



**POLARIS MINE**

**DECOMMISSIONING AND RECLAMATION ACTIVITIES**

**QUARTERLY REPORTING – 4th QUARTER 2003**

**SUBMITTED TO**

**THE NUNAVUT WATER BOARD**

**AND TO THE**

**DEPARTMENT OF INDIAN AND NORTHERN AFFAIRS CANADA**

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## **1. EXECUTIVE SUMMARY IN INUKTITUT**

Refer to Appendix 1 for an executive summary of plans, reports and studies conducted under this licence during the period October 1, 2003 to December 31, 2003 that has been translated into Inuktitut.

## **2. INTRODUCTION**

This is the fourth quarterly Decommissioning and Reclamation progress report submitted in relation to the Polaris Mine's Decommissioning and Reclamation Plan ('Closure Plan') and in compliance of the Water Licence NWB1POL0311 issued on April 24, 2003 with an effective date of March 1, 2003.

The Polaris Closure Plan dated March 2001 received its initial conditional approval April 15, 2002. The Closure Plan was jointly conditionally approved by the Nunavut Water Board ('NWB') and the Department of Indian and Northern Affairs Canada ('INAC'). The Closure Plan has subsequently received further approvals. The approvals contain reporting requirements and this document has been prepared to consolidate all of the reporting requirements into one document. This report is being submitted to both NWB and INAC on a quarterly basis with an annual report completed by March 31<sup>st</sup> of the subsequent year.

## **3. STATUS OF AUTHORIZATIONS AND/OR APPROVALS**

As of December, 2003, the status of project approvals received during the quarter was as follows:

1. Polaris Mine Decommissioning and Reclamation Plan – March 1, 2001
  - Previously approved.
2. DFO Authorization Under the Fisheries Act to Decommission Garrow Lake Dam and Decommission the Marine Dock and Adjacent Shoreline
  - Previously approved.
3. Application to the NWB and INAC for additional underground storage locations for disposal of hydrocarbon contaminated soils submitted on September 16, 2003.
  - Approved during the 4<sup>th</sup> Quarter.
4. Request for Modification of Haulage Location (Garrow Lake dam core material into the barge excavation) dated October 15, 2004.
  - Outstanding at the end of the 4<sup>th</sup> Quarter.
5. Application to Place Metals Contaminated Soils in LRDQL and Remaining Hydrocarbon Contaminated Soils Underground in the Mine dated December 19, 2003.
  - This was approved during the 4<sup>th</sup> Quarter.

## **4. UNAUTHORIZED DISCHARGES AND SUMMARY OF FOLLOW UP ACTIONS**

There were no unauthorized discharges of water or effluent during the 4th Quarter of 2003.

## 5. PROGRESS REPORT OF STUDIES / PLANS REQUESTED

The routine monitoring required as part of the Closure Plan approvals and the Water Licence are included in other sections of the report and so are not duplicated in this section of the report.

The Closure Plan approvals and/or the Water Licence require submission of the following plans and/or reports:

- a) Certified landfill cover design specifications and plans were submitted during the 3<sup>rd</sup> Quarter.
  - Approval with conditions was granted in the 4<sup>th</sup> Quarter.
- b) Certified design drawings and specifications for Garrow Lake Dam Decommissioning were submitted during the 3<sup>rd</sup> Quarter.
  - Approval with conditions was granted in the 4<sup>th</sup> Quarter
- c) Certified specifications and design drawings for sealing the mine entrances were submitted during the 3<sup>rd</sup> Quarter.
  - Approval was granted in the 4<sup>th</sup> Quarter.
  - The following design modifications and/or actions will be done to address concerns identified in the Approval:
    - a. TCL will relocate the North Portal seal deeper into the mine to ensure there is at least 10 metres of cover (or approximately 2 tunnel diameters) of rock cover which is in excess of what has been requested.
    - b. Determining actual overburden thickness versus rock thickness is not practical at this time. To ensure there is more than adequate cover thickness over the concrete seals, we will ensure that all the seals are placed deep enough into the mine that there is at least 10 metres of cover over the seal. This represents approximately 2 times the tunnel height (or more). Revised locations will be presented on the as-built drawings after construction of the seals has been completed.
    - c. The area where the seals are installed will be inspected prior to installation to confirm that there are no faults in the vicinity.
    - d. There will be no void space above the concrete portal seal. Muck placed between the seal and the tunnel entrance will be packed as tight as possible by mobile equipment. In no case shall the void space above the muck pile be more than 0.5 metres in height. This will be done by pushing the muck to the back using a scooptram with a push plate attached.
  - The portal seal design drawings were also submitted to the Workers' Compensation Board for review and approval. Appendix 9 of this report contains a copy of a letter from Sylvester Wong, Chief Inspector of Mines approving the designs as submitted.
- d) Certified specifications and design drawings for Decommissioning the Marine Dock and Adjacent Shoreline were submitted during the 3<sup>rd</sup> Quarter.
  - Approval with conditions was granted in the 4<sup>th</sup> Quarter
- e) Questions Regarding the Garrow Lake Wave Break Structure from the NWB and DIAND were received December 22, 2003.

