendix 3.III display the baseline data and the applicable CWS and/or AAQC for each parameter that was measured. Shaded italic values indicate data over the applicable standard.

2. *Same response as MOE – Atmosph 5* – Section 3.1.1.1 of the Atmospheric Environment TSD identifies the Operations Phase of the Project to be the bounding assessment for air quality, when emissions and associated effects will be highest. The Construction Phase of the Project will involve the same types of emission sources as the Operations Phase (e.g. emissions from diesel engines, fugitive dust, etc.). However, the Construction Phase would involve less equipment for a shorter duration of time. Based on feedback received from Environment Canada during a meeting held on October 10, 2013 and email correspondence subsequent to this meeting, an additional investigation was performed to compare the potential emissions during both the Operations and Construction phases. The results of this investigation are provided in a technical memorandum included in the Supplemental Information Package of the Atmospheric Environment TSD and conclude that the peak annual vehicle distance traveled and diesel fuel consumption (considering primary power generation during the construction phase only) will be higher during the operations phase. Thus, the emissions from the Project will be higher during the Operations Phase. Assessing the emissions from the Operations Phase captures the effects of the Construction Phase since the types of emission sources are the same but the actual emissions and associated effects will be greater during the Operations Phase than during the Construction Phase. This also means that if the Construction Phase was assessed separately, the predicted impacts would be less than the Operations Phase.

3. *Same response as MOE – Atmosph 4* – The potential cumulative effects of the Project are discussed in Chapter 6.8 of the main EIS document. Table 6-64 of this section states that there are no cumulative effects with respect to the atmospheric components of the Project and the four possible existing or reasonable future projects or activities that could potentially interact with the Project.

   The air quality assessment was concluded using two separate approaches. The first approach focussed on demonstrating that the Project would be capable of meeting the regulatory permitting requirements in Ontario (i.e., O.Reg. 419/05). Should the EIS be approved, and the Project proceeds, O.Reg. 419/05 would be the legislative vehicle under which the air emissions from the facility would be regulated. In addition to the regulatory review, all of the emissions and sources of emissions at the Project, whether regulated under O.Reg. 419/05 or not, were used as inputs to the AERMOD dispersion model and the results provided to other disciplines that assessed the effects of changes in air quality on the receiving environment (e.g., Human Health). The assessments of the combined effects of all emission sources on

the receiving environment are presented in the respective sections of the EIS (e.g., Human Health and Ecological Risk Assessment TSD, Lake Water Quality TSD, etc.).

4. *Same response as MOE – Atmosph 3* – The primary focus in the Atmospheric Environment TSD was to describe the potential air quality effects in a manner that was consistent with the regulatory framework the Project will need to operate under, should it proceed (i.e., O. Reg. 419/05). As noted in the question, dustfall is not regulated in Ontario. However, the EIS recognizes that changes in air quality and the resulting particle deposition (dustfall) could affect the receiving environment. Therefore the Atmospheric Environment TSD described predictions of the particle deposition from all sources in Appendix 3.IV.

   Predictions of dustfall from the Project were passed along to other disciplines to be incorporated into the appropriate assessments. The EIS documents discuss dustfall, and metals in dustfall, in the following sections:

   - Section 5.2.1.1.1 of the Human Health and Ecological Risk Assessment TSD discusses the deposition values in the assessment of soil quality.
   - Section 4.4.2.2 of the Lake Water Quality TSD discusses deposition in the assessment of lake water quality
   - The Site Water Quality TSD does not identify dustfall as a significant contributor to the water quality on the site.
   - Section 3.0 of the Terrestrial Ecology TSD discusses the effects of dustfall on each of the Terrestrial VECs.

Attachments

Updated Table 3-13 from Atmospheric Environment TSD

Table 3-13: Existing Air Quality for the Local and Regional Study Areas

Compound	Ave. Period	90th Percentile of Monitored Data (µg/m³)							
		Fort Liard	Fort Chipewyan	La Loche	Brandon	Pickle Lake	Thunder Bay	Fraserdale	Senneterre
PM_{10}	24-hour	17.81	—	102.09	47.44	—	—	—	—
$PM_{2.5}$	24-hour	6.77	4.93	8.86	—	—	8.50	—	8.21
SO_2	1-hour	3.19	2.62	2.62	2.62	—	—	—	—
	24-hour	3.21	2.73	1.77	2.73	—	—	—	—
NO_2	1-hour	2.32	5.64	11.29	22.57	—	33.86	—	—
	24-hour	2.32	5.32	9.48	18.73	—	28.29	—	—
CO	1-hour	—	—	1.15	—	—	—	—	—
	8-hour	—	—	1.16	—	—	—	—	—
O_3	1-hour	76.79	76.54	74.57	78.50	84.39	78.50	80.46	—
	8-hour	75.75	75.80	74.57	74.57	83.65	75.55	78.99	—
	24-hour	73.22	74.66	72.68	70.20	82.01	69.18	75.51	—

Notes:

Data considered in the Human Health Risk Assessment and noted in Appendix 3.III.

— = Data not available.

INFORMATION REQUEST – MOE_NOISE-1

Source: Ministry of Environment

Summary of Comment

from 4.0; "monitoring to confirm the effectiveness of mitigation measures and predicted changes to operating conditions during the operations phase"; this conflicts with 4.4, "no noise follow-up monitoring is proposed as the predicted noise levels are well below the MOE noise level limits".

Potential Environmental Effects

The point of the monitoring proposed in 4.0 is to confirm that the actual sound emissions from the project are in line with the predicted sound levels, and to confirm the compliance with limits; 4.4 assumes that the actual project sound levels will be the same or less than the predicted levels, which is not a reasonable assumption and could result in an out-of-compliance condition.

Proposed Action

Design and propose a noise monitoring program; add this to Section 7.1.

Reference to EIS

Atmospheric Environment TSD Section 4.0 pg. 48 and Section 4.4 page 71.

Response

The Atmospheric Environment TSD is incorrect; no follow-up monitoring is planned for noise. Should noise complaints be received then a follow-up action plan would be developed.

INFORMATION REQUEST – MOE-NOISE-2

Source: Ministry of Environment

Summary of Comment

Mitigation of non-compliant Points of Reception is proposed by means of restricting access to these locations; this is an unusual approach, and the meaning of "restricted access", along with proposed enforcement methods, should be clarified before this approach is approved. In addition it was not made clear that the proponent had either ownership of these locations, or otherwise had the authority to restrict access to these locations.

Potential Environmental Effects

A declaration of non-compliant Points of Reception as having "restricted access" could lead to people being exposed to non-compliant levels of noise if not effectively communicated or enforced.

Proposed Action

1) Clarify how the "restricted access" status of noncompliant noise receptors will be communicated and enforced. 2) State the means by which the proponent has the authority to restrict access to these locations, either through ownership or other means.

Reference to EIS

Atmospheric Environment TSD Section 4.3 Pg. 71

Response

The sites that were identified as potentially experiencing elevated levels of noise are campsites on Crown Land. The initial suggestion to restrict access to these sites has been revisited and it has been determined that access restriction is not the most appropriate mitigation measure. The campsites are not residences and are not subject to specific noise levels. Access to these sites will be restricted only if required for safety reasons. Osisko will endeavour to control noise emissions at the source by implementing noise reduction mitigation measures where deemed necessary through ongoing communications with the public and tourist outfitters. Instead of restricting access to the campsites, a more appropriate measure would be to post signs advising potential campers of the mine operations and the potential elevated noise levels.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE_NOISE-3

Source: Ministry of Environment

Summary of Comment

"The study area and methods for noise evaluation are described in the Atmospheric Environment TSD. Based on the remote nature of the Project and PORs, the existing noise conditions have been assumed to be un-impacted by man-made sources and therefore onsite measurements were not required." This does not state any specific aspects of the baseline acoustic condition of the study area, and is not supported by either direct measurements or reference documentation.

Potential Environmental Effects

Without knowing the exact state of the baseline condition it is impossible to appropriately state the changes which will be brought to the study area by the project.

Proposed Action

Perform baseline sound level measurements in the study area and document them in the EIS, or add specific numeric sound level figures to the EIS from documented sources, and add their references to the EIS.

Reference to EIS

EIS 3.2.3.4 "Noise" Pg 3-33

Response

During a teleconference to discuss the regulator review of baseline data on June 1, 2012, on which MOE noise reviewer Mr. Tom Shevlin took part, Golder explained that the existing noise levels in the vicinity of the Project would be assumed to be 5 dB more restrictive than the MOE sound level limits as specified in NPC 232. Mr. Shevlin indicated that this approach was acceptable, therefore no further measurements are proposed.

It is noted that baseline measurement of existing noise levels would not have changed the outcome of the noise assessment as the predicted noise levels are well below the MOE noise level limits at all locations not controlled by Osisko. As such, there was little value in conducting these measurements.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE_NOISE-4

Source: Ministry of Environment

Summary of Comment

"Existing noise levels in the Project Site are expected to be typical of background noise for the boreal region, dominated by natural sounds and the effects of wind. Existing noise levels were established using published literature and accepted background noise levels for remote areas in Ontario." This vague general statement does not meet the expectations for a baseline study, and it is noted that this quote is a very minor revision of a statement found in the Terms of Reference document, Section 6.3, pg. 36. This reviewer could not find references to the "published literature", and is not aware of what the quote means by "accepted background noise levels".

Potential Environmental Effects

Without knowing the exact state of the baseline condition it is impossible to appropriately state the changes which will be brought to the study area by the project.

Proposed Action

Perform baseline sound level measurements in the study area and document them in the EIS, or add specific numeric sound level figures to the EIS from documented sources, and add their references to the EIS.

Reference to EIS

EIS 3.2.3 "Atmospheric Environment" Page 3-24

Response

During a teleconference to discuss the regulator review of baseline data on June 1, 2012, on which MOE noise reviewer Mr. Tom Shevlin took part, Golder explained that the existing noise levels in the vicinity of the Project would be assumed to be 5 dB more restrictive than the MOE sound level limits as specified in NPC 232. Mr. Shevlin indicated that this approach was acceptable, therefore no further measurements are proposed.

It is noted that baseline measurement of natural noise would not have changed the outcome of the impact assessment. As such, there was little value in conducting these measurements.

INFORMATION REQUEST – MOE_NOISE-5

Source: Ministry of Environment

Summary of Comment

"The EIS shall describe current ambient noise levels at the site and in the local study areas, and include information on its source(s), geographic extent and temporal variations." This statement in the Guidelines was fulfilled in a very minimal manner by EIS 3.2.3 as referenced in another comment.

Potential Environmental Effects

Without knowing the exact state of the baseline condition it is impossible to appropriately state the changes which will be brought to the study area by the project.

Proposed Action

Perform baseline sound level measurements in the study area and document them in the EIS, or add specific numeric sound level figures to the EIS from documented sources, and add their references to the EIS.

Reference to EIS

EIS Guidelines 9.1.3 "Acoustic Environment"

Response

During a teleconference to discuss the regulator review of baseline data on June 1, 2012, on which MOE noise reviewer Mr. Tom Shevlin took part, Golder explained that the existing noise levels in the vicinity of the Project would be assumed to be 5 dB more restrictive than the MOE sound level limits as specified in NPC 232. Mr. Shevlin indicated that this approach was acceptable, therefore no further measurements are proposed.

It is noted that baseline measurement of natural noise would not have changed the outcome of the impact assessment. As such, there was little value in conducting these measurements.

INFORMATION REQUEST – MOE NOISE-6

Source: Ministry of Environment

Summary of Comment

The topics of noise and vibration, and the effects of blasting in particular, are absent from the Summary Matrix of Potential Environmental Effects.

Potential Environmental Effects

The effects of noise and vibration, particularly from blasting, are an inherent part of the intentions for this EIS. It is difficult to ascertain from their absence from this listing of environmental effects whether the proponents feel there are no such effects, or if the subject was inadvertently omitted from the document.

Proposed Action

Explicitly reference the topics of noise and vibration, particularly from blasting, in the Summary Matrix of Potential Environmental Effects. If it has been determined that, in the view of the proponent, there are no such effects, this should be stated.

Reference to EIS

APPENDIX 4.I Hammond Reef Gold Project Summary Matrix of Potential Environmental Effects

Response

A detailed assessment of the potential environmental effects of the project is provided in Chapter 6 of the EIS. Note that blasting was inadvertently left out of the Tables in Chapter 6 and has been added into the revised version of these tables.

INFORMATION REQUEST – MOE_NOISE-7

Source: Ministry of Environment

Summary of Comment

"Based on the remote nature of the Project and PORs, the existing noise conditions have been assumed to be 5 dB quieter than the MOE exclusionary noise levels for daytime and nighttime operations of the Project (i.e., 40 dBA during daytime hours and 35 dBA during nighttime hours)." The EIS does not appear to include any quoted literature or project-specific measurements which support these figures and significantly lower numbers are often measured at remote locations.

Potential Environmental Effects

The effect of the project on the environment should arguably be presented in terms of the best possible representation of the pre-project baseline figures.

Proposed Action

Perform baseline sound level measurements in the study area and document them in the EIS, or add specific numeric sound level figures to the EIS from documented sources, and add their references to the EIS.

Reference to EIS

Atmospheric Environment TSD Section 4.2.1, "Description of Existing Conditions" pg. 58

Response

During a teleconference to discuss the regulator review of baseline data on June 1, 2012, on which MOE noise reviewer Mr. Tom Shevlin took part, Golder explained that the existing noise levels in the vicinity of the Project would be assumed to be 5 dB more restrictive than the MOE sound level limits as specified in NPC 232. Mr. Shevlin indicated that this approach was acceptable, therefore no further measurements are proposed.

It is noted that baseline measurement of natural noise would not have changed the outcome of the impact assessment. As such, there was little value in conducting these measurements.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – MOE_NOISE-8

Source: Ministry of Environment

Summary of Comment

"• Existing noise levels are assumed to be quiet • 40 dBA during daytime hours and 35 dBA during night time hours". The EIS does not appear to include any quoted literature or project-specific measurements which support these figures and significantly lower numbers are often measured at remote locations.

Potential Environmental Effects

The effect of the project on the environment should arguably be presented in terms of the best possible representation of the pre-project baseline figures.

Proposed Action

Perform baseline sound level measurements in the study area and document them in the EIS, or add specific numeric sound level figures to the EIS from documented sources, and add their references to the EIS.

Reference to EIS

Appendix 7.V Record of Communications – Aboriginal - Acoustic

Response

During a teleconference to discuss the regulator review of baseline data on June 1, 2012, on which MOE noise reviewer Mr. Tom Shevlin took part, Golder explained that the existing noise levels in the vicinity of the Project would be assumed to be 5 dB more restrictive than the MOE sound level limits as specified in NPC 232. Mr. Shevlin indicated that this approach was acceptable, therefore no further measurements are proposed.

It is noted that baseline measurement of natural noise would not have changed the outcome of the impact assessment. As such, there was little value in conducting these measurements.

INFORMATION REQUEST – MOE_NOISE-9

Source: Ministry of Environment

Summary of Comment

While the Executive Summary of the EIS states "The accommodation camp will be located approximately 10 km to the north, near the location of the existing exploration camp", in reference to a newly introduced concept of a dedicated camp for operational mine workers, it is not obvious that the list of Points of Reference for noise in Section 4.1.5.1 of the Atmospheric Environment TSD includes this camp as a Point of Reception. It is noted that there are designated Points of Reception which are further away than 10 km from the mine sources.

Potential Environmental Effects

If the camp is a Point of Reception, the occupants of the accommodation camp should be given the same protection as occupants of the other Points of Reception; if it is considered not to be a Point of Reception, this position should be justified.

Proposed Action

Clarify the status of the accommodation camp in regards to whether it is a Point of Reception for noise, and include additional assessment of noise and vibration effects upon this facility if appropriate.

Reference to EIS

Atmospheric Environment TSD Section 4.1.5.1, "Noise Receptor Locations", Pp. 56-57

Response

The accommodations camp is located within the project area and will be occupied by Osisko employees. It is therefore not considered a Point of Reception for noise or vibration in accordance with MOE guidelines and no further assessment is required.

INFORMATION REQUEST – MOE_NOISE-10

Source: Ministry of Environment

Summary of Comment

The Atmospheric Environment TSD, while referencing the results of acoustic modelling via the CADNA software program, does not provide any sample calculations such as will be required at the provincial Environmental Compliance Approval stage.

Potential Environmental Effects

It is difficult for the reviewer to confirm the accuracy of the modelling results upon which the claims of environmental noise compliance are made without sample calculation printouts having been made available.

Proposed Action

Include sample output printouts, used to generate the sound level predictions in the EIS, from the CADNA noise predictive software.

Reference to EIS

Atmospheric Environment TSD

Response

Sample model configurations are attached to this IR.

Attachments

Sample model configurations

Report (10-1118-0020 Hammond Reef Osisko.cna)

CALCULATION CONFIGURATION

Configuration	
Parameter	Value
General	
Country	International
Max. Error (dB)	0.00
Max. Search Radius (m)	25000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	60.00
Reference Time Night (min)	60.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	432.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	0
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	0.70
Wind Speed for Dir. (m/s)	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03)	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

NOISE SOURCES

Noise Source Library

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Transformer Wall	TransformerWall	Lw		78.8	90.5	90.8	75.6	65.2	45.2	31.2	26.2	19.2	75.9	93.9	
Transformer Roof	TransformerRoof	Lw		86.2	97.9	98.2	83.0	72.6	52.6	38.6	33.6	26.7	83.3	101.3	
Primary Crusher Roof	PrimaryCrusherRoof	Lw		112.0	117.0	114.3	100.5	89.7	77.6	68.9	67.5	63.7	100.0	119.8	
PrimaryCrusherWall	PrimaryCrusherWall	Lw		116.8	121.9	119.1	105.3	94.5	82.4	73.8	72.3	68.5	104.8	124.6	
Secondary Crusher Roof	SecondaryCrusherRoof	Lw		116.1	121.6	115.8	103.7	93.1	82.8	74.2	70.6	63.8	102.4	123.5	
SecondaryCrusherWall	SecondaryCrusherWall	Lw		120.4	125.9	120.1	108.1	97.4	87.2	78.5	74.9	68.2	106.7	127.9	
Concentrator Roof	ConcRoof	Lw		128.3	130.6	128.6	116.3	106.9	97.1	90.7	87.7	78.2	114.7	134.1	
Concentrator Walls	ConcWall	Lw		128.2	130.4	128.4	116.1	106.8	96.9	90.6	87.5	78.0	114.5	134.0	
General ventilation Exhaust * 3	V8a	Lw		101.1	96.3	96.3	94.7	92.4	88.3	86.3	84.9	79.6	94.9	104.4	
General Ventilation Exhaust * 8	V6a	Lw		101.1	96.3	96.3	94.7	92.4	88.3	86.3	84.9	79.6	94.9	104.4	
Gen Set 2500 kW Exhaust Stack	GenSetExhaust2500kW	Lw			124.0	112.0	103.0	98.0	98.0	92.0	82.0	75.0	103.9	124.3	
580 HP bulldozer	PS001	Lw		102.7	105.9	112.2	110.1	99.7	99.7	101.2	96.9	90.1	107.6	115.6	
580 HP bulldozer	PS002	Lw		102.7	105.9	112.2	110.1	99.7	99.7	101.2	96.9	90.1	107.6	115.6	
580 HP bulldozer	PS003	Lw		102.7	105.9	112.2	110.1	99.7	99.7	101.2	96.9	90.1	107.6	115.6	

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
580 HP bulldozer	PS004	Lw		102.7	105.9	112.2	110.1	99.7	99.7	101.2	96.9	90.1	107.6	115.6	
687 HP Wheel Dozer	PS005	Lw		102.7	105.9	112.2	110.1	99.7	99.7	101.2	96.9	90.1	107.6	115.6	
Bulk Explosives Pump Truck	PS006	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Bulk Explosives Pump Truck	PS007	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Bulk Explosives Pump Truck	PS008	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Bulk Explosives Pump Truck	PS009	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Bulk Explosives Pump Truck	PS010	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Bulk Explosives Pump Truck	PS011	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Drill Rig	PS012	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Drill Rig	PS013	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Drill Rig	PS014	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Drill Rig	PS015	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Drill Rig	PS016	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Drill Rig	PS017	Lw		100.1	104.2	122.2	111.4	112.8	115.1	113.9	113.4	112.1	120.8	124.7	
Front End Wheel Loaders	PS018	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Fuel Lube Truck	PS019	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Fuel Lube Truck	PS020	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Fuel Storage Transfer Pump	PS021	Lw		89.6	90.6	91.6	93.6	93.6	96.6	93.6	89.6	83.6	100.1	102.0	
Hydraulic Face Shovels	PS022	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Hydraulic Face Shovels	PS023	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Hydraulic Face Shovels	PS024	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Material Transfer	PS025	Lw		105.4	103.9	108.4	102.3	99.1	96.0	96.2	97.0	91.8	104.0	112.3	
Material Transfer	PS026	Lw		105.4	103.9	108.4	102.3	99.1	96.0	96.2	97.0	91.8	104.0	112.3	
Off-road lowboy	PS027	Lw		99.3	102.3	106.3	105.3	102.3	98.3	95.3	88.3	81.3	104.2	111.2	
Portable Light Stand	PS028	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS029	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS030	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS031	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS032	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS033	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS034	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Portable Light Stand	PS035	Lw		106.3	102.3	108.3	104.3	96.3	92.3	86.3	76.3	68.3	99.9	112.0	
Road Grader	PS036	Lw		117.7	122.4	113.0	112.8	112.5	110.4	109.0	107.6	101.1	116.2	125.0	
Road Grader	PS037	Lw		117.7	122.4	113.0	112.8	112.5	110.4	109.0	107.6	101.1	116.2	125.0	
Small Excavator	PS038	Lw		108.9	108.7	117.4	107.9	97.9	101.7	98.0	94.3	88.7	107.2	119.0	
Small Excavator	PS039	Lw		108.9	108.7	117.4	107.9	97.9	101.7	98.0	94.3	88.7	107.2	119.0	
Tool Carrier	PS040	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Tool Carrier	PS041	Lw		116.1	122.7	111.4	108.7	108.4	113.9	103.2	100.8	99.1	115.4	124.5	
Water Truck	PS042	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
Water Truck	PS043	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
West Pit Ore Truck to Stockpile	LS001	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
Light Service Truck	LS002	Lw		89.3	92.3	96.3	95.3	92.3	88.3	85.3	78.3	71.3	94.2	101.2	
East Pit Waste Rock Truck to Stockpile	LS003	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
East Pit Ore Truck to Stockpile	LS004	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
East Pit Ore Truck to Crusher	LS005	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
West Pit Ore Truck to Crusher	LS006	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
West Pit Waste Rock to Stockpile	LS007	Lw		111.1	121.6	123.6	112.6	118.6	106.8	112.9	105.6	96.7	118.9	127.0	
West Pit Light Service Truck	LS008	Lw		89.3	92.3	96.3	95.3	92.3	88.3	85.3	78.3	71.3	94.2	101.2	
Ore Dome Roof	OreDomeRoof	Lw		112.4	115.4	112.6	95.4	84.6	69.8	60.3	59.5	58.0	97.7	118.5	
Ore Dome Wall	OreDomeWall	Lw		109.3	112.3	109.4	92.2	81.5	66.7	57.1	56.3	54.9	94.6	115.4	
Generators Air Intake	GenSetAllAirIntake	Lw			105.2	107.9	105.1	105.6	106.4	105.9	102.6	93.6	111.5	114.2	
Generators Air Outlet	GenSetsAllAirOutlet	Lw			105.2	107.9	105.1	105.6	106.4	105.9	102.6	93.6	111.5	114.2	
Concentrator Roof	ConcRoof	Lw		128.3	130.6	128.6	116.3	106.9	97.1	90.7	87.7	78.2	114.7	134.1	
Concentrator Walls	ConcWall	Lw		128.2	130.4	128.4	116.1	106.8	96.9	90.6	87.5	78.0	114.5	134.0	
Concentrator Wall 1	ConcWall01	Lw		107.0	109.3	107.2	94.9	85.6	75.8	69.4	66.3	56.9	93.4	112.8	
Concentrator Wall 2	ConcWall02	Lw		102.8	105.0	103.0	90.7	81.4	71.5	65.2	62.1	52.6	89.1	108.6	
Concentrator Wall 3	ConcWall03	Lw		99.6	101.9	99.8	87.5	78.2	68.3	62.0	58.9	49.4	85.9	105.4	
Concentrator Wall 4	ConcWall04	Lw		102.9	105.2	103.1	90.8	81.5	71.7	65.3	62.2	52.8	89.3	108.7	
Concentrator Wall 5	ConcWall05	Lw		100.0	102.2	100.2	87.9	78.6	68.7	62.4	59.3	49.8	86.3	105.8	
Concentrator Wall 6	ConcWall06	Lw		105.1	107.4	105.3	93.0	83.7	73.8	67.5	64.4	54.9	91.4	110.9	
Concentrator Wall 7	ConcWall07	Lw		104.5	106.7	104.7	92.4	83.1	73.2	66.9	63.8	54.3	90.8	110.3	
Concentrator Wall 8	ConcWall08	Lw		106.6	108.9	106.8	94.6	85.2	75.4	69.0	65.9	56.5	93.0	112.4	
Concentrator Wall 9	ConcWall09	Lw		102.6	104.9	102.8	90.5	81.2	71.3	65.0	61.9	52.4	88.9	108.4	
Concentrator Wall 10	ConcWall10	Lw		100.4	102.7	100.6	88.3	79.0	69.2	62.8	59.7	50.3	86.8	106.2	
Concentrator Wall 11	ConcWall11	Lw		102.7	104.9	102.9	90.6	81.3	71.4	65.1	62.0	52.5	89.0	108.5	
Concentrator Wall 12	ConcWall12	Lw		109.3	111.6	109.6	97.3	87.9	78.1	71.7	68.6	59.2	95.7	115.1	
Concentrator Wall 13	ConcWall13	Lw		92.5	94.8	92.7	80.4	71.1	61.3	54.9	51.8	42.4	78.9	98.3	
Concentrator Wall 14	ConcWall14	Lw		99.4	101.6	99.6	87.3	78.0	68.1	61.8	58.7	49.2	85.7	105.2	
Concentrator Wall 15	ConcWall15	Lw		94.5	96.8	94.7	82.4	73.1	63.3	56.9	53.8	44.4	80.9	100.3	
Concentrator Wall 16	ConcWall16	Lw		95.6	97.9	95.8	83.5	74.2	64.3	58.0	54.9	45.4	81.9	101.4	
Concentrator Wall 17	ConcWall17	Lw		95.2	97.5	95.4	83.1	73.8	64.0	57.6	54.5	45.1	81.6	101.0	
Concentrator Wall 18	ConcWall18	Lw		93.3	95.6	93.5	81.2	71.9	62.1	55.7	52.6	43.2	79.7	99.1	
Concentrator Wall 19	ConcWall19	Lw		91.7	94.0	91.9	79.6	70.3	60.5	54.1	51.0	41.6	78.1	97.5	
Concentrator Wall 20	ConcWall20	Lw		97.0	99.3	97.2	84.9	75.6	65.8	59.4	56.3	46.9	83.4	102.8	
Concentrator Wall 21	ConcWall21	Lw		94.9	97.2	95.1	82.8	73.5	63.7	57.3	54.2	44.7	81.2	100.7	
Concentrator Wall 22	ConcWall22	Lw		97.7	100.0	97.9	85.6	76.3	66.5	60.1	57.0	47.5	84.0	103.5	
Concentrator Wall 23	ConcWall23	Lw		100.8	103.0	101.0	88.7	79.4	69.5	63.2	60.1	50.6	87.1	106.6	
Concentrator Roof Segment 1	ConcRoof1	Lw		99.6	101.9	99.8	87.5	78.2	68.4	62.0	58.9	49.4	86.0	105.4	
Concentrator Roof Segment 2	ConcRoof2	Lw		113.2	115.5	113.4	101.1	91.8	81.9	75.6	72.5	63.0	99.5	119.0	
Concentrator Roof Segment 3	ConcRoof3	Lw		117.3	119.6	117.5	105.2	95.9	86.0	79.7	76.6	67.1	103.6	123.1	
Concentrator Roof Segment 4	ConcRoof4	Lw		109.7	112.0	110.0	97.7	88.3	78.5	72.1	69.1	59.6	96.1	115.6	
Concentrator Roof Segment 5	ConcRoof5	Lw		103.6	105.9	103.8	91.5	82.2	72.4	66.0	62.9	53.4	89.9	109.4	
Waste Rock Haul Truck & Dozer	WasteRockSources	Lw		111.6	121.7	123.9	114.6	118.7	107.6	113.1	106.1	97.5	119.2	127.3	

