DORIS NORTH PROJECT

TYPE A WATER LICENCE AMENDMENT PACKAGE No. 02- SUPPORTING MEMO

September 2010
Project #1009-002-54(2)

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DORIS NORTH PROJECT

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DORIS NORTH PROJECT
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1. INTRODUCTION

This memo is intended to provide information to support the Amendment Package No. 02 to the Doris North Type A Water Licence 2AM-DOH0713.

The activities/infrastructure addressed in this memo are as follows:

- Roberts Bay Fuel Tank Farm Expansion and Secondary Containment
- Doris North Airstrip Expansion & Airstrip Bypass Road
- Construction of Secondary Containment and Sumps for Reagent and Cyanide Storage

The following sections present information that was identified in the Supplementary Information Guidelines prepared by the Nunavut Water Board (NWB) as being applicable to this amendment application, and as identified in the Concordance Table enclosed with this amendment application.

2. ENVIRONMENTAL SETTING & BASELINE

NWB Information Request: Provide a brief overview of the environmental setting in the area where the proposed infrastructure/activities will occur.

A description of the environmental setting for the area was included in the Doris North Final EIS (Miramar 2005). The areas included in this amendment were covered in the Doris North Final EIS or the existing Type B Water Licence for water withdrawal from Windy Lake (2BE-HOP0712).

Chapter 4 of the Doris North EIS includes a description of the environmental setting for topography, geologic conditions, hydrologic characteristics, climate conditions, seismicity, and permafrost conditions. A description of the regional and local surface water regime and drainage areas relevant to this amendment were also included in the Doris North EIS.

The following sections provide requested information outlined in the NWB's Supplemental Information Guidelines. Information presented is either from the Doris North EIS or more recent information gathered as part of on-going compliance or baseline monitoring programs for the Doris North Project.

2.1 Description of Regional Setting

NWB Information Request: Provide a description of the regional setting using maps and/or aerial photos with scales that allow the determination of distances between the objects depicted.

The Doris North Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound (Figure 2.1-1). The nearest communities are Omingmaktok (~75 km to the southwest of the property), Cambridge Bay, and Bathurst Inlet (~160 km to the southwest of the property).

Figure 2.1-1

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Doris North Project Location Map

Figure 2.1-1

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The property consists of a greenstone belt running in a north/south direction, approximately 80 km long, with 3 main deposit areas. The Doris North deposit is located in the northern portion of the belt.

The northern portion of the belt (where the Doris North deposit is) consists of several watershed systems that drain into Roberts Bay, and a large river (Koignuk River) that drains into Hope Bay. Watersheds in the southern portion of the belt ultimately drain into the upper Koignuk, which drains into Hope Bay. The entire area lies within the Bathurst Inlet-Burnside Watershed.

Climate in the region can be described as a sub-Arctic desert with limited rainfall. Prevailing winds are from the northwest. Most precipitation falls as rain during the summer, and an average of 10 cm of snow per month falls during the winter (WKRLUP, 2005).

The property is located within the Queen Maud Gulf Lowlands, which covers the east central portion of the West Kitikmeot region. This area is made up of undulating plains near the coast, to massive Archean rocks rising to 300 metres above sea level in the south (WKRLUP, 2005). The coastal areas are mantled by postglacial silts and clays, and exposed bedrock, Cryosol soils, and marine deposits are common. Permafrost is continuous and deep with low ice content (WKRLUP, 2005).

The area lies within the Slave Geological Province, which is underlain by granite and related gneisses, as well as by sedimentary and volcanic rocks (more than 2.5 billion years old) (WKRLUP, 2005).

The nearest Environment Canada climate station with a 30 year climate normal is Kugluktuk. The mean annual temperature is approximately -10.6˚C with a summer mean of 6.9˚C (June to September) and a winter mean of -19.4˚C (October to May). The mean annual precipitation range is 200–300 mm (Environment Canada website).

The region is characterized by long dark winters and short summers. The ground is covered in snow from October to June most years. Lakes are ice-covered from approximately October to June most years, with ice thickness reaching depths of 2.0 metres.

2.2 Description of Local Setting

NWB Information Request: Provide a description of the local setting using maps and/or aerial photos with scales that allow the determination of distances between the objects depicted.

Chapter 4 of the Doris North Final EIS includes a description of the local setting of the areas relevant to this amendment. Further specific details are provided below.