- Response from Teck Cominco Limited (TCL) was outstanding at the end of the quarter.
- f) Requirement to Submit a Spill Response Plan as per the Water Licence.
- A spill response plan was submitted earlier in 2003 with regulator reviews resulting in requests for revisions. The Spill Plan was updated and re-submitted in December addressing the regulators comments and updating the Plan to reflect personnel and other changes at the site during the year.
  - Appendix 8 contains a listing supplied by SNC-Lavalin Engineers and Constructors of the emergency spill response training conducted during the year. In March, 2003 there was a spill of diesel fuel (reported as required) due to a leak in a fuel line. SNC-Lavalin responded to the spill in accordance with the spill response plan and the incident in itself became a practice session that was real rather than simulated.
- g) Environmental Effects Monitoring (EEM) Program Progress.
- In December, TCL and its consultants met with the technical advisory committee of Environment Canada to review the results of the 2003 field season EEM study results and to discuss the scope and details of the 2004 field work being considered. At the end of the quarter TCL is awaiting response of its proposals from Environment Canada.
- h) During August, the field work for study program required under the Department of Fisheries and Oceans (DFO) Fisheries Authorization related to Garrow Lake was undertaken. Water quality data was collected, sediments sampled and sculpins collected for analysis.
- At the end of the quarter, work had begun on preparation of the report for DFO which should be available by early 2<sup>nd</sup> quarter of 2004.
- i) TCL's request to store additional hydrocarbon contaminated soils underground was approved in a letter dated December 22, 2004.
- The approval contained disposal requirements which will be complied with as the hydrocarbon contaminated soils are placed underground.
  - The authorization also requires that a table of information be developed and submitted with this quarterly report that:
    - Presents data to the end of the 3rd Quarter 2003.
    - Presents the original volumes of contaminated materials identified in the DRP.
    - Presents the quantities of soils disposed of to date.
    - Presents the predicted volume of soils yet to be disposed of.
    - Presents the volume of the mine workings filled with contaminated soils and the usable volume of the mine remaining available.
 This information is presented in Appendix 6 along with the mine plans of areas filled to date.
- j) In December, TCL received a letter from NWB and DIAND commenting on the contents of the 1<sup>st</sup> and 2<sup>nd</sup> quarterly reports.
- Additional information regarding percentage completion of the project and the various elements was requested. This has been incorporated into Section 7 ('Update of Decommissioning and Reclamation Schedule') of this report.



- Additional information was requested related to cost estimates provided and explanations of variances from the original budgets. This has been incorporated into this report along with the 4<sup>th</sup> Quarter budget update in Section 8 of this report.

## **6. DECOMMISSIONING AND RECLAMATION PROGRESS REPORT**

Reclamation activities continued at higher than expected levels for the fall season to accomplish as much work as possible due to the increased quantities of contaminated soils over original estimates. Work also continued later in the fall than planned to gain as much extra earthmoving time as possible. Work related to earth excavation proceeded until the ground froze hard enough that productivity became unacceptably low. Manpower then decreased to minimal level as Christmas approached. Manpower levels were as follows:

	<u><b>Peak</b></u>	<u><b>Minimum</b></u>
October	120	94
November	105	72
December	72	20

### **6.1. Building Demolition**

#### **6.1.1. Mill / Offices / Warehouse Facilities / Barge**

- As previously reported the barge has been demolished and the debris hauled to LRDQL and laid out in the pit bottom awaiting burial. Barge hull debris is being further processed (cut into smaller pieces) in LRDQL to lower the height of the debris to ensure there are no voids created by burying sections that are too large.

#### **6.1.2. Concentrate Storage Building**

- Five column stubs are all that remain of the building structure. They will be removed in the early spring of 2004.

#### **6.1.3. Thickener Building**

- A short section of tails line remaining near Garrow Lake shoreline was removed in December. There is a run of tailings line remaining up slope from the former Concentrate Storage Building. It will be removed in the spring.
- Final clean up by hand around the thickener building area remains outstanding. To be done in the spring once the snow melts.