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Correction		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)
125 kW Transfer Pump *2	-	V6b	0.0	0.0	0.0	Lw			3.0	3.0	3.0
150 kW Agitator (CIP Circuit) *8	-	V6c	0.0	0.0	0.0	Lw			9.0	9.0	9.0
250 kW Transfer Pump * 2	-	V2d	0.0	0.0	0.0	Lw			3.0	3.0	3.0
40 kW Transfer Pump * 2	-	V8b	0.0	0.0	0.0	Lw			3.0	3.0	3.0
75 kW Transfer Pump * 4	-	V3	0.0	0.0	0.0	Lw			6.0	6.0	6.0
75 kW Transfer Pump * 4	-	V4b	0.0	0.0	0.0	Lw			6.0	6.0	6.0
75 kW Transfer Pump *2	-	V10b	0.0	0.0	0.0	Lw			3.0	3.0	3.0
750 kW Transfer Pump	-	V13	0.0	0.0	0.0	Lw			0.0	0.0	0.0
750 kW Transfer Pump *6	-	V14	0.0	0.0	0.0	Lw			7.8	7.8	7.8
Agitator 250 kW * 8	-	V5a	0.0	0.0	0.0	Lw			9.0	9.0	9.0
Agitator 450 kW * 10	-	V2c	0.0	0.0	0.0	Lw			10.0	10.0	10.0
Ball Mill	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Ball Mill	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Banana Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Banana Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Banana Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Banana Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Bin Dust Collector	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Blower 450 kW *3	-	V2a	0.0	0.0	0.0	Lw			4.8	4.8	4.8
Bulk Explosives Pump Truck	-	PS006	118.9	118.9	118.9	Lw	PS006		0.0	0.0	0.0
Bulk Explosives Pump Truck	-	PS007	118.9	118.9	118.9	Lw	PS007		0.0	0.0	0.0
Bulk Explosives Pump Truck	-	PS008	118.9	118.9	118.9	Lw	PS008		0.0	0.0	0.0
Bulk Explosives Pump Truck	-	PS009	118.9	118.9	118.9	Lw	PS009		0.0	0.0	0.0
Bulk Explosives Pump Truck	-	PS010	118.9	118.9	118.9	Lw	PS010		0.0	0.0	0.0
Bulk Explosives Pump Truck	-	PS011	118.9	118.9	118.9	Lw	PS011		0.0	0.0	0.0
Carbon sizing screens * 2	-	V9f	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Carbon strip vessel transfer Pump *2	-	V9c	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Compressor 100 kW *3	-	V2b	0.0	0.0	0.0	Lw			4.8	4.8	4.8
Concentrate Thickener Lime Silo Baghouse	-	V12a	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Cyanide Destruction Tank 300 kW Agitator	-	V11b	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Effluent Treatment Plant Agitators *4	-		0.0	0.0	0.0	Lw			6.0	6.0	6.0
Effluent Treatment Plant Recovered Solids Pumps *4	-		0.0	0.0	0.0	Lw			6.0	6.0	6.0
Final Crushing Dust Collector	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Fresh Carbon Baghouse	-	V12b	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Fresh Carbon Sizing Screens * 2	-	V9d	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Fuel Lube Truck	-	PS019	104.2	104.2	104.2	Lw	PS019		0.0	0.0	0.0
Fuel Lube Truck	-	PS020	104.2	104.2	104.2	Lw	PS020		0.0	0.0	0.0
Primary Crushing Haul Truck Dumping	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
HPGR Tertiary Crusher	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
HPGR Tertiary Crusher	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Crushing Hydraulic Rock Breaker	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Hydrocyclone	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Hydrocyclone	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
IsaMill * 4	-	V4a	0.0	0.0	0.0	Lw			6.0	6.0	6.0
Loaded Carbon Screen * 2	-	V9b	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Loaded Carbon vibrating Screen * 2	-	V6d	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Oxygen Plant Blowoff	-	V5d	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Oxygen Plant Casing	-	V5e	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Oxygen Plant Discharge	-	V5c	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Oxygen Plant Suction	-	v5b	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Crusher	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Crusher Apron Feeder to Primary Crushed Ore Conveyor	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Crusher Compressed Air	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Crusher Dust Collector	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Ore Vibratory Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Primary Ore Vibratory Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Pump Box	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Pump Box	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Quench Tank Transfer Pump *2	-	V9e	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Reactivation Kiln	-	V9a	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Reagent Baghouse	-	V12c	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Reclaim Dust Collector	-	PS036	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Reclaim Dust Collector	-	PS037	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Reclaim Dust Collector	-	PS038	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Refining Furnace Scrubber Stack	-	VI2	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Refining General Ventilation Exhaust *4	-	VI1a	0.0	0.0	0.0	Lw			6.0	6.0	6.0
Refining Transfer Pumps	-	VI1b	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Road Grader	-	PS036	116.2	116.2	116.2	Lw	PS036		0.0	0.0	0.0
Road Grader	-	PS037	116.2	116.2	116.2	Lw	PS037		0.0	0.0	0.0
Secondary Crushed Ore Conveyor Drop to Bin	-	PS041	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crushed Ore Short Conveyor Drop Point	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crushed Ore Short Conveyor Drop Point	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crushed Ore Short Conveyor Drop Point	-	PS042	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crushed Ore Undersize Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crusher	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crusher	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Secondary Crushers Dust Collector	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Stockpile Reclaim Apron Feeder Drop To Secondary Crushed Ore Conveyor	-	PS045	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Stockpile Reclaim Apron Feeder Drop To Secondary Crushed Ore Conveyor	-	PS046	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Stockpile Reclaim Apron Feeder Drop To Secondary Crushed Ore Conveyor	-	PS047	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Tailings Disposal 1250 kW transfer pumps *11	-	VII1	0.0	0.0	0.0	Lw			10.4	10.4	10.4
Tertiary Crushed Ore Mixing Box	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0

Name	M.	ID	Result. PWL			Lw / Li			Correction		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)
Tertiary Crushed Ore Mixing Box	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Transformer 230-27.6 kV 72/96/120 MVA	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Transformer 230-27.6 kV 72/96/120 MVA	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Trash Screen	-	V4c	0.0	0.0	0.0	Lw			0.0	0.0	0.0
Trash screen * 2	-	V10a	0.0	0.0	0.0	Lw			3.0	3.0	3.0
Trommel Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Trommel Screen	-		0.0	0.0	0.0	Lw			0.0	0.0	0.0
Water Truck	-	PS042	118.9	118.9	118.9	Lw	PS042		0.0	0.0	0.0
Water Truck	-	PS043	118.9	118.9	118.9	Lw	PS043		0.0	0.0	0.0
580 HP bulldozer		PS002	107.6	107.6	107.6	Lw	PS002		0.0	0.0	0.0
687 HP Wheel Dozer		PS005	107.6	107.6	107.6	Lw	PS005		0.0	0.0	0.0
Drill Rig		PS012	120.8	120.8	120.8	Lw	PS012		0.0	0.0	0.0
Drill Rig		PS013	120.8	120.8	120.8	Lw	PS013		0.0	0.0	0.0
Drill Rig		PS014	120.8	120.8	120.8	Lw	PS014		0.0	0.0	0.0
Drill Rig		PS015	120.8	120.8	120.8	Lw	PS015		0.0	0.0	0.0
Drill Rig		PS016	120.8	120.8	120.8	Lw	PS016		0.0	0.0	0.0
Drill Rig		PS017	120.8	120.8	120.8	Lw	PS017		0.0	0.0	0.0
Front End Wheel Loader *2		PS018	118.4	118.4	118.4	Lw	PS018		3.0	3.0	3.0
Fuel Storage Transfer Pump		PS021	100.1	100.1	100.1	Lw	PS021		0.0	0.0	0.0
Gen Set 2.5 MW Exhaust Stack		GenSetExhaust2500kW	103.9	103.9	103.9	Lw	GenSetExhaust2500kW		0.0	0.0	0.0
General ventilation Exhaust * 3		V8a	99.7	99.7	99.7	Lw	V8a		4.8	4.8	4.8
General Ventilation Exhaust * 8		V6a	103.9	103.9	103.9	Lw	V6a		9.0	9.0	9.0
Hydraulic Face Shovels/Small Excavators		PS022	115.4	115.4	115.4	Lw	PS022		0.0	0.0	0.0
Hydraulic Face Shovels/Small Excavators		PS023	115.4	115.4	115.4	Lw	PS023		0.0	0.0	0.0
Hydraulic Face Shovels/Small Excavators		PS024	115.4	115.4	115.4	Lw	PS024		0.0	0.0	0.0
Material Transfer		PS025	104.0	104.0	104.0	Lw	PS025		0.0	0.0	0.0
Material Transfer		PS026	104.0	104.0	104.0	Lw	PS026		0.0	0.0	0.0
Off-road lowboy		PS027	104.2	104.2	104.2	Lw	PS027		0.0	0.0	0.0
Portable Light Stand		PS028	99.9	99.9	99.9	Lw	PS028		0.0	0.0	0.0
Portable Light Stand		PS029	99.9	99.9	99.9	Lw	PS029		0.0	0.0	0.0
Portable Light Stand		PS030	99.9	99.9	99.9	Lw	PS030		0.0	0.0	0.0
Portable Light Stand		PS031	99.9	99.9	99.9	Lw	PS031		0.0	0.0	0.0
Portable Light Stand		PS032	99.9	99.9	99.9	Lw	PS032		0.0	0.0	0.0
Portable Light Stand		PS033	99.9	99.9	99.9	Lw	PS033		0.0	0.0	0.0
Portable Light Stand		PS034	99.9	99.9	99.9	Lw	PS034		0.0	0.0	0.0
Portable Light Stand		PS035	99.9	99.9	99.9	Lw	PS035		0.0	0.0	0.0
Small Excavator		PS038	107.2	107.2	107.2	Lw	PS038		0.0	0.0	0.0
Small Excavator		PS039	107.2	107.2	107.2	Lw	PS039		0.0	0.0	0.0
Tool Carrier		PS040	115.4	115.4	115.4	Lw	PS040		0.0	0.0	0.0
Tool Carrier		PS041	115.4	115.4	115.4	Lw	PS041		0.0	0.0	0.0

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	N
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(
East Pit Ore Truck to Crusher		LS005	118.2	118.2	118.2	83.4	83.4	83.4	PWL-Pt	LS005		0.0	0.0	0.0						
West Pit Ore Truck to Crusher		LS006	122.5	122.5	118.7	87.3	87.3	83.4	PWL-Pt	LS006		0.0	0.0	0.0						
East Pit Waste Rock to Stockpile		LS003	122.0	122.0	122.0	85.0	85.0	85.0	PWL-Pt	LS003		0.0	0.0	0.0						
West Pit Waste Rock to Stockpile		LS007	127.9	127.9	127.9	89.3	89.3	89.3	PWL-Pt	LS007		0.0	0.0	0.0						
East Pit Ore Truck to Stockpile		LS004	115.3	115.3	115.3	79.7	79.7	79.7	PWL-Pt	LS004		0.0	0.0	0.0						
West Pit Ore Truck to Stockpile		LS001	119.7	119.7	119.7	83.4	83.4	83.4	PWL-Pt	LS001		0.0	0.0	0.0						
Bulk Explosives Pump Truck East		LS010	102.6	102.6	102.6	66.2	66.2	66.2	PWL-Pt	PS006		0.0	0.0	0.0						
Bulk Explosives Pump Truck West		LS009	106.5	106.5	106.5	69.2	69.2	69.2	PWL-Pt	PS006		0.0	0.0	0.0						
Road Grader East Pit		LS010	114.1	114.1	114.1	82.2	82.2	82.2	PWL-Pt	PS037		0.0	0.0	0.0						
Road Grader West Pit		LS009	117.1	117.1	117.1	82.2	82.2	82.2	PWL-Pt	PS036		0.0	0.0	0.0						
Water Truck East Pit		LS010	115.3	115.3	115.3	81.9	81.9	81.9	PWL-Pt	PS043		0.0	0.0	0.0						
Water Truck West Pit		LS009	116.8	116.8	116.8	81.9	81.9	81.9	PWL-Pt	PS042		0.0	0.0	0.0						
Fuel Lube East Pit		LS010	96.6	96.6	96.6	63.2	63.2	63.2	PWL-Pt	PS020		0.0	0.0	0.0						
Fuel Lube West Pit		LS009	98.1	98.1	98.1	63.2	63.2	63.2	PWL-Pt	PS019		0.0	0.0	0.0						

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduc	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)
BUILDINGS_25Jul12		Primary Crusher Roof	100.0	100.0	100.0	72.3	72.3	72.3	Lw	PrimaryCrusherRoof		0.0	0.0	0.0		
Secondary Crusher Roof		Sec_Tert_Crusher	102.4	102.4	102.4	65.6	65.6	65.6	Lw	SecondaryCrusherRoof		0.0	0.0	0.0		
Transformer_25Jul12		Transformer	75.9	75.9	75.9	39.0	39.0	39.0	Lw	TransformerWall		0.0	0.0	0.0		
Ore Dome Roof		OreDomeRoof	97.7	97.7	97.7	72.2	72.2	72.2	Lw	OreDomeRoof		0.0	0.0	0.0		
Concentrator Roof	-	ConcRoof	114.7	114.7	114.7	70.3	70.3	70.3	Lw	ConcRoof		0.0	0.0	0.0		
Concentrator Roof 3		ConcRoof3	103.6	103.6	103.6	64.4	64.4	64.4	Lw	ConcRoof3		0.0	0.0	0.0		
Concentrator Roof 4		ConcRoof4	96.1	96.1	96.1	60.4	60.4	60.4	Lw	ConcRoof4		0.0	0.0	0.0		
Concentrator Roof 5		ConcRoof5	89.9	89.9	89.9	56.2	56.2	56.2	Lw	ConcRoof5		0.0	0.0	0.0		
Concentrator Roof 2		ConcRoof2	99.5	99.5	99.5	59.3	59.3	59.3	Lw	ConcRoof2		0.0	0.0	0.0		
Concentrator Roof 1		ConcRoof1	86.0	86.0	86.0	52.3	52.3	52.3	Lw	ConcRoof1		0.0	0.0	0.0		
Waste Rock Pile Top Dozer & Haul Truck		WasteRockSources	119.2	119.2	119.2	68.9	68.9	68.9	Lw	WasteRockSources		0.0	0.0	0.0		

Vertical Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Atte
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)	
Gen Sets All Air Intake		GenSetAllAirIntake	111.5	111.5	111.5	105.4	105.4	105.4	Lw	GenSetAllAirIntake		0.0	0.0	0.0			
Gen Set Air Outlet - All Combined		GenSetsAllAirOutlet	111.5	111.5	111.5	105.4	105.4	105.4	Lw	GenSetsAllAirOutlet		0.0	0.0	0.0			
Ore Dome Wall		OreDomeWall	94.6	94.6	94.6	67.1	67.1	67.1	Lw	OreDomeWall		0.0	0.0	0.0			
BUILDINGS_25Jul12		Primary Crusher Wall	104.8	104.8	104.8	72.3	72.3	72.3	Lw	PrimaryCrusherWall		0.0	0.0	0.0			
BUILDINGS_25Jul12		Sec_Tert_Crusher	106.7	106.7	106.7	65.5	65.5	65.5	Lw	SecondaryCrusherWall		0.0	0.0	0.0			
Transformer_25Jul12		TransformerWall	75.9	75.9	75.9	40.9	40.9	40.9	Lw	TransformerWall		0.0	0.0	0.0			
Concentrator Walls		ConcWall01	93.4	93.4	93.4	57.5	57.5	57.5	Lw	ConcWall01		0.0	0.0	0.0			
Concentrator Walls		ConcWall02	89.1	89.1	89.1	59.4	59.4	59.4	Lw	ConcWall02		0.0	0.0	0.0			
Concentrator Walls		ConcWall03	85.9	85.9	85.9	58.3	58.3	58.3	Lw	ConcWall03		0.0	0.0	0.0			
Concentrator Walls		ConcWall04	89.3	89.3	89.3	57.1	57.1	57.1	Lw	ConcWall04		0.0	0.0	0.0			
Concentrator Walls		ConcWall05	86.3	86.3	86.3	55.3	55.3	55.3	Lw	ConcWall05		0.0	0.0	0.0			
Concentrator Walls		ConcWall06	91.4	91.4	91.4	57.3	57.3	57.3	Lw	ConcWall06		0.0	0.0	0.0			
Concentrator Walls		ConcWall07	90.8	90.8	90.8	61.3	61.3	61.3	Lw	ConcWall07		0.0	0.0	0.0			
Concentrator Walls		ConcWall08	93.0	93.0	93.0	63.0	63.0	63.0	Lw	ConcWall08		0.0	0.0	0.0			
Concentrator Walls		ConcWall09	88.9	88.9	88.9	60.3	60.3	60.3	Lw	ConcWall09		0.0	0.0	0.0			
Concentrator Walls		ConcWall10	86.8	86.8	86.8	59.3	59.3	59.3	Lw	ConcWall10		0.0	0.0	0.0			
Concentrator Walls		ConcWall11	89.0	89.0	89.0	60.6	60.6	60.6	Lw	ConcWall11		0.0	0.0	0.0			
Concentrator Walls		ConcWall12	95.7	95.7	95.7	61.0	61.0	61.0	Lw	ConcWall12		0.0	0.0	0.0			
Concentrator Walls		ConcWall13	78.9	78.9	78.9	53.3	53.3	53.3	Lw	ConcWall13		0.0	0.0	0.0			
Concentrator Walls		ConcWall14	85.7	85.7	85.7	55.0	55.0	55.0	Lw	ConcWall14		0.0	0.0	0.0			
Concentrator Walls		ConcWall15	80.9	80.9	80.9	55.3	55.3	55.3	Lw	ConcWall15		0.0	0.0	0.0			
Concentrator Walls		ConcWall16	81.9	81.9	81.9	55.1	55.1	55.1	Lw	ConcWall16		0.0	0.0	0.0			
Concentrator Walls		ConcWall17	81.6	81.6	81.6	53.3	53.3	53.3	Lw	ConcWall17		0.0	0.0	0.0			
Concentrator Walls		ConcWall18	79.7	79.7	79.7	53.3	53.3	53.3	Lw	ConcWall18		0.0	0.0	0.0			
Concentrator Walls		ConcWall19	78.1	78.1	78.1	53.3	53.3	53.3	Lw	ConcWall19		0.0	0.0	0.0			
Concentrator Walls		ConcWall20	83.4	83.4	83.4	52.3	52.3	52.3	Lw	ConcWall20		0.0	0.0	0.0			
Concentrator Walls		ConcWall21	81.2	81.2	81.2	52.3	52.3	52.3	Lw	ConcWall21		0.0	0.0	0.0			
Concentrator Walls		ConcWall22	84.0	84.0	84.0	52.3	52.3	52.3	Lw	ConcWall22		0.0	0.0	0.0			
Concentrator Walls		ConcWall23	87.1	87.1	87.1	55.3	55.3	55.3	Lw	ConcWall23		0.0	0.0	0.0			

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
Explosives Storage BUILDINGS_25Jul12		BUILDINGS00001	x	0		7.00	r
Explosives Storage BUILDINGS_25Jul12		BUILDINGS00002	x	0		7.00	r
BUILDINGS_25Jul12		BUILDINGS00003	x	0		10.00	r
Transformer_25Jul12		Transformer	x	0		10.00	a
BUILDINGS_25Jul12		Sec_Tert_Crusher	x	0		35.00	a
BUILDINGS_25Jul12		BUILDINGS00007	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00008	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00009	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00010	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00011	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00012	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00013	x	0		0.00	a
BUILDINGS_25Jul12		BUILDINGS00014	x	0		0.00	a
BUILDINGS_25Jul12		Primary Crusher	x	0		17.00	r
CAMP_25Jul12		CAMP00001	x	0		0.00	a
CAMP_25Jul12		CAMP00002	x	0		0.00	a
CAMP_25Jul12		CAMP00003	x	0		0.00	a
CAMP_25Jul12		CAMP00004	x	0		0.00	a
CAMP_25Jul12		CAMP00005	x	0		0.00	a
CAMP_25Jul12		CAMP00006	x	0		0.00	a
CAMP_25Jul12		CAMP00007	x	0		0.00	a
CAMP_25Jul12		CAMP00008	x	0		0.00	a
CAMP_25Jul12		CAMP00009	x	0		0.00	a
CAMP_25Jul12		CAMP00010	x	0		0.00	a
CAMP_25Jul12		CAMP00011	x	0		0.00	a
CAMP_25Jul12		CAMP00012	x	0		0.00	a
CAMP_25Jul12		CAMP00013	x	0		0.00	a
Processing Plant_25Jul12		BUILDINGS00005	x	0		25.00	r

Ground Absorption Area(s)

Name	M.	ID	G
PONDS 25Jul12		PONDS00002	0.0
PONDS 25Jul12		PONDS00003	0.0
PONDS 25Jul12		PONDS00002	0.0
PONDS 25Jul12		PONDS00003	0.0
PONDS 25Jul12		PONDS00002	0.0
PONDS 25Jul12		PONDS00003	0.0
WATERBODY_UTM		WATERBODY_UTM00001	0.0
WATERBODY_UTM		WATERBODY_UTM00002	0.0
WATERBODY_UTM		WATERBODY_UTM00003	0.0
WATERBODY_UTM		WATERBODY_UTM00004	0.0
WATERBODY_UTM		WATERBODY_UTM00005	0.0

Name	M.	ID	G
WATERBODY_UTM		WATERBODY_UTM00006	0.0
WATERBODY_UTM		WATERBODY_UTM00007	0.0
WATERBODY_UTM		WATERBODY_UTM00008	0.0
WATERBODY_UTM		WATERBODY_UTM00009	0.0
WATERBODY_UTM		WATERBODY_UTM00010	0.0
WATERBODY_UTM		WATERBODY_UTM00011	0.0
WATERBODY_UTM		WATERBODY_UTM00012	0.0
WATERBODY_UTM		WATERBODY_UTM00013	0.0
WATERBODY_UTM		WATERBODY_UTM00014	0.0
WATERBODY_UTM		WATERBODY_UTM00015	0.0
WATERBODY_UTM		WATERBODY_UTM00016	0.0
WATERBODY_UTM		WATERBODY_UTM00017	0.0
WATERBODY_UTM		WATERBODY_UTM00018	0.0
WATERBODY_UTM		WATERBODY_UTM00019	0.0
WATERBODY_UTM		WATERBODY_UTM00020	0.0
WATERBODY_UTM		WATERBODY_UTM00021	0.0
WATERBODY_UTM		WATERBODY_UTM00022	0.0
WATERBODY_UTM		WATERBODY_UTM00023	0.0
WATERBODY_UTM		WATERBODY_UTM00024	0.0
WATERBODY_UTM		WATERBODY_UTM00025	0.0
WATERBODY_UTM		WATERBODY_UTM00026	0.0
WATERBODY_UTM		WATERBODY_UTM00027	0.0
WATERBODY_UTM		WATERBODY_UTM00028	0.0
WATERBODY_UTM		WATERBODY_UTM00029	0.0
WATERBODY_UTM		WATERBODY_UTM00030	0.0
WATERBODY_UTM		WATERBODY_UTM00031	0.0
WATERBODY_UTM		WATERBODY_UTM00032	0.0
WATERBODY_UTM		WATERBODY_UTM00033	0.0
WATERBODY_UTM		WATERBODY_UTM00034	0.0
WATERBODY_UTM		WATERBODY_UTM00035	0.0
WATERBODY_UTM		WATERBODY_UTM00036	0.0
WATERBODY_UTM		WATERBODY_UTM00037	0.0
WATERBODY_UTM		WATERBODY_UTM00038	0.0
WATERBODY_UTM		WATERBODY_UTM00039	0.0
WATERBODY_UTM		WATERBODY_UTM00040	0.0
WATERBODY_UTM		WATERBODY_UTM00041	0.0
WATERBODY_UTM		WATERBODY_UTM00042	0.0
WATERBODY_UTM		WATERBODY_UTM00043	0.0
WATERBODY_UTM		WATERBODY_UTM00044	0.0
WATERBODY_UTM		WATERBODY_UTM00045	0.0
WATERBODY_UTM		WATERBODY_UTM00046	0.0
WATERBODY_UTM		WATERBODY_UTM00047	0.0
WATERBODY_UTM		WATERBODY_UTM00048	0.0
WATERBODY_UTM		WATERBODY_UTM00050	0.0
WATERBODY_UTM		WATERBODY_UTM00051	0.0
WATERBODY_UTM		WATERBODY_UTM00052	0.0
WATERBODY_UTM		WATERBODY_UTM00053	0.0
WATERBODY_UTM		WATERBODY_UTM00054	0.0
WATERBODY_UTM		WATERBODY_UTM00055	0.0
WATERBODY_UTM		WATERBODY_UTM00056	0.0
WATERBODY_UTM		WATERBODY_UTM00057	0.0
WATERBODY_UTM		WATERBODY_UTM00058	0.0
WATERBODY_UTM		WATERBODY_UTM00059	0.0
WATERBODY_UTM		WATERBODY_UTM00060	0.0
WATERBODY_UTM	-	WATERBODY_UTM00061	0.0
WATERBODY_UTM		WATERBODY_UTM00062	0.0
WATERBODY_UTM		WATERBODY_UTM00063	0.0
WATERBODY_UTM		WATERBODY_UTM00064	0.0
WATERBODY_UTM		WATERBODY_UTM00065	0.0
WATERBODY_UTM		WATERBODY_UTM00066	0.0
WATERBODY_UTM		WATERBODY_UTM00067	0.0
WATERBODY_UTM		WATERBODY_UTM00068	0.0
WATERBODY_UTM		WATERBODY_UTM00069	0.0
WATERBODY_UTM		WATERBODY_UTM00070	0.0
WATERBODY_UTM		WATERBODY_UTM00071	0.0
WATERBODY_UTM		WATERBODY_UTM00072	0.0
WATERBODY_UTM		WATERBODY_UTM00073	0.0
WATERBODY_UTM		WATERBODY_UTM00074	0.0
WATERBODY_UTM		WATERBODY_UTM00075	0.0
WATERBODY_UTM		WATERBODY_UTM00076	0.0
WATERBODY_UTM		WATERBODY_UTM00077	0.0
WATERBODY_UTM		WATERBODY_UTM00078	0.0
WATERBODY_UTM		WATERBODY_UTM00079	0.0
WATERBODY_UTM		WATERBODY_UTM00080	0.0
WATERBODY_UTM		WATERBODY_UTM00081	0.0
WATERBODY_UTM		WATERBODY_UTM00082	0.0
WATERBODY_UTM		WATERBODY_UTM00083	0.0
WATERBODY_UTM		WATERBODY_UTM00084	0.0
WATERBODY_UTM		WATERBODY_UTM00085	0.0
WATERBODY_UTM		WATERBODY_UTM00086	0.0

Receptor Noise Impact Level(s)

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	=f(x)	Day	=f(x)	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Eva Lake Resorts		POR01	2.2	2.2	40.5	40.5				1.50	r	634728.75	5435559.92	461.50
Walleyes Forever		POR02	14.6	14.4	40.5	40.5				1.50	r	621328.55	5407826.53	426.07
Steep Rock Lake		POR03	12.6	12.3	40.5	40.5				1.50	r	599103.10	5407954.61	308.96
Atikokan		POR04	10.0	9.7	40.5	40.5				4.50	r	601019.43	5401373.16	387.80
Bow Lake		POR05	16.4	16.1	40.5	40.5				4.50	r	602252.15	5433100.84	453.26
Marmion Lake Reservoir		POR06	24.3	24.0	40.5	40.5				1.50	r	606969.95	5415291.52	416.50
Marmion Lake Reservoir		POR07	22.8	22.5	40.5	40.5				1.50	r	606969.95	5413525.24	416.50
Marmion Lake Reservoir		POR08	29.9	29.6	40.5	40.5				1.50	r	607976.05	5417527.29	421.68
No Name Lake UTM-612400, 5438700		POR09	14.7	14.5	40.5	40.5				1.50	r	612400.41	5439064.19	438.66
Sawbill Bay		POR10	44.1	44.0	40.5	40.5				1.50	r	613616.32	5424307.83	417.75
Flood Bay		POR11	34.5	34.3	40.5	40.5				1.50	r	616858.22	5419277.31	430.14
Marmion Lake Reservoir		POR12	24.1	23.8	40.5	40.5				1.50	r	610866.32	5413195.97	430.72
Upper Seine Bay		POR13	23.9	23.8	40.5	40.5				1.50	r	621419.22	5418271.20	416.20
Bradshaw Bay		POR14	20.4	20.2	40.5	40.5				1.50	r	619205.80	5411765.07	421.50
Eva Lake Resort Ltd.		POR20	22.4	22.3	40.5	40.5				1.50	r	623275.45	5422826.33	433.50
Pine Point Resort Limited		POR21	13.3	13.1	40.5	40.5				1.50	r	620559.29	5439329.07	434.72
Canoe Canada Outfitters		POR22	15.7	15.5	40.5	40.5				1.50	r	606018.83	5436032.01	451.50
Canoe Canada Outfitters		POR23	45.1	45.0	40.5	40.5				1.50	r	614432.01	5423596.13	417.86
Trapper Cabin		POR24	23.6	23.4	40.5	40.5				1.50	r	606925.22	5428702.47	479.84
Trapper Cabin		POR25	20.8	20.6	40.5	40.5				1.50	r	622015.18	5428871.49	429.06
Trapper Cabin		POR26	17.3	17.1	40.5	40.5				1.50	r	618758.06	5435289.71	451.50
Trapper Cabin		POR27	18.1	17.9	40.5	40.5				1.50	r	621600.39	5432857.17	451.50
Trapper Cabin		POR28	17.7	17.5	40.5	40.5				1.50	r	626979.71	5419176.43	433.48
Trapper Cabin		POR29	30.9	30.8	40.5	40.5				1.50	r	617282.59	5426252.65	419.44
Trapper Cabin		POR30	17.1	16.8	40.5	40.5				1.50	r	602629.27	5412109.01	417.90
Trapper Cabin		POR31	21.7	21.4	40.5	40.5				1.50	r	613059.42	5410972.59	428.87
Trapper Cabin		POR32	27.1	26.9	40.5	40.5				1.50	r	617518.13	5415903.70	419.10
Trapper Cabin		POR33	19.1	18.9	40.5	40.5				1.50	r	606883.00	5432877.00	461.50
LUP REF-1124		POR34	15.6	15.4	40.5	40.5				1.50	r	629367.82	5420149.74	431.50
Cottage		POR35	18.6	18.4	40.5	40.5				1.50	r	616319.63	5434785.02	451.50
Finlayson Resort		POR39	16.4	16.1	40.5	40.5				1.50	r	599386.21	5413575.00	414.69
Reserve Bay		POR40	19.3	19.1	40.5	40.5				1.50	r	622089.96	5412726.45	421.50
Camp Accommodation		POR41	28.8	28.6	40.5	40.5				1.50	r	616458.55	5426888.26	418.50

Result Table

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Eva Lake Resorts	POR01		40	40	0	22713.32	10.00	2.2	2.2	-	-	0.0	0.0	-	-	-
Walleyes Forever	POR02		40	40	4029	15249.23	-25.19	14.6	14.4	-	-	0.0	0.0	-	-	-
Steep Rock Lake	POR03		40	40	1812	18242.59	-103.44	12.6	12.3	-	-	0.0	0.0	-	-	-
Atikokan	POR04		40	40	1812	22400.64	-24.60	10.0	9.7	-	-	0.0	0.0	-	-	-
Bow Lake	POR05		40	40	540	15300.59	40.86	16.4	16.1	-	-	0.0	0.0	-	-	-
Marmion Lake Reservoir	POR06		40	40	1812	7508.91	4.10	24.3	24.0	-	-	0.0	0.0	-	-	-
Marmion Lake Reservoir	POR07		40	40	1812	8916.08	4.10	22.8	22.5	-	-	0.0	0.0	-	-	-
Marmion Lake Reservoir	POR08		40	40	1812	5211.27	9.28	29.9	29.6	-	-	0.0	0.0	-	-	-
No Name Lake UTM-612400, 5438700	POR09		40	40	0	15610.41	-11.96	14.7	14.5	-	-	0.0	0.0	-	-	-
Sawbill Bay	POR10		40	40	1405	1576.47	-22.32	44.1	44.0	3.6	3.5	0.0	0.0	-	-	-
Flood Bay	POR11		40	40	4075	3120.64	-21.34	34.5	34.3	-	-	0.0	0.0	-	-	-
Marmion Lake Reservoir	POR12		40	40	1832	7818.59	18.32	24.1	23.8	-	-	0.0	0.0	-	-	-
Upper Seine Bay	POR13		40	40	4075	7426.87	-35.27	23.9	23.8	-	-	0.0	0.0	-	-	-
Bradshaw Bay	POR14		40	40	4029	10782.40	-29.76	20.4	20.2	-	-	0.0	0.0	-	-	-
Eva Lake Resort Ltd.	POR20		40	40	381	7857.09	-18.69	22.4	22.3	-	-	0.0	0.0	-	-	-
Pine Point Resort Limited	POR21		40	40	0	16447.47	-15.90	13.3	13.1	-	-	0.0	0.0	-	-	-
Canoe Canada Outfitters	POR22		40	40	0	15430.90	0.88	15.7	15.5	-	-	0.0	0.0	-	-	-
Canoe Canada Outfitters	POR23		40	40	1392	529.92	-22.44	45.1	45.0	4.6	4.5	0.0	0.0	-	-	-
Trapper Cabin	POR24		40	40	2951	8900.45	41.33	23.6	23.4	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR25		40	40	0	8426.21	-21.56	20.8	20.6	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR26		40	40	0	12052.74	0.88	17.3	17.1	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR27		40	40	0	11067.22	0.88	18.1	17.9	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR28		40	40	425	12277.10	-21.70	17.7	17.5	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR29		40	40	0	3183.48	-31.18	30.9	30.8	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR30		40	40	1812	12814.75	5.50	17.1	16.8	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR31		40	40	2051	10024.60	16.47	21.7	21.4	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR32		40	40	4029	6318.70	-32.16	27.1	26.9	-	-	0.0	0.0	-	-	-
Trapper Cabin	POR33		40	40	2951	12367.23	22.99	19.1	18.9	-	-	0.0	0.0	-	-	-
LUP REF-1124	POR34		40	40	381	14298.77	-20.69	15.6	15.4	-	-	0.0	0.0	-	-	-
Cottage	POR35		40	40	0	11096.02	0.88	18.6	18.4	-	-	0.0	0.0	-	-	-
Finlayson Resort	POR39		40	40	1812	14529.99	2.29	16.4	16.1	-	-	0.0	0.0	-	-	-
Reserve Bay	POR40		40	40	4075	11501.09	-29.97	19.3	19.1	-	-	0.0	0.0	-	-	-
Camp Accommodation	POR41		41	41	0	3348.94	-32.12	28.8	28.6	-	-	0.0	0.0	-	-	-

Building Evaluation

Name	M.	ID	Level		Excess Levels		Land Use			Coordinates			Floor Height		Round up
			Day	=f(x)	From	To	Type	Auto	Noise Type	X	Y	Ø	EG	OG-OG	
			(dBA)	(dBA)	Floor	Floor				(m)	(m)	(m)	(m)	(m)	

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-HYDRO-1

Source: Ministry of Environment

Summary of Comment

Clarity into watershed delineation should be provided. Although NRVIS does contain topographic data which has been used to generate the provincial Ontario Base Maps, the methods used, including software or other tools should be outlined.