Figure 2.2-1 shows the watershed boundaries in the Doris North Project area. All proposed activities in the amendment package are contained within the northern tip of the Doris Watershed or the area on land just north of the Doris Watershed. The areas where the fuel containment facility expansion and the airstrip expansion are proposed are in the area outside of the Doris Watershed (to the north) that would drain into Roberts Bay. The construction of new sumps would all be done on the existing Doris pad, which is located in the northern portion of the Doris Watershed. The Doris Watershed drains northward into Little Roberts Lake, which drains into Roberts Bay. The land north of the Doris Watershed where the existing road and Roberts Bay laydown area is has no defined streams but would ultimately drain into Roberts Bay.

Following are descriptions of the areas where the proposed amendment activities would occur.

2.2.1 Expanded Fuel Storage and Containment Facility, Fuel Tank Farm, Laydown Area near Roberts Bay

The area around the proposed fuel storage and containment facility is generally dry, and there are no fish-bearing waters affected by the proposed footprint.

The tank farm will be built in a primarily rocky area with no permanent streams or ponds, and there are no fish-bearing waters affected by the proposed footprint.

For the laydown area, there are two small streams originating near the proposed footprint. The larger of the two streams originates east of the current airstrip and south of the rock deposit area (Plate 2.2-1). The smaller stream originates immediately east of the proposed laydown area, just north of the rock deposit area. Both streams run north and drain into a wetland area. Neither of these upper reaches contained fish. Portions of both upper streams become subsurface flows before reaching the wetland (Plate 2.2-2). This may create a barrier, preventing fish access to the upper reaches. The wetland area then drains into Roberts Bay via a single outflow. This lower stream does contain nine-spine stickleback, but the stream is at least 200 m from the nearest mine footprint.

The rocky outcrop where the tank farm would be built is classified as poor quality habitat for caribou, grizzly bears and most breeding birds because it does not include available forage or cover areas for most tundra-nesting birds (Plate 2.2-3). It is also not sufficiently tall to support raptor breeding and no raptor nesting sites were found there during any annual raptor surveys conducted over the 2000 to 2010 period.

Plate 2.2-1. Upper stream flowing parallel to proposed laydown area and into Roberts Bay.

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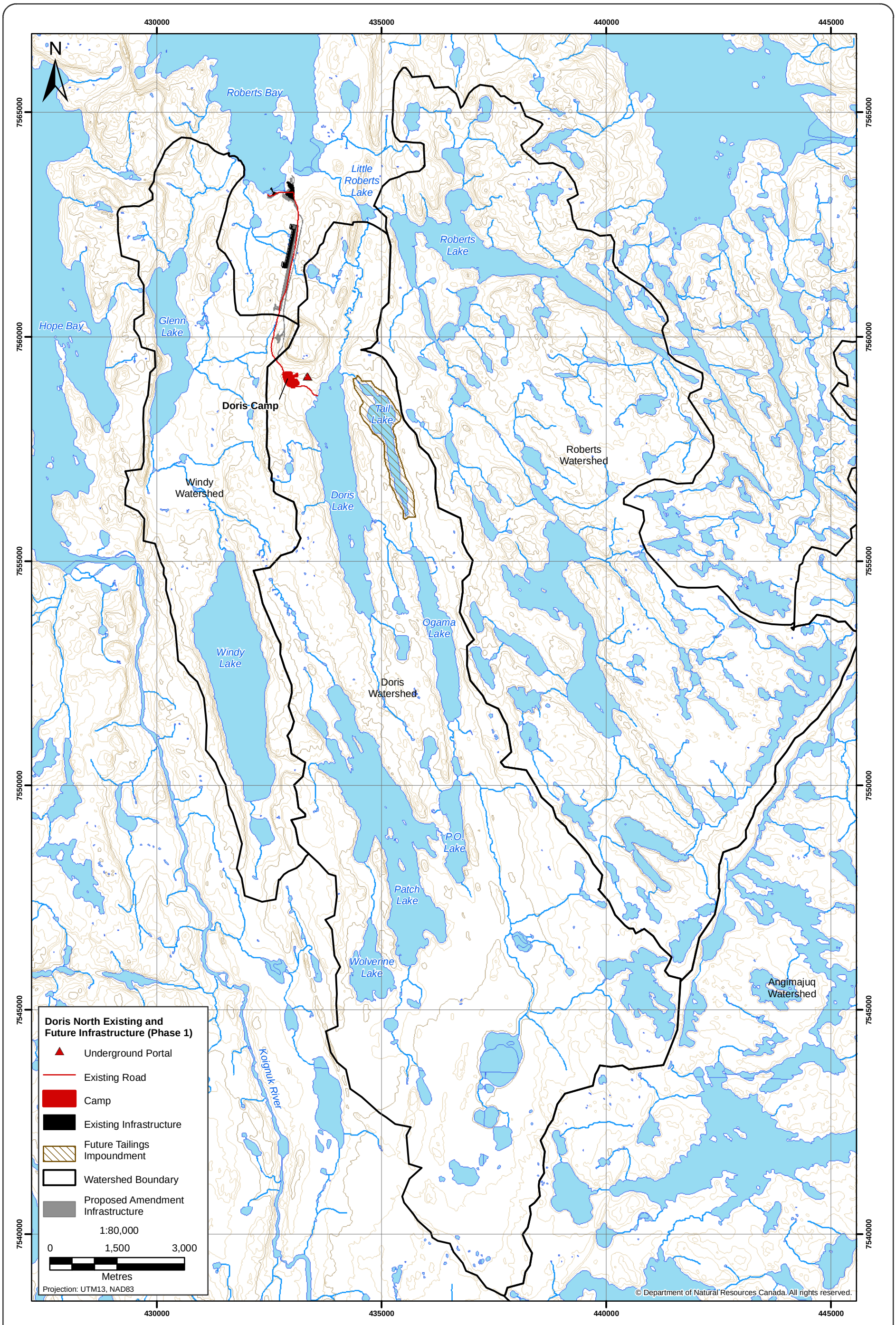