#### **6.1.4. CRF Plant**

- Previously completed.

#### **6.1.5. Fuel Tank Farm**

- No further activity until 2004.

#### **6.1.6. Accommodations Building**

- No demolition activities in this area have been initiated as the facility will remain in active use until the summer of 2004.

#### **6.1.7. Other Buildings / Structures**

- No activities.

## **6.2. Earthworks**

### **6.2.1. Marine Dock and Adjacent Shoreline**

- Work ceased in the dock area early in October waiting for the sea ice to form. Weather during October delayed further significant work until early spring of 2004.
- Re-contouring of the shoreline north of the dock was on-going from Oct 10<sup>th</sup> to the end of November. Much of the protective berm at the edge of shoreline was removed once the sea ice thickened north of the dock. The sea ice will protect the shoreline from wave action until re-contouring work has been completed.

### **6.2.2. Garrow Lake Dam**

- Excavation of the dam proceeded through until November using an excavator with a ripper to avoid the need for blasting. The ground became too hard to productively work so activities were suspended until March/April of 2004.

### **6.2.3. Operational Landfill**

- As of November 16, approximately 16,000 cu.m. of limestone cap material was reported to have been placed by SNC. Hauling continued until November 30<sup>th</sup> at which time 98% of the cap had been placed. Will complete next spring once the snow is gone.

### **6.2.4. Little Red Dog Quarry Landfill ('LRDQL')**

- Blasting from Bench 3 and 4 of LRDQL was on-going during the quarter until November 17<sup>th</sup> to supply limestone cover materials for the Operational Landfill. Dam shell and core materials (c/w Styrofoam insulation) were hauled and placed into LRDQL as fill for burying demolition materials.

### **6.2.5. Back 40 Area (Including CRF Area, New Quarry, North Pit, Subsidence Area, North Portal Area)**

- Minimal activities re-contouring in this area due to winter weather. Substantial progress was made the previous quarter when the active layer was thawed.

### **6.2.6. Exploration Waste Rock Dump**

- Continuing to remove contaminated soils from this area until ceasing work November 16<sup>th</sup>.

### **6.2.7. Temporary Dock**

- Is forecast to be removed in March. The temporary dock consists of a number of robust steel I beams anchored into the sea bottom. There are no sheet piles associated with the temporary dock either now or in the past. In March while the ice extends to the base of the I-beams (they are in shallow water), the ice can be dug out with an excavator and the I-beams cut off just below the sea bottom. In this way sedimentation during the removal process will not be a concern.

### **6.2.8. Roadways**

- No activity other than snow clearing.

## **6.3. Contaminated Soil Remediation**

The Polaris Mine Decommissioning and Reclamation Plan (DRP) identified a number of locations at the mine site that had potential environmental concerns (Figure 18, Volume 1 of the DRP). These areas were identified as a result of the environmental assessments

conducted by Gartner Lee Ltd. (GLL) in 1999 and 2000 and reported in Volumes 3 and 4 of the DRP. Teck Cominco Limited (TCL) has contracted GLL to oversee the detailed assessment of these areas and to monitor the soil remediation activities. GLL has updated Figure 18 from the DRP renumbering the areas to more precisely identify them (Refer to Figure 1 in Appendix 2 of this report). TCL has been methodically remediating each of these areas. GLL guides the remediation work utilizing field screening tools such as the X-ray Fluorescence Analyzer (which can analyze for metals), Photo Ionization Detector (for hydrocarbon vapor testing) and Handby kit (for hydrocarbon concentrations in soils). As the remediation of each area is completed, GLL conducts confirmatory sampling and forwards the samples to a commercial laboratory for analysis. Once the laboratory results are received and a review of the data confirms that the remedial targets (approved in the DRP) have been achieved, then GLL prepares a 'Close-Out' report to document that successful remediation of the area has been completed. As remediation of soils in each of the areas is completed, Figure 1 of Appendix 2 will be updated to identify where work has been completed and where remedial work remains outstanding.

TCL's schedule has been to complete all of the required work on site by September 2004 (as indicated in the DRP). At that time, TCL will demobilize all personnel and equipment from the site. It is our intent to provide regulators with documentation of successful remedial work as far in advance of this date as possible. If there is additional remedial work required it is critical that this be identified as far in advance of the demobilization date as possible so that follow up work can be completed. For this reason TCL is submitting documentation of completed contaminated soils remediation as the work is completed for each discrete area rather than submitting one massive report at the end of the project for review.