Potential Environmental Effects

Watershed delineation was used to identify potential areas which could be impacted. Understanding how the areas were determined, provides clarity as to the accuracy of the potential impact statements and may have implications to other aspects of the project, not found in the Hydrology TSD.

Proposed Action

Within the Land Information Ontario database several layers exist [pre-constructed sub-basins produced by WRIP (Water Resources Inventory Group within MNR), a 20m provincial DEM layer for the project area, provincial contours] such that the data source used, including the accuracy, should be provided (horizontal and vertical), as well as creation date, data source (and date) associated with the data layer used. Often, field validation can be used depending on the data source used to ensure the accuracy associated with historic data sets, or other newer techniques can be used to gather higher resolution digital terrain models.

Reference to EIS

Hydrology TSD, Version 1, Section 2.1.4, page 19

Response

Site watersheds were delineated manually from working maps, prepared using Project specific topography and MNR NRVIS topography (see attached figure) as described below. Watershed divides were identified by interpreting the topographical data. Watersheds delineated by hand were digitized using ArcView GIS software.

Project specific topography

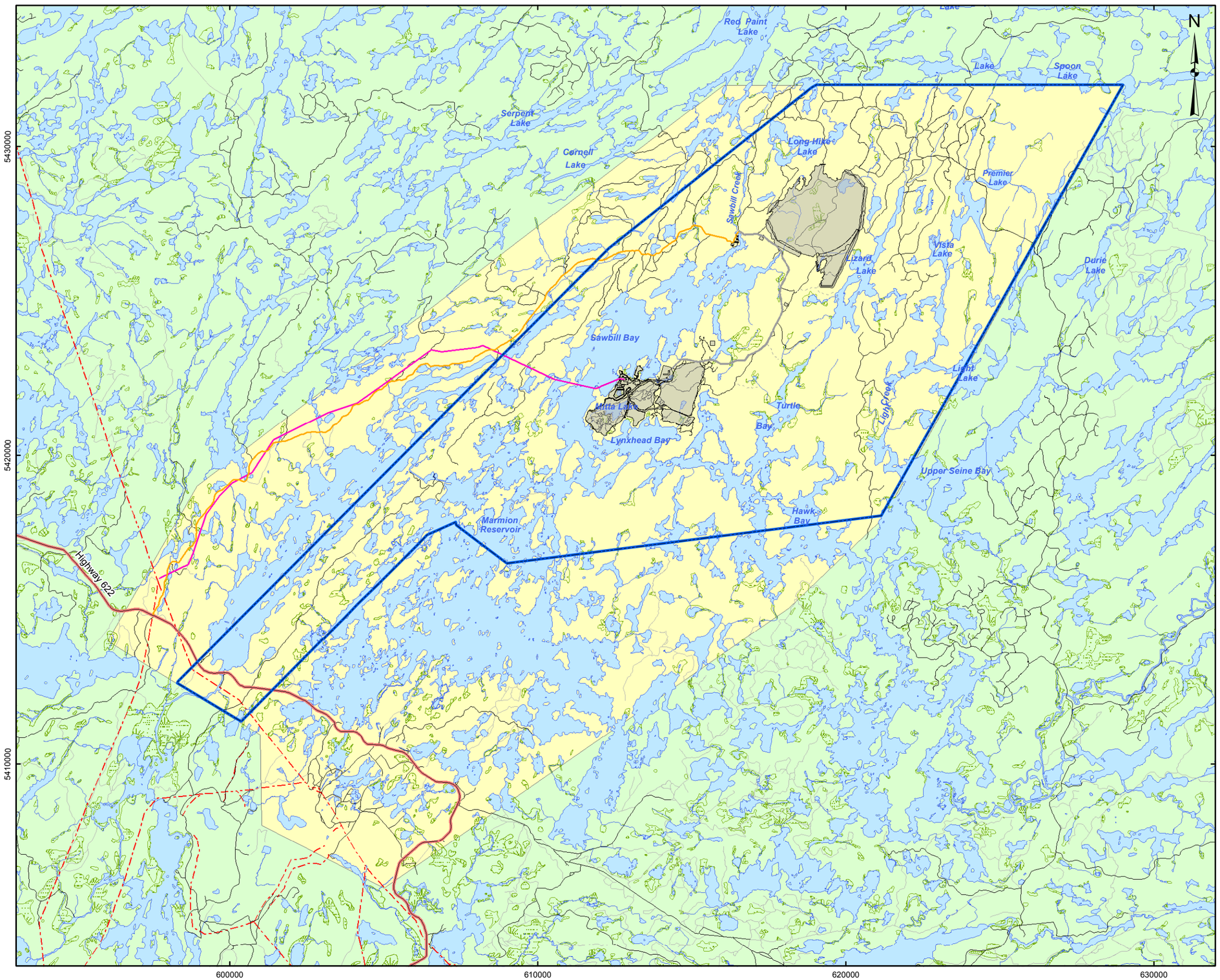
Data collection method:	Contours derived from Aerial Photography Collection
Author of the data:	Aero Geometrics Ltd. – Mapping Services
Creation date:	August 2010
Data accuracy (horizontal):	20 cm over the mine site and 50 cm north and south of the central zone
Data accuracy (vertical):	1 m over the mine site and 5 m north and south of the central zone

MNR NRVIS topography

Data type:	10 m contour dataset
Creation date:	2006
Date received:	January 2008
Data accuracy (horizontal):	± 10 m
Data accuracy (vertical):	± 5 m

Attachments

Figure MOE-Hydro-1: Topography Data Sources



LEGEND

- Trail
- Road
- Power Transmission Line
- River/Stream
- Lake
- Wetland
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities

Topography Data Sources

- Aero Geometrics Ltd. - Mapping Services
- Aero Geometrics Ltd. Central Zone
- MNR NRVIS

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2,000 0 2,000 4,000 6,000
SCALE 1:125,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
TOPOGRAPHY DATA SOURCES

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 1
DESIGN	CGE	14 Nov. 2008	**FIGURE:**	
GIS	JO	11 Jun. 2013	**MOE-HYDRO-1**	
CHECK	SP	11 Jun. 2013		
REVIEW	SP	11 Jun. 2013		

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\Other\AerialSurveyExtents.mxd

INFORMATION REQUEST – MOE-HYDRO 2

Source: Ministry of Environment

Summary of Comment

Clarification as to the water year (WY) being used in annual statistics would provide insight to the reader.

Potential Environmental Effects

Table 4-17 seems to indicate that only one water year was affected by missing results, as opposed to two. In addition, the missing 3 months were not mentioned during other hydrology summaries when the data was used. It was noted that the WY was mentioned on page 74.

Proposed Action

The clear identification of the WY used at the first use of hydrologic summaries would be useful. When using water years ensure that the water year used won't affect the metrics used, such as the low flow period being calculated (and could potentially disrupt low flow characterization).

Reference to EIS

Hydrology TSD, Version 1, Section 5.1.2.1.2, pages 60 to 66

Response

Local flow monitoring stations were installed at the end of August 2010, and data collected to the end of August 2012 were used to evaluate baseline flow conditions. The 'water year' selected for use in Tables 5-4, 5-5, 5-6 and 5-7 on pages 60, 61, 63 and 65, respectively, was September 1 to August 31 in order to provide two full years of baseline data. The sentences preceding these tables indicate that the period of flow record is September 1, 2010 to August 31, 2012 and the tables present data for the years 2010-2011 and 2011-2012. The 'water year' used in Table 5-8 on page 65, that presents annual low flows observed at the monitoring stations, is stated as May 1, 2011 to April 30, 2012 in the preceding paragraph.

The note below Table 4-17 on page 47 (Section 4.2.1.2.8) indicates there are missing data for local scale flow monitoring station SW-01. This station was out of operation from August 28 to October 28 (Appendix 5.I). There are only four missing days in the year September 1, 2010 to August 31, 2011, which does not significantly affect the annual baseflows computed for this year. However, there are two missing months in the year September 1, 2011 to August 31, 2012, hence the note under the table that reads 'based on 10 months of daily flow data …'

INFORMATION REQUEST – MOE-HYDRO-3

Source: Ministry of Environment

Summary of Comment

Under local site watersheds, flow metrics provided use regional curves to interpolate local conditions. Although it was mentioned that the basins used were thought to be the most similar to local watersheds, the further characterization of basin conditions would provide more understanding as to their selection (wetland area, storage, annual precipitation, similarity in flow patterns between sites of interest and potential index sites (when available). Typically, the similarity between datasets for overlapping periods has been used and is considered during the weighting process.

Potential Environmental Effects

It was described that daily time series data was generated using a weighted average of flow series derived from three nearby sites (Turtle River 4,870 km², Namakan River 13,400 km² and Atikokan River 332 km²). Hughes and Smakhtin (1996) recommends using a weighting factor based on the degree of similarity between flow regimes and the destination site which was used. Providing further clarity on modelling methods increases confidence in modelling efforts used, and any subsequent impact assessment statements.

Proposed Action

Further refinement to modelling efforts could be completed dependent on their subsequent uses and required accuracy. The derivation of the weighting factor, as well as the weighting factor should be provided.

Reference to EIS

Hydrology TSD, Version 1, Section 5.1.1.3.3, 1st paragraph on page 57

Response

Spatial interpolation and regionalization methods were used to develop synthetic flows for the natural watershed areas tributary to Lac des Mille Lacs, Lower Marmion Reservoir and Upper Marmion Reservoir. These flows were used to estimate total inflows to the reservoir under the 2004 to 2014 Seine River Water Management Plan using water balance methods due to the high percentage (34%) of missing days in the record of outflows from Raft Lake Dam. (1st and 3rd paragraph of Section 5.1.1.3.3 on page 56).

Three synthetic daily mean time series were developed for the natural watershed areas tributary to the Upper and Lower Marmion Reservoirs, based on observed flows at Environment Canada hydrometric stations on Turtle River, Namakan River and Atikokan River, and monthly flow duration curves derived for these stations. A final time series for each natural watershed area was then calculated as the weighted average of the three daily mean time series. (Section 5.1.1.3.3, 1st paragraph on page 57).

The similarities between the source sites (Turtle River, Namakan River and Atikokan River) and the destination site (Seine River) were examined as part of the analysis. Watershed characteristics for the four sites are shown in Table 1 below. The similarities in flow regime are presented in the various tables and charts in Section 5.1.2.2.2 of the Hydrology TSD on pages 73 to 85.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

Table 1: Watershed Characteristics

Characteristic	Seine River at Raft Lake Dam	Turtle River near Mine Centre	Namakan River at outlet of Lac La Croix	Atikokan River at Atikokan
Latitude (°N)	48.9176	48.8500	48.3825	48.7519
Longitude (°W)	91.5451	92.7236	92.1761	91.5839
Drainage Area (km^2)	4512	4843	13472	342
Perimeter (km)	578	603	708	225
Lake and Wetland Area (km^2)	1067	1098	1881	68
Lake and Wetland Coverage (%)	23%	23%	14%	19%
Length of Main Channel (km)	201	216	190	80
Length to Center (along main channel) (km)	103	95	66	46
Mean Slope of Watershed (%)	3.67	4.92	4.69	4.49
Mean Slope of Main Channel (%)	2.1	3.55	4.19	2.65

Table 2 shows the factors that were applied to derive weighted average time series for the natural watershed areas tributary to the Upper Marmion Reservoir and the Lower Marmion Reservoir.

Table 2: Weights for Source Sites

Source Site	Weighting Factors
Turtle River near Mine Centre	2.5
Namakan River at outlet of Lac La Croix	1.0
Atikokan River at Atikokan	1.5

These factors were determined by trial and error; annual mean outflows recorded at Raft Lake Dam in years with less than 10% missing days were compared with annual mean inflows to the reservoir calculated from synthetic data for the period September 1999 to August 2010 (Table 3) and factors giving comparable results were selected. The underlying assumption to this approach is that, over a period of one year, the inflows to the reservoir are equal to the outflows through the dam.

Table 3: Comparison of Recorded and Synthetic Flow Data

Year[(a)]	Annual Mean Flow (m^3/s)		Percent difference
	Recorded	Synthetic	
1999-2000	39.90	35.14	-12%
2000-2001	37.24	49.53	33%
2001-2002	40.10	44.53	11%
2002-2003	17.77	13.68	-23%
2005-2006	30.52	29.13	-5%
2010-2011	27.01	--[(b)]	--[(b)]

(a) For the period September 1 to August 31

(b) Not evaluated

INFORMATION REQUEST – MOE-HYDRO-4

Source: Ministry of Environment

Summary of Comment

Based on the importance of the site for subsequent analysis other methods could be used (Q-ratio, MOVE.1 or baseflow correlation if used in other reports such as the Surface Water TSD), as these have been found to be more accurate than regional estimates when a partial on-site data record is available.

Potential Environmental Effects

Subsequent impact assessments based on regional methods may have higher degree of uncertainty depending on site characteristics

Proposed Action

Re-evaluation of low flow characterization if further refinement is warranted.

Reference to EIS

Hydrology TSD, Version 1, Section 5.1.2.3.7, pages 95 to 97

Response

Section 5.1.2.3.7 provides estimates of baseline low flows (7Q2, 7Q20, 30Q2) in site and local scale watercourses. These were provided to satisfy the Environmental Impact Statement Guidelines prepared for the Project by the Canadian Environmental Assessment Agency (December 2011), and were not generally used for impact assessments.

Only the 7Q20 derived for the local scale flow monitoring station SW-01, Sawbill Creek at Sawbill Bay, was used in mixing calculations to predict nutrient concentrations in basins 7c and 11 in the Upper Marmion Reservoir, resulting from the discharge of treated sewage from the accommodation camp into Sawbill Bay (Section 4.4.1 of the Lake Water Quality TSD, pages 62 to 65). The outflow from basin 7c was conservatively assigned the value of the 7Q20 for station SW-01 (the drainage area to basin 7c is larger than that to station SW-01). The outflow from basin 11 was assigned the value of the average discharge rate through Raft Lake Dam.

Mixing calculations for basin 7c predicted that the concentration of total phosphorus will exceed PWQO guidelines, and it was proposed that phosphorus levels be managed by using low phosphorus soaps and detergents at the accommodation camp. All other parameters (nitrate, ammonia, unionized ammonia, cBOD and TSS) were predicted to be significantly below ODWS, CCME, CWQG and PWQO guidelines. Mixing calculations for basin 11, predicted that nutrient concentrations will be well below baseline concentrations and within receiving water quality guidelines.

Based on the above, re-evaluation of low flow characterization is considered unwarranted; a more accurate assessment of low flows will not materially affect the conclusions with respect to nutrient concentrations in Upper Marmion Reservoir.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-HYDRO-5

Source: Ministry of Environment

Summary of Comment

The project was described as potentially having an effect on the Upper Marmion Reservoir inflows and therefore regulated outflows from Raft Lake Dam. Given that the sluice gate between the Upper and Lower has been known to be delayed in opening in low water years, the potential to consider the proposed operations on the potential regulation of Marmion Lake should be considered during all water balance model efforts (delays in opening the gate) while considering the level of control of Raft Lake Dam outflow (based on the outflow being a stop log operation).

Potential Enviromental Effects

In the current water balance provided, Marmion Lake is considered to be open all summer which is often not the case during low flow years (pers. comm.. Brian Jackson, 2013). This could have local effects on the environment and economy, as potential impacts would not be identified since this was not considered during the Hydrology TSD.

Proposed Action

Considering water levels outside of the target operating level (lower end of target operation during assessment) in model design. More information on the storage curve used should also be provided. Further evaluation of the time until the gate between the Lower Marmion Reservoir and Upper Marmion Reservoir can be opened should be considered and evaluated.

Reference to EIS

Hydrology TSD, Version 1, Section 4.2.1.2.7, page 45

Response

Section 4.2.1.2.7 shows the average monthly and annual water balance of the Upper Marmion Reservoir for the period 2005 to 2010, which was included to show the hydrological components of the water balance, as well as the relative magnitudes of the inputs to and outputs from the water balance. The water balance presented in Section 4.2.1.2.7 does not assess potential changes in inflows to, outflows from, or lake water levels in the reservoir. Predicted changes occurring as a result of the Project are discussed in Section 5.2.2.3 on pages 111 to 116 (outflows), and in Sections 6.2.1.4 on page 158 and Section 6.2.2.3 on pages 160 to 163 (lake water levels).

Potential changes were assessed using a hydrologic water balance (not a hydraulic model), which assumes that the outlet structure at Raft Lake Dam has sufficient hydraulic control to achieve the desired outflows. A stage-discharge curve was not used in the modelling. It should be noted that at the start of the Project in September 2010, Golder (on behalf of Osisko) made a request for a stage-discharge table but was informed that this information was proprietary.

Consideration of lake water levels below the assumed target operating levels will not change the assessment of effects based on the model results. This is because the prediction of changes is based on the relative difference

in lake water levels obtained from simulations of outflows under existing conditions, and future conditions during Project operations. Lake water levels under both conditions were evaluated by regulating outflows to achieve the minimum outflow, and assumed target lake water levels within the operating range, specified in the operating plan for Raft Lake Dam. Changing the absolute value of the target water levels would not substantively change the model results. Similarly, varying the time when the Lower Marmion Sluiceway is opened will not materially affect the model results. The modelling evaluates the relative changes in outflows and lake water levels, and the same sluiceway open time would be applied in both simulations of existing conditions, and future conditions during Project operations.

Based on the above, it is concluded that further modelling effort would not provide additional useful information for the assessment.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-HYDRO-6

Source: Ministry of Environment

Summary of Comment

The reported difference between local watershed B size and SW-11.

Potential Environmental Effects

Several hydrological summaries provide statistics for local watershed B and report it as analogous to SW-11, when there is a 23% difference in drainage area. The difference would equate to a difference in estimated flows and could alter the proposed potential impacts.

Proposed Action

Provide rationale as to the site conditions used for SW-11.

Reference to EIS

Hydrology TSD, Ver. 1, Section 2.1.4, Figure: 2-4, page 20.

Response

Local flow monitoring station SW-11 is located in site scale watershed B, upstream of the Reef Road crossing over Sawbill Bay East Tributary. The drainage area tributary to this station is 461.80 ha (Section 5.1.1.2, Figure: 5-1, page 52). The total drainage area of watershed B, to the mouth of Sawbill Bay East Tributary at Sawbill Bay (downstream of SW-11), is 609.82 ha (Figure: 2-4, Section 2.1.4, page 20).

Section 5.1.2.3.1, 2nd paragraph, page 86 reads that '... watercourses B and R were included in the local scale flow monitoring program and correspond to stations SW-11 (Sawbill Bay East Tributary) and SW-12 (Lizard Lake West Tributary) respectively'. The intention of this sentence was to indicate that station SW-11 is located on the same watercourse draining to the mouth of watershed B.

References to SW-11 were made when reporting baseline flows for watershed B in the following locations:

- Section 5.1.2.3.2, Table 5-23 on page 88
- Section 5.1.2.3.2, Tables 5-24 and 5-25 on page 89
- Section 5.1.2.3.3, Table 5-26 on page 90
- Section 5.1.2.3.4 Table 5-27 on page 92
- Section 5.1.2.3.5, Table 5-28 on page 93
- Section 5.1.2.3.6, Table 5-29 on page 95
- Section 5.1.2.3.7, Table 5-30 on page 96
- Section 5.1.2.3.7, Table 5-31 on page 97

The drainage area and flows reported in these tables for watershed B are incorrect; values have been provided for SW-11. Corrected data are provided in the tables below. However, these data were not used to assess the potential change in flows in the watercourse draining watershed B.

The 2nd paragraph of Section 5.2.1.2 on page 102 reads that '… the evaluation of changes to flows in site … scale watercourses as a result of the Project was based on changes in tributary drainage areas'. Table 5-33 in Section 5.2.2.1 on page 108 correctly reports the drainage area for watershed B, and evaluates the percentage reduction in the watershed as a result of the Project as 85%.

Table 1: Annual Mean Flows

Average Annual Mean Flow, m³/s	0.049
Range in Annual Mean Flows, m³/s	0.080

Wet Conditions		**Dry Conditions**	
Return Period (yrs)	**Annual Mean Flow**	**Return Period (yrs)**	**Annual Mean Flow**
2	0.049	2	0.049
10	0.071	10	0.035
25	0.079	25	0.028
50	0.084	50	0.020
100	0.089	100	0.015

Table 2: Seasonal Mean Flows

Season	**Average Seasonal Mean Flow, m³/s**
Fall (Oct – Dec)	0.037
Winter (Jan-Mar)	0.024
Spring (Apr-Jun)	0.080
Summer (Jul-Sep)	0.055

Table 3: Monthly Mean and Exceedance Percentile Flows

Month	**Monthly Mean Flow, m³/s**	**75th Exceedance Percentile Flow, m³/s**	**25th Exceedance Percentile Flow, m³/s**	**90th Exceedance Percentile Flow, m³/s**
Jan	0.027	0.020	0.035	0.140
Feb	0.024	0.019	0.029	0.013
Mar	0.021	0.015	0.023	0.014
Apr	0.037	0.017	0.053	0.020

Month	Monthly Mean Flow, m³/s	75th Exceedance Percentile Flow, m³/s	25th Exceedance Percentile Flow, m³/s	90th Exceedance Percentile Flow, m³/s
May	0.102	0.048	0.140	0.024
Jun	0.099	0.043	0.113	0.032
Jul	0.075	0.033	0.095	0.030
Aug	0.050	0.018	0.065	0.023
Sep	0.040	0.013	0.047	0.015
Oct	0.038	0.017	0.045	0.013
Nov	0.038	0.022	0.048	0.014
Dec	0.033	0.023	0.043	0.015

Table 4: Instantaneous Peak Flows and Low Flow Indices, m/s

Return Period (yrs)	Instantaneous Peak Flow, m³/s
1.5	0.120
2	0.155
10	0.265
25	0.772
100	3.077
Low Flow Index	**Mean Flow, m³/s**
7Q2[(a)]	0.018
7Q20[(b)]	0.009
30Q2[(c)]	0.019

(a) Annual minimum 7-day mean flow with a 2-year return period

(b) Annual minimum 7-day mean flow with a 20-year return period

(c) Annual minimum 30-day mean flow with a 2-year return period

INFORMATION REQUEST – MOE-HYDRO-7

Source: Ministry of Environment

Summary of Comment

Lizard Lake was modelled using HEC-HMS. While the data sources used were provided, the calibration and validation of the model was not.

Potential Environmental Effects

Impacts on lake are based on modelling. Without providing calibration, there is a degree of uncertainty associated with using the model to assess impacts.

Proposed Action

Additional data describing the calibration, the goodness of fit of the model would provide further understanding into the error or risks associated with using the model implementation to determine impacts.

Reference to EIS

Hydrology TSD, Version 1, Section 5.2.1.3 on page 102, Section 5.2.2.2 on page 110, Section 6.2.1.3 on pages 157 to 158, and Section 6.2.2.2 on pages 159 to 160.

Response

Details of HEC-HMS modelling, including a description of model calibration, are provided in the a new Appendix 5.II, which has been included in the Supplemental Information Package of the Hydrology TSD.

The degree of uncertainty in simulated values indicated by model calibration to observed values under existing conditions will not affect the assessment of effects. This is because the prediction of changes is based on the relative differences in flows and lake water levels obtained from simulations of existing conditions, and future conditions during Project operations. Potential errors in model calibration will apply equally to both scenarios since the only changes made to the model to simulate future conditions under Project operations were subbasin drainage areas, and lengths and slopes used in the Kinematic Wave Transform Method to convert excess precipitation to surface runoff.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-NR-GW-01

Source: Ministry of Environment

Summary of Comment

These sections discuss the waste rock composition and the waste rock sampling for chemical analysis. Table 3.1 provides the breakdown of the samples by rock type. But there is no breakdown by rock type to show the actual proportions of each waste rock type.

Potential Environmental Effects

A break down by percentage of the waste rock is required to ensure that the samples are appropriately representative with respect to representing the composition of the waste rock management facility.

Proposed Action

Provide an estimate of the composition of the final waste rock stockpile by rock type, and illustrate how the sample selection is appropriately representative.

Reference to EIS

Sec 3.3.1, Sec 3.3.1.1.1, Sec 3.3.1.1.2, and Table 3.1

Response

Please see response to IR_MOE-NR-GW-02 for a detailed discussion of waste rock sample representativeness.

INFORMATION REQUEST – MOE-NR-GW-02

Source: Ministry of Environment

Summary of Comment

For chemical characterization of the tailings, a single composite sample was created using 10 different ore samples. The consultant believes that this is representative. The description of ore notes some differences in ore composition between zones, and this includes the presence of pyrite in some zones and not others. With the composite, is there certainty that the composition is proportionally representative of the expected final tailings composition? Similarly, if ore differs in the different zones, which would be mined at different times, would there be sorting within the TMF that could result in zones of more reactive tailings separated from zones with neutralizing potential, thus resulting in increased leaching effects?

Potential Environmental Effects

If ore differs in the different zones, which would be mined at different times, there could be sorting within the TMF that could result in zones of more reactive tailings separated from zones with neutralizing potential, thus resulting in increased leaching effects.

Proposed Action

Provide information on the composition of the ore as it might relate to the chemical composition of the tailings, and determine if a composite sample will be suitably representative.

Reference to EIS

Section 3.3.1.2

Response

A detailed letter to Osisko on the representativeness of ore, tailings and waste rock samples, and testing procedures used on the tailings and waste rock samples was prepared and is included in the Supplemental Information package of the Geochemistry, Geology and Soil TSD. Additional information is provided in the Geochemistry Geology and Soils TSD. Excerpts from metallurgical and geological reports that will be referenced or become part of the feasibility study, and summary of the geochemical testing program that was performed on the waste rock, tailings and individual drillhole composite and overall composite samples generated by Osisko (SGS Lakefield and Ounpuu) for the Osisko Hammond Reef Gold (OHRG) Project are provided in the Supplemental Information package of the Geochemistry, Geology and Soil TSD.

Given that only gold will be removed from the mined ore, the tailings will be reflective of the blended ore. Blending of the ore will be required to provide a consistent “head grade” to the mill for processing, hence the tailings are expected to be relatively homogeneous in nature. The tailings sample as tested represents the best estimate of the overall tailings composition as discussed in the Supplemental Information package of the Geochemistry, Geology and Soil TSD.

As can be observed and discussed in the Supplemental Information package of the Geochemistry, Geology and Soil TSD, the ore zones are relatively homogeneous with respect to assay concentrations of the various parameters, and particularly with respect to the sulphide and carbonate content. The sulphide content of the ore

is typically less than 0.3 % by weight, with a maximum concentration in the “extreme high grade” (EHG) sample of 0.42 % sulphide by weight. The carbonate contents are typically greater than 3% with a minimum value of 2.11 %. For the EHG sample the carbonate neutralization potential ratio (CaNP Ratio) is greater than 4 indicating the material will be non-acid generating with excess neutralizing potential from carbonate minerals. For all other metallurgical samples representing the variability of the deposit the CaNP ratio is greater than 6 confirming that all expected zones of the deposit as used in metallurgical evaluation testing are expected to be non-acid generating with excess neutralizing potential.

Based on this additional information and an understanding of the geologic conditions related to emplacement of ore it is considered that the composite sample is suitably representative of the tailings. Furthermore as provided in the Supplemental Information package of the Geochemistry, Geology and Soil TSD, there is information on greater than 20 samples of ore from a variety of locations which comprise the deposit that will make up the tailings, thus providing suitable information on possible deposit and tailings heterogeneity. This additional information is consistent with the information developed from the composite sample.

INFORMATION REQUEST – MOE-NR-GW-03

Source: Ministry of Environment

Summary of Comment

ABA, NAG and leach testing were all done on the waste rock, as was chemical characterization. Was ABA and NAG done on the ore? Or are there chemistry results for the ore with regards to overall composition and metals content?

Potential Environmental Effects

Although testing was done on the tailings, as noted above, it is possible that the composite sample could have masked effects of the different types of ore. Therefore, it would be useful to have ABA on a variety of the ore material to determine the potential for ARD.

Proposed Action

A discussion of ore chemistry and its effect on tailings composition and reactivity is needed, including discussion of the homogeneity/heterogeneity of the ore within and between ore zones.

Reference to EIS

Section 3.3.2 & Section 3.3.2.1

Response

Yes, ABA and leach testing was done on the ore. Chemical results were to be included in the feasibility study but are included in response to MOE-NR-GW-02 and provided in the Supplemental Information package of the Geochemistry, Geology and Soil TSD. To summarize, testing on ore samples occurred in two phases, one in March 2009 with a follow-up as provided in April 2011. The characterization testwork was conducted on a wide selection of ore samples which captured the different alterations, lithologies and the grade variations that are present within the ore deposit and included the following:

2009 (see Tables 1 and 2)

- Ten (10) individual drill hole composites (BR-2, BR-13, BR-23, BR-28, BR-64, BR-67, BR-68, BR-87, BR-88 and BR-102) were collected in 2009, representing various locations in the deposit. Several composite samples (A-Zone, 41-Zone, Master, LG A-Zone Variability, HG A-Zone Variability and EHG Variability composites) were created from these 10 drill hole composites.
- The A-Zone composite was created from six drill hole composites from the following drill holes: BR-28, BR-64, BR-68, BR-87, BR-88 and BR-102.
- The 41-Zone composite was created from three drill hole composites from the following drill holes: BR-02, BR-13 and BR-23.
- The Master composite (2009) sample was created from 78% A-Zone composite and 22% 41-Zone composite. LG (low grade) A-Zone Variability Composite was created from drill hole composites BR-28, BR-87 and BR-102.