Figure 2.2-1

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Doris North Project Drainage Basins

Figure 2.2-1

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Plate 2.2-2. Upper stream from proposed laydown area becoming subsurface flow and forming a barrier to fish passage.

Plate 2.2-3 Rock outcrop in proposed expanded Roberts Bay laydown area.

2.2.2 Airstrip Expansion Area & Bypass Road

There are five ponds and two streams in this area. All the ponds are shallow and none contain fish; nor do they appear to allow access to suitable overwintering habitat (Plate 2.2-4). Of the 2 streams, neither is fish bearing in the area near the airstrip. However, the larger stream is connected to a pond west of the airstrip that contains abundant nine-spine sticklebacks. Fish were found in the lower reaches of this stream, about 700 m from the proposed expansion area, but do not appear to access the upper reaches near the airstrip.

Plate 2.2-4. Pond on west side of current airstrip. No fish were present.

The terrestrial ecosystems in the airstrip expansion and bypass road areas are predominantly wet meadow (45%) and hummock tussock tundra dominated by various grass and sedge species (Plate 2.2-5). As with the majority of the wildlife study area, these areas were classified by habitat suitability mapping in the 2005 Doris North Project Final EIS as moderate to good quality grizzly bear and caribou habitat. However, given the disturbances, noise and human presence in the adjacent Project area, these expansion areas are likely not used as frequently by large mammals as areas further removed. Wet meadow and tussock hummock tundra is also habitat for many species of birds. These habitat types are widely represented on the landscape and not limited to the proposed expanded areas.

2.3 Baseline Information

NWB Information Request: Indicate whether any baseline information has or will be collected as part of this amendment.

Numerous baseline studies have been conducted in the area of the Doris North Project since the mid 1990s. Many studies were conducted before the preparation and submission of the Doris North EIS. The Final Doris North EIS included numerous baseline reports (as supporting documents).

Additional baseline studies have been conducted since the Doris North Final EIS was submitted. The following list of baseline reports includes the Doris North Project area including the geographical area of the proposed amendment activities:

- 2009 Hydrology Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. December 2009.
- 2009 Freshwater Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. February 2010.
- Air Quality Compliance Report for Section 4 Item 30 of the Project Certificate, Doris North Gold Mine Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. November 2009.
- Wildlife Mitigation and Monitoring Program, Doris North Gold Mine Project 2009. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. January 2010.
- Aquatic Effects Monitoring Plan, Doris North Gold Mine Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. February 2010.
- 2009 Meteorology Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. December 2009.
- 2009 Freshwater Fish and Fish Habitat Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. May 2010.

In addition, baseline studies were also conducted in the Doris North Project area in 2010. These baseline reports will be available in the future. Baseline studies conducted in 2010 included: meteorology, hydrology, freshwater, freshwater fish and fish habitat, marine, marine fish and fish habitat, wildlife, vegetation, and mapping.

In order to ensure that no fish habitat was affected by the proposed amendments, site visits were made to all proposed amendment activity areas. Information from these site visits is included in this report in the fish habitat section.

2.4 Consultation and Baseline

NWB Information Request: Provide a description of the results of any consultation with Elders regarding the collection of baseline data.