**TCL requests that the NWB and DIAND review the Close-Out reports as they are submitted in the quarterly reports and identifies any unresolved issues or concerns related to the areas being reported. TCL will assume that regulators are satisfied with soils remediation in these areas if no comments are received.**

#### **6.3.1. Concentrate Storage Shed and Area**

- During October, final clean-up of the floor area was completed. In some areas contaminated soils were removed to bedrock. Small quantities of residual contaminated concentrate dusts have filtered into the cracks of the bedrock preventing further contaminant removal. Clean beach gravel fill was hauled in as a cover material which was completed October 26<sup>th</sup>. Refer to Appendix 2-A for a detailed discussion of remedial efforts employed for the Concentrate Storage Shed in the Close-Out report titled 'Former Concentrate Storage Shed Area'.
- Areas surrounding the perimeter of the Concentrate Storage have only limited remedial work completed to date and will be address in 2004.

#### **6.3.2. Cemented Rock Fill (CRF) Plant Area**

- As previously reported, both building demolition and soils remediation have been completed. Refer to Appendix 2-B for the GLL Close-Out report titled 'Former CRF Plant Fuel Storage Tank'.

**6.3.3. Former Quonset Huts Fuel Storage Area**

- An area of potential concern was identified in the 1999/2000 environmental site assessment, locally known as the High Arctic Club and associated maintenance shed. This was an area suspected of having hydrocarbon contaminated soils. Additional investigations were completed by GLL staff and confirmatory samples indicated no hydrocarbon concentrations exceeding the remedial targets. GLL's Close-Out report for this area is included in Appendix 2-C and is titled 'Former Quonset Huts Fuel Storage Area'.

**6.3.4. Tailings Thickener Building and Area**

- While some minor clean-up of building debris is still required in this area, the soils in the area have either been verified as meeting the remedial targets (without requiring remedial work) or as in the case of the spills pond beside the thickener, remedial activities have been undertaken and successfully completed. The results of the remedial efforts are reported in Appendix 2-D in the GLL report titled 'Former Tailings Thickener Area'.

**6.3.5. Former Fuel Bladder Storage Area**

- Remedial work in this area was completed earlier in the year. Attached in Appendix 2-E is the GLL Close-Out report for this area titled 'Former Fuel Bladder Storage Area'.

**6.3.6. Former Crusher Area**

- This area was identified as having potential for metals contaminated soils in the 1999/2000 environmental site assessments. In early August approximately 1,800 cu.m. (loose volume) of metals contaminated soils were excavated in this area. In the 3<sup>rd</sup> Quarter, confirmatory sampling was completed. Appendix 2-F includes the GLL Close-Out report for this area titled 'Old Crusher Area'.

**6.3.7. Main Snow Dump**

- Remedial work was completed in the 3<sup>rd</sup> Quarter. The GLL Close-Out report titled 'Main Snow Dump' is included in Appendix 2-G.

**6.3.8. North Portal Ore Stockpile**

- Remedial work was completed in the 3<sup>rd</sup> Quarter with confirmatory sampling results received in the 4<sup>th</sup> Quarter. Refer to Appendix 2-H for the GLL Close-Out report titled 'North Portal Stockpile'.

**6.3.9. Exploration Waste Dump / Stockpile Area and Shoreline North of Dock**

- The exploration waste rock dump was identified as an area of contamination in the DRP without a quantity being assigned. Substantial contaminated soils have been identified and remediated in this area. As the contamination in this area has been quantified, it has increased the estimate of the overall quantities of contaminated soils to be remediated at site. Remedial activities in this area have now been completed. This area is adjacent to the shoreline north of the dock and is reported in the Close-Out Report titled 'Exploration Stockpile and Shoreline North of the Dock' (Figure 1, Area #23) and is attached in Appendix 2-I of this report.
- This does not infer that the final contouring or re-grading has been completed in this area, only that the contaminated soils have been remediated. Additional work re-grading of the foreshore remains to be completed.

#### **6.3.10. June 2002 Oil Spill Area**

- Polaris had an oil spill at the tank farm facilities on June 25/26, 2002. Terrestrial remediation was initiated immediately and soils above the foreshore of the ocean were remediated by July 6, 2002. Gartner Lee Ltd. was on site to monitor the clean up activities and conducted the confirmatory sampling confirming the remedial targets were achieved. GLL prepared an assessment report dated November 2002 and it was submitted to the NWB and DIAND on December 2, 2002.
- Remediation of the foreshore remained outstanding at the end of 2002 and was completed early in the spring of 2003. GLL has prepared a Close-Out report titled '2002 Fuel Spill' for the foreshore area and it is enclosed in Appendix 2-J.