- HG (high grade) A-Zone Variability Composite was created from drill hole composites BR-64, BR-68 and BR-88.
- EHG (extreme high grade) Variability Composite was created from drill hole composites BR-13, BR-23, BR-28, BR-64, BR-68, BR-87 and BR-102.
- Characterization testing was carried out on 9 of the 10 individual drill hole composites (BR-2, BR-13, BR-23, BR-28, BR-64, BR-67, BR-87, BR-88 and BR-102) as well as the Master Composite, LG A-Zone Variability Composite, HG A-Zone Variability Composite and the EHG Variability Composite samples.

2011 (see Table 3)

- Ten (10) variability metallurgical (Met) composite samples were collected in 2011 to represent various zones in the deposit.
- One Master composite sample was created from the ten variability Met composites, selected to be representative of expected mill head grade.

The characterization testwork consisted of static tests designed to assess the general physical and geochemical characteristics, and included elemental composition, acid-base accounting (ABA) and net acid generation (NAG) testing. The results of the elemental composition testwork are presented in Table 1 (see attached). The results of the ABA and NAG testwork are presented in Table 2 (for 2009 ore and composite samples, see attached) and Table 3 (for 2011 ore and composite samples, see attached). The ABA and NAG test results indicated that all ore and ore composite samples are expected to be non-potentially acid generating with excess neutralizing capacity according to the MEND (2009) guidelines.

As indicated in the attached response to MOE-NR-GW-02, the ore and tailings will not be materially different given that the only product expected to leave the site as a result of processing is gold. All the other components of the ore will end up in the tailings in a much more homogenized manner compared to the ore given that the ore will be crushed and ground before being processed.

Attachments

Table 1: Elemental composition for the 2009 ore samples.

Table 2: Acid Base Accounting and Net Acid Generating Results for the 2009 ore samples.

Table 3: Location, Lithology and Acid Base Accounting Results for the 2011 Met Composite Samples.

References

Brett Resources Inc., 2009. An investigation of gold recovery from Hammond Reef Project samples, Project 11734-002 – Final Report.

Ounpuu, 2011. Memorandum titled “Metallurgical Update on Hammond Reef Testwork”. Issued to Osisko February 10, 2011 by Mike Ounpuu (Consulting Metallurgist).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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Table 1: Elemental composition for the 2009 ore samples.

Sample	Zone	Ag g/t	Al g/t	As g/t	Ba g/t	Be g/t	Bi g/t	Ca g/t	Cd g/t	Co g/t	Cr g/t	Cu g/t	Fe g/t	K g/t	Li g/t	Mg g/t	Mn g/t	Mo g/t	Na g/t	Ni g/t	P g/t	Pb g/t	Sb g/t	Se g/t	Sn g/t	Sr g/t	Ti g/t	Tl g/t	U g/t	V g/t	Y g/t	Zn g/t
Drill Hole Composites																															
BR-2	41	< 2	80000	< 30	410	0.80	< 20	25000	< 2	< 20	18	20	23000	27000	< 5	5800	360	11	26000	< 20	530	30	< 10	< 30	< 20	130	1900	< 30	< 20	34	5.3	150
BR-13	41	< 2	75000	< 30	490	0.88	< 20	21000	< 2	< 20	31	28	25000	24000	< 5	7200	370	< 10	22000	< 20	460	31	< 10	< 30	< 20	120	2300	< 30	< 20	51	4.8	160
BR-23	41	< 2	70000	< 30	430	0.74	< 20	28000	< 2	< 20	100	24	29000	22000	< 5	12000	430	< 10	19000	84	320	76	< 10	< 30	< 20	120	2300	< 30	< 20	45	4.2	360
BR-28	A	< 2	78000	< 30	550	0.86	< 20	17000	< 2	< 20	33	14	23000	23000	< 5	5300	330	26	22000	< 20	490	< 20	< 10	< 30	27	100	2000	< 30	< 20	39	4.8	66
BR-64	A	< 2	71500	< 30	435	0.81	< 20	22500	< 2	< 20	26.5	24	23500	24000	< 5	5000	320	11.5	21500	< 20	450	< 20	< 10	< 30	< 20	120	2050	< 30	< 20	36	4.7	67.5
BR-67	A	< 2	73000	< 30	460	0.86	< 20	24000	< 2	< 20	24	26	22000	24000	< 5	5200	350	< 10	24000	< 20	430	< 20	< 10	< 30	< 20	120	2000	< 30	< 20	35	4.4	79
BR-68 [a]	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BR-87	A	< 2	72000	< 30	500	0.80	< 20	18000	< 2	< 20	17	15	20000	23000	< 5	3800	310	< 10	21000	< 20	330	25	< 10	< 30	< 20	120	1800	< 30	< 20	29	4.5	110
BR-88	A	< 2	68000	< 30	450	0.76	< 20	14000	< 2	< 20	35	60	24000	20000	< 5	2900	220	< 10	23000	< 20	240	140	< 10	< 30	< 20	100	1400	< 30	< 20	22	3.4	100
BR-102	A	< 2	73000	< 30	490	0.88	< 20	19000	< 2	< 20	44	25	22000	24000	< 5	4300	270	< 10	24000	< 20	380	25	< 10	< 30	< 20	110	1600	< 30	< 20	30	5.2	93
Zone Composites																															
A-Zone [b]	A	< 2	66500	< 30	440	0.81	< 20	19000	< 2	< 10	43	15.5	21000	24500	< 5	4850	310	13	22000	< 20	395	< 40	< 10	< 30	< 20	110	1650	< 30	< 20	32	4.8	43
41-Zone [b]	41	< 2	67000	< 30	420	0.72	< 20	24000	< 2	28	76	21	27000	21000	< 5	8600	370	12	18000	39	430	< 40	< 10	< 30	< 20	120	2000	< 30	< 20	43	4.6	48
Master Composite [b]	A and 41	< 2	67000	< 30	450	0.80	< 20	20000	< 2	< 10	49.0	20.0	22000	22000	< 5	6300	330.0	13.0	20000.0	22.0	430	< 40	< 10	< 30	< 20	120	1800	< 30	< 20	35	4.9	220
Grade Composites																															
LG A-Zone [b]	A	< 2	72000	< 30	480	0.70	< 20	18000	< 2	< 20	42	17	19000	22000	< 5	5000	330	< 10	23000	< 20	380	< 30	< 10	< 30	< 20	110	1700	< 30	< 20	33	4.5	41
HG A-Zone [b]	A	< 2	67000	< 30	410	0.80	< 20	18000	< 2	< 20	39	15	20000	22000	< 5	4300	310	15	21000	< 20	430	< 30	< 10	< 30	< 20	110	1800	< 30	< 20	31	3.9	42
EHG [b]	41	< 2	72000	< 30	470	0.80	< 20	23000	< 2	< 20	22	25	29000	27000	< 5	5800	440	18	18000	< 20	760	30	< 10	< 30	< 20	110	2800	< 30	< 20	46	5.3	57

Notes:
(a) Elemental analysis was not conducted on the drill composite sample BR-68.
(b) See text for details of sample composition for the composite samples.
A dash "-" indicates that no data was reported.

Table 2: Acid Base Accounting and Net Acid Generating Results for the 2009 ore samples.

Sample	Collar location				From (m)	To (m)	Lithology ID [c]	Acid Base Accounting											Net Acid Generation Testing
	Zone	Section	Easting	Northing				Paste pH	NP[d]	AP[d]	NPR[d]	CaNPR[d]	Total Sulphur	SO_4	Sulphide	Total Carbon	Carbonate	Carbonate NP	Final NAG-pH
								s.u.	t CaCO3/1000 t	t CaCO3/1000 t	ratio	ratio	%	%	%	%	%	%	s.u.
Drill Hole Composites											-	-							
BR-2	41	3470E	613783.11	5422056.3	145	191	11, 20, 50	9.31	73.2	5.43	**13.5**	**14.0**	0.16	< 0.01	0.17	1.02	4.55	75.8	10.8
BR-13	41	3370E	613613.95	5422128.9	40.5	126	20, 32, 33, 34	9.23	70.4	6.59	**10.7**	**10.7**	0.33	0.12	0.21	0.98	4.23	70.5	10.1
BR-23	41	3270E	613543.79	5422052.9	63	139.5	20, 33, 40, 60	9.23	102	4.51	**22.6**	**24.2**	0.26	0.12	0.14	1.47	6.56	109.4	10.1
BR-28	A	1820E	612237.07	5421397.1	21.5	102.5	20, 33, 34, 40	9.15	51.2	4.41	**11.6**	**11.8**	0.26	0.11	0.14	0.72	3.11	51.8	10.1
BR-64	A	1670E	612220.71	5421160.8	91.5	292.5	11, 15, 20, 32, 40	9.29	59.8	6.42	**9.3**	**8.8**	0.35	0.14	0.21	0.84	3.40	56.7	10.6
BR-67	A	1670E	611838.62	5420825.7	NR	NR	NR	9.36	71.3	5.27	**13.5**	**13.1**	0.43	0.26	0.17	0.96	4.13	68.8	10.9
BR-68 [a]	A	1800E	612374.18	5421187.2	141	256.5	13, 15, 40	-	-	-	**-**	**-**	-	-	-	-	-	-	-
BR-87	A	1420E	611912.97	5421162.9	3.74	88.5	12, 15, 20	9.37	46.9	3.23	**14.5**	**13.8**	0.35	0.25	0.1	0.60	2.67	44.5	10.9
BR-88	A	1420E	611985.14	5421059.7	160.5	252	20	9.6	37.8	4.68	**8.1**	**7.6**	0.37	0.22	0.15	0.50	2.13	35.5	10.3
BR-102	A	1670E	612149.06	5421258	6.52	213	20, 33, 40	9.47	53	4.71	**11.3**	**10.9**	0.26	0.11	0.15	0.70	3.08	51.3	10.9
Zone Composites																			
A-Zone [b]	A	---	---	---	---	---	---	9.12	57.7	5.09	**11.3**	**11.3**	0.31	0.14	0.16	0.85	3.46	57.7	10.3
41-Zone [b]	41	---	---	---	---	---	---	9.39	85.2	3.54	**24.0**	**24.6**	0.39	0.28	0.11	1.17	5.22	87.0	9.8
Master Composite [b]	A and 41	---	---	---	---	---	---	9.32	66.3	7.8	**8.5**	**7.4**	0.31	0.1	0.3	0.93	3.5	57.8	10.6
Grade Composites											-	-							
LG A-Zone [b]	A	---	---	---	---	---	---	9.05	55.9	2.83	**19.7**	**18.8**	0.19	0.1	0.09	0.75	3.19	53.2	10.5
HG A-Zone [b]	A	---	---	---	---	---	---	9.31	54.8	7.22	**7.6**	**7.0**	0.45	0.22	0.23	0.74	3.05	50.8	10.2
EHG [g]	41	---	---	---	---	---	---	9.07	71.2	13.00	**5.5**	**4.2**	0.80	0.38	0.42	1.02	3.26	54.3	9.3

Notes:

0.1 - Non-Potentially Acid Generating (Non- PAG) according to MEND (2009).

(a) Acid Base Accounting and net acid generation (NAG) testing were not conducted on the drill composite sample BR-68.

(b) See text for details of sample composition for the composite samples.

(c) Description of the lithology ID codes is as follows: 11- fine grained granite; 12- contaminated granite; 15 - chloritic granite porphyry; 20 - altered granitoid; 32- sheared granitoid; 33 - chlorite schist; 34 - tectonized-sheared vein zone/brecciated pegmatite; 40 - pegmatite; 50 - mafic dyke; 60 - intermediate dyke.

(d) NP = neutralization potential; AP = acid potential; NPR = neutralization potential ratio; and CaNPR = carbonate neutralization potential ratio

A dash "-" indicates that no data was reported. A triple dash "---" indicates that the data is presented in the Brett Resources Inc., 2009. An investigation of gold recovery from Hammond Reef Project samples, Project 11734-002 – Final Report. "NR" indicates that no information was recorded.

Table 3: Location, Lithology and Acid Base Accounting Results for the 2011 Metallurgical Composite Samples.

Sample	Drillhole ID	Collar location				From (m)	To (m)	Lithology ID [a]	Sulphide-Sulphur (wt % as S)	CO_2 (%)	AP [b] (t $CaCO_3$/1,000t)	CaNP [c] (t $CaCO_3$/1,000t)	CaNPR [d]
		Zone	Section	Easting	Northing								
Met Comp 1	207	A	1795 E	612360	5421170	153	177	20,40	0.28	3.4	8.8	78	**8.9**
Met Comp 2	207	A	1795 E	612360	5421170	321	350	20,40	0.25	3.4	7.8	77	**9.8**
Met Comp 3	220	A	1420 E	612040	5420973	7.0	28	40,20,18	0.21	3.1	6.6	71	**11**
Met Comp 4	220	A	1420 E	612040	5420973	28	52	18	0.11	3.2	3.4	72	**21**
Met Comp 5	220	A	1420 E	612040	5420973	69	87	20	0.09	2.6	2.8	60	**21**
Met Comp 6	220	A	1420 E	612040	5420973	166	187	50,40	0.33	2.9	10	65	**6.3**
Met Comp 7	240	A	1770 E	612067	5421389	8.5	31	13,20,40	0.24	3.4	7.5	76	**10**
Met Comp 8	240	A	1770 E	612067	5421389	58	82	20,40,35	0.35	2.8	11	63	**5.8**
Met Comp 9	248	41	3420 E	613663	5422151	72	87	30,34	0.23	20	7.2	448	**62**
Met Comp 10	257	41	3160E	613501	5421935	171	197	20,40	0.2	4.0	6.3	90	**14**

Notes:

0.1 - Non-Potentially Acid Generating (Non- PAG) according to MEND (2009).

(a) The description of the lithology ID codes is as follows: 13 - chloritic granite; 18 - tonalite; 20 - altered granitoid; 30 - sheared mafic unit; 34 - tectonized-sheared vein zone/brecciated pegmatite; 35 - ankeritized dyke; 40 - pegmatite; 50 - mafic dyke.

(b) Acid Potential = acid potential; CaNP = carbonate neutralization potential; and CaNPR = carbonate neutralization potential ratio.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – MOE-NR-GW-04

Source: Ministry of Environment

Summary of Comment

Results of the NAG leach test found total chromium concentrations greater than the CCME standard and PWQO for hexavalent chromium. And hexavalent chromim was found in excess of standards in Tailings NAG Leach Test (Sec 3.5.2.4.2), but dismissed as a product of elevated ph, and not expected in typical site conditions.

Potential Environmental Effects

Total chromium in excess of the standards for hexavalent chromium could indicate hexavalent chromium, which is significant environmental toxicity effects in comparison to total chromium, at levels that could result in impacts.

Proposed Action

The NAG leach test should include speciation of total chromium to determine if the standards are exceeded. Further discussion is required regarding the significance of elevated hexavalent chromium in the Tailings NAG leach test.

Reference to EIS

Section 3.5.1.4

Response

In nature, chromium exists in four oxidation states (0, 2+, 3+ and 6+). In groundwater, chromium is present predominantly in the 3+ (trivalent) and 6+ (hexavalent) valence states. The species of the chromium in natural waters is highly dependent on pH and redox potential (Eh). Under more reducing and acidic conditions, Cr(III) is thermodynamically stable. Cr(VI), the more mobile and toxic species in groundwater (Palmer and Wittbrodt, 1991), predominates under more oxidizing and alkaline conditions.

The NAG leach test intentionally pushes the pH and Eh of the water to a condition not likely to be experienced in the natural environment for the purpose of enhancing the liberation of metals to provide a worst case load estimate. While the NAG leach test is a useful screening tool, the expected natural conditions must be considered to accurately interpret the test results.

Figure 1 presents an Eh-pH diagram showing approximate predominance or stability fields for Cr(III) and Cr(VI). The expected receiving surface water pH and Eh at the mine site discharge point (i.e., south end of Sawbill Bay), represented by the range (minimum to maximum) of baseline monitoring data for the surface and bottom samples collected at Sawbill Bay and Lynxhead Bay, are indicated on Figure 1 as the circle labeled “A” (see the Water and Sediment Quality TSD for baseline surface water quality monitoring data). The baseline pH and Eh at Sawbill Bay ranges from 5.7 to 7.6 and 0.04 to 0.3 V, respectively. The resultant NAG test leachate pH and expected Eh for the tailings sample are indicated on Figure 1 as the circle labeled “B”. The tailings NAG leachate pH ranges from 11.1 to 11.4. The NAG test leachate Eh was not reported. Conservatively, an Eh range can be assumed assigning a minimum Eh for typical groundwater (approximately 0.2 V) and the maximum Eh observed in baseline monitoring data for all surface water stations for the Project (0.34 V) (Water and Sediment Quality TSD).

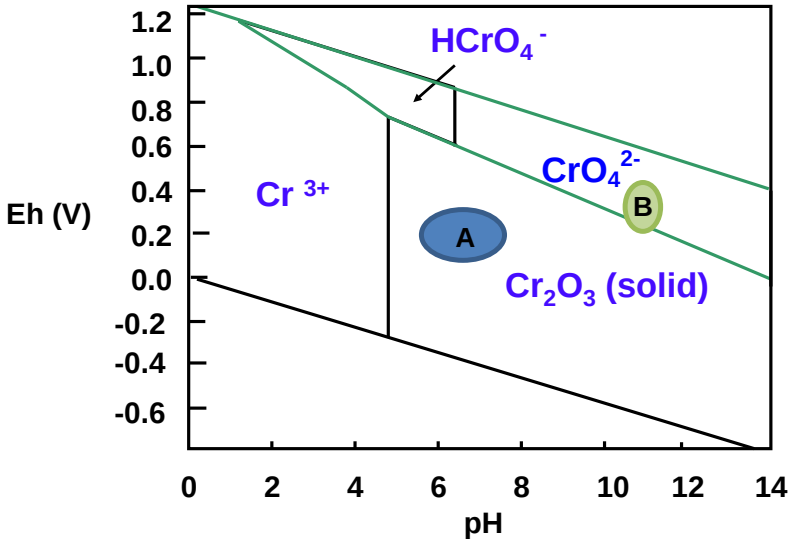


Figure 1: Eh-pH diagram for chromium with predominance field of Cr (VI) bounded in green. The circle labeled "A" indicates the expected Eh and pH range for Sawbill Bay, and the circle labeled "B" indicates the measured pH and expected Eh range for the tailings NAG test leachate.

Under moderately oxidizing conditions (200 mV), the transition from Cr(III) to Cr(VI) will occur at approximately pH 10.5. Based on the discussion above, because the tailings NAG test leachate was alkaline (pH 11.1 to 11.4), chromium would be expected to be predominantly present in the 6+ valence state over the entire range of expected redox conditions. In contrast to the NAG leachate test results, the shake flask extraction testing of the tailings sample resulted in concentrations of total and hexavalent chromium that were below detection (<0.0005 and <0.00002 mg/L, respectively). In addition, total chromium concentrations were below detection (<0.0005 mg/L) throughout the humidity cell testing of the tailings sample. This is in agreement with the expected predominance of solid Cr_2O_3 for the given Eh and pH conditions in the receiving waters as indicated in Figure 1 (label "A").

Elevated concentrations of chromium (hexavalent or trivalent) are therefore not expected to occur in waters on site given the conditions expected on site, and the chromium is expected to continue to remain in solid phase in the rock mass or tailings.

References

Palmer, C.D., and Wittbrodt, P.R., 1991. Processes Affecting the Remediation of Chromium Contaminated Sites, Environmental Health Perspectives, Vol. 92, pp. 25-40. Published by the National Institute of Environmental Health Sciences, National Institute of Health, Department of Health and Human Services. NIH Publication No. (=DHHS) 91-218.

INFORMATION REQUEST – MOE-NR-GW-05

Source: Ministry of Environment

Summary of Comment

The criteria for selection of the site for the TMF does not discuss specifically the effects of soil/groundwater conditions at the 3 alternatives with respect to seepage management. And the effects of seepage are identified only as still needing to be confirmed. However, the area that has been chosen is an area of outwash and deltaic deposits, understood to consist of sands and gravels, and generally an exception for this area, where soil conditions consist of a thin veneer over bedrock. Evaluation of TMF sites should have included a more detailed discussion of the impacts of soil on seepage and how these are addressed.

Potential Environmental Effects

Soil conditions in the area proposed for the TMF could have significant impact on groundwater flow and leachate mobility, and will consequently impact significantly on mitigation measures and contingency plans.

Proposed Action

Update the evaluation of the preferred site to consider soil conditions in the alternate sites.

Reference to EIS

Section 4.3 Tailings Management Facility Siting

Response

Soil conditions and potential impacts to groundwater from seepage were considered in the environmental and technical criteria for evaluation and selection of a Tailings Management Facility location assessment. The environmental and technical multiple accounts ledgers for the Tailings Management Facility location assessment are included in the updated Mine Waste Disposal Alternatives Assessment Report. The indicators related to soils and groundwater that were considered are provided below.

Environmental Multiple Accounts Ledger

Account	Sub-Account	Indicator	Metric	Unit
Environmental	Water Resources	Impact to groundwater	Number of collection ponds required	#
		Ability to limit impact to water quality in surrounding water bodies	Qualitative Rank	-

Technical Multiple Accounts Ledger

Account	Sub-Account	Indicator	Metric	Unit
Technical	Complexity of Design and Construction	Foundation conditions	Qualitative Rank	-
		Topography containment	Dam fill volume	-
		Geotechnical Risk	Maximum height of dams	m
	Water Management	Net run-off from tailings area	Area of tailings	ha
		Number of collection ponds required	Value	#
		Seepage collection ditches	Length of seepage collection ditches	km

Additional discussion and detail on potential water quality of groundwater from the TMF are discussed in the Site Water Quality TSD and in response to the information request from MNDM-18 and MOE-NR-GW-16.

INFORMATION REQUEST – MOE-NR-GW-06

Source: Ministry of Environment

Summary of Comment

Borehole locations are widely spaced, and there are very few in and around the waste rock storage area. Holes have been strategically located along the perimeter of the TMF and WRMF, but there are none in the central areas of these facilities to confirm the soil, rock and hydrogeological conditions.

Potential Environmental Effects

Groundwater gradients cannot be established accurately over the site area. The effects of this may be evident on Fig 4-1 of Appendix 2.IX, which presents the predevelopment groundwater contours generated by the GW model. In this contour map, there are no obvious influences from the smaller surface water features located across the site.

Proposed Action

Install more monitoring wells and/or provide detailed description of how the lack of groundwater elevation data was considered in the model, particularly with respect to calibration.

Reference to EIS

Sec 2.3.2.1 Figure 2.6

Response

See response to MNDM-18 and MOE-NR-GW-09. Additional boreholes and data will be collected during the detailed design and construction phases of the project such that the collection system can be appropriately designed and constructed.

In order to conservatively predict potential for impact to the environment a water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence since this is considered to have less uncertainty than using hydraulic conductivity and estimates of bedrock topography to determine groundwater flow rates. The current approach is conservative in that it accounts for all potential mass loading to the water system. Implications of direct water quality discharge from key facilities is also evaluated and provided in response to MNDM-18 and MOE-NR-GW-09.

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INFORMATION REQUEST – MOE-NR-GW-07

Source: Ministry of Environment

Summary of Comment

The geology description notes the presence of shear zones which include fracturing and faulting. Although the fractures are noted as having been mostly mineralized and infilled, some open fractures were noted, and the loss of water during diamond drilling was noted, indicating some continuity to these fractures. Were any of the zones where water loss was noted specifically tested for conductivity?

Potential Environmental Effects

Open fractures and faults will act as the primary pathway for water movement in bedrock, and can have a severe impact on the use of bulk hydraulic conductivity in estimating groundwater movement and flow.

Proposed Action

Provide details on how the fracture zones were tested in the field.

Reference to EIS

Section 2.3.2.2

Response

Geotechnical investigations conducted in the area of the planned open pit comprised the drilling and testing of six geotechnical boreholes ranging from lengths of 260 to 396 m below the drill collar. These boreholes were inclined at angles of between 60 to 65 deg (below the horizontal) and oriented specifically to intersect shears, fractures and faults in the vicinity of the planned pit walls. Of the 213 packer tests conducted, 19 of these intersected sheared and fractured rock.

As presented in Table 2-3 (Hydrogeology TSD) the geomean hydraulic conductivity of 1.9 x 10-7 m/s is reported for the structured rock, with values ranging from 1 x 10-9 to 1 x 10-5 m/s.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – MOE-NR-GW-08

Source: Ministry of Environment

Summary of Comment

The discussion of groundwater levels does not provide any differentiation between overburden and bedrock. Considering that even the upper weathered bedrock is likely to have distinctly different hydrogeological characteristics than the overburden, there should have been some discussion of water levels with respect to the hydraulic connection between the 2 regimes. Admittedly, over most of the site, there is little overburden present and therefore possibly no significant groundwater level maintained within the overburden. If this is the case, this should have been clearly identified.

Potential Environmental Effects

Depending on the extent of the overburden soils, the hydraulic properties of the soils are very likely to serve as a more preferential conduit for the transport of seepage from the WRMF and the TMF.

Proposed Action

Provide discussion that differentiates groundwater levels and groundwater movement in the overburden from the bedrock.

Reference to EIS

Section 2.4

Response

As noted in Section 2.3 Existing Conditions of the Hydrogeology TSD, bedrock covers much of the site and overburden deposits are discontinuous, thin and of limited lateral extent, typically comprising swampy lowland areas. As such groundwater movement in the overburden is controlled by the morphology of the underlying bedrock and local topography. Thicker and more extensive overburden materials are present within the portions of the TMF area. Again groundwater flow within these overburden deposits is controlled by the morphology of the underlying bedrock and local topography with discharge from both the overburden and shallow bedrock providing flow to local streams. The upper portion of the bedrock is typically more fractured and is expected to provide the primary pathway for groundwater flow in the bedrock. Groundwater in the overburden, where saturated permeable materials are present, does not comprise a distinctly different flow system from that present in the underlying bedrock.

Flow in both the overburden and fractured rock is controlled by local topography with discharge locally to nearby streams or collection systems where present; thus flow directions are the same in both the overburden and the shallow bedrock. Groundwater levels in the overburden where present, are similar to those in the underlying bedock with vertical gradients (difference with water levels between overburden and bedrock) observed in the vicinity of streams where discharge (upward) hydraulic gradients are evident. Groundwater in the overburden does not comprise a distinctly different flow system from that present in the underlying shallow fractured bedrock.

It should be noted that monitoring of groundwater levels in the overburden and underlying bedrock will be conducted as detailed in Chapter 8, Table 8-5: Proposed Monitoring Program Considerations – Hydrogeology.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
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INFORMATION REQUEST – MOE-NR-GW-09

Source: Ministry of Environment

Summary of Comment

In the groundwater modelling, the waste rock and stockpiles are represented as increased infiltration in the model. Does the model also represent the placement of the material itself, as the WRMF particularly represents a significant physical feature upon completion of mining?

Potential Environmental Effects

The WRMF and the other stockpiles in the mine area represent significant changes in the physiography of the site, and will therefore change significantly both surface water and groundwater flow characteristics, including the possible production of groundwater mounding, which could represent a significant driving force for post-closure groundwater flow.

Proposed Action

Provide discussion on how the WRMF etc. were considered in the model with respect to the changes in site topography, and/or update the model as required to determine the effects of these features. The location of the mine features should be illustrated on the maps showing the water table and drawdown contours.

Reference to EIS

Section 2.10

Response

The changes in topography of the WRMF throughout the course of the mine life were not considered in the groundwater model. To simulate the effects of the WRMF, an increased infiltration rate (relative to pre-mining conditions) was assigned over the fully developed footprint. As noted in Section 2.3 Existing Conditions of the Hydrogeology TSD, the area is dominated by steep knobs and ridges of exposed bedrock with the intervening lows covered by a discontinuous veneer of glacial till overlain with organic topsoil or swampy organic deposits. Bedrock, which is situated at or near the ground surface throughout much of the area, controls the topography and surface drainage conditions.

Groundwater flow in the overburden (where present) is controlled by the topography of the underlying bedrock. In order to evaluate the water quality and flow from the WRMF and TMF it is conservatively assumed that all precipitation (less evaporation) will report eventually to the collection system either directly from the waste rock or from the overburden to the collection system that will be constructed around the perimeter of these facilities, and all of this water was assigned a mass load based on expected leachate quality as defined in the Site Water Quality TSD (both during operations and at closure). Thus it is considered that the site water balance approach to evaluate site water quality is both appropriate and conservative.

This water will be monitored for water quality and treated if necessary prior to release. During operations additional process water is added to the TMF and assumed to report to the seepage collection system where it will be pumped back to the TMF for recirculation to the process, or will be released to the environment if it meets appropriate discharge criteria.

At closure water from the piles will be directed to the open pit until such time as it meets appropriate discharge criteria. Further discussion on possible implications of groundwater are provided in responses to MNDM-18 and MNDM-16.

INFORMATION REQUEST – MOE-NR-GW-10

Source: Ministry of Environment

Summary of Comment

It is indicated that the modelling presented is for the end of mining, when drawdown effects will be at their greatest. What about transient analysis for post closure, particularly with respect to the amount of seepage from the WRMF that will be directed to the pits. This volume will decline as water levels in the pits rise, thereby reducing the gradient.

Potential Environmental Effects

The EA needs to address post closure impacts. The groundwater flow around the pits will change considerably once dewatering has been terminated, and the model needs to reflect this to determine where groundwater from the WRMF and other stockpiles will be discharging to.

Proposed Action

Provide post closure modelling of groundwater flow.

Reference to EIS

Section 2.10

Response

A 3-D groundwater flow model has been prepared to represent the greatest potential impact to water level declines. This is considered reasonable within the overall context of the site. Following the operational phase, the groundwater drawdown and impact will reduce over time as the pit slowly fills (estimated at 218 years post closure) from precipitation and groundwater inputs. Rather than explicitly assess each of the groundwater pathways between the source areas and Marmion Reservoir, a water balance approach was used to evaluate potential for groundwater impacts to surface water. The approach adopted is considered conservative as it was assumed that the source mass entered directly into Marmion Reservoir without any attenuation or dilution of concentrations along groundwater flow paths.

From a groundwater elevation perspective this is considered more appropriate than a detailed hydrogeological approach since the changes in boundary conditions and pit infilling conditions vary depending on surface water conditions, and the surface water has a much larger influence on groundwater levels than does the groundwater flow regime. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

In Closure and Post Closure the infiltration, groundwater and runoff are all assigned the leachate water quality of the material on which the precipitation lands, and all of that mass is directed to the Marmion basin. The Site Water Quality model and Lake Water Quality Mixing Model thus include potential groundwater flow components and all mass associated with these groundwater flow components, thus implications to groundwater are conservatively accounted for in current site water quality predictions into closure and post closure. Geochemically the materials are all non-acid generating with low metal leaching potential, so this approach is considered reasonable from a geochemical stability perspective.

Responses to Information Requests MNDM-18 and MOE-NR-GW-16 provide additional information on potential for impact at point of groundwater discharge to receiving waters and show that there are no anticipated adverse effects on aquatic life; even should no attenuation of groundwater concentrations occur along the flow paths between the TMF, WRSF, Ore Stockpile or Overburden Stockpile and the receiving water.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-NR-GW-11

Source: Ministry of Environment

Summary of Comment

Similar to above, there should be modelling for steps during the operational stage to illustrate how seepage might be intercepted as the stockpiles and the pits progress - will there be stages of the operation where the drawdown is not significant enough to intercept seepage? Section 2.10.1.3 is a transient analysis during operations. This analysis seems to have been limited to quantifying the amount of inflow to the pit, but no assessment of where the water comes from or how this impacts seepage from the stockpiles/WRMF.