Public consultation was conducted as part of the Doris North EIS regulatory process. A summary of the consultation conducted as part of the Doris North Project can be found in Chapter 1, Section 1.6 of the Doris North Final EIS (Miramar 2005). Results of consultation were used throughout the environmental assessment and regulatory phase of the Doris North Project.

Hope Bay Mining Limited has been conducting on-going consultation activities since acquiring the leases for the Doris North Project. These activities have been summarized in the Annual Reports to the Nunavut Impact Review Board.

Most recently, HBML has conducted a community tour, in which the proposed amendments included in this amendment package were presented and discussed. Baseline studies being conducted in the Doris North area were also presented and discussed. Table 2.4-1 provides a summary of the communities that were visited, and the number of estimated attendees.

Table 2.4-1. Public Meeting Dates and Attendance

Date	Community	Attendance*
Friday, August 20	Kugluktuk	6
Monday, August 23	Cambridge Bay	13
Tuesday, August 24	Taloyoak	34
Wednesday, August 25	Kugaaruk	18
Thursday, August 26	Gjoa Haven	50

**Attendance numbers estimated from draw prize entries and visual observations*

The communities where Elders were in attendance included Gjoa Haven, Taloyaok, and Kugaaruk. The turnout in Kugluktuk was lower than anticipated due to poor weather. Many of the people who attended the Cambridge Bay meeting were involved with regulatory agencies or local organizations with an interest in the project.

For the 3 communities where Elders were present, the following questions/topics were discussed:

1. Gjoa Haven: Discussion topics included opportunities for work, employment requirements, training, scheduling, and activities in the Windy Lake area.

2. Taloyoak: Discussion topics included climate change, possible site visits for local residents, mine abandonment, training and opportunities for youth, helicopter use and wildlife, and potential effects on human health.

3. Kugaaruk: Questions were primarily on training and employment opportunities and applications.

A topic relevant to baseline collection in the Doris North area is the discussion on helicopter use and wildlife. HBML is in ongoing discussions on this issue with the GN-DOE and NIRB. The opinion of the Elders in Kugaaruk will be incorporated into future discussions between the GN-DOE and HBML. HBML is working on updating methods for monitoring wildlife in the area, and the comments from Elders in Kugaaruk will be directly factored into these plans.

In addition to the recent community visit, HBML hosted a group of Elders for a site tour in July of 2010. This same group of Elders was also brought to site in 2009.

Under the existing commercial lease between the KIA and HBML for the Doris North Project, HBML is required to involve an Inuit Environmental Advisor Group that can provide KIA and HBML with advice on environmental management matters.

On July 22, 2010 HBML brought a group of Elders and members of the Inuit Environmental Advisor Group to site. KIA staff were also present. HBML provided a tour of site, including areas that are covered in this amendment package. Specific advice was sought to determine optimum locations of caribou crossing structures for the Windy all weather road. These locations have been fixed with the group and are on file with the KIA and HBML. There were no concerns raised during the tour by the Elders about plans associated with the proposed amendments in this package.

The same group of Elders were also brought to site in 2009 for a general site visit. They stayed for a day and were able to see the site operations and ask any questions. There were no pressing issues to resolve so the 2009 tour could be characterized as a familiarization tour.

2.5 Historical Uses of Water

NWB Information Request: Provide a description of the historical uses of the waters affected by the amendment.

Historical uses of water in the Doris North area were addressed in the Doris North EIS (Doris North EIS Supporting Documents, Section E1). All of the waters potentially influenced by the proposed amendments were included in the Doris North Project Final EIS.

The following text is a summary of what information was included in the Doris North Final EIS.

The *Inuit Qaujimajatuqangit* (Inuit Traditional Knowledge) workshop held in September 2003 revealed that the Hope Bay Belt area has historically been a popular fishing area. Inuit Elders and other knowledge holders from the communities of Cambridge Bay, Kugluktuk, Gjoa Haven, and Taloyoak commented that Doris Lake and surrounding lakes were commonly fished for Arctic char, lake trout, and lake whitefish.

Lakes in the Project area were historically used as a source of drinking water. Participants in the *Inuit Qaujimajatuqangit* workshop explained that drinking water sources were typically selected based on indicators such as water clarity, depth, substrate type, and taste and smell.

Archaeological studies of the Project area also found evidence of stone circles, hunting blinds, caches, and other structures throughout the Hope Bay Belt, including near the shores of Doris and Windy lakes (Doris North EIS Supporting Documents, Sections E4 and E5). These findings support the results of the *Inuit Qaujimajatuqangit* workshop and highlight the historical importance of the Project area.