#### **6.3.11. Marine Dock and Adjacent Foreshore Areas**

- Minor excavation in the dock area occurred at the beginning of October removing the final remains of the hydrocarbon contamination in Cell #3. Confirmatory sampling results will be provided once excavation work is complete in this area.
- Excavation in the shoreline north of the dock continued until November 4<sup>th</sup> and activity ceased until the new year.

#### **6.3.12. Barge Area**

- Hauling of metals and hydrocarbon contaminated soils for disposal in the mine was on-going until work ceased in mid November. Hydrocarbon contamination is extending beyond expected boundaries, increasing the forecast quantities of contaminated soils. As a result additional assessment of adjacent areas using a drill was conducted to better define contaminant boundaries and to improve the accuracy of forecast quantities. As of November 10<sup>th</sup>, all excavated hydrocarbon contamination had been placed underground and approximately 30,000 cu.m. of metals contaminated soils had been stockpiled. Additional metals and hydrocarbon contaminated soils remain to be excavated from this area in 2004.

### **6.4. Disposal of Hazardous Materials / Special Wastes**

As of December 3, 2003 the following inventory of fluids was on hand:

• 15W30 and 0W30 used oil	252 drums
• Coolant (clean)	72 drums
• Methyl Hydrate	28 drums
• Tellus Arctic	20 drums
• Varsol	4 drums
• Glycol	150 drums
• Equipment Lube oil	40 drums
• Waste Oil	90 drums
• Waste Fuel	160 drums

Incineration of waste hydrocarbons continued during the period with the following quantities being incinerated during the quarter:

<b>2003</b>	<b>Wastes</b>	<b>Fuel</b>
October	10,876	2,306
November	15,616	2,743
December	0	0
<b>Total Quarter</b>	26,492	5,049
Total YTD	50,118	8,559

Units – Imperial Gallons

- The Incinerator was mothballed in December as crew levels were decreased for the Christmas period. It will be utilized in 2004 to complete incineration of remaining hydrocarbon wastes and newly generated wastes (oil changes in mobile equipment, draining glycol from equipment as it is scrapped and from cleaning fuel tanks as they are decommissioned).

## **7. UPDATE OF DECOMMISSIONING AND RECLAMATION SCHEDULE**

Appendix 3 contains an updated decommissioning schedule current as of December 31, 2003. The source of the data for the schedule is primarily from our demolition contractor. There are some revisions to the near term portions of the schedule as more detailed planning occurred. The project is still forecast to be completed by the end of September of 2004.

Reviews of previous quarterly reports indicated a desire to obtain regular updates on the percentage completion of the various work elements of the project. An additional column has been added to the schedule presented in Appendix 3 which estimates this for each line item in the schedule. This will be updated each quarter.

Reviews of previous quarterly reports indicated a desire to obtain regular updates on the percentage completion of the project as a whole. ***It is our judgment that as of December 31, 2003 the project is 71% complete*** (excluding site monitoring required subsequent to 2004).

## **8. PROJECT COST ESTIMATE UPDATE**

### **8.1. Update of Estimated Mine Decommissioning, Reclamation and Monitoring Costs**

Appendix 4 contains the detailed estimate of the Polaris Mine Decommissioning and Reclamation Plan (DRP) cost forecast updated as of December 31, 2003 in accordance with Part B, Item 3 and Part G, Item 21 and forecasts costs to the end of 2011.

In summary, total DRP costs to December 31, 2003 were \$43,655,000. Estimated costs to complete decommissioning, reclamation and monitoring through to 2011 have increased to \$62,312,000 from an original budget of \$47,500,000. The cost report included in Appendix

4 contains discussions of the forecast project cost variances relative to the original budget as requested in the quarterly report review document submitted to TCL in December by the NWB and INAC.

## **9. RECLAMATION SECURITY REQUIREMENTS**

Teck Cominco has submitted detailed documentation in the quarterly reports to the NWB and INAC. Excellent progress has been made in decommissioning and reclamation activities at the site on all fronts in accordance with the approved Decommissioning and Reclamation plan. The project as a whole is approximately 71% complete at year end.

While TCL has identified that there are substantial increases in quantities of contaminated soils over original estimates, TCL has been addressing this by extending the fall work season later than originally anticipated and by increasing crew sizes sooner in the New Year than originally anticipated in order to keep the project on schedule. Work is still forecasted to be completed on schedule in the fall of 2004.