Potential Environmental Effects

Throughout all stages of mining, there will be seepage from the WRMF and other stockpiles which could be contaminated. The current mine plan is to collect all of the seepage. However, there has been nothing to demonstrate how the seepage will be collected, and the modelling for dewatering shows clearly that not all of the seepage from these facilities will be collected by the dewatering.

Proposed Action

Groundwater modelling needs to address seepage from the facilities, where seepage will discharge, and how it will be mitigated, including modelling to illustrate that the proposed seepage collection concepts will be effective.

Reference to EIS

Section 2.10

Response (Same as MNDM 18)

A water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

For Waste rock, Ore Stockpile, and Overburden the total annual precipitation is assigned a value of 758 mm. Mass load values are assigned to 85 % of the precipitation, whereas the remaining 15% is assumed to be lost to the system due to evaporation and reduction in snow accumulation due to the height of the pile. This is considered a reasonable and conservative assumption given that the measured evaporation rates from rock piles at other Canadian Shield mine sites (Macroline, 2008 as cited in Areva, 2011) indicate that evaporation from the top of the pile can be as high as 60% of rainfall, and that evaporation in other natural areas of the Canadian Shield is several hundred mm (>20% of rainfall) (Singer and Cheng (2002)).

It is considered that the mass load assigned to the waste rock (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure mass continues to be assigned to 85% of precipitation falling on the waste rock pile.

Geochemical testing indicates that the waste rock (all lithologies encountered) is non-acid generating with excess neutralization potential and low potential for metal leaching over the long-term, based on both static and

kinetic testing. Should groundwater flow occur, additional attenuation reactions including adsorption and chemical precipitation would also be expected to improve water quality.

The prediction of waste rock and ore stockpile water quality is presented in the Version 2 Site Water Quality TSD. Table 4-8 of the Site Water Quality TSD presents predicted concentrations of the steady state waste rock groundwater quality during the Operation Phase. Table 4-9 of the Site Water Quality TSD presents predicted concentrations of the steady state and worst case concentrations of the ore stockpile groundwater quality during the Operation's Phase.

The predicted worst case groundwater concentrations of aluminum (0.25 mg/L), arsenic (0.03 mg/L), copper (0.009 mg/L), and uranium (0.007 mg/L) are greater than the PWQO protection for aquatic life regulatory guidelines (PWQO). These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04 (with the exception of aluminum for which there is no GW3 criteria). When accounting for a 10 times dilution along the flow path (similar to the rationale used in developing the GW3 criteria) it is considered that there is no anticipated adverse effect on aquatic life due to these concentrations (i.e. aluminum would be below the PWQO at the point of discharge).

Since PWQOs do not provide acute guidelines, concentrations of the above parameters were compared to the U.S. EPA Ambient Water Quality Criteria CMC (Freshwater Acute) values. These represent acute concentrations to which aquatic life should only be exposed to for short periods of time.

Aluminum – no guideline available

Arsenic – 0.34 mg/L

Copper – 0.013 mg/L

Uranium – no guideline available.

Based on comparison with the above guidelines, the undiluted groundwater concentrations expressing to surface waters would not be considered as acutely toxic.

Given the current accounting of flows and mass load, and the geochemical conditions of the materials on site, it is considered that the groundwater component is negligible with respect to influencing the overall results or conclusions of the EIS/EA with respect to potential for water quality impacts from the site.

Parameter	Units	Guidelines		Waste Rock Run Off [a]	Ore Run Off [b]	
		PWQO [c]	GW3 [d]	Maximum ALL[f]	Steady State	Worst Case
Al [e]	mg/L	0.075	-	*0.25*	0.04	*0.25*
As	mg/L	0.005	1.5	*0.03*	0.0002	*0.03*
Cu	mg/L	0.001	0.069	*0.009*	0.0005	*0.009*
U	mg/L	0.005	0.33	*0.007*	0.0002	*0.007*

Notes:

a) Presented in Table 4-8, Site Water Quality TSD.

b) Presented in Table 4-9, Site Water Quality TSD.

c) MOEE (Ministry of Environment and Energy). 1999. Provincial Water Quality Objectives (PWQO), PIBS 3303E, Queen's Printer for Ontario. July 1994, reprinted February 1999. Values greater than the PWQO are in *italic font*.

d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

e) A 10 times dilution or attenuation along the groundwater flow path would result in aluminum concentration lower than the PWQO values.

f) Maximum Runoff for all Rock Types.

MOE, under O. Reg 153/04 has developed groundwater protection values (GW3) that would be protective of aquatic life based on aquatic protection values (APVs). The APVs are based on the U.S. EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life and therefore are considered to provide suitable protection for aquatic life.

Prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path. Attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers. "Under most conditions, copper is present in aqueous solution as the divalent cation, Cu2+, or as Cu(II) hydroxide or carbonate complexes. However, copper is not especially mobile in aquatic environments due to the relatively low solubility of Cu(II)-bearing solids and high affinity of copper for mineral and organic surfaces." (U.S. EPA, 2007).

References:

Areva, 2011; Hydrology of Waste Rock Piles in Cold Climates; Technical Appendix 5I of the Kiggavik Project Environmental Impact Statement. December 2011.

Macroline, J., 2008. Investigations of water and tracer movement in covered and uncovered unsaturated waste rock, PhD. Dissertation, University of British Columbia, Vancouver, Canada.

Singer, S.N., and Cheng, C.K. 2002. An Assessment of the Groundwater Resources of Northern Ontario. Hydrogeology of Ontario Series (Report 2). Ministry of the Environment. Toronto. Canada.

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

INFORMATION REQUEST – MOE-NR-GW-12

Source: Ministry of Environment

Summary of Comment

The models seem to be focussed on dewatering. There is no indication that the seepage from the WRMF and TMF have been modelled, nor have the proposed mitigation measures been modelled.

Potential Environmental Effects

Leachate seepage from the WRMF and TMF represent a significant source for transport of contaminants into the environment, with a risk of discharge to Marmion Reservoir. The conceptual plan indicates that seepage will be collected, but there is no modelling to show how effective the proposed mitigation will be, and to estimate the quantity of seepage which might not be captured.

Proposed Action

Groundwater modelling needs to address seepage from the facilities, where seepage will discharge, and how it will be mitigated, including modelling to illustrate that the proposed seepage collection concepts will be effective.

Reference to EIS

Section 2.10

Response (same response as MOE-NR-GW-16 and MNDM 18)

A water balance approach was used to evaluate potential for groundwater impacts to surface water. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in hydraulic conductivity values and/or boundary conditions.

Waste Rock Management Facility (WRMF) and Stockpiles

For the Waste Rock Management Facility (WRMF), Ore Stockpile, and Overburden the total annual precipitation is assigned a value of 758 mm. Mass load values are assigned to 85% of the precipitation, whereas the remaining 15% is assumed to be lost to the system due to evaporation and reduction in snow accumulation due to the height of the pile. This is considered a reasonable and conservative assumption given that the measured evaporation rates from rock piles at other Canadian Shield mine sites (Macroline, 2008 as cited in Areva, 2011) indicate that evaporation from the top of the pile can be as high as 60% of rainfall, and that evaporation in other natural areas of the Canadian Shield is several hundred mm (>20% of rainfall) (Singer and Cheng, 2002).

It is considered that the mass load assigned to the WRMF (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system and is thus accounted for in the final discharge values. At closure mass continues to be assigned to 85% of precipitation falling on the WRMF.

Geochemical testing indicates that the waste rock (all lithologies encountered) is non-acid generating with excess neutralization potential and low potential for metal leaching over the long-term, based on both static and kinetic testing. Should groundwater flow occur, additional attenuation reactions including adsorption and chemical precipitation would be expected to improve water quality.

The prediction of WRMF and Ore Stockpile water quality is presented in the Site Water Quality TSD. Table 4-8 of the Site Water Quality TSD presents predicted concentrations of the steady state WRMF groundwater quality during the Operation Phase. Table 4-9 of the Site Water Quality TSD presents predicted concentrations of the steady state and worst case concentrations of the Ore Stockpile groundwater quality during the Operations Phase.

The predicted worst case groundwater concentrations of aluminum (0.25 mg/L), arsenic (0.03 mg/L), copper (0.009 mg/L), and uranium (0.007 mg/L) are greater than the Provincial Water Quality Objectives (PWQO) protection for aquatic life regulatory guidelines. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04 (with the exception of aluminum for which there is no GW3 criterion). When accounting for a 10 times dilution or attenuation along the flow path (similar to the rationale used in developing the GW3 criteria) it is considered that there is no anticipated adverse effect on aquatic life due to these concentrations (i.e. aluminum would be below the PWQO at the point of discharge).

Since PWQOs do not provide acute guidelines, concentrations of the above parameters were compared to the U.S. EPA Ambient Water Quality Criteria CMC (Freshwater Acute) values, as shown below. These values represent acute concentrations to which aquatic life should only be exposed to for short periods of time.

Aluminum – no guideline available

Arsenic – 0.34 mg/L

Copper – 0.013 mg/L

Uranium – no guideline available

Based on comparison with the above guidelines, the undiluted groundwater concentrations expressing to surface waters would not be considered as acutely toxic.

Parameter	**Units**	**Guidelines**		**Waste Rock Run Off** [a]	**Ore Run Off** [b]	
		PWQO [c]	GW3 [d]	Maximum ALL[f]	Steady State	Worst Case
Al [e]	mg/L	0.075	-	*0.25*	0.04	*0.25*
As	mg/L	0.005	1.5	*0.03*	0.0002	*0.03*
Cu	mg/L	0.001	0.069	*0.009*	0.0005	*0.009*
U	mg/L	0.005	0.33	*0.007*	0.0002	*0.007*

Notes:

a) Presented in Table 4-8, Site Water Quality TSD.

b) Presented in Table 4-9, Site Water Quality TSD.

c) MOEE (Ministry of Environment and Energy). 1999. Provincial Water Quality Objectives (PWQO), PIBS 3303E, Queen's Printer for Ontario. July 1994, reprinted February 1999. Values greater than the PWQO are in *italic font*.

d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

e) A 10 times dilution or attenuation along the groundwater flow path would result in aluminum concentration lower than the PWQO values.

f) Maximum Runoff for all Rock Types.

MOE, under O. Reg 153/04 has developed groundwater protection values (GW3) that would be protective of aquatic life based on aquatic protection values (APVs). The APVs are based on the U.S. EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life and therefore are considered to provide suitable protection for aquatic life.

Prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path. Attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers. "Under most conditions, copper is present in aqueous solution as the divalent cation, Cu2+, or as Cu(II) hydroxide or carbonate complexes. However, copper is not especially mobile in aquatic environments due to the relatively low solubility of Cu(II)-bearing solids and high affinity of copper for mineral and organic surfaces." (U.S. EPA, 2007).

Tailings Management Facility (TMF)

All precipitation (minus evaporation) and process water entering the TMF was assigned a water quality based on the geochemical testing results, and the resulting mass is accounted for and tracked in the site water quality model. As such, the mass load assigned to the TMF water (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure all precipitation (less evaporation) continues to be applied a water quality based on the TMF process water chemistry and is thus conservative.

The planned seepage collection system is an engineered system which will require further detailed design as the Project planning process moves forward. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings following EIS/EA approval. In the water balance model all runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and groundwater flow.

Furthermore, looking specifically at the concentrations expected in the TMF water, Table 4-10 of the Version 2 Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase. The predicted TMF groundwater concentrations of cyanide, cobalt, copper, molybdenum and uranium are greater than the PWQO protection for aquatic life regulatory guidelines. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04, with the exception of copper which at 0.11 mg/L exceeds the target GW3 value of 0.069 mg/L. The proposed SSWQO for copper developed as part of the risk assessment carried out for the Project is 0.0079 mg/L. Therefore, copper concentrations in downstream receiving waters could exceed the proposed SSWQO should water from the TMF directly enter receiving waters through groundwater flow paths. However, the prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path as discussed above.

Parameter	Units	Guidelines				Groundwater Quality reporting from TMF
		CCME CWQG[a]	PWQO[b]	MISA[c]	GW3[d]	
Total Cyanide	**mg/L**	0.005	-	-	0.05	***0.03***[e]
Co	**mg/L**	-	0.0009	-	0.052	**0.003**
Cu	**mg/L**	0.002	0.001	0.6	0.069	***0.11***
Mo	**mg/L**	-	0.04	-	**-**	**0.08**
U	**mg/L**	-	0.005	-	0.33	**0.007**

Notes:

(a) Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines (CCME CWQG) for the protection of freshwater aquatic life. Values greater than the CCME CWQG are in *italic font*.

(b) Provincial Water Quality Objectives (PWQO). Values greater than the PWQO are in **bold font**.

(c) Municipal/Industrial Strategy for Abatement (MISA). Values greater than the MISA are underlined.

(d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

(e) Assuming treatment efficiency of 5 ppm and natural degradation of cyanide as described in Section 4.2.3.

As a result of the predicted copper concentrations, the potential effects of copper at 0.011 mg/L on aquatic life were considered with respect to published toxicity data to determine whether there could be an adverse effect on aquatic life should groundwater with this concentration of copper enter receiving waters. The U.S. EPA ECOTOX database was accessed to obtain toxicity data for copper. The Aquatic Ecology TSD has noted that the fish fauna in the vicinity of the TMF are characterized by small-bodied forage fish. Therefore, toxicity data for fathead minnow, a typical test species in toxicity tests, was used to predict the potential for adverse effects on fish species. The potential effects on invertebrates were also assessed through a review of the available toxicity data.

The lowest reported effects concentration for the fathead minnow reported in the database was a MATC (calculated as the geometric mean of the NOEC and LOEC) of 0.016 mg/L during a 7 day exposure. Reported no effects concentrations (NOECs) for the amphipod *Hyalella azteca* ranged from 0.013 mg/L to 0.05 mg/L. The results indicate that should water at the predicted TMF concentration reach the downstream waters, there would be no anticipated adverse effect on aquatic life.

Given the current accounting of flows and mass load, and the geochemical conditions of the materials on site, it is considered that the influence of groundwater quality is negligible with respect to the overall conclusion that the Project will not have significant effects to water quality or aquatic health.

References:

Areva, 2011; Hydrology of Waste Rock Piles in Cold Climates; Technical Appendix 5I of the Kiggavik Project Environmental Impact Statement. December 2011.

Macroline, J., 2008. Investigations of water and tracer movement in covered and uncovered unsaturated waste rock, PhD. Dissertation, University of British Columbia, Vancouver, Canada.

MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011.

Singer, S.N., and Cheng, C.K. 2002. An Assessment of the Groundwater Resources of Northern Ontario. Hydrogeology of Ontario Series (Report 2). Ministry of the Environment. Toronto. Canada.

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

U.S. EPA ECOTOX database. http://cfpub.epa.gov/ecotox/ Accessed July 2013.

INFORMATION REQUEST – MOE-NR-GW-13

Source: Ministry of Environment

Summary of Comment

The discussion of the existing conditions with respect to groundwater quality focuses on those parameters which exceed ODWS or PWQO. However, to be relevant in the assessment of impacts from the TMF and WRMF, existing water quality should have been compared to the expected quality of the seepage from these facilities (from the chemistry report), and discussion should have focussed on those parameters identified as key components of the likely seepage. The parameters discussed here are generally not relevant to the assessment of impacts due to seepage from either the WRMF or the TMF.

Potential Environmental Effects

Leachate seepage and the quality of that leachate represents a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

Existing groundwater quality should be compared to the anticipated groundwater quality impacts resulting from leachate discharge based on the geochemistry report.

Reference to EIS

Section 3.3

Response

The prediction of WRMF and TMF water quality is presented in the Site Water Quality TSD. Table 4-8 of the Site Water Quality TSD presents predicted concentrations of the steady state WRMF groundwater quality during the Operation Phase. Table 4-10 of the Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase.

Existing groundwater samples were collected from select monitoring wells throughout the LSA on three occasions in 2011 and two occasions in 2012. Monitoring locations were selected based on proximity to the proposed Project infrastructure. Monitoring well locations are shown on Figures 2-6 and 2-7 of the Hydrogeology TSD and Table 3-2 of the Hydrogeology TSD provides a summary of the wells that were sampled routinely during this monitoring program. The detailed results of this monitoring program are provided in Appendix 3.I of the Hydrogeology TSD and are summarized in Section 3.3 of the Hydrogeology TSD.

INFORMATION REQUEST – MOE-NR-GW-14

Source: Ministry of Environment

Summary of Comment

Monitoring well locations for water levels are focussed on the Marmion Lake reservoir (located along the shore). However, as water will generally discharge back to the reservoir that is not really the sensitive "receptor". Rather, it would be the smaller surface water features beyond the 11 impacted watersheds identified in Table 2-13. It would be better that the monitoring program focus on assuring that features that were not to be impacted are not impacted. Monitoring wells should be more to the east of the pits, towards surface water features beyond the predicted drawdown. And in this case, monitoring need not be limited to groundwater levels - water levels in surface water features should also be monitored. Surface water features to be monitored should include those within the drawdown cone, just beyond the cone, and some well beyond the cone as background to differentiate dewatering effects from natural.

Potential Environmental Effects

A reduction in local groundwater levels from pit dewatering could also result in reduced flow in smaller surface water features located within the drawdown cone from the dewatering. Most of the surface water features located within this drawdown cone are located in areas that will be significantly disrupted by the excavation of the mine and the construction of stockpiles, but there are some smaller features located beyond this area which could be impacted.

Proposed Action

The proposed monitoring program should be revised to ensure that surface water features that are not anticipated to be impacted my mining activities are also monitored to confirm these predictions of impact.

Reference to EIS

Section 4.0

Response

The hydrogeology component of the water monitoring program is designed to allow for long-term monitoring of the effects of Project activities on groundwater levels and groundwater quality within the LSA throughout all stages of the Project. With the exception of the area of open pit mining, groundwater monitoring locations will be selected primarily based on water quality considerations; and will likely include monitoring at the following general areas:

- Perimeter monitoring at the Perimeter monitoring at the WRMF, PPCP, effluent treatment plant, low-grade ore stockpile, overburden stockpile and the TMF.
- Perimeter monitoring at the worker accommodation camp.
- Perimeter monitoring around areas of chemical/fuel storage and maintenance facilities.

INFORMATION REQUEST – MOE-NR-GW-15

Source: Ministry of Environment

Summary of Comment

The modelling has only been carried out for the main mine operations area, and focusses on dewatering. There is no modelling for the TMF, and the modelling report does not discuss seepage discharges from the waste rock stockpile, even though Figure 5.3 seems to clearly illustrate seepage from the waste rock discharging to Marmion Lake to the east and northeast, and seepage from the overburden stockpile to the south.

Potential Environmental Effects

Leachate seepage and the quality of that leachate represent a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

Groundwater modelling needs to address seepage from the facilities, where seepage will discharge, and how it will be mitigated, including modelling to illustrate that the proposed seepage collection concepts will be effective.

Reference to EIS

Appendix 2.IX

Response

These aspects are discussed in more detail in responses to MNDM-18 and MOE-NR-GW-16.

INFORMATION REQUEST – MOE-NR-GW-16

Source: Ministry of Environment

Summary of Comment

Indicates that ditches will be excavated around the TMF to collect "seepage", which will then be directed to the reclaim pond for re-use, or to the pit upon closure. How deep are these ditches? Are they intended to intercept "all" of the seepage? Has the effectiveness of the ditches to intercept all of the seepage been modelled? The TMF lies in an area of deep overburden deposits which are far less likely to inhibit groundwater movement, and could result in seepage moving at depth (model?). The water table in the TMF area is at depths of 2 to 3 metres in the area of BRH-0021. The head in the pond could induce fairly steep vertical gradients that could result in significant downwards migration of seepage.

Potential Environmental Effects

Leachate seepage and the quality of that leachate represents a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

The proposed seepage collection measures need to be more clearly defined and modelled to demonstrate if they will be suitably effective. Seepage needs to be quantified, and the consequent quantities that will be intercepted and/or lost need to be estimated. The potential impact of seepage losses on receptors needs to be estimated and assessed with respect to suitable criteria.

Reference to EIS

Sec 3.1, 3rd paragraph

Response

A water balance approach was used to evaluate the potential for near surface vs. groundwater water quality influence. All precipitation (minus evaporation) and process water entering the TMF is assigned a water quality and based on the geochemical testing results the resulting mass is accounted for and tracked in the model. As such, the mass load assigned to the TMF water (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure all precipitation (less evaporation) continues to be applied a water quality based on the TMF process water chemistry and is thus conservative. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

The seepage collection system is an engineered system which will require detailed design as part of the detailed design phase of the project. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings following EIS/EA approval. In the water balance model all runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and groundwater flow.

Furthermore, looking specifically at the concentrations expected in the TMF water, Table 4-10 of the Version 2 Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase. The predicted TMF groundwater concentrations of cyanide, cobalt, copper, molybdenum and uranium are greater than the PWQO protection for aquatic life regulatory guidelines (PWQO).

Seepage from the all site facilities including the TMF to Lizard Lake during operations will be managed through a seepage collection system that will direct seepage from the TMF back to the TMF. In the event that some seepage bypasses the system, the evaluation conservatively considered the implications assuming 10% of the seepage bypassed the collection system and migrated to Lizard Lake. Predictions of worst case conditions resulted in free cyanide concentrations in Lizard Lake of up to 0.0011 mg/L. Since the predicted concentration is below the guideline of 0.005 mg/L and below a Site Specific Water Quality Objective (SSWQO) of 0.01 mg/L, there are no predicted adverse effects due to free cyanide.

For Waste Rock and Ore, the predicted worst case groundwater concentrations of aluminum (0.25 mg/L), arsenic (0.03 mg/L), copper (0.009 mg/L), and uranium (0.007 mg/L) are greater than the PWQO protection of aquatic life guidelines (PWQO) as presented in the Version 2 Site Water Quality TSD, Table 4-8 and Table 4-9. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O.Reg 153/04 (with the exception of aluminum for which there is no GW3 criteria). When accounting for a 10 times dilution or attenuation along the flow path (similar to the rationale used in developing the GW3 criteria) it is considered that there is no anticipated adverse effect on aquatic life due to these concentrations. Attenuation along groundwater flow pathways has the potential to substantially reduce concentrations of many parameters (U.S. EPA 2007).

Since PWQOs do not provide acute guidelines, concentrations of the above parameters were compared to the U.S. EPA Ambient Water Quality Criteria CMC (Freshwater Acute) values. These represent acute concentrations to which aquatic life should only be exposed to for short periods of time.

Aluminum – no guideline available

Arsenic – 0.34 mg/L

Copper – 0.013 mg/L

Uranium – no guideline available.

Based on comparison with the above guidelines, the undiluted groundwater concentrations expressing to surface waters would not be considered as acutely toxic.

Given the current accounting of flows and mass load, and the geochemical conditions of the materials on site, it is considered that the groundwater component from stockpiles including the Ore and Waste Rock is negligible with respect to influencing the overall results or conclusions of the EIS/EA with respect to potential for water quality impacts from the site.

In order to assess whether groundwater could affect aquatic life, the MOE under O. Reg 153/04 has developed groundwater concentrations that would be protective of aquatic life based on aquatic protection values (APVs). The APVs are based on the U.S. EPA Ambient Water Quality Criteria (AWQC) for protection of aquatic life and therefore are considered to provide suitable protection for aquatic life. The MOE based the development of the

groundwater protection values (GW3) on the APVs. In developing the GW3, the MOE has assumed that there will be a minimum of a 10x reduction in concentration due to dilution within the receiving waterbody (MOE 2011). With this minimum dilution, all parameters, with the exception of copper for the predicted TMF water quality will be below the PWQO guidelines. Under the assumed conditions, the predicted concentration of copper entering downstream waters could be 0.11 mg/L compared to a GW3 value of 0.069 mg/L (MOE 2009).

These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O.Reg 153/04 (with the exception of aluminum for which there is no GW3 criteria). When accounting for a 10 times dilution along the flow path (similar to the rationale used in developing the GW3 criteria) it is considered that there is no anticipated adverse effect on aquatic life due to these concentrations. Attenuation of these values along groundwater flow pathways has the potential to further, substantially reduce concentrations of many parameters (U.S. EPA 2007).

A abridged version of Table 4-10 is provided below which presents only parameters that are higher than the PWQO. This table also presents the GW3 criteria. The predicted TMF seepage water quality is formatted to indicate values that are higher than applicable guidelines (see Table 4-10 notes).

Based on the assumptions in MOE (2011) the mixed concentration in the downstream waters would be predicted to be 0.011 mg/L. The SSWQO for copper developed for lakes in the Project area was 0.0079 mg/L. Therefore, copper concentrations in downstream receiving waters could be slightly higher than the SSWQO should water from the TMF enter receiving waters through groundwater flow paths. As a result of copper concentrations potentially higher than SSWQO, the potential effects of copper at 0.011 mg/L on aquatic life that could be present in the receiving waters were considered with respect to published toxicity data to determine whether there could be an adverse effect on aquatic life should groundwater with this concentration enter receiving waters. The U.S. EPA ECOTOX database was accessed to obtain toxicity data for copper. The Aquatic Ecology TSD has noted that the fish fauna of this pond is characterized by small-bodied forage fish. Therefore, toxicity data for fathead minnow, a typical test species in toxicity tests, was used to predict the potential for adverse effects on fish species. The potential effects on invertebrates were also assessed through a review of the available toxicity data.

The lowest reported effects concentration for the fathead minnow reported in the database was a MATC (calculated as the geometric mean of the NOEC and LOEC) of 0.016 mg/L during a 7 day exposure (Norberg and Mount 1985, cited in ECOTOX 2013). Reported no effects concentrations (NOECs) for the amphipod *Hyalella azteca* ranged from 0.013 mg/L to 0.05 mg/L. The results indicate that should water at the predicted TMF concentration reach the downstream waters, there would be no anticipated adverse effect on aquatic life.

It should be noted that the above prediction of copper in groundwater is considered conservative in that it does not provide for attenuation of copper concentrations along the flow path nor for dilution in the receiving water. Since the TMF is located more than 100 m from downstream water bodies, attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers.

Parameter	Units	Guidelines				Groundwater Quality reporting from TMF
		CCME CWQG[a]	PWQO[b]	MISA[c]	GW3[d]	
Total Cyanide	**mg/L**	0.005	-	-	0.05	***0.03***[f]
Al [e]	**mg/L**	0.1	0.075	-	-	0.02
As	**mg/L**	0.005	0.005	1	1.5	0.0001
Co	**mg/L**	-	0.0009	-	0.052	**0.003**
Cr	**mg/L**	0.001	0.001	-	0.64	0.0002
Cu	**mg/L**	0.002	0.001	0.6	0.069	***0.11***
Mo	**mg/L**	-	0.04	-	**-**	**0.08**
U	**mg/L**	-	0.005	-	0.33	**0.007**

Notes:

(a) Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines (CCME CWQG) for the protection of freshwater aquatic life. Values greater than the CCME CWQG are in *italic font*.

(b) Provincial Water Quality Objectives (PWQO). Values greater than the PWQO are in **bold font**.

(c) Municipal/Industrial Strategy for Abatement (MISA). Values greater than the MISA are underlined.

(d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

(e) A 10 times dilution or attenuation along the groundwater flow path would result in aluminum concentration lower than the PWQO values.

(f Assuming treatment efficiency of 5 ppm and natural degradation of cyanide as described in Section 4.2.3.

References

MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011.

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

U.S. EPA ECOTOX database. http://cfpub.epa.gov/ecotox/ Accessed July 2013.

INFORMATION REQUEST – MOE-NR-GW-17

Source: Ministry of Environment

Summary of Comment

Discussion of seepage from pump stations indicates that seepage should be minimal based on minimal heads etc. This sounds like monitoring might be required. Certainly monitoring will be required for the reclaim ponds.

Potential Environmental Effects

Seepage losses from the pump stations could represent an uncontrolled discharge to the environment.

Proposed Action

The operational groundwater monitoring program should address possible seepage from the pumping stations.

Reference to EIS

Section 3.1, 3rd paragraph

Response

As stated in the Chapter 8 Table which provides a summary of monitoring for the physical environment, water levels will be routinely monitored in the vicinity of the pit, and monitored on less frequent but regular intervals at other site locations. The preliminary hydrogeology monitoring program is further detailed in Chapter 8.

INFORMATION REQUEST – MOE-NR-GW-18

Source: Ministry of Environment

Summary of Comment

With regards to the estimate of precipitation that will become groundwater seepage, the estimate of 15% is reasonable but arbitrary. However, could not the seepage estimates from each stockpile be estimated more reasonably from a model?

Potential Environmental Effects

Leachate seepage and the quality of that leachate represent a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

Use a groundwater model to estimate seepage volumes.

Reference to EIS

Section 3.3.4, 2nd Paragraph

Response

A water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions. The uncertainty associated with hydrogeological modelling can often be several orders of magnitude, whereas the statistical hydrological analyses for a somewhat closed system such as the Hammond Reef site, where all flow reports to one basin is generally less than 20%.

Of note is that the groundwater seepage mass is included in the overall mass reporting from the site, and is accounted for in the Site Water Quality model mass balance. In the case of the Site Water Quality model, all precipitation less evaporation is assigned a water quality based on the leachate water quality from the material it falls upon. Given that all of this water eventually will end up in the Marmion Basin the overall water quality estimates for Marmion Basin are no longer dependant on the pathway that the water takes as it is already accounted for. It is considered that the mass load assigned to the waste rock (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass (whether surface or groundwater flow) is represented in the collection system thus is accounted for in the final discharge values. At closure mass continues to be assigned to the precipitation (less evaporation) falling on each if the facilities in a similar manor.

Evaluation of specific leachate water quality from each main facility as a point discharge of groundwater is presented in more detail in responses to MNDM-18 and MOE-NR-GW-16.

INFORMATION REQUEST – MOE-NR-GW-19

Source: Ministry of Environment

Summary of Comment

With respect to seepage losses from the TMF, there has been an assumption that there will be no losses from the collection ditches, and that there will be a loss of 10% to Lizard Lake. The 10% is an assumption, and the quantity has been calculated from there. This is not adequate. Seepage discharge from all of the facilities needs to be modelled, as this needs to be quantified to assess impacts. The seepage modelling should include the mitigation measures that will be included.

Potential Environmental Effects

Leachate seepage and the quality of that leachate represents a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

Seepage losses from the TMF should be estimated using a groundwater model.

Reference to EIS

Section 3.3.5

Response

A water balance approach was used to evaluate potential for groundwater impacts to surface water. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in hydraulic conductivity values and/or boundary conditions. Just as assumptions must be made to construct a hydrogeological model, some assumptions were also made in the water balance approach. We are confident that these assumptions are both reasonable and conservative.

All precipitation (minus evaporation) and process water entering the TMF was assigned a water quality based on the geochemical testing results, and the resulting mass was accounted for and tracked in the site water quality model. As such, the mass load assigned to the TMF water (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system and is thus accounted for in the final discharge values.

The planned seepage collection system is an engineered system which will require further detailed design as the Project planning process moves forward. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings following EIS/EA approval. In the water balance model runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and groundwater flow.