3. POTENTIAL ENVIRONMENTAL EFFECTS & CUMULATIVE EFFECTS

3.1 Predicted Environmental Impacts

NWB Information Request: Does the proposed amendment change the predicted environmental impacts of the undertaking and the proposed mitigation measures?

The proposed amendment activities that result in expanded footprint areas do not change the predicted environmental impacts as originally assessed in the Doris North Project Final EIS (Miramar 2005). The Doris North Project has numerous required mitigation measures in place in the form of management plans and monitoring programs. The existing Doris North management and monitoring programs include the geographical area and activities associated with the proposed amendments in this package.

3.2 Traditional Water & Land Use

NWB Information Request: Confirmation that no new traditional water use and land use areas may be impacted by the changes to the project.

The proposed amendment activities do not include any new geographical areas that were not included in the Doris North Project final EIS.

3.3 Fish Habitat

NWB Information Request: With respect to fisheries, confirm whether changes have any impact or potential impact on fisheries. If applicable, provide baseline data and an evaluation of baseline data describing fish and fish habitat in the project area. The applicant is advised to consult with DFO

regarding fish and fish habitat related issues and to visit DFO's website at http://www.dfo-mpo.gc.ca/habitat/habitat-eng.htm. Indicate whether the applicant has consulted with DFO and provide the results of any consultation.

Baseline fish and fish habitat information has been collected for all areas of the expanded footprint associated with this amendment (i.e. the expanded fuel storage and containment facility, tank farm, and laydown area near Roberts Bay, the airstrip and bypass road). This information was shared with engineers to allow adaptive planning, such that any potential habitat alteration, disruption, or destruction (HADD) could be avoided. The type of habitat, its location, width and depth, and presence/absence of fish are recorded in Table 3.3-1.

Based on the environmental data gathered, the infrastructure plans for this Type A amendment have been engineered to avoid impacts on the aquatic environment.

Because the expanded infrastructure footprint was developed adaptively, through the use of environmental data collected in concert with engineering planning, the amendment will have a negligible impact on fish habitat. There are no structures being placed within or across water bodies, and a minimum 30 m setback is maintained from all waterbodies. This includes waters in which no fish were found, but which could be temporary fish habitat during spring high water levels.

The Doris North area supports populations of Arctic char and lake trout, both of which are important in Inuit subsistence fisheries. There is also a limited commercial fishery for Arctic char in the region. However, there will be no effect on fisheries as a result of this amendment. None of the waterbodies proximal to the expanded footprint contain char or lake trout habitat; nor do they support lake trout or char populations. The only species found in the area of the expansion is nine-spine stickleback, and even stickleback habitat has been avoided by at least 30 m in the current expansion plan.

Table 3.3-1. Description and Fish-Bearing Status of Aquatic Habitat in Proximity to the Proposed Amendment Activities

Footprint area	Habitat type	UTM East	UTM North	Mean width	Mean depth	Temp.	pH	Fish present
Fuel storage and containment	NA	NA	NA	NA	NA	NA	NA	no
Tank farm	NA	NA	NA	NA	NA	NA	NA	no
Laydown area	Stream	433172	7562659	0.3 m	0.1 m	9.2 C	7.72	no
Laydown area	Stream	433083	7563110	0.3 m	0.1 m	9.2 C	7.72	no
Airstrip expansion area	Stream	432959	7562256	4.5 m	0.5 m	10.2 C	7.46	no
Airstrip expansion area	Pond	432931	7562245	55.0 m	0.4 m	8.5 C	8.56	no
Airstrip expansion area	Pond	432937	7562134	100.0 m	0.3 m	9.8 C	8.46	no
Airstrip expansion area	Pond	432840	7562062	30.0 m	0.3 m	10.0 C	8.46	no
Airstrip expansion area	Pond	432707	7561563	50.0 m	0.3 m	9.8 C	8.52	no
Airstrip expansion area	Pond	432918	7561654	25.0 m	0.3 m	10.0 C	8.46	no
Airstrip expansion area	Stream	432806	7561632	0.3 m	0.1 m	9.4 C	7.81	no

Expanded fuel storage and containment facility

There are no fish-bearing waters affected by this footprint. The area around the proposed fuel storage and containment facility is generally dry.

Tank farm

There are no fish-bearing waters affected by this footprint. The tank farm will be built in a primarily rocky area with no permanent streams or ponds.