Outstanding reclamation liabilities have been decreasing rapidly due to the high level of reclamation effort expended in 2003. At the end of the 4<sup>th</sup> Quarter of 2003 a detailed review of costs was conducted based on the progress made during the year and with the updated knowledge that the quantities of contaminated soils have increased substantially. The current forecast of the outstanding liability has decreased to \$18,600,000 as of December 31, 2003. Teck Cominco currently has submitted \$18,000,000 in security.

Work is continuing to progress at the site and by the time that this report is reviewed by the NWB and INAC the outstanding liability at the site will be less than \$18,000,000.

**Teck Cominco requests that as provided in the Water Licence under Part B, Paragraph 3 that the NWB and INAC agree to adjust the security requirements to \$18,000,000.**

## **10. PUBLIC CONSULTATION / PARTICIPATION**

There were no public meetings held in the quarter.

Inuit employment was 14 people in October, 10 people in November and two people in December. This was a reflection of earthmoving activities decreasing as temperatures on site decreased into the winter season. Anticipate that Inuit employment will increase as earth moving activities increase again 2004.

## **11. SUMMARY OF WORK DONE IN RESPONSE TO INSPECTION / COMPLIANCE REPORTS**

There were no site inspections during the 4<sup>th</sup> Quarter. The review of TCL's 1<sup>st</sup> and 2<sup>nd</sup> Quarter 2003 reports by the NWB and INAC contained a request for additional information regarding the project cost variances relative to the original budget. The requested information is included in the Section 8 'Project Cost Estimate Update' in the 4<sup>th</sup> Quarter report and will continue to be

submitted with the quarterly reports in the future. The quarterly report review also requested that percentage complete estimates be included in the quarterly reports and this is being done starting with this report.

The review also requests TCL to state whether or not TCL is requesting a reduction in security requirements. TCL is requesting an adjustment to the security requirements as identified above in Section 9 of this report.

## **12. FRESHWATER USE**

Freshwater use from Frustration Lake for all uses during the 4<sup>th</sup> Quarter of 2003 was:

October 2003	3,514 cu.m.
November 2003	4,814 cu.m.
December 2003	<u>18,926 cu.m.</u>
Total 4 <sup>th</sup> Quarter	64,695 cu.m.
Total 3 <sup>rd</sup> Quarter	27,254 cu.m.
Total 2 <sup>nd</sup> Quarter	29,088 cu.m.
Total 1 <sup>st</sup> Quarter	<u>56,927 cu.m.</u>
Total Annual Used 2003	177,964 cu.m.

Water use for the year was within the 250,000 cubic metres authorized for 2003 in Part C of the Water Licence.

## **13. PHYSICAL MONITORING OF SITE**

### **13.1. Disposal of Demolition Debris and Contaminated Soils**

#### **13.1.1. Disposal of Demolition Debris Into Little Red Dog Quarry Landfill**

The approval letter for Landfill protocols requires us to report a record of materials (preferably in digital form). Refer to Appendix 5 for a listing of both quantities and general descriptions of the types of demolition debris transported to LRDQL during the quarter, drawings of disposal locations, and a photographic log of the work during the period. Any equipment originally containing hazardous materials such as hydraulic oils, fuel, greases and/or batteries are required to undergo an inspection to verify they have been properly prepared for disposal. As decommissioning of the mechanical portions of the barge facility was completed in prior periods, and there were no mobile equipment discarded in the period, there are no hazardous material inspections to report this period.

#### **13.1.2. Disposal of Metals / Hydrocarbon Contaminated Soils Underground in the Mine**

In the December 22, 2003 letter of approval for disposal of additional hydrocarbon contaminated soils underground, it was requested that a table be submitted that identifies:

- The original volumes of contaminated materials identified in the DRP.
- The quantities of soils disposed of to date.
- The predicted volume of soils yet to be disposed of.
- The volume of the mine workings filled with contaminated soils to date.
- The usable volume of the mine remaining available.



A table has been developed and is included in Appendix 6 of this report. Also included in Appendix 6 are the detailed plans of the mine levels showing where the contaminated soils have been placed to the end of December 2003.

## **13.2. Thermistors Data**

### **13.2.1. Garrow Lake Dam**

Siphoning of Garrow Lake was completed in the 3<sup>rd</sup> Quarter of 2003. Removal of the dam commenced so that the thermistors in the dam have been decommissioned so there is no temperature data to be reported in the 4<sup>th</sup> Quarter of 2003 or beyond.