The water quality assessment performed on Lizard Lake was conducted to evaluate potential effects to the lake should groundwater containing the predicted TMF concentration reach Lizard Lake through deep groundwater pathways. The results of this mixing assessment are presented in the Lake Water Quality TSD and were carried forward to the Human Health and Ecological Risk Assessment TSD; Aquatic Environment TSD and Terrestrial

Environment TSD. The results of these assessments show no predicted adverse effects to humans or the environment.

The response to MOE-NR-GW-16 specifically discusses the predicted concentrations of the TMF water and the potential for these concentrations to discharge to the environment. The conclusion of our assessment is that should water at the predicted TMF concentration reach the downstream waters though deep groundwater pathways; there would be no anticipated adverse effect on aquatic life (See response to MOE-NR-GW-16 for further details).

Given that additional information will be required during the detailed design phase of the Project, it is considered premature to conduct additional hydrogeological modelling at this time. OHRG is confident in the predictions provided in the EIS/EA Report and is committed to the protection of aquatic life through the responsible management of groundwater at the site. As the Project planning progresses, additional groundwater modelling will be informed by detailed design decisions and information collected throughout the planned groundwater monitoring program (as described in Chapter 8 of the EIS/EA Report).

INFORMATION REQUEST – MOE-NR-GW-20

Source: Ministry of Environment

Summary of Comment

Indicated that seepage losses from the TMF were calculated using SEEP/W, which was used to calculate losses through the dams only. The model has not been provided, and there is no indication that the seepage collection ditches were modelled to ensure that seepage would be intercepted. Consequently, there is no information available to assess the proponent's commitment that seepage will be intercepted (with the exception of some seepage loss to Lizard Lake).

Potential Environmental Effects

Without groundwater modelling of the TMF and the proposed mitigation measures (dams and seepage collection ditches) there is no way to assess the effectiveness of the mitigation measures, nor determine the potential impacts of the TMF on receptors.

Proposed Action

Groundwater modelling is to be carried out for the TMF to quantify the seepage from this facility.

Reference to EIS

Section 3.4.3

Response

A water balance approach was used to evaluate potential for groundwater impacts to surface water. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in hydraulic conductivity values and/or boundary conditions. Just as assumptions must be made to construct a hydrogeological model, some assumptions were also made in the water balance approach. We are confident that these assumptions are both reasonable and conservative.

The planned seepage collection system is an engineered system which will require further detailed design as the Project planning process moves forward. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings following EIS/EA approval. In the water balance model runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and groundwater flow.

A water quality assessment performed on Lizard Lake was conducted to evaluate potential effects to the lake should groundwater containing the predicted TMF concentration reach Lizard Lake through deep groundwater pathways. The results of this mixing assessment are presented in the Lake Water Quality TSD and were carried forward to the Human Health and Ecological Risk Assessment TSD; Aquatic Environment TSD and Terrestrial Environment TSD. The results of these assessments show no predicted adverse effects to humans or the environment.

The response to MOE-NR-GW-16 specifically discusses the predicted concentrations of the TMF water and the potential for these concentrations to discharge to the environment. The conclusion of our assessment is that

should water at the predicted TMF concentration reach the downstream waters though deep groundwater pathways; there would be no anticipated adverse effect on aquatic life (See response to MOE-NR-GW-16 for further details).

Mitigation measures for potential effects to groundwater have been further detailed and are now more clearly outlined in Chapter 6, Section 6.1.5 Summary of Mitigation Measures for the Physical Environment. Mitigation measures will be assessed for effectiveness through a groundwater monitoring program. Should predictions not be confirmed in practice, a contingency plan will be put in place. A revised groundwater monitoring plan has been included in the EIS/EA Report in Chapter 8, Section 8.2.2.3 and is summarized below.

Table 1: Hydrogeology Monitoring Considerations

Potential Effect	Monitoring Location(s)	Method	Frequency	Duration
Changes to Groundwater Levels	In the vicinity of and at select locations downgradient from the Mine, Stockpiles, Waste Rock Management Facility (WRMF) and Water Management Systems	Manual depth to water measurements for at all locations and continuous monitoring using data logging pressure transducer at select locations	Quarterly for manual depth to water measurements. Continuous for locations with data logging pressure transducers	Construction phase through the operations phase until closure or as required based on review of monitoring data
	Select locations between the open pit(s) and Upper Marmion Reservoir			
	Select locations downgradient from the TMF near the shoreline of Lizard Lake and Upper Marmion Reservoir (Sawbill Bay).	Manual depth to water measurements	Bi-annual	
	Select locations downgradient from the Accommodation Camp's septic system near the shoreline of Upper Marmion Reservoir (Sawbill Bay).			
	Select locations near surface water (hydrology) monitoring stations		Quarterly	

Potential Effect	Monitoring Location(s)	Method	Frequency	Duration
Changes to Groundwater Quality	In the vicinity of and at select locations downgradient from the Mine, Stockpiles, Waste Rock Management Facility (WRMF) and Water Management Systems	Discrete (grab) sampling and laboratory analysis	Bi-annual	Construction phase through the operations phase until closure
	Select location(s) between the open pit(s) and Upper Marmion Reservoir			
	Select location(s) downgradient from the TMF near the shoreline of Lizard Lake and Upper Marmion Reservoir (Sawbill Bay).			
	Select location(s) downgradient from the Accommodation Camp's septic system near the shoreline of Upper Marmion Reservoir (Sawbill Bay) and the chemical/fuel storage and maintenance facilities.			

INFORMATION REQUEST – MOE-NR-GW-21

Source: Ministry of Environment

Summary of Comment

It is indicated that seepage losses from pump stations will not be calculated, because it has been assumed that the levels will be maintained at levels that will prevent a head from building up. This does not seem to reflect my knowledge of how a pumped sump would normally operate. Seepage losses under what would be normal operations need to be estimated and impacts assessed. I would think that losses would be low and that attenuation available, but this should be confirmed.

Potential Environmental Effects

Seepage losses from the pump stations could represent an uncontrolled discharge to the environment.

Proposed Action

Seepage losses from the pump stations should be estimated, and the potential impacts due to these losses discussed.

Reference to EIS

Section 3.4.3

Response

Given that:

- The system would be constructed in bedrock, and/or could be lined to limit seepage loss (in the event fractured bedrock or sediment is encountered);
- The specific conditions will not be known until the detailed design phase;
- All mass is currently accounted for and used in the lake mixing model (i.e. it is assumed it all ends up in Marmion basin; and,
- Discrete input of groundwater containing concentrations as assigned from any of the facilities are not expected to result in adverse aquatic impacts (see MNDM 16 and MOE-NR-GW-16).

It is considered that impacts due to potential losses from these systems have been conservatively and adequately incorporated into the current assessment.

INFORMATION REQUEST – MOE-NR-GW-22

Source: Ministry of Environment

Summary of Comment

Seepage losses for the PPCP have not been calculated because final operating parameters have not been set. Seepage loss calculations should have then been determined based on an anticipated worst case.

Potential Environmental Effects

The PPCP is located close to the lake, and therefore poses a high risk for seepage impacts, as there is little attenuation if contaminant levels in the seepage are elevated. The groundwater model for the dewatering clearly indicates that there will be losses from the PPCP directly to Marmion Lake.

Proposed Action

Seepage losses from the PPCP need to be estimated, especially with respect to the seepage towards Marmion Reservoir, as illustrated in the groundwater model for dewatering effects.

Reference to EIS

Section 3.4.3

Response

Given that:

- The PPCP would be lined to limit seepage loss;
- The specific conditions will not be known until the detailed design phase;
- All mass is currently accounted for and used in the lake mixing model (i.e. it is assumed it all ends up in Marmion basin; and
- Discrete input of groundwater containing concentrations as assigned from any of the facilities are not expected to result in adverse aquatic impacts (see MNDM 16 and MOE-NR-GW-16).

It is considered that impacts due to potential losses from the PPCP have been conservatively and adequately incorporated into the current assessment.

As described in the EIS, the PPCP consists of two cells: a lined cell that receives tailings reclaim water for re-use in the processing plant, and an unlined cell that receives site runoff, which includes seepage from the WRSF and ore stockpiles. The potential impacts to groundwater would be limited to the unlined cell. The Site Water Quality TSD provided predictions of runoff water quality from these facilities. The potential effects on aquatic life from TMF reclaim water and waste rock and ore stockpile on groundwater expressing to surface waters (i.e., Upper Marmion Reservoir) were assessed in the responses to MOE-NR-GW-16 and MNDM-18, and showed there would be no anticipated effects on aquatic life.

INFORMATION REQUEST – MOE-NR-GW-23

Source: Ministry of Environment

Summary of Comment

Notes that seepage losses for the EA have been set to 0, but then states that as the project develops and seepage losses are quantified, action will be taken to reduce the losses. This second part is contrary to the first, and contrary to how the project has been assessed. For the purposes of the EA, probable seepage losses need to be quantified for the purpose of assessing impact, and it needs to be shown that the mitigation measures proposed are adequate, and that there are contingencies. As it is discussed here, it seems that the assumption that there will be no losses from the collection points is ambiguous, as it is then stated that this will be assessed during operation, and that measures will be taken to attempt to achieve no loss.

Potential Environmental Effects

Probable seepage losses need to be quantified for the purpose of assessing impact, and it needs to be shown that the mitigation measures proposed are adequate, and that there are contingencies

Proposed Action

Estimate seepage losses from the TMF, WRMF, PPCP and overburden storage using the groundwater model. Assess the effectiveness of the proposed seepage control measures, and assess the potential impact of seepage discharge to receptors.

Reference to EIS

Section 3.7, Seepage Rates from the PPCP and TMF

Response

As discussed in several responses (MNDM-18; MOE-NR-GW-16; MOE-NR-GW-22) all mass load and potential impact of water quality from the site has been included in the assessment or supplemental discussion.

Given that:

- The system would be constructed in primarily in bedrock, and/or could be lined to limit seepage loss (in the event fractured bedrock or sediment is encountered)
- The specific conditions will not be known until the detailed design phase;
- All mass is currently accounted for and used in the lake mixing model (i.e. it is assumed it all ends up in Marmion basin; and
- Discrete input of groundwater containing concentrations as assigned from any of the facilities are not expected to result in adverse aquatic impacts (see MNDM 18 and MOE-NR-GW-16).

It is considered that impacts due to potential losses from these systems have been conservatively and adequately incorporated into the current assessment and that discrete impacts from groundwater, should they occur will not result in adverse aquatic impacts.

During detailed design additional information will be collected, thus it would be premature and speculative to construct a hydrogeological model at present, given that there is less uncertainty in the current water balance approach than there would be in the hydrogeological model. The uncertainty associated with hydrogeological modelling can often be several orders of magnitude, whereas the statistical hydrological analyses for a somewhat closed system such as the Hammond Reef site, where all flow reports to one basin is generally less than 20%.

Effects of the TMF, waste rock pile and ore stockpile on groundwater were addressed with respect to groundwater migration to adjacent surface waters. The responses to MOE-NR-GW-16 and MNDM-18 show that there are no predicted effects on aquatic life in adjacent surface water bodies.

INFORMATION REQUEST – MOE-NR-GW-24

Source: Ministry of Environment

Summary of Comment

For the PPCP, it is stated that there will be low permeability containment, but losses are expected due to being within the drawdown cone for the pit, but that as a result all losses will report to the pit. However, the model in Appendix 2.IX of the Hydrogeology report clearly shows in Figure 5-3 that there will be seepage from the PPCP reporting to Marmion Lake.

Potential Environmental Effects

Seepage losses need to be properly quantified to assess impacts and identify mitigation and contingencies.

Proposed Action

Clarify the estimates of seepage losses from the PPCP.

Reference to EIS

Section 3.7, Seepage Rates from the PPCP and TMF

Response

Regardless of the pathway taken, all water reporting to the PPCP is assigned a mass load within the system (as discussed in MNDM-18 and MOE-NR-GW-16), and all mass is discharged to Marmion basin, thus is accounted for in the project impact assessment.

Given that:

- The PPCP would be lined to limit seepage loss;
- The specific conditions will not be known until the detailed design phase;
- All mass is currently accounted for and used in the lake mixing model (i.e. it is assumed it all ends up in Marmion basin; and
- Discrete input of groundwater containing concentrations as assigned from any of the facilities are not expected to result in adverse aquatic impacts (see MNDM-16 and MOE-NR-GW-16).

It is considered that impacts due to potential losses from the PPCP have been conservatively and adequately incorporated into the current assessment.

As described in the EIS, the PPCP consists of two cells: a lined cell that receives tailings reclaim water for re-use in the processing plant, and an unlined cell that receives site runoff, which includes seepage from the WRSF and ore stockpiles. The Site Water Quality TSD provided predictions of runoff water quality from these facilities. The potential effects on aquatic life from TMF reclaim water and waste rock and ore stockpile on groundwater expressing to surface waters (i.e., Upper Marmion Reservoir) were assessed in the responses to MOE-NR-GW-16 and MNDM-18, and showed there would be no anticipated effects on aquatic life.

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INFORMATION REQUEST – MOE-NR-GW-25

Source: Ministry of Environment

Summary of Comment

It is noted that seepage losses from the TMF will occur, but that the seepage will be recovered by the surface water drainage system, with the exception of a loss of 10% to Lizard Lake (estimate). The seepage losses and the ability of the surface water drainage system to control seepage losses does not seem to have been assessed at all. This is required. It is not enough to state (as per the last sentence of the paragraph) that seepage will be monitored and mitigation considered if necessary, especially when the EA is based on no discharge. And the possible mitigation measures should be identified and feasibility assessed.

Potential Environmental Effects

Seepage losses from the TMF need to be properly quantified to assess impacts.

Proposed Action

Properly quantify seepage losses from the TMF and assess the effectiveness of seepage control measures and the impacts of seepage losses and discharges to receptors.

Reference to EIS

Section 3.7, Seepage Rates from the PPCP and TMF

Response

To clarify, discharge is expected from this site as discussed in the Site Water Quality TSD and Lake Water Quality TSD and mass load from all incipient precipitation and waters on the site has been accounted for. For detail regarding the TMF mass load and groundwater see Response to MOE-NR-GW-16.

INFORMATION REQUEST – MOE-NR-GW-26

Source: Ministry of Environment

Summary of Comment

Groundwater seepage quality into the open pit has been assumed to be equal to the existing groundwater quality at the site (from the pump tests). However, once mining starts, there will be a waste rock stockpile, overburden stockpile, ore stockpiles and the PPCP located within the drawdown cone of the pits. Seepage from all of these sources will impact the groundwater quality, particularly with elevated metals from the WRMF and likely the PPCP (as per the geochem report). This impact on seepage quality will continue for some time after closure also. This impact from the waste has not been accounted for in assessing the water quality.

Potential Environmental Effects

Impacts to the quality of groundwater that will discharge to the pit during dewatering are required to assess the quality of discharge from the mine.

Proposed Action

Using the data from the geochemistry report, provide an estimate of the quality of the groundwater that will discharge to the open pit during dewatering and after dewatering has been terminated.

Reference to EIS

Section 4.2.1, Groundwater Seepage into Open Pit

Response

In the Site Water Quality TSD the mass load from all precipitation (less evaporation), including expected seepage and runoff is assigned water quality from the Geochemistry TSD as summarized and described in Section 4.2 of the Site Water Quality TSD. The tables are as follows: TMF – Tables 4-5 and 4-6; WRMF – Table 4-8; Ore and Ore Stockpile – Table 4-9. The values in these tables originate from the leachate test work as described in the Geochemistry TSD. Where rainfall (less evaporation) falls upon a facility it is assigned a leachate water quality, from their it no longer matters where it reports to, since all water is assumed to eventually end up in Marmion reservoir, thus the mass is conservatively treated and assessed.

As described in responses to MNDM-18 and MOE-NR-GW-16, all mass has been accounted in discharge to Marmion Lake as such has been accounted for in the EIS/EA impact assessment. Furthermore, should water from this any of the facilities directly enter a water body at a discreet point, at leachate concentrations there are not expected adverse aquatic effects (see MNDM-18 and MOE-NR-GW-16).

An evaluation of potential pit water quality assuming these sources enter the pit is also included and discussed in Section 3.8 of the Site Water Quality TSD. Furthermore there will be ample time to monitor and adjust water quality in the Open Pit following closure of the site if required.

INFORMATION REQUEST – MOE-NR-GW-27

Source: Ministry of Environment

Summary of Comment

The concept is to allow the pits to refill and then spill over. The proposed elevation of the spillway is approximately 420m, approximately 5 metres above the elevation of Marmion Basin. This provides some head difference and a somewhat steep gradient between the pits and the lake. Considering the permeability of the shear zones, there could be significant subsurface discharge from the pit.

Potential Environmental Effects

Seepage from the pits after closure could result in discharge of untreated water from the pit beyond the overflow.

Proposed Action

Provide an assessment of the potential for seepage from the pit upon closure once water levels in the pit are higher than Marmion Reservoir. What kind of volumes and contaminant loadings are possible due to this effect?

Reference to EIS

Section 2.3, Section 4.6

Response

Predicted outflows from the flooded pit were developed from precipitation and run off inputs minus estimates of evaporation losses. Thus the predicted outflows implicitly incorporate subsurface seepage losses. Geochemical and water quality modeling currently indicate that post-closure water quality will be suitable for discharge from the pit, both near surface and at depth (see Site Water Quality TSD), however monitoring of this water will be conducted, and should pit water quality be unacceptable at post closure contingency measures such as in situ treatment are possible. Monitoring throughout life of mine will indicate if these contingency measures will need to be considered more fully, well in advance of any potential seepage or surface water discharges.

INFORMATION REQUEST – MOE-NR-GW-28

Source: Ministry of Environment

Summary of Comment

In the first paragraph it is stated that water quality from the TMF seeps will require treatment for the first one or two years post closure, and after that, it can be directly discharged. What is the basis for this timeframe?

Potential Environmental Effects

Leachate seepage and the quality of that leachate represents a significant risk to the environment, with the potential for leachate to transport contaminants to the Marmion Reservoir.

Proposed Action

Provide the basis for the proposed time frame and indicate the monitoring and contingency plan.

Reference to EIS

Section 4.7

Response

Predicted water quality for the water collected in the TMF seepage collection ponds is based on geochemistry and process chemistry test data as provided in the Geochemistry, Geology and Soils TSD, and summarized in Section 4.2.2 of the Site Water Quality TSD. The Site Water Quality TSD uses a water balance and mass balance approach to evaluate the input waters to the TMF over time to develop estimates of water quality within the TMF and related water quality for water that will report to the seepage collection ponds. Also considered in the conceptual development of the model is the geochemical nature of the tailings and ore.

Expected steady-state water quality for water in the TMF seepage collection ponds during the operations phase is shown in Table 4-10 of the Version 2 Site Water Quality TSD. To be conservative, in the model the water quality for the seepage collection ponds is assigned a “steady state” value based on the geochemistry leachate concentrations that do not change over time, however the tailings are expected to be non acid generating with substantial excess neutralization capacity, therefore the water quality from the TMF is expected to improve over time for a number of reasons as follows:

- Cyanide rapidly degrades in a natural setting; and
- Laboratory testing for non-acid generating materials tend to overestimate leachate concentrations relative to natural conditions due to metal complexation, chemical precipitation, and adsorption.

Given that the existing water quality predicted from the leach testing is very close to guideline values, it is considered that the main factor that will influence the ability of the water to be released are the cyanide levels and that these will naturally degrade once addition of cyanide stops at the end of operations. Thus within one or two years it is expected that these waters will be suitable for direct release.

Direct discharge of waters from the TMF to the environment would not occur until such time as monitoring has shown them to consistently meet appropriate values. Based on professional judgement, it has been assumed in

the pit flooding model that the water from the TMF will be pumped to the open pits for a period of 3 years following closure. Monitoring will occur throughout the operations and closure periods on a regular basis. Should these waters not meet appropriate discharge values they would be placed in the open pit where additional monitoring would occur. Geochemical and water quality modeling currently indicate that post-closure water quality will be suitable for discharge from the pit, even with addition of water from the TMF, both near surface and at depth (see Site Water Quality TSD). However monitoring of this water will be conducted, and should pit water quality be unacceptable at post closure contingency measures such as in situ treatment are possible. Monitoring throughout life-of-mine will indicate if these contingency measures will need to be considered more fully, well in advance of any potential seepage or surface water discharges.

INFORMATION REQUEST – MOE-NR-GW-29

Source: Ministry of Environment

Summary of Comment

In Section 6.4, it is indicated that groundwater flow will return to predevelopment conditions, with the exception of some GW flow from the pits, but that it is anticipated that the water in the pit will be stratified, and that there will be no issues with groundwater quality. However, in reviewing the monitoring program in Sec 5.2, there is no groundwater monitoring post closure with respect to water quality in seepage from the pits. Considering the high permeability shear zones, seepage volumes could be significant. The monitoring program needs to include wells specifically located in the shear zones, and the post closure discussion should note that the assumption is that water quality seeping from the pit will be fine, but that there is monitoring and contingencies in place.

Potential Environmental Effects

After closure, there is a potential for discharge of water from the pit via the shear zones.

Proposed Action

Provide an assessment of the potential for seepage from the pit upon closure once water levels in the pit are higher than Marmion Reservoir. What kind of volumes and contaminant loadings are possible due to this effect? Provide an outline for ongoing model to address potential seepage via the shear zone.

Reference to EIS

Section 5.2 and Section 6.4

Response

It is anticipated that some form of groundwater monitoring at closure will be required. The initial elements of the monitoring program are provided in Table 8-2 of the EA under “Pit Dewatering”; however it will be necessary to further develop this program during operations as the understanding of the pit geology and implications of fractures increases, and dependant on the monitoring of pit water quality at closure. The need for groundwater quality monitoring at the pit perimeter post closure will be established from the results of pit water quality and quantity monitoring during operations, closure and post-closure.

Geochemical and water quality modeling currently indicate that post-closure water quality will be suitable for discharge from the pit, both near surface and at depth (see Site Water Quality TSD), however monitoring of this water will be conducted, and should pit water quality be unacceptable at post closure contingency measures such as in situ treatment are possible. Monitoring throughout life of mine will indicate if these contingency measures will need to be considered more fully, well in advance of any potential seepage or surface water discharges.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-WQ 1

Source: Ministry of Environment

Summary of Comment

TMF seepage was estimated using the results of five weeks of humidity cell testing.

Potential Environmental Effects

Using the results of humidity cell testing carried out for only 5 weeks has the potential to under-predict metal releases.

Proposed Action

Humidity cell testing should be carried out for a longer duration (i.e. 10 weeks) as recommended in standard protocols (USEPA, 1994).

Reference to EIS

Lake Water Quality TSD Section 2.4. Assumptions and Limitations. Page 17.

Response

See Section 3.5.2.6 of the Geochemistry Geology and Soils TSD. Tailings humidity cell testing was carried out for 20 weeks (SGS Lakefield testing) and 23 weeks (Lakehead testing). The statement referred to in this information request is as follows:

> Post-closure input water quality for TMF seepage was derived from the average of steady state conditions of the final five weeks of humidity cell testing (Site Water Quality TSD).

The final five results of the 20/23 week humidity cell testing is the timeframe selected to represent stable rates (i.e., steady state conditions) which is based on standard geochemistry recommendations as per MEND (2009).

References

MEND (Mine Environment Neutral Drainage). 2009. *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials*. MEND Report 1.20.1. Mining Environment Neutral Drainage Program, Natural Resources Canada. December 2009.

INFORMATION REQUEST – MOE-WQ-2

Source: Ministry of Environment

Summary of Comment

Total mercury concentrations are estimated (under the average condition) to increase in Marmion Lake to 34 ng/L as a result of mining activities. Baseline concentrations are 5 ng/L.

Potential Environmental Effects

The potential for mercury increases in Marmion Lake represents a significant impact if calculations are correct.

Proposed Action

Given the concentration increase predicted, additional analysis should be undertaken to better understand the change to the bioavailability of MeHg. Simple comparison with PWQO and CWQG is not sufficient.

Reference to EIS

Pg. 16. Sec. 2.2. Mercury Concentrations

Response

Table 6-36 of Chapter 6 of the EIS/EA report presents predicted concentrations of total mercury (0.000034 mg/L) based on calculations that assigned baseline values that were below detection a value equal to the detection limit. This was found to result in an over-estimation of predicted mercury concentrations which was an artifact of the detection limit used. When adjusted to account for these artificially inflated numbers, the average baseline total mercury concentration for Marmion Reservoir is expected to be less than 0.000005 mg/L. The process to arrive at these lower values was to evaluate all detection limits from samples collected and (where all, or almost all values are below detection limits) assign an expected baseline value that is some fraction (in this case ½) of the typical analytical detection limit. Section 4.2.1 of the Site Water Quality TSD Appendix 2.III of the Water and Sediment Quality TSD discusses adjustments to detection limits in detail. The Site Water Quality TSD model calculations used a baseline value of 0.000005 mg/L. This is considered reasonable and appropriate based on the analytical data available for mercury which showed that mercury concentrations were below a detection limit of 0.00001 mg/L. The same approach was used both for the baseline concentrations and for site water quality concentrations since there is not expected to be any source or addition of mercury resulting from the project geology or mineral processing.

The predicted effluent concentrations from the Site Water Quality TSD were used in the Lake Water Quality TSD receiving environment mixing calculations. The lake mixing calculations predicted total mercury concentrations were 0.000005 mg/L for both the predicted average and bounding case scenarios. Thus, total mercury concentrations were predicted to not change due to the Project (see Section 4.3 of the Lake Water Quality TSD).

Table 6-36 of Chapter 6 of the EIS/EA report will be revised to reflect the Site Water Quality and Lake Water Quality TSD predictions based on the detection limit adjustment. This will be addressed in the next version of the EIS/EA report.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MOE-WQ-3

Source: Ministry of Environment

Summary of Comment

Total mercury concentrations are estimated (under the average condition) to increase in Marmion Lake to 34 ng/L as a result of mining activities. Baseline concentrations are 5 ng/L.

Potential Environmental Effects

The potential for mercury increases in Marmion Lake represents a significant impact if calculations are correct.

Proposed Action

The MDL used for the analysis is too high to fully understand the potential for mercury bioavailability. To evaluate mercury methylation and uptake a quantitation limit of 0.1 ng/L for total and 0.02 ng/L for MeHg is generally used. Future analysis needs to include Might.

Reference to EIS

Pg. 16. Sec. 2.2. Mercury Concentrations

Response

Table 6-36 of Chapter 6 of the EIS/EA report presents predicted concentrations of total mercury (0.000034 mg/L) based on calculations that assigned baseline values that were below detection a value equal to the detection limit. This was found to result in an over-estimation of predicted mercury concentrations which was an artifact of the detection limit used. When adjusted to account for these artificially inflated numbers, the average baseline total mercury concentration for Marmion Reservoir is expected to be less than 0.000005 mg/L. The process to arrive at these lower values was to evaluate all detection limits from samples collected and (where all, or almost all values are below detection limits) assign an expected baseline value that is some fraction (in this case ½) of the typical analytical detection limit. Section 4.2.1 of the Site Water Quality TSD Appendix 2.III of the Water and Sediment Quality TSD discusses adjustments to detection limits in detail. The Site Water Quality TSD model calculations used a baseline value of 0.000005 mg/L. This is considered reasonable and appropriate based on the analytical data available for mercury which showed that mercury concentrations were below a detection limit of 0.00001. The same approach was used both for the baseline concentrations and for site water quality concentrations since there is not expected to be any source or addition of mercury resulting from the project geology or mineral processing.

The predicted effluent concentrations from the Site Water Quality TSD were used in the Lake Water Quality TSD receiving environment mixing calculations. The lake mixing calculations predicted total mercury concentrations were 0.000005 mg/L for both the predicted average and bounding case scenarios. Thus, total mercury concentrations were predicted to not change due to the Project (see Section 4.3 of the Lake Water Quality TSD).

Table 6-36 of Chapter 6 of the EIS/EA report will be revised to reflect the Site Water Quality and Lake Water Quality TSD predictions based on the detection limit adjustment. This will be addressed in the next version of the EIS/EA report.

INFORMATION REQUEST – WASTE-4

Source: Ministry of Environment

Summary of Comment

In section 5.1.3, the proponent states that demolition wastes from on-site facilities would be "disposed of in a solid waste landfill to be licensed within the TMF (Tailings Management Facility)." I did not find any other reference to obtaining licensing for a landfill within the TMF in the remaining materials that I reviewed. While approval for a small landfill (i.e. Less than 40,000 cubic metres in capacity) may be granted through future ECA applications, it should not be assumed that approval would be granted or that establishing a small landfill would be a preferred alternative in site decommissioning. Alternatives should be presented for disposal of these materials.

Approvals for new landfills greater than 40,000 cubic metres in capacity are subject to approval through the Environmental Assessment Act as well as the Environmental Protection Act.

Potential Environmental Effects

None

Proposed Action

Propose alternatives for final disposal of demolition wastes from decommissioning of on-site facilities

Reference to EIS

EIS/EA Report - Chapter 5

Response

The plan is to establish a facility for non-hazardous solid waste in the TMF at the time of closure. This is intended to deal with the debris that will be generated by the demolition of the site facilities. After demolition is completed, the TMF landfill will be closed following the terms of the licence. This will involve placing a cover over the wastes as well as post-closure monitoring.

Ministry of Tourism, Culture and Sport

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MTCS-1

Source: Ministry of Tourism, Culture and Sport

Summary of Comment

Appendix 2.1 is the *Stage 1 and 2 Archaeological Assessment Report* and it has not yet been submitted to Ministry of Tourism, Culture and Sport (MTCS) for technical archaeological licensing review and this needs to be completed as soon as possible. No further archaeological work is recommended and it is not clear that this recommendations adequately addresses archaeological licensing requirements, i.e. more work may be recommended.

Potential Environmental Effects

None

Proposed Action

The recommendation from MTCS re: Archaeological assessment report review is required in Ontario under the *Ontario Heritage Act* regulations. All archaeological licensees are required to submit archaeological assessment reports for review/comment by MTCS.

Reference to EIS

Appendix 2.1 of Cultural Heritage TSD

Response

The *Stage 1 and 2 Archaeological Assessment Report* has since been submitted to the Ministry of Tourism, Culture and Sport (MTCS) for technical archaeological licensing review. The report was submitted on June 10, 2013, with additional information provided on June 19, 2013.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – MTCS-2

Source: Ministry of Tourism, Culture and Sport

Summary of Comment

In *Cultural Heritage Resources TSD V1* Golder has recommended a Cultural Heritage Evaluation Report be completed [which should be a Heritage Impact Assessment (HIA) as the heritage features are to be impacted] and this is needed as soon as possible.

The above recommendations from MTCS re: an HIA are identified in the provincial Terms of Reference requirements section 6.8.3 "*Cultural heritage resources, including archaeological resources, cultural heritage landscapes and built heritage will be assessed as part of the EA. This assessment will include a screening for built heritage and cultural landscapes in the Project area, using the Ministry of Culture and Sport's standard checklist for identifying potential heritage sites. If it is determined that the Project may impact heritage and cultural heritage landscapes, a heritage impact assessment will be conducted."* Also reference is made to cultural heritage resources being considered in EIS Guidelines section 10.5 Physical and Cultural Heritage Resources.

Potential Environmental Effects

None.

Proposed Action

Once the HIA is completed and a technical review has occurred for the archaeology and the heritage technical reports, the TSDs would need to be modified and the appropriate text from those would need to be incorporated into the main "Hammond Reef Gold Project Environmental Impact Statement/Environmental Assessment Report."