Laydown and excavated rock deposit area

There are two small streams originating near this area. The larger of the two streams originates east of the current airstrip and south of the rock deposit area (Plate 2.2-1). The smaller stream originates immediately east of the laydown, just north of the rock deposit area. Both streams run north and drain into a wetland area. Neither of these upper reaches contained fish. Portions of both upper streams become subsurface flows before reaching the wetland (Plate 2.2-2). This may create a barrier, preventing fish access to the upper reaches. The wetland area then drains into Roberts Bay via a single outflow. This lower stream does contain nine-spine stickleback, but the stream is at least 200 m from the nearest mine footprint.

Airstrip expansion area & bypass road

There are five ponds and two streams in this area. All the ponds are shallow and none contain fish; nor do they appear to allow access to suitable overwintering habitat (Plate 2.2-4). Of the 2 streams, neither is fish bearing in the area near the airstrip. However, the larger stream is connected to a pond west of the airstrip that contains abundant nine-spine sticklebacks. Fish were found in the lower reaches of this stream, about 700 m from the proposed expansion area, but do not appear to access the upper reaches near the airstrip.

3.4 Water Source

NWB Information Request: Provide a description of the effects of changes to water usage on the source from which water will be drawn, including the potential for drawdown, if any.

There are no proposed activities associated with water usage as part of this amendment package.

3.5 Potential Effects of Water Use & Waste Disposal

NWB Information Request: Identify the potential effect of water use and waste disposal relating to the amendments, on the following components: Vegetation, Aquatic Ecosystems, Wildlife.

3.5.1 Vegetation

NWB Information Request: Identify the potential effect of water use and waste disposal relating to the amendments, on the following components: Vegetation including: species composition and abundance, non-native species introduction, accumulation of toxins and heavy metals (in relation to remediation objectives for closure).

There are no proposed activities associated with water usage as part of this amendment package.

The only proposed amendment activity involving waste disposal is construction of additional sumps. As all sumps will be constructed on existing pads, there are no anticipated effects to vegetation.

3.5.2 Aquatic Ecosystems

NWB Information Request: Identify the potential effect of water use and waste disposal relating to the amendments, on the following components: Aquatic Ecosystems including: Fish, benthic invertebrates, plankton.

There are no proposed activities associated with water usage as part of this amendment package.

The only proposed amendment activity involving waste disposal is construction of additional sumps. The additional sumps to be constructed on site will all have monitoring stations established, and the monitoring location will be determined by the INAC inspector. All sump water will be handled as per the existing Doris North Project Type A Water Licence. Sump water will be tested and not released into the receiving environment unless it meets the criteria outlined in the Type A Water Licence. As such, the construction of additional sumps is not expected to impact aquatic ecosystems in the project area.

3.5.3 Wildlife

NWB Information Request: Identify the potential effect of water use and waste disposal relating to the amendments, on the following components: Wildlife.

There are no proposed activities associated with water usage as part of this amendment package.

The only proposed amendment activity involving waste disposal is construction of additional sumps. As all sumps will be constructed on existing pads, there are no anticipated effects to wildlife.

3.6 Potential Effects by Project Phase

NWB Information Request: Identify effects separately for each project phase.

The Doris North Project final EIS provided an assessment based on each project phase. The proposed amendments are not anticipated to result in effects, so no further details are provided.

3.7 Methods of Effects Prediction

NWB Information Request: Provide a description of the methods used to predict effects.

The Doris North Project Final EIS outlined the methods used to predict effects of the Doris North Project (Chapter 5 of the Final EIS). The proposed amendments have geographical areas that lie within the geographical area included in the Doris North Project Final EIS.

The following text is copied from Section 5 of the Doris North Final EIS.

Valued Environmental Components (VECs) were selected based on both western scientific data and *Inuit Qaujimajatuqangit.*

The detailed analysis of potential adverse environmental effects resulting from the Project is focused on VECs, determined by the Project team after full consideration of potential Project-environment interactions and a good understanding of the nature of the Project and the local area.

For each VEC, the environmental assessment methodology included the following steps:

- description of the existing environment;

- description of environmental assessment boundaries (administrative, spatial and temporal);
- a consideration of *Inuit Qaujimajatuqangit*;
- an assessment of likely future conditions without the Project;
- an environmental effects assessment;
- a consideration of cumulative environmental effects; and
- a summary of environmental design, mitigation and monitoring measures.