### **13.2.2. Operational Landfill**

The Operational Landfill has the cover cap approximately 98% installed by the end of the 4<sup>th</sup> Quarter. As the work on the cap is not complete, the current thermistors would not provide relevant data so that recording of temperature data has been temporarily discontinued. Once construction of the cap is complete in the spring of 2004, monitoring of temperature data will resume. The Closure Plan states that a minimum of three will be maintained to confirm that freezing of the landfill has occurred.

### **13.2.3. Little Red Dog Quarry Landfill**

Filling of LRDQL continues. The heavy metal pipes installed as housings for the thermistors have remained intact while LRDQL is filled debris and soils. Once placing of the debris and soils are complete and the pipes are extended to their final elevation, thermistor strings will be installed in the pipes. Thermistor readings will then be recorded on a monthly basis while personnel are on site and after the fall of 2004, they will be monitored during regular site inspections.

## **13.3. Erosion Monitoring**

### **13.3.1. Garrow Lake Erosion Pins**

Not required in the winter season as the lake is frozen.

### **13.3.2. Marine Dock and Adjacent Foreshore Erosion Monitoring**

Not required in the winter season as the ocean is frozen. Early in the 4<sup>th</sup> Quarter before the ocean froze, there was no active work occurring below high tide level.

## **14. GARROW LAKE STRATIGRAPHIC MONITORING**

The Water Licence requires that a monitoring event of Garrow Lake Stratigraphy be conducted during the mid-winter, maximum ice thickness and at maximum ice melt during the summer. In previous reports, the mid winter and maximum ice thickness sampling have been submitted. The maximum ice melt sampling is normally conducted during mid August when there is usually (but not always) a brief period where Garrow Lake is ice free. Due to personnel and equipment problems the summer sampling of Garrow Lake was not able to be completed while it was ice free. To attempt to sample as soon after the maximum ice free period as possible, the ice thickness of Garrow was monitored so that the sampling event could be accomplished after the ice became strong enough to be safe to work from. However, testing of the ice thickness in October indicated that it was still not safe to take equipment out onto the ice so that the meaningful time to do the open water sampling long since passed.

Despite the low site activity planned in January, a GLL staff member will be contracted to travel to site specifically to ensure the January sampling of Garrow Lake occurs as scheduled.

## **15. SUMMARY OF EFFLUENT MONITORING AND EFFLUENT CHARACTERIZATION**

No effluent was discharged during the quarter so effluent sampling was not required. Appendix 7 contains the effluent monitoring report submitted to Environment as required under the Metal Mining Effluent Regulations.

## **16. SUMMARY OF EEM STUDY PROGRAM PROGRESS**

In December, Teck Cominco and its consultants (Azimuth Consulting) met with the Environment Canada's Technical Advisory Committee ('TAC') to review the 2003 summer field program and results. The purpose of the meeting was to obtain guidance regarding the requirements for the 2004 sampling program so that planning can proceed. Field conditions were extreme in 2003 and only through the diligence and hard efforts of the seasoned consultants was the program successfully undertaken. At the end of the quarter, formal response from the TAC was outstanding.

## **17. SUMMARY OF GARROW LAKE DFO STUDY PROGRAM PROGRESS**

Laboratory results from the 2003 summer field program were received. Reporting of results will occur in the New Year.

## **APPENDIX 1**

### **EXECUTIVE SUMMARY IN INUKTITUT**

>CΔn<sup>+</sup> Δ>9<sup>b</sup>/Δ<sup>c</sup>Λ<sup>a</sup>U

အညကုဏ္ဍိယ နိမိတ်အရပ်ရပ် ပါရှိပါသည်။ အကုဏ္ဍိယ

በካሊፈርኔኤችፕ ስቴት - በካሊፊ 2003

[illegible]

ጤግግ ልረጽጊኦብ ህባረኦብ

◀L\_ ▶d\_m^s

ΔφC<sub>2</sub>H<sub>5</sub>CO<sub>2</sub>H

### 13.3. ልጋራ

- 1 ቅጥር/ፋይል/ፋይል ወይም ሌላ ማንኛውም
- 2 የሥራ ሰሌዳ
- 3 የግብርና/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 4 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም የሥራ ሰሌዳ
- 5 ለጥሬ ምርት ወይም ሌላ ማንኛውም የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6 ለጥሬ ምርት ወይም ሌላ ማንኛውም የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም

#### 6.1 ሌላ ማንኛውም

- 6.1.1 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.2 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.3 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.4 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.5 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.6 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.1.7 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም

#### 6.2 ማጠቃለያ

- 6.2.1 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.2 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.3 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.4 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.5 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.6 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.7 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.2.8 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም

#### 6.2 ሌላ ማንኛውም ኢንፎርሜሽን

- 6.3.1 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.2 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.3 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.4 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.5 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.6 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.7 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.8 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.9 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.10 2002 የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.11 ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም
- 6.3.12 ሌላ ማንኛውም ኢንፎርሜሽን/ጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም

#### 6.3 ሌላ ማንኛውም የጥሬ ምርት/ጥሬ ምርት ወይም ሌላ ማንኛውም

- [illegible]

## ልረብላቅበኝ

- ልረብላቅ 1            ላዕረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 2            ሥራጠኝ ልረብላቅ 2003፣ ለጋራጠኝ ልረብላቅጠኝ
- ልረብላቅ 3            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 4            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 5            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 6            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 7            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 8            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ
- ልረብላቅ 9            ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ ልረብላቅጠኝ









[illegible][illegible][illegible][illegible][illegible][illegible]

- ለኃይማኖት ማህበራዊ ግንኙነት ለሚፈጠሩ ልዩ ልዩ ሁኔታዎች 2-ኛ ልዩነት ይኖራል፡፡

[illegible][illegible][illegible]

### 6.3.10 2002 年 7 月 1 日 实施

- ### 6.3.11 ጋራ ርዕሰ ፍጽሞታዊ ስራዎችን ማግኘት

- 6.3.12  $\Delta^b \supset \supset^b (C \supset^b \supset^b) \supset^b \supset^b \supset^b$

- 6.4.  $\Delta \Gamma \triangleright \sigma^{\omega}$  ከ  $\Gamma \vdash \Delta$  የ  $\Gamma \vdash \Delta$  /  $\wedge$  ልዩነት  $\Delta \Gamma \vdash \Delta$

- ከገጠናው ደረሰው ልዩ ልዩ ሁኔታ ጋር በተያያዘ በሰሜን ቅርንጫፍ አካባቢ የሚገኙ የግል ሥራዎች ለማስፈጸም የሚያስፈልጉ የፍጥነት ማሻሻያ ስራዎች ላይ ማስተካከል ይገባል። በተጨማሪም የፍጥነት ማሻሻያ ስራዎች ላይ ማስተካከል ይገባል።

[illegible]

10.  $\Delta_{\text{ac}} \dot{L}^{\text{a}} \sigma^{\text{c}} \rightarrow \text{H}^{\text{a}} \sigma^{\text{b}} / \Delta_{\text{cd}} \rightarrow \text{H}^{\text{a}} \sigma^{\text{b}} \sigma^{\text{c}}$

[illegible][illegible][illegible]

### 13.1 $\Delta \Gamma \text{CD} \triangleright \sigma^{\omega} \Gamma^C$ $\Delta \text{JNC} \triangleright \sigma \delta \Delta^C$ $\text{J?JL} \text{?} \text{J}$ $\text{me} \Delta^C$

[illegible]

13.1.2 ልቦና ምክር ቤቱ የሚሰጠው የጥገና ሪፖርት ለሚገኝ ሁሉም የጥገና ሪፖርት አባል አባል ሆኖ ማሳተፍ ይገባል፡፡

13.4. **ፌዴራል ሚኒስቴር ልማትና የፍትሕ ጥያቄ**

### 13.2.1 ԲԱՐՈՋԱՆԱԿԱՆ ԴՐՈՒՄ

[illegible]

### 13.2.2 $\Delta_{\text{C}}^{\text{C}}$ $\Delta_{\text{C}}^{\text{C}}$

[illegible][illegible][illegible]

### 13.3 ኢኮኖሚክ ሲስተም ፍልጥነት

### 13.3.1 የጋን ምጣኔ ምርጫ ምርመራ ማድረግ

Not required in the winter season as the lake is frozen.

### 13.3.2 Ⴕၤၢၦၣၡၢ ၼၤၢ ၶၢၥၤၢၦၣ ၶၢၥၤၢၦၣ

(L<sub>a</sub> ▷P▷d<sup>c</sup> bLr▷<sup>9</sup>b(C<sup>a</sup>r)<sup>9</sup> (r<sup>9</sup> r<sup>9</sup>bσ<sup>a</sup>u<sub>o</sub><sup>c</sup>.

14. የፋን ርዕሪሽ ፍጥነት ምን ያህል ነው?

ΛC<sup>96</sup>፡፻፲፱፡፱፱ CL፡፲፱፡፱፱ በካሊፈርኒያ፡፱፱፡፱፱.

[illegible]

ልረብላገር ፣ በበሥራኤል ልገ 'ፊደላዊ' ምርጫ ምክር ቤት ልምድ ሊፈጸም፡