Reference to EIS

Cultural Heritage TSD

Response

Section 3.2.1.2.1 of the Cultural Heritage TSD and Section 6.3.3 of the Environmental Impact Statement/Environmental Assessment (EIS/EA) Report, states:

"…it is recommended that a Cultural Heritage Evaluation Report be undertaken for the two historic mining operations to document the cultural heritage landscapes under the Ontario Heritage Act Reg. 9/06 Criteria for Determining Cultural Heritage Value or Interest and Reg. 10/06 Criteria for Determining Cultural Heritage Value or Interest of Provincial Significance; and to recommend further mitigation if required prior to these areas being impacted by ground disturbance activities."

Osisko is committed to complying with the above identified regulations. A Cultural Heritage Evaluation (or Heritage Impact Assessment) will be undertaken and mitigation measures recommended through the evaluation will be implemented prior to ground disturbance in the area of the two historic mining operations. Section 6.3.3 of the EIS/EA has been revised to include this commitment.

Natural Resources Canada

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – NRCAN-1

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

Geology and Soils - To have a better understanding of the fractures as there may be potential to impact the water transmitting capability

Proposed Action

Please provide information - are all fractures quartz-filled or are some fracture sets infilled with calcite? Dissolution focused along latter fractures could influence water transmitting capabilities.

Reference to EIS

EIA-EA Report
3.0 Existing Conditions 3.2.2.1.3.3
Influence of Geology and Physiography on Project Infrastructure

Response

Bedrock lithologies identified by the Osisko Hammond Reed Gold Ltd. (OHRG) exploration geologists were overlayed with geotechnical data compiled during the geotechnical site investigation conducted in 2010. These logs can be found in Appendix 2.1 of the Golder 2010 Geotechnical Investigation Report (February 19, 2013).

All of the veins (assuming fracture filled veins) have been documented as containing quartz with no references to calcite infilled fractures, however calcite concentration in the host rock lithologies average from about 2% to 6% depending on the rock type.

INFORMATION REQUEST – NRCAN-2

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

A better understanding of the characteristics of the material used for the structural integrity of the project components.

Proposed Action

- NRCan would like to know if Table 3-7 captures all terrain units. No till is mentioned in the table, yet an extensive veneer is recorded on the Overburden Geology Map (Figure 2-5 in the Hydrogeology TSD) and it is recognized as underlying glaciofluvial deposits in Section 3.2.5.3

- NRCan recommends that the proponent provide a better description of terrain (surficial) units that should include: name, grain size, texture, structure, colour, thickness, morphology, stratigraphy, depositional environment, drainage, geotechnical properties, and other distinguishing characteristics (e.g., prone to failure).

NRCan suggestions on Mapping:

- Please provide a map of the surficial geology deposits with consistent labelling.

Reference to EIS

EIA-EA Report

3.0 Existing Conditions

3.2.2.3 Terrain and Soil

3.2.2.3.3 Results

3.2.5 Hydrogeology

3.2.5.3 Results

Response

The information provided is based on existing Ontario Geological Service mapping and reporting verified by soil sampling and mapping of ecological habitat units. Of note is that the terrain and soils quality in this region of Canada is generally poor (MNR, 2004) and will not support agriculture due to the amount of bedrock. It is of limited benefit therefore to spend considerable effort and time evaluating the soil conditions; however confirmation of the soil conditions was conducted and is provided.

The purposes of the information presented is not to define the structural integrity of the project components, this will be completed during the detailed design phase and will include gathering of additional information, and

appropriate engineering documentation, specification and sign-off. It is possible that as more extensive work is completed on the site, additional mapping units such as till will be better identified.

Surficial geology mapping and soil classification with respect to the properties requested are provided in the following locations:

- Figure 4-3 “Soil Map Units in the Local Study Area” of the Geochemistry, Geology and Soils TSD
- Section 4.2 Background, and Section 6.0 Glossary of Terms of the Geochemistry, Geology and Soils TSD, in relation to soil horizons as shown on Figure 4-3 “Soil Map Units in the Local Study Area”
- Section 2.1 Quaternary Geology (including Figure 2-1) of the Geochemistry, Geology and Soils TSD
- Geotechnical evaluation of the materials has been conducted and will be presented in the Feasibility Study report when released.

Additional discussion of specific features is presented in the Geochemistry, Geology and Soils TSD; Section 4.4.1.1 Soil Erosion Risk; and Section 4.4.1.2, Soil Chemistry.

Based on the available mapping and confirmation, it is considered that the information as provided is suitable for decision making at the EIS / EA level for this particular environment.

INFORMATION REQUEST – NRCAN-3

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

Geology and Soils

To better understand the safety of mine components

Proposed Action

General comment

- NRCan suggests removing all till, glaciolacustrine, glaciofluvial and organic deposits from the rim around the open pit to avoid slumping of unstable unconsolidated earth materials.

Reference to EIS

EIA-EA Report

6.0 Effects Assessment

6.1.1.1.1 Alteration or Loss of Soil and Terrain Units

Response

As stated in EIA Section 5.2.1, all overburden will be stripped from the pit area. The depth of overburden is relatively thin. The estimated volume of overburden in expected to be about 4.5 Mm^3, which represents an average depth of roughly 1 m over the pit area. As a matter of good engineering practice, the overburden will be stripped somewhat beyond the pit rim at the bedrock sub-crop, and cut slopes in the overburden materials will be flattened to stable angles.

INFORMATION REQUEST – NRCAN-4

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

To understand the bedrock setting and its fracture system; It appears that at less than 30 m deep, this sub-surface zone may be the result of bedrock fracturing during southwest flow of the Laurentide Ice Sheet (>2 km thick) during the Late Wisconsinan Glaciation.

Proposed Action

Please provide information on the orientations of the shallow fractures.

Reference to EIS

6.0 Effects Assessment; 6.1.4 Hydrogeology

6.1.4.1.2 Effects Assessment – Hydrogeology

Response

Bedrock structure has been mapped regionally with a pronounced southwest-northeast trend as shown on Figures 2-3 and 2-4 in the Hydrogeology TSD. Mapping of bedrock outcrops in the vicinity of the planned open pit was conducted with a dominant southwest-northeast trend observed. Bedrock structure was also assessed from oriented core obtained from deep inclined boreholes drilled at the planned open pit. Again, the dominant structural trend observed was to the southwest-northeast.

The dominant southwest-northeast structural trend is observed in out crop in the fracture orientation at depth in inclined boreholes. The dominant structural trend in bedrock at the Project is not related to the flow of Laurentide Ice.

INFORMATION REQUEST – NRCAN-5

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

Content conformity

Geology and Soils

Proposed Action

- Bedrock and soils are described in the EIS, NRCan recommends to describe the terrain units as follows: Terrain unit name, grain size, texture, structure, colour, thickness, morphology, stratigraphy, depositional environment, drainage, geotechnical properties, and other distinguishing characteristics (e.g., geochemistry, prone to failure); see EIS Section 3.2.2.3.

Reference to EIS

Terms of Reference Appendix 1.1; 9.1.1 Geology and Geochemistry

Response

Soil classification with respect to the properties requested are provided in the following locations:

- Figure 4-3 “Soil Map Units in the Local Study Area” of the Geochemistry, Geology and Soils TSD
- Section 4.2 Background, and Section 6.0 Glossary of Terms of the Geochemistry, Geology and Soils TSD, in relation to soil horizons as shown on Figure 4-3 “Soil Map Units in the Local Study Area”
- Section 2.1 Quaternary Geology (including Figure 2-1) of the Geochemistry, Geology and Soils TSD
- Geotechnical evaluation of the materials has been conducted and will be presented in the Feasibility Study report when released.

Additional discussion of specific features is presented in the Geochemistry, Geology and Soils TSD; Section 4.4.1.1 Soil Erosion Risk; and Section 4.4.1.2, Soil Chemistry.

Of note is that the terrain and soils quality in this region of Canada is generally poor (MNR, 2004) and will not support agriculture due to the amount of bedrock. It is of limited benefit therefore to spend considerable effort and time evaluating the soil conditions; however confirmation of the soil conditions was conducted and is provided. Based on the available mapping and confirmation, it is considered that the information as provided is suitable for decision making at the EIS / EA level for this particular environment.

References

MNR (Ontario Ministry of Natural Resources). 2004. *Natural Resources and Values Information System.*

INFORMATION REQUEST – NRCAN-6

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

Content conformity

Geology and Soils

Proposed Action

Terrain maps, e.g., Figure 4-2 (Figures 3-1 and 3-6 in EIS) show different earth materials to the Overburden Geology map (Figure 2-5 in the Hydrogeology TSD) and Table 4-2 (Table 3-7 in EIS document). Please provide a map with consistent labelling of surficial geology deposits.

Reference to EIS

Geochemistry, Geology and Soil TSD

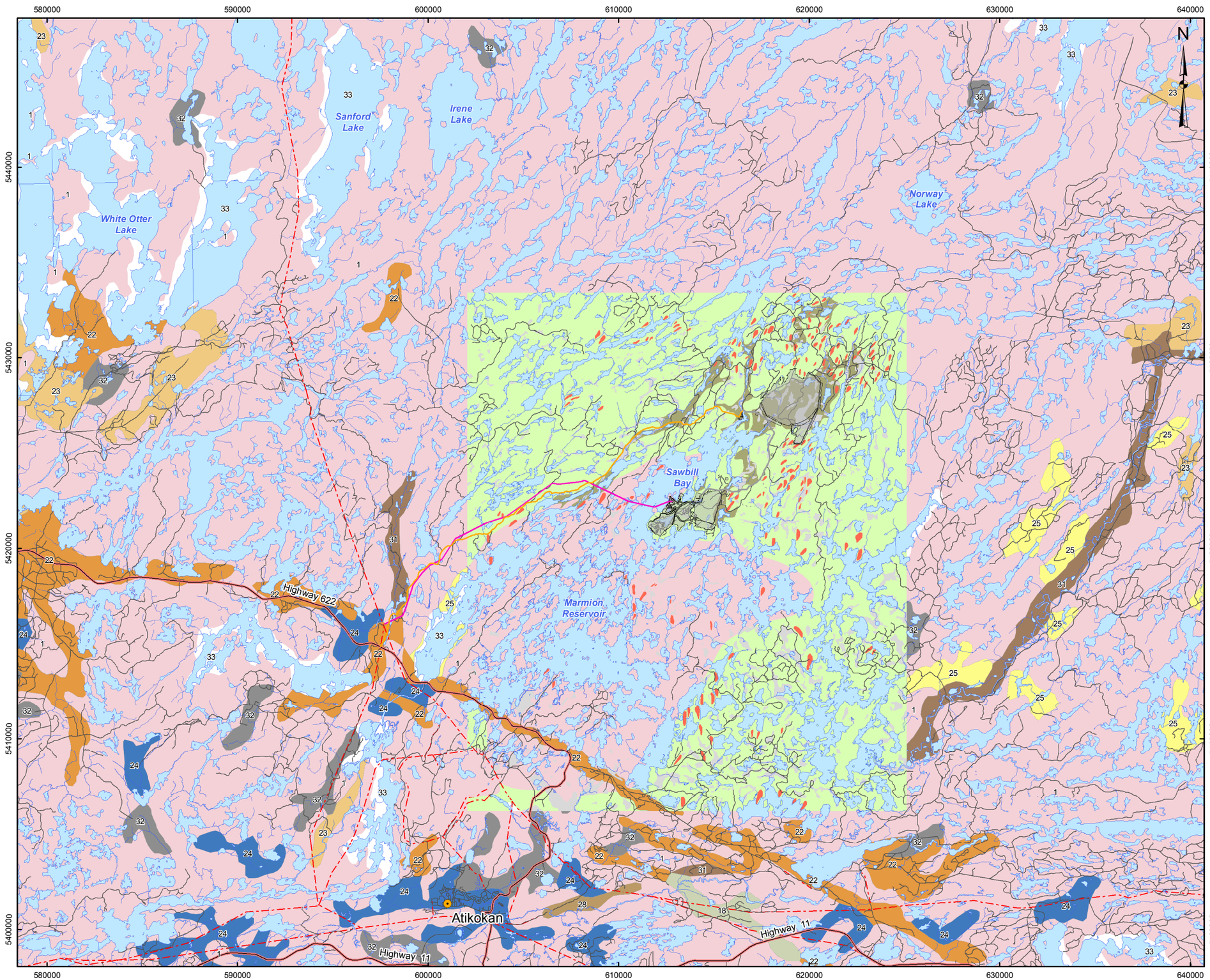
2.1 Quaternary Geology

Response

These maps were produced for different purposes by the Ontario Ministry of Natural Resources. Figure 2-5 in the Hydrogeology TSD appears to have slightly more detail in some respects which was useful for the hydrogeological interpretation; however the coverage area is limited. The attached figure shows the coverage of this figure superimposed on Figure 4-2 (Figures 3-1 and 3-6 in EIS). It was determined for the EIS/EA and in discussion of overall quaternary geology that a regional coverage would be more appropriate.

Attachments

Figure 1 Quaternary Geology and Geology RSA



LEGEND

- City/Town
- Provincial Highway
- Road
- Trail
- Power Transmission Line
- River/Stream
- Lake

Surficial Geology

- 1 — Bedrock: undifferentiated igneous and metamorphic rock exposed at surface or covered by a discontinuous, thin layer of drift
- 18 — Till: undifferentiated, predominantly sand to silty to silt matrix, commonly rich in clasts, often low in matrix carbonate content
- 21 — Glaciofluvial ice-contact deposits: gravel and sand minor till includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits
- 22 — Glaciofluvial outwash deposits: gravel and sand includes proglacial river and deltaic deposits
- 24 — Glaciomarine deposits: silt and clay, minor sand basin and quiet water deposits
- 25 — Glaciomarine deposits: sand, gravelly sand and gravel nearshore and beach deposits
- 28 — Fluvial deposits: gravel, sand, silt and clay deposited on abandoned flood plains, terrace remnants
- 31 — Fluvial deposits: gravel, sand, silt and clay deposited on modern flood plains
- 32 — Organic deposits: peat, muck and marl
- Rock drumlin
- Organic Terrain
- Outwash Deltas/Channels
- Till Veneer
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Project Facilities

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Surficial Geology - Ontario Geological Survey, 1997. Quaternary geology, seamless coverage of the province of Ontario: Ontario Geological Survey, Data Set 14.
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2,500 0 2,500 5,000 7,500
SCALE 1:200,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
QUATERNARY GEOLOGY AND GEOLOGY REGIONAL STUDY AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	12 Jul. 2013		
CHECK	SP	12 Jul. 2013		
REVIEW	SP	12 Jul. 2013		

FIGURE: 1

G:\Projects\2013\13-1118-0010_Osisko_Hammond_Reef\GIS\MXDs\Reporting\InformationRequests\NRCan_6\Geology_RSA.mxd

INFORMATION REQUEST – NRCAN-7

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

During the 78 years of the post-closure period that the open pits are filling with water, the groundwater flow regime will change from what it was at the end of mining. When mining ceases, all groundwater flow will be directed in towards the pits, but as the pits fill, the hydraulic head in the pits will rise and eventually flow may occur from the pits to the groundwater system. Once in the groundwater system, there is a very short distance for groundwater to travel from the pit to Sawbill Bay and/or Lynxhead Bay. Hence, a groundwater flow path from the flooded open pits to surface waters may exist during the post-closure period. It appears that the proponent has not evaluated this scenario and the possible effects to groundwater quality and the resulting surface water quality in Sawbill Bay and Lynxhead Bay.

Proposed Action

- Provide an assessment of the changing groundwater flow dynamics during the 78 year post-closure period while the open pits are filling. This would include an evaluation of how groundwater flow directions will change.

- Provide an evaluation of groundwater quality derived from flow from the filled open pits and the potential effect on groundwater quality in surrounding surface waters (Sawbill Bay and Lynxhead Bay).

Reference to EIS

6.1.5.3 (Pg. 6-68)

Response

The pit overflow estimate has been revised, and is now estimated to occur approximately 218 years after closure. The basis and results of the revised pit flooding model are provided in an addendum to the Conceptual Closure and Rehabilitation Plan TSD.

This situation has been considered during the evaluation of Site Water Quality. The rock types encountered in this deposit are all non-acid generating with low potential for metal leaching, as a result, in all scenarios it is expected that the open pit water quality will be suitable for discharge in the near term after closure, as such, whether the water reports as overland flow or groundwater flow, when the water level of the pit eventually reaches a level above that of the Marmion reservoir, there will be no change to the conclusion of the impact assessment.

Regardless, given the long duration prior reaching the elevation of the Marmion Reservoir, it is considered that the monitoring of the water flow, fracture spacing, flux and water quality during operations and during closure will allow for contingency measures (such as batch treatment) to be implemented if necessary well in advance of any potential for impact. It is not however expected that this would be required based on all information available to date.

Table 4-16 in the Site Water Quality TSD provides predictions on pit water quality under both stratified and mixed conditions. Based on predicted water quality only cadmium concentrations in the pits could exceed the CWQGs (PWQOs would not be exceeded). The CCME (1999) in developing the current CWQG for cadmium noted that the effect level (LOEL) for the most sensitive species was 0.00017 mg/L (from which a guideline of 0.000017 mg/L was derived by applying a safety factor of 0.1). Predicted water quality in the pits for cadmium ranges up to 0.000002 mg/L. As a result, should water from the pit migrate via groundwater pathways to Marmion Reservoir, there would be no adverse effects expected on aquatic life. The above assessment is based on a very conservative approach that assumes that there is no attenuation of cadmium in the groundwater, and no dilution in the receiving water.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – NRCAN-8

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

At the southwest section of the Tailings Management Facility (TMF), a trough of granular material was encountered to depths of 25 m. At this location, groundwater elevations are about 2 m higher than nearby surface waters and exhibit similar fluctuations, suggesting that overburden groundwater in this area readily discharges to Upper Marmion Reservoir through a permeable pathway in granular materials. The proponent plans to collect seepage from the TMF that collects in ditches along the downstream toe of the proposed TMF dams. However, the proponent doesn't consider seepage that may occur beneath the TMF, particularly seepage that could occur to the more permeable trough of granular material. It is possible that this could provide a conduit for contaminated water to reach the Upper Marmion Reservoir.

Proposed Action

- Provide an evaluation of the possibility of seepage to groundwater underneath the TMF. Include an estimate of the rate of seepage.
- Provide an assessment of the possible effect this seepage could have on groundwater quality and the resultant surface water quality in the Upper Marmion Reservoir and adjacent Lizard Lake.

Reference to EIS

EIA-EA Report; Hydrogeology TSD; Water Quality TSD: Section 3.2.5.3 (p. 3-57); Hydrogeology TSD: Section 2.4 (Pg. 33); Site Water Quality TSD: Section 3.1 (Pg. 17)

Response (Same as MOE-NR-GW-16)

A water balance approach was used to evaluate potential for near surface vs. groundwater water quality influence. All precipitation (minus evaporation) and process water entering the TMF is assigned a water quality and based on the geochemical testing results, and the resulting mass is accounted for and tracked in the model. As such, the mass load assigned to the TMF water (both for surface water and groundwater) is reasonably represented within the current system as modelled, and is appropriately conservative. All of this mass is represented in the collection system thus is accounted for in the final discharge values. At closure all precipitation (less evaporation) continues to be applied a water quality based on the TMF process water chemistry and is thus conservative. This approach is considered to contain less uncertainty than a hydrogeological modelling approach due to the inherent uncertainty and heterogeneity in expected hydraulic conductivity values and/or boundary conditions.

The seepage collection system is an engineered system which will require detailed design as part of the detailed design phase of the project. At the detailed design phase the depth of ditching, slopes, sump dimensions and pumping system will be developed into construction level drawings following EIS/EA approval. In the water

balance model all runoff and seepage is captured and the mass is therefore included in the final discharge water quality, thus the predicted Marmion Basin water quality accounts for all surface water and groundwater flow.

Table 4-10 of the Version 2 Site Water Quality TSD presents predicted concentrations of the steady state TMF groundwater quality during the Operation Phase. The predicted TMF groundwater concentrations of cyanide, cobalt, copper, molybdenum and uranium are greater than the PWQO protection for aquatic life regulatory guidelines. These values, while above the PWQO values are below the GW3 criteria as developed by MOE under O. Reg 153/04, with the exception of copper which at 0.11 mg/L exceeds the target GW3 value of 0.069 mg/L. The proposed SSWQO for copper developed as part of the risk assessment carried out for the Project is 0.0079 mg/L. Therefore, copper concentrations in downstream receiving waters could exceed the proposed SSWQO should water from the TMF directly enter receiving waters through groundwater flow paths.

Parameter	Units	Guidelines				Groundwater Quality reporting from TMF
		CCME CWQG[(a)]	**PWQO**[(b)]	**MISA**[(c)]	GW3[(d)]	
Total Cyanide	**mg/L**	0.005	-	-	0.05	***0.03***[(e)]
Co	**mg/L**	-	0.0009	-	0.052	**0.003**
Cu	**mg/L**	0.002	0.001	0.6	0.069	***0.11***
Mo	**mg/L**	-	0.04	-	**-**	**0.08**
U	**mg/L**	-	0.005	-	0.33	**0.007**

Notes:

(a) Canadian Council of Ministers of the Environment, Canadian Water Quality Guidelines (CCME CWQG) for the protection of freshwater aquatic life. Values greater than the CCME CWQG are in *italic font*.

(b) Provincial Water Quality Objectives (PWQO). Values greater than the PWQO are in **bold font**.

(c) Municipal/Industrial Strategy for Abatement (MISA). Values greater than the MISA are underlined.

(d) MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario. Standards Development Branch, MOE. April 2011. Appendix A3(18), Table 9 (GW3 Values). Values greater than the GW3 are in red font.

(e) Assuming treatment efficiency of 5 ppm and natural degradation of cyanide as described in Section 4.2.3.

The prediction of copper in groundwater is considered very conservative in that it does not provide for attenuation of copper concentrations along the flow path. Attenuation of copper concentrations in groundwater would be expected, particularly where flow may occur through soil layers. “Under most conditions, copper is present in aqueous solution as the divalent cation, Cu2+, or as Cu(II) hydroxide or carbonate complexes. However, copper is not especially mobile in aquatic environments due to the relatively low solubility of Cu(II)-bearing solids and high affinity of copper for mineral and organic surfaces.” (U.S. EPA, 2007).

As a result of the predicted copper concentrations, the potential effects of copper at 0.011 mg/L on aquatic life were considered with respect to published toxicity data to determine whether there could be an adverse effect on aquatic life should groundwater with this concentration of copper enter receiving waters. The U.S. EPA ECOTOX database was accessed to obtain toxicity data for copper. The Aquatic Ecology TSD has noted that the fish fauna in the vicinity of the TMF are characterized by small-bodied forage fish. Therefore, toxicity data for fathead minnow, a typical test species in toxicity tests, was used to predict the potential for adverse effects on

fish species. The potential effects on invertebrates were also assessed through a review of the available toxicity data.

The lowest reported effects concentration for the fathead minnow reported in the database was a MATC (calculated as the geometric mean of the NOEC and LOEC) of 0.016 mg/L during a 7 day exposure. Reported no effects concentrations (NOECs) for the amphipod *Hyalella azteca* ranged from 0.013 mg/L to 0.05 mg/L. The results indicate that should water at the predicted TMF concentration reach the downstream waters, there would be no anticipated adverse effect on aquatic life.

References

U.S. Environmental Protection Agency (USEPA). 2007. Monitored Natural Attenuation of Inorganic Contaminants in Ground Water. Volume 2, Assessment for Non-Radionuclides Including Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Nitrate, Perchlorate, and Selenium. October 2007. U.S. Environmental Protection Agency Report EPA/600/R-07/140 http://www.epa.gov/ada/gw/mna.html. Cincinnati, Ohio 45268.

U.S. EPA ECOTOX database. http://cfpub.epa.gov/ecotox/ Accessed July 2013.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – NRCAN-9

Source: Natural Resources Canada

Summary of Comment

None

Potential Environmental Effects

NRCan is requesting additional information regarding explosives use and storage for the Hammond Reef Gold Mine Project. This information assists NRCan in verifying whether appropriate/standard measures will be implemented to minimize accidents and malfunctions as well as potential impacts to the environment.

Proposed Action

- Provide an estimate of the maximum quantity of explosives to be stored at the temporary and permanent explosives facilities.
- The proponent is requested to provide the liquid effluent disposal plans for the explosives manufacturing and storage facilities.
- The EIS specifies that the permanent explosives facilities will be in accordance with the Quantity-Distance Principles User's Manual and provides a map showing its location. NRCan requests that a similar map be provided for the temporary explosives factory and magazine.

Reference to EIS

EIS 5.2.1.2, 5.2.6.1, 6.6

Site Water Quality Technical Support Document 4.2.3

Response

Temporary explosives facility: This facility will be used during the construction period only. The purpose of the temporary explosives facility is to store explosives that are brought to site during the construction phase. Unlike the permanent facility, the temporary facility is not directly related to mining activities, but rather tied to general construction needs such as site preparation, levelling and prestripping. The quantity of explosives required during construction is linked directly to the site topography and is difficult to predict at this time. Quantities will be determined on an as-needed basis by the site preparation contractor throughout the construction phase.

Permanent explosive facility:

1. Bulk emulsion produce will be stored in two 60 tonne silos (total 120 tonnes) located outside.

2. Ammonium nitrate used in the emulsion fabrication will be stored in an 80 tonne silo.

3. Approximately 10,000 units of detonators will be stored in a separate location at a safe distance from the explosive product.

Effluent Disposal Plan: The explosives plant will be equipped with a septic tank and a polishing pond. The polishing pond effluent will be directed to the PPCP.

Temporary Explosives Factory: The Project does not include a temporary explosives factory and magazine. The temporary facility will be a mobile storage container located on site throughout the construction phase.

Transport Canada

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-1

Source: Transport Canada

Summary of Comment

First line under Mine Study Area Water Bodies states that 4 water bodies will be completely 'in-filled'. Mitta Lake is included as one of these four. Transport Canada's understanding of the project is that Mitta Lake is to be drained for the open pit mine, not in-filled.

Potential Environmental Effects

Clarification is required as to which water bodies are being in-filled, or more precisely, the exact nature of the works and activities that will result in the loss of a water body.

Proposed Action

Clarify and expand on this statement.

Reference to EIS

EIS/EA Report, Version 1, Chapter 6 – Effects Assessment, Section 6.1.3.1.3, 1st sentence on page 6-34

Response

The project activities that may result in changes in lake water levels are discussed in Section 6.1.3.1.1.

The text in the 1st and 2nd paragraphs on the Version 1 page 6-34 (the text now appears on Version 2 page 6-33) under heading "Mine Study Area Water Bodies" is amended as follows:

Four MSA water bodies are completely contained within the Project footprint and will be lost. They are discussed further in Section 6.2.2, Aquatic Ecology. The four water bodies are:

- Mitta Lake (API #12), located within the footprint of the open pit mine. This water body will be dewatered and the sediment on the lake bottom will be removed and stockpiled. Mitta Lake will be lost with the development of the west pit.
- Unnamed Lake 1 (API #13), which is to be used as the Mine Water Emergency Spill Pond. Water levels in this water body will be influenced by mine dewatering and runoff collection from areas within the Project footprint. Unnamed Lake 1 forms part of the water collection system for the Project.
- Unnamed Lake 3 (API #11), located within the footprint of the WRMF. This water body will be in-filled with waste rock from the open pit mining, and will be completely covered over by the WRMF.
- Unnamed Lake 4 (API #2), located within the footprint of the TMF. This water body will be in-filled with tailings, and will be completely covered over by the TMF.

Only one MSA water body, Unnamed Lake 5 (API #8), will be affected by a reduction in its tributary drainage area, and the corresponding changes in inflows to and outflows from the lake, as well as water levels. This water body is located to the east of the TMF and is tributary to Lumby Creek located in the Trap-Turtle-Lynxhead

Bay watershed. The expected changes in monthly mean water levels in the lake were assessed using hydraulic and hydrologic modelling. Details of the modelling approach are provided in the Hydrology TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-2

Source: Transport Canada

Summary of Comment

Second paragraph from the bottom, second sentence beginning 'in addition, the progressive expansion ...' includes the wording '... will fill in or cover over Mitta Lake, four smaller unnamed lakes ...' As per the previous comment, what is the work in association with Mitta Lake? This statement also states 'Mitta Lake and 4 other lakes'. The previous comment states 4 lakes, including Mitta Lake.

Potential Enviromental Effects

The EIS must provide a clear indication of which water bodies will be affected and the exact nature of the proposed works and activities associated with each of those water bodies.

Proposed Action

Provide clarification of the water bodies and associated works, as per the previous comment.

Reference to EIS

EIS/EA Report, Version 1, Chapter 6 – Effects Assessment, 3rd paragraph of Section 6.1.3.1.4, page 6-39

Response

The text will be amended to read as follows:

'In addition, the progressive expansion of the Mine, Overburden Stockpile, WRMF and TMF will cover over entirely sections of several small watercourses, encompass Mitta Lake, and three smaller unnamed lakes and reduce the tributary drainage area to a fifth unnamed lake in the Mine Study Area.'

A clear indication of which water bodies will be affected and by which Project activities will be provided under the subheading "Changes to Navigability due to Changes in Lake Water Levels" in accordance with information request TC-3. The purpose of the text in this section is to identify the bounding (worst case) scenario for changes in navigability.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-3

Source: Transport Canada

Summary of Comment

First line under the section 'Changes to Navigability due to Changes in Lake Water Levels' refers to 4 small lakes to be in-filled. There is no reference to Mitta Lake in this statement (need to clarify as per previous 2 comments). This section does not include discussion of the changes to navigability as a result of lake drainage.

Potential Environmental Effects

The EIS must provide a clear indication of which water bodies will be affected and, the exact nature of the proposed works and activities associated with each of those water bodies.

Proposed Action

Specify which lakes are being referenced and the associated work, as per the previous two comments.

Reference to EIS

EIS/EA Report, Ver. 1, Chapter 6 – Effects Assessment, Section 6.1.3.1.4, 4th paragraph on page 6-41

Response

The text has been amended as follows:

In the MSA, four small water bodies are completely contained within the Project footprint and will be lost as development of the Project progresses. The following lakes will no longer retain any potential for navigation:

- Mitta Lake (API #12), located within the footprint of the open pit mine. This water body will be dewatered and the sediment on the lake bottom will be removed and stockpiled. Mitta Lake will be lost with the development of the west pit.
- Unnamed Lake 1 (API #13), which is to be used as the Mine Water Emergency Spill Pond. Water levels in this water body will be influenced by mine dewatering and runoff collection from areas within the Project footprint. Unnamed Lake 1 forms part of the water collection system for the Project.
- Unnamed Lake 3 (API #11), located within the footprint of the WRMF. This water body will be in-filled with waste rock from the open pit mining, and will be completely covered over by the WRMF.
- Unnamed Lake 4 (API #2), located within the footprint of the base case TMF. This water body will be in-filled with tailings, and will be completely covered over by TMF.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-4

Source: Transport Canada

Summary of Comment

Table 10-1, last row pertaining to TC is not entirely accurate.

Potential Environmental Effects

Important that there is clarity for the potential application of the NWPA.