The environmental effects analysis included the identification of criteria against which to assess the significance of environmental effects. The analysis included a review of the pathways of potential environmental effects, a consideration of the project activities which may contribute to those pathways, and a consideration of potential effects in each phase of the Project including construction, operations, closure, postclosure, and accidental events. In each VEC chapter, the potential adverse environmental effects of the Project are described, as appropriate, using the following factors: magnitude; geographic extent; timing/duration and/or frequency; reversibility; ecological and socio/cultural context.

For the amendments proposed in this package, the activities and geographical areas were assessed in the Doris North Final EIS. No significant effects are expected as a result of the proposed amendment activities/infrastructure.

In order to confirm that none of the proposed amendments would adversely affect fish habitat, proposed footprint areas were surveyed in the field in August of 2010. If any habitat was found that could be fish-bearing, the field information was used to re-design the proposed infrastructure. The final proposed infrastructure amendments provided in this package avoid all fish habitat, and maintain a minimum 30 m setback from all fish habitat. These were the methods used to avoid effects (rather than predict effects), but by avoiding effects the need to rely on predictions is eliminated.

3.8 Cumulative Effects

NWB Information Request: Provide a cumulative effects assessment of the changes to the project's water use and waste disposal activities in relation to other activities in the same drainage basin.

The cumulative effects assessment conducted in the Doris North Project Final EIS (Miramar 2005) included the proposed footprint amendment activities that involve waste disposal. Please see Chapter 5 of the Doris North Project Final EIS and supporting document D6 for details of the cumulative effects assessment that was conducted.

3.9 Accidents and Malfunctions

NWB Information Request: Identify effects arising from accidental events or malfunctions relating to the changes.

Potential accidents or malfunctions that could arise from the proposed amendment activities include:

- Accidental fuel spills (from proposed new tank farm); and
- Accidental other spills (from storage areas, sumps).

Hope Bay Mining Limited, as part of the Doris North Project, has the following management plans in place that would be followed in the event on an accidental spill:

- Emergency Response Plan
- Hazardous Waste Management Plan, and
- Spill Contingency Plan.

Effects arising from accidental spills or malfunctions were included in Doris North Final EIS (Miramar 2005). The potential effects would be the same as considered in the Doris North Final EIS.

The potential effects of a fuel spill would vary depending on whether the spill occurred on land or near the marine or freshwater environment. The time of year would also determine the potential effects. All of these factors are considered in the Spill Contingency Plan. The current Spill Contingency Plan will be updated to include the proposed new Tank Farm near Roberts Bay.

3.10 Traditional Knowledge

NWB Information Request: Provide details as to how traditional knowledge was considered and incorporated in environmental analysis.

Traditional knowledge, or Inuit Qaujimajatuqangit, was considered and incorporated in the Doris North Project Final EIS (Miramar 2005). Please refer to Supporting Document, Section E1 for a report on the traditional knowledge that was available and used for the environmental analysis. The Doris North Project Final EIS covered the activities associated with the proposed amendments.

The following text provides a brief description of how traditional knowledge was considered and incorporated in the Doris North Project environmental analysis.

In May 2003, Miramar Hope Bay Ltd. (MBHL) conducted a review of Inuit Qaujimajatuqangit (Inuit traditional knowledge) available for the Kitikmeot Region. To supplement this information, an Inuit Qaujimajatuqangit workshop was held in September 2003 with Inuit Elders and other knowledge holders from the communities of Cambridge Bay, Kugluktuk, Gjoa Haven, and Taloyoak. The purpose of the workshop was to gather information about current and historical land and resource use, and to identify any key sensitive areas or periods of the year (e.g., caribou migration periods).

Results of the workshop and the review of Inuit Qaujimajatuqangit were considered and incorporated into the selection of Valued Environmental Components (VECs), which formed the basis of the environmental assessment process (see Section 3.7). Inuit Qaujimajatuqangit was incorporated in to every section of the VECs and VSECs of the Doris North Project Final EIS.

4. MITIGATION, MANAGEMENT, & MONITORING

4.1 Monitoring Sites

NWB Information Request: Describe proposed additional locations of environmental monitoring sites resulting from changes.

The only proposed amendment activity for which additional monitoring locations are anticipated is the construction of new sumps. Additional monitoring locations associated with newly constructed sumps will be determined with an INAC inspector and HBML site personnel.

4.2 Mitigation, Management, and Monitoring Programs

NWB Information Request: Provide a description of any proposed mitigation, management and monitoring programs to mitigate adverse impacts.

The Doris North Project has existing management and monitoring plans that will encompass the proposed amendment activities. The following monitoring plans already include the geographical areas and proposed activities associated with the amendments in this package:

- The Aquatic Effects Monitoring Program;
- The Wildlife Mitigation and Monitoring Program; and
- The Noise Abatement Plan.