Proposed Action

In the third column, 'Activities that may require Permit/Approval', this would be better defined as 'Works built or placed in, on, over, under or across navigable waters. The deposition of materials that is liable to interfere with navigation in waters that are navigable or flow into any navigable waters.'

In the last column, 'Permit/Approval required', this should state 'Approval of works under Part I of the NWPA and Proclamation of Exemption under Part II of the NWPA'.

Reference to EIS

EIS/EA Report, Ver. 1, Chapter 10 - Other Approvals, Table 10-1, page 10-4

Response

The table will be amended as follows:

Table 1: Summary of Permitting Requirements (Continued)

Jurisdiction - Department	Applicable Act or Regulation	Activities that may require Permit/Approval	Permit/Approval Required
Federal Transport Canada	*Navigable Waters Protection Act*	■ Works built or placed in, on, over, under or across navigable waters; ■ The deposition of materials that is liable to interfere with navigation in waters that are navigable or flow into any navigable waters.	Approval of works under Part I of the NWPA and Proclamation of Exemption under Part II of the NWPA

INFORMATION REQUEST – TC-5

Source: Transport Canada

Summary of Comment

The second bullet under the 2nd paragraph, last sentence 'If a waterway or water body has the potential to be navigated ...' is not entirely accurate.

Potential Environmental Effects

Clarification

Proposed Action

Suggest that this statement reads '... potential to be navigated, it may be determined navigable. There are a number of other criteria which are also used by Transport Canada to assess navigability.'

Reference to EIS

Hydrology TSD, Version 1, Section 7.1, 2nd bullet under 2nd paragraph, page 164

Response

The history of the waterway or water body includes all navigational use. However, the frequency of navigation may not be the determining factor in classifying navigable waters. If a waterway or water body has the potential to be navigated, it may be determined navigable. There are a number of other criteria which are also used by Transport Canada to assess navigability.

This has been clarified in Part A of the Version 2 Hydrology TSD.

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-6

Source: Transport Canada

Summary of Comment

The legend does not include a definition of the symbols 'F' and 'P'. Are these supposed to be the fibre optics and project transmission line?

Potential Environmental Effects

Clarification

Proposed Action

Suggest these definitions be added to the legend.

Reference to EIS

Hydrology TSD, Version 1, Figure: 7-1, page 167

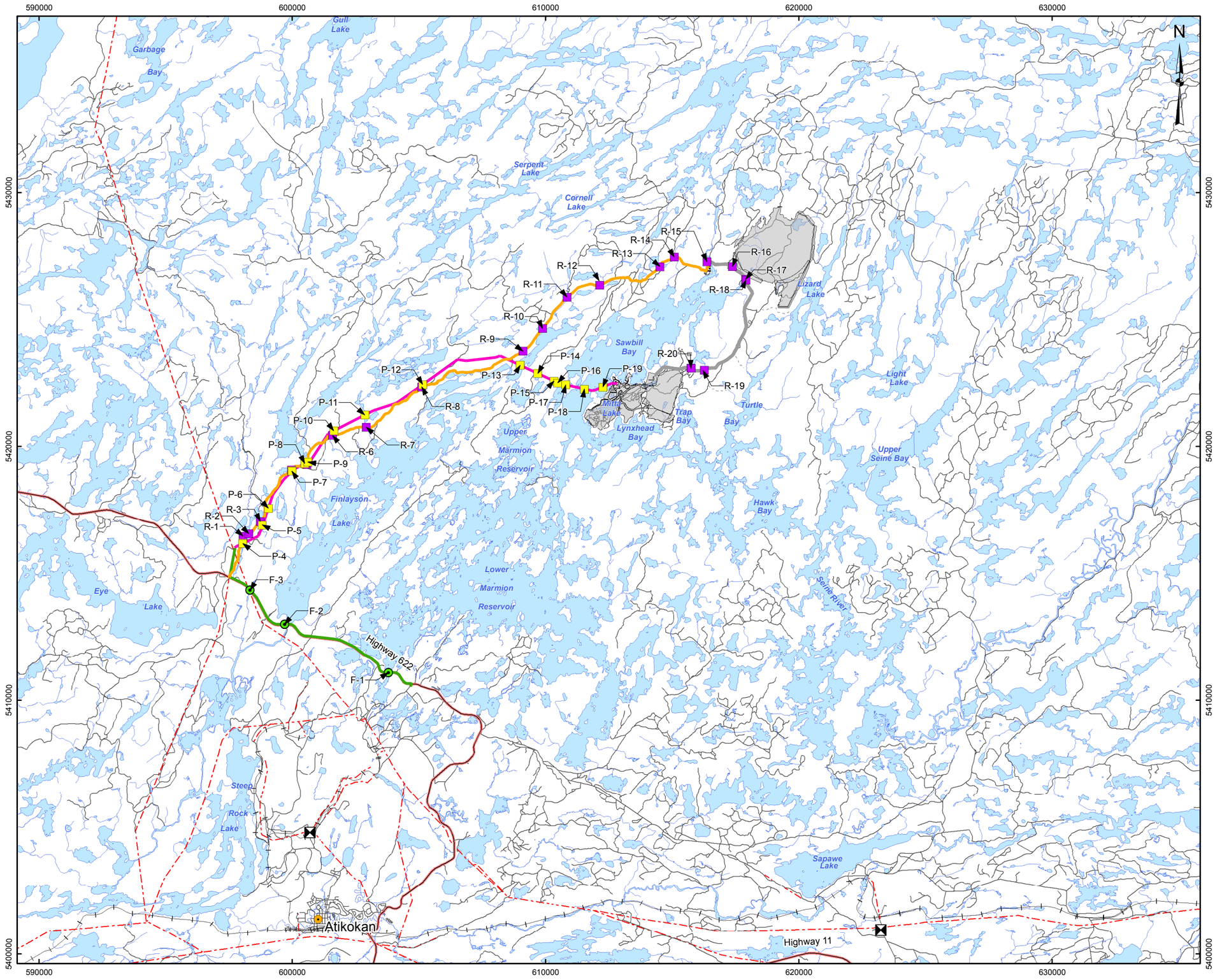
Response

A revised Figure 7-1 is attached with the following amendments:

- The symbols in the legend will be changed to show road crossings, project transmission line/fibre optics line crossings, and fibre optics line only crossings.
- Crossing ID #s B-1, B-2, B-3 and AF-2 will be renumbered to read R-16, R-17, R-18 and R-20 respectively.
- As per Information Request TC-8, crossing ID # F-4 will be added to the figure and renumbered as R-19. Crossing ID # AF-5 is already shown in the figure; it was incorrectly labelled as #AF-2.

Attachments

Revised Figure: 7-1 Water Crossings



LEGEND

- City/Town
- Road Crossing
- Fibre Optics Line Crossing
- Project Transmission / Fibre Optics Line Crossing
- Existing Power Transmission Station
- Provincial Highway
- Road
- Trail
- Existing Railway
- Power transmission line
- River/Stream
- Lake
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Fibre Optics Line
- Project Facilities

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2,000 0 2,000 4,000 6,000 8,000
SCALE 1:150,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
WATER CROSSINGS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	13 Jun. 2013		
CHECK	CC	13 Jun. 2013		
REVIEW	THW	13 Jun. 2013		

FIGURE: 7-1

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INFORMATION REQUEST – TC-7

Source: Transport Canada

Summary of Comment

The first column of the table states “Watercourse ID”. Is this supposed to be “Watershed ID” (which would therefore relate back to the watershed figure)?

Potential Environmental Effects

Clarification.

Proposed Action

Suggest that this first column heading be clarified. It would also be very helpful if there was a corresponding map identifying the sample locations. In its current form, one would have to plot the UTM coordinates to ascertain the tributary location.

Reference to EIS

Hydrology TSD, Version 1, Section 7.2.2.1, Table 7-1, pages 170-172

Response

The heading for the first column should read ‘Watershed ID’. The watershed ID’s correspond to the watersheds in Figure 2-4 on page 20 in Section 2.1.4.

A new Figure: TC-7, Site Scale Watercourses, showing the UTM coordinates at the watershed outlets from Table 7-1 is attached.

Attachments

New Figure: TC-7, Site Scale Watercourses

610000

620000

5430000

5420000

N

Cornell Lake

Sawbill Bay

Mitta Lake

Lynxhead Bay

Lizard Lake

Light Lake

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH

LEGEND

- Sample Location
- Trail
- Road
- River/Stream
- Lake
- Wetland
- Local Watershed Boundary

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

1,000 0 1,000 2,000

SCALE 1:50,000 METRES

PROJECT

HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE

SITE WATERSHEDS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008	FIGURE: TC-7	
GIS	JO	12 Jun. 2013		
CHECK	CC	12 Jun. 2013		
REVIEW	THW	12 Jun. 2013		

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-8

Source: Transport Canada

Summary of Comment

Does the "Watercrossing ID" correspond with Figure 7-1? If so, F-4 and AF-5 do not appear to be on this figure.

Potential Environmental Effects

Clarification.

Proposed Action

Please clarify and, if necessary, provide a corresponding map, as per the previous comment.

Reference to EIS

Hydrology TSD, Version 1, Section 7.2.2.1, Table 7-2, Page 173

Response

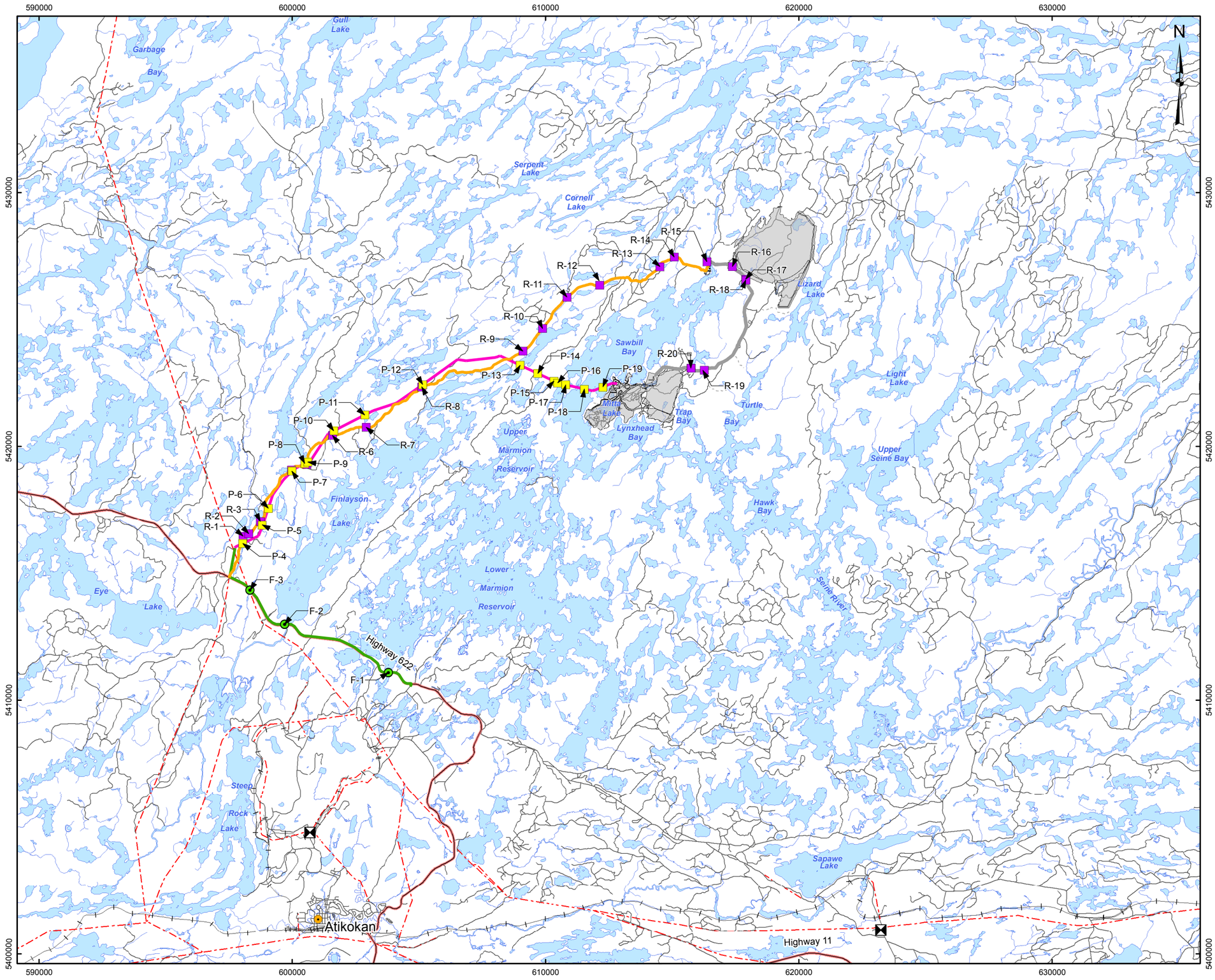
Table 7-2 should correspond with Figure: 7-1 on page 167. A revised Figure: 7-1 is attached which includes crossing ID # F-4. Crossing ID # AF-5 is already shown in the figure; it was incorrectly labelled as AF-2 but has been labelled properly in the revised Figure 7.1.

In keeping with Information Request TC-6, the following revisions to Figure 7-1 have also been made:

- The symbols in the legend have been changed to show road crossings, project transmission line/fibre optics line crossings, and fibre optics line only crossings.
- Crossing ID #s B-1, B-2, B-3, F-4, and AF-5 have been renumbered to read R-16, R-17, R-18, R-19, and R-20 respectively.

Attachments

Revised Figure: 7-1, Water Crossings



LEGEND

- City/Town
- Road Crossing
- Fibre Optics Line Crossing
- Project Transmission / Fibre Optics Line Crossing
- Existing Power Transmission Station
- Provincial Highway
- Road
- Trail
- Existing Railway
- Power transmission line
- River/Stream
- Lake
- Mine Site Road
- Access Road (Hardtack / Sawbill)
- Project Transmission Line
- Fibre Optics Line
- Project Facilities

REFERENCE

Base Data - Provided by OSISKO Hammond Reef Gold Project Ltd.
Base Data - MNR NRVIS, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15N

2,000 0 2,000 4,000 6,000 8,000
SCALE 1:150,000 METRES

PROJECT
HAMMOND REEF GOLD PROJECT
ATIKOKAN, ONTARIO, CANADA

TITLE
WATER CROSSINGS

Golder Associates
Mississauga, Ontario

PROJECT NO. 13-1118-0010			SCALE AS SHOWN	VERSION 2
DESIGN	CGE	14 Nov. 2008		
GIS	JO	13 Jun. 2013		
CHECK	CC	13 Jun. 2013		
REVIEW	THW	13 Jun. 2013		

FIGURE: 7-1

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OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-9

Source: Transport Canada

Summary of Comment

There is no map of sample site locations.

Potential Environmental Effects

Clarification

Proposed Action

As per previous two comments, a map showing the sample locations would be helpful.

Reference to EIS

Hydrology TSD, Version 1, Table 7-3, page 173

Response

The sample locations correspond to the following flow monitoring stations which were installed to gauge flows in the local watersheds:

- SW-01 Sawbill Creek at Sawbill Bay
- SW-03 Lumby Creek below Lizard Lake

The locations of these stations are shown in Figure: 5-1 Local Scale Flow and Water Level Monitoring Stations on page 52 of the Hydrology TSD, Version 1.

As part of the hydrology baseline monitoring program, flow monitoring stations were established in the lower reaches of Sawbill Creek and Lumby Creek (stations SW-01 and SW-03 in Figure 5-1). At the time that the stations were installed, information on the bankfull depth and bankfull width at the stations was collected, and cross-sections of the watercourses were surveyed (Appendix 5.I).

OSISKO HAMMOND REEF GOLD PROJECT EIS/EA
INFORMATION REQUEST RESPONSES

INFORMATION REQUEST – TC-10

Source: Transport Canada

Summary of Comment

Although this table outlines project activities and the potential impacts to water bodies in general, it would be very helpful to have another table that specifically identifies each water body within the infrastructure feature and the impact of this structure/work on the water body.

Potential Environmental Effects

This information would provide a clearer understanding of the proposed works as they relate to each of the water bodies.

Proposed Action

A table such as Table 3-5 from the Aquatic Environment TSD, Ver. 1, (but tailored to navigable waters rather than fish) would be helpful. Please also include details of the actual works. For example: how Mitta Lake will be drained and how the TMF will be constructed to ensure that there is no seepage of materials from the site into adjacent navigable water bodies.

Please also include a column documenting any known navigational use of the water bodies and access to those water bodies (e.g. road, trails, portage, etc.).

Reference to EIS

Hydrology TSD, Version 1, Section 7.3.1, Table 7-8 on pages 177 to 181

Response

Tables 1 and 2 below provide information on the predicted changes to navigable watercourses and water bodies, respectively, in the Local Study Area during the operations phase of the Project. The operations phase is identified as the bounding (worst case) scenario for navigability in Section 7.3.1 on pages 177 to 182.

Table 1: Predicted Changes to Watercourses in the Local Study Area during the Operations Phase

Watercourse[1]	Mine Facility	Project Activity	Predicted Change
B	Mine Site Road	Transport of people and materials	Obstruction (width, depth and height restrictions) due to upgraded road crossings
	Tailings Management Facility (TMF)	Progressive expansion of the TMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 85%; watercourse lost
		Runoff collection from the TMF footprint	
C	Mine Site Road	Transport of people and materials	None; road alignment does not cross watercourse, and reduction in flows and water levels due to the reduction in tributary drainage area will be very small
		Runoff collection from Mine Site Road	

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Watercourse[1]	Mine Facility	Project Activity	Predicted Change
E	Mine Site Road	Transport of people and materials	None; road alignment does not cross watercourse, and reduction in flows and water levels due to the reduction in tributary drainage area will be very small
		Runoff collection from Mine Site Road	
F	Mine Site Road	Transport of people and materials	Obstruction (width, depth and height restrictions) due to upgraded road crossing; very small reduction in flows and water levels due to the reduction in tributary drainage area
		Runoff collection from Mine Site Road	
H	Mine Site Road	Transport of people and materials	None; road alignment does not cross watercourse, and reduction in flows and water levels due to the reduction in tributary drainage area will be very small
		Runoff collection from Mine Site Road	
I	East Pit	Progressive expansion of the east pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 100%; watercourse lost
		Mine dewatering in the east pit footprint	
	Waste Rock Management Facility (WRMF)	Progressive expansion of the WRMF footprint	
		Runoff collection from the WRMF footprint	
J	Ore Processing Facility	Runoff collection from the ore processing facility footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 98%; watercourse lost
K	West Pit	Progressive expansion of the west pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 99%; watercourse lost
		Mine dewatering in the west pit footprint	
	East Pit	Progressive expansion of the east pit footprint	
		Mine dewatering in the east pit footprint	
L	Overburden Stockpile	Progressive expansion of the overburden stockpile footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 98%; watercourse lost
		Runoff collection from the overburden stockpile footprint	
	WRMF	Progressive expansion of the WRMF footprint	
		Runoff collection from the WRMF footprint	

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Watercourse[1]	Mine Facility	Project Activity	Predicted Change
N	Mine Site Road	Transport of people and materials	None; road alignment does not cross watercourse, and reduction in flows and water levels due to the reduction in tributary drainage area will be very small
		Runoff collection from Mine Site Road	
Q	TMF	Progressive expansion of the TMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 95%; watercourse lost
		Runoff collection from the TMF footprint	
R	TMF	Progressive expansion of the TMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 24%
		Runoff collection from the TMF footprint	
AB	East Pit	Progressive expansion of the east pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 68%
		Mine dewatering in the east pit footprint	
	WRMF	Progressive expansion of the WRMF footprint	
		Runoff collection from the WRMF footprint	
AD	East Pit	Progressive expansion of the east pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 86%; watercourse lost
		Mine dewatering in the east pit footprint	
	Low Grade Ore Stockpile	Progressive expansion of the low grade ore stockpile footprint	
		Runoff collection from the low grade ore stockpile footprint	
AF	Mine Site Road	Transport of people and materials	Obstruction (width, depth and height restrictions) due to upgraded road crossing; reduction in flows and water levels due to reduction in tributary drainage area of up to 41%
		Runoff collection from Mine Site Road	
	WRMF	Progressive expansion of the WRMF footprint	
		Runoff collection from the WRMF footprint	
AH	WRMF	Progressive expansion of the WRMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 53%
		Runoff collection from the WRMF footprint	
AI	West Pit	Progressive expansion of the west pit footprint	Reduction in flows and water levels due to reduction in

Watercourse[1]	Mine Facility	Project Activity	Predicted Change
		Mine dewatering in the west pit footprint	tributary drainage area of up to 92%; watercourse lost
AJ	Emulsion Plant and Detonator Storage Area	Runoff collection from the emulsion plant and detonator storage area footprint	None; any reduction in flows and water levels due to the reduction in tributary drainage area will be very small
AK	WRMF	Progressive expansion of the WRMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 42%
		Runoff collection from the WRMF footprint	
AL	Overburden Stockpile	Progressive expansion of the overburden stockpile footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 57%
		Runoff collection from the overburden stockpile footprint	
AM	Overburden Stockpile	Progressive expansion of the overburden stockpile footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 39%
		Runoff collection from the overburden stockpile footprint	
AN	Low Grade Ore Stockpile	Progressive expansion of the low grade ore stockpile footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 64%
		Runoff collection from the low grade ore stockpile footprint	
AP	East Pit	Progressive expansion of the east pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 64%
		Mine dewatering in the east pit footprint	
	Ore Processing Facility	Runoff collection from the ore processing facility footprint	
AQ	West Pit	Progressive expansion of the west pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 43%
		Mine dewatering in the west pit footprint	
AR	West Pit	Progressive expansion of the west pit footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 73%
		Mine dewatering in the west pit footprint	
Sawbill Creek	Access Road	Transport of people and materials	Obstruction (width, depth and height restrictions) due to upgraded road crossing
Lumby Creek	TMF	Progressive expansion of the TMF footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 6.9%; a maximum predicted reduction in monthly flows of 7.7%
		Runoff collection from the TMF footprint	

Watercourse[1]	Mine Facility	Project Activity	Predicted Change
Seine River below Raft Lake Dam	All Mine Facilities	Progressive expansion of the Project footprint	Reduction in flows and water levels due to reduction in tributary drainage area of up to 0.33%; a maximum predicted reduction in monthly flows of 4.9%
		Runoff collection from the Project footprint	
		Water taking for potable and process water supply	
		Treated sewage and waste-water effluent	

Table 2: Predicted Changes to Water Bodies in the Local Study Area during the Operations Phase

Water Body	Mine Facility	Project Activity	Predicted Change
Mitta Lake (API #12)	West Pit	Runoff collection from footprint of west pit	Lake dewatered and sediment from the lake bottom removed and stockpiled during the construction phase; water body lost
Unnamed Lake #3 (API #11)	WRMF	Infilling with waste rock	Water body lost
		Runoff collection from footprint of WRMF	
Unnamed Lake #1 (API #13)	Ore Processing Facility	Use as the Process Plant Collection Pond; part of the water collection system	Water body lost
		Runoff collection from Ore Processing Facility and open pit	
Unnamed Lake #4 (API #2)	TMF	Infilling with tailings Runoff collection from footprint of TMF	Water body lost
Unnamed Lake #5 (API #8)	TMF	Progressive expansion of TMF footprint	Reduction in inflows, outflows and water levels due to reduction in tributary drainage area of up to 30%; a maximum predicted reduction in monthly water levels of 2.1 cm
		Runoff collection from footprint of TMF	
Lizard Lake	TMF	Progressive expansion of TMF footprint	Reduction in inflows, outflows and water levels due to reduction in tributary drainage area of up to 6.9%; a maximum reduction in monthly water levels of 2.7 cm
		Runoff collection from footprint of TMF	

Water Body	Mine Facility	Project Activity	Predicted Change
Upper Marmion Reservoir	All Mine Facilities	Progressive expansion of Project footprint	Reduction in inflows, outflows and water levels due to reduction in tributary drainage area of up to 0.33%; a maximum reduction in monthly water levels of 9.0 cm
		Runoff collection from Project footprint	
		Water taking for potable and process water supply	
		Treated sewage and waste-water effluent	

[1] Watercourses identified by a letter correspond to the main drainage channels in site watersheds identified by the same letter.

Mitta Lake will be drained by pumping with flows used to satisfy construction water requirements at the mine site and TMF, and to provide start-up water in the TMF Reclaim Pond.

The TMF will be contained by dams constructed from rockfill. The dams will be lined with a geomembrane filter to the starter dam height to prevent seepage losses during the early stages of mining. At higher stages, a beach will have developed which will restrict seepage losses from the TMF. A seepage collection system will be constructed against the toe of the dams around the perimeter of the TMF, and water collected will be pumped back into the facility.

Two water bodies within the study area are actively used for navigational purposes: Lizard Lake and Upper Marmion Reservoir. Access to Lizard Lake is through a boat launch approximately 10 km down Lizard Lake Road, the turnoff for which is located at the 35 km mark on Premier Road. Access to Upper Marmion Reservoir through the following five boat launches:

- The Anderson Dam bridge, located directly off Highway 622, approximately 1 km past the Atikokan Generating Station. Provides access via Lower Marmion Reservoir.
- The Sluice Gates via an access road off Highway 622.
- The Raft Lake Dam located approximately 25 km down an access road from Highway 622.
- Upper Seine Bay located approximately 40 km down Premier Road.
- Lower Seine Bay located approximately 10 km down Sapawe Road.

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INFORMATION REQUEST – TC-11

Source: Transport Canada

Summary of Comment

Section 7.3.2 – first section describing the loss, to varying degrees, of watercourses does not elaborate as to which watercourses will be impacted.

Potential Environmental Effects

Clarification.

Proposed Action

The information could be included in the table suggested in the previous comment.

Reference to EIS

Hydrology TSD, Version 1, Section 7.3.2, page 183

Response

The watercourses that will be affected are identified, together with the predicted changes, in Table 1 in the response to Information Request TC-10.

INFORMATION REQUEST – TC-12

Source: Transport Canada

Summary of Comment

Second sentence 'At the site scale, four water bodies...' This is the same statement that was referred to in comment TC-1.

Potential Environmental Effects

Clarification is required as to which water bodies are being in-filled, or more precisely, the exact nature of the works and activities that will result in the loss of a water body.

Proposed Action

Clarify and expand on the explanation of how the water bodies will be eliminated.

Reference to EIS

Hydrology TSD, Version 1, Section 7.3.2, 2nd paragraph on page 184

Response

The text is amended as follows:

At the site scale, four water bodies will be completely contained within the Project footprint and will be lost. These are:

- Mitta Lake (API #12), located within the footprint of the open pit mine. This water body will be dewatered and the sediment on the lake bottom will be removed and stockpiled. Mitta Lake will be lost with the development of the west pit.
- Unnamed Lake 1 (API #13), which is to be used as the Mine Water Emergency Pond. Water levels in this water body will be influenced by mine dewatering and runoff collection from areas within the Project footprint. Unnamed Lake 1 forms part of the water collection system for the Project.
- Unnamed Lake 3 (API #11), located within the footprint of the WRMF. This water body will be in-filled with waste rock from the open pit mining, and will be completely covered over by the WRMF.
- Unnamed Lake 4 (API #2), located within the footprint of the base case TMF. This water body will be in-filled with tailings, and will be completely covered over by the TMF.

The above lakes would no longer retain any potential for navigation.

Also at the site scale, changes in the water levels in Unnamed Lake 5 (API #8), located to the east of the TMF in watershed R, are expected due to a reduction in the drainage area tributary to this lake (runoff from the TMF footprint will be collected in the TMF Reclaim Pond). Changes in the water levels in Unnamed Lake 5 are predicted to be in the range of -2.1 cm to 0.0 cm during the operations phase.

INFORMATION REQUEST – TC-13

Source: Transport Canada

Summary of Comment

The Table of Concordance (Table 7-11) does not capture all of the Aboriginal communities' concerns. For example, according to Appendix 7.V, Seine River First Nation has raised concerns regarding Mitta Lake and this has not been listed in Table 7-11. The Table of Concordance should provide a brief summary of all concerns raised by Aboriginal groups through consultation.

Potential Environmental Effects

A complete list of concerns is required in order to determine the effects that project-induced changes in the environment may cause to the current use of lands and resources for traditional purposes by aboriginal persons. This information is also needed in order to determine the extent to which the Duty to Consult has been discharged.

Proposed Action

Update Table 7-11 to capture all concerns to date.

Reference to EIS

EIS Report Chapter 7 page 51 Table 7-11

Response

Table 7-11 (now Table 7-14 of the Version 2 report) details only written comments that have been received. A full record of all communications, including meetings and workshops is provided in Appendix 7-V.

INFORMATION REQUEST – TC-14

Source: Transport Canada

Summary of Comment

The EIS Executive Summary does not provide a summary of Aboriginal consultation, as per the EIS Guidelines. In addition to summarizing Aboriginal interests in the project, this section should also provide a summary of the Proponent's consultation efforts.

Potential Environmental Effects

This is a requirement of the EIS Guidelines. It is needed to order to ensure that Executive Summary provides an overview of all key aspects of the environmental assessment.

Proposed Action

Include a summary of Aboriginal consultation in the Executive Summary.

Reference to EIS

EIS Executive Summary

Response

The Executive Summary has been updated to closely match the exact structure of the EIS/EA Report. Each Chapter of the report is directly linked to a section in the Executive Summary. This includes Chapter 7, which provides the details of consultation activities.

INFORMATION REQUEST – TC-15

Source: Transport Canada

Summary of Comment

The EIS report does not provide a summary of outstanding issues, as per the EIS guidelines.

Potential Environmental Effects

It is important to have a clear list of outstanding Aboriginal concerns/issues for the regulatory phase of the project.

Proposed Action

Provide either a list of outstanding issues or include an additional column which addresses this in the Appendix 7.V tables.

Reference to EIS

None

Response

Section 7.1.5 of Chapter 7 entitled "Outstanding Concerns from the Public" provides a summary of outstanding issues as per the EIS Guidelines.

INFORMATION REQUEST – TC-16

Source: Transport Canada

Summary of Comment

The Aboriginal issue tables included in the Appendix 7.V section could be made more complete. For instance, there are numerous sections were the response column is blank. These tables should be as complete and as up to date as possible. Furthermore, as was mentioned above, it is suggested that these tables include an outstanding issues column.

Potential Environmental Effects

The information provided must be complete, in order to determine the effects that project-induced changes in the environment may cause to the current use of lands and resources for traditional purposes by aboriginal persons. This information is also needed in order to determine the extent to which the Duty to Consult has been discharged.

Proposed Action

Update and complete the tables to capture all issues, responses, follow-up and outstanding issues.

Reference to EIS

Appendix 7.V

Response

Aboriginal concerns are detailed in Section 7.3 of Chapter 7 Public and Aboriginal Consultation and the corresponding Appendix 7-V Record of Consultation – Aboriginal. Two key tables within these documents provide a record of key issues raised by Aboriginal communities and outline both where within the EIS/EA Report the issue is fully addressed as well as communication activities that took place to specifically discuss and follow up on key issues.

These tables have been updated to include activities that took place up to October 15, 2013 and revised for clarity based on comments received from the Government Review Team.

Outstanding issues are summarized in Section 7.3.6 of Chapter 7. The outstanding issues are also summarized under the “Follow Up” column found in the Appendix 7-V table.