The Aquatic Effects Monitoring Program (AEMP) was initiated in 2010. This program includes monitoring locations in both freshwater and marine environments around the Doris North Project area (as well as reference areas well away from the Project area), and includes locations in the Doris Watershed, Little Roberts Lake and Outflow, Roberts Bay, 2 freshwater reference areas, and 1 marine reference area. The AEMP includes the monitoring of water quality, sediment quality, phytoplankton, periphyton, benthic invertebrates, and fish.

The Wildlife Mitigation and Monitoring Program (WMMP) has been ongoing for a number of years. This program has undergone refinements based on discussions between HBML, NIRB, CWS, and the Government of Nunavut, Department of Environment. The geographical areas associated with the proposed amendments are included in the monitoring area covered in the WMMP. The WMMP includes the monitoring of caribou, muskox, breeding birds, raptors, waterfowl, seabirds, grizzly bears, and wolverine. Monitoring evaluates the population and breeding success of wildlife populations adjacent to the mine site and at a greater distance (control areas).

Mitigation for wildlife would include scheduling construction activities during the least risk work timing windows, in particular for waterfowl and songbirds that have been observed nesting and foraging along the edge of the existing airport strip and for grizzly bears that have been observed along Roberts Bay. Wildlife monitoring activities will occur during construction activities that have the potential to cause negative impacts on wildlife or their habitat and will be conducted by qualified environmental monitors. Pre-construction surveys would also be required to ensure that no incidental wildlife or nests were present.

The Noise Abatement Plan is closely associated with the WMMP, as it includes the noise abatement mitigation measures to reduce or eliminate the potential effects of noise on wildlife. Again, this plan encompasses all of the current Doris North Project activities, and the activities associated with the proposed amendments will be covered in the existing Noise Abatement Plan.

In addition to the above programs/plans, the following plans are also in place for the Doris North Project:

- Oil Pollution Prevention Plan/Oil Pollution Emergency Plan;
- Emergency Response Plan;
- Hazardous Waste Management Plan;
- Incinerator Management Plan;
- Doris North Landfarm Management and Monitoring Plan;
- Spill Contingency Plan;
- Quality Assurance and Quality Control Plan;
- Hope Bay Quarry Monitoring; and

- Doris North Infrastructure Project Management Plan.

5. LIST OF REPORTS AND PLANS

NWB Information Request: Provide a list of studies, reports and plans relevant to the application that have been undertaken to date.

Numerous baseline studies have been conducted in the area of the Doris North Project since the mid 1990s. Many studies were conducted before the preparation and submission of the Doris North EIS. The Final Doris North EIS included numerous baseline reports (as supporting documents).

Additional baseline studies have been conducted since the Doris North Final EIS was submitted. The following list of baseline reports includes the Doris North Project area including the geographical area of the proposed amendment activities:

- 2009 Hydrology Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. December 2009.
- 2009 Freshwater Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. February 2010.
- Air Quality Compliance Report for Section 4 Item 30 of the Project Certificate, Doris North Gold Mine Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. November 2009.
- Doris North Gold Mine Project: Incinerator Stack Testing Compliance Report for Section 4 Item 30 of the Project Certificate. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. February, 2010.
- Wildlife Mitigation and Monitoring Program, Doris North Gold Mine Project 2009. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. January 2010.
- Aquatic Effects Monitoring Plan, Doris North Gold Mine Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. February 2010.
- 2009 Meteorology Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. December 2009.
- 2009 Freshwater Fish and Fish Habitat Baseline Report, Hope Bay Belt Project. Prepared for Hope Bay Mining Limited by Rescan Environmental Services. May 2010.

In addition, baseline studies were also conducted in the Doris North Project area in 2010. These baseline reports will be available in the future. Baseline studies conducted in 2010 included: meteorology, hydrology, freshwater, freshwater fish and fish habitat, marine, marine fish and fish habitat, wildlife, vegetation, and mapping.

REFERENCES

Golder Associates Ltd. 2006. *Report on Bathymetric Surveys, Hope Bay Project, Hope Bay, Nunavut*. Prepared by Golder Associates Ltd. for SRK Consulting Canada Inc. October, 2006.

Miramar 2005. Final Environmental Impact Statement. Doris North Project, Nunavut, Canada. Miramar Hope Bay Ltd. October 28, 2005.

WKRLUP. 2005. West Kitikmeot Regional Land Use Plan. Draft. Public Hearing, Cambridge Bay, January 18-19, 2005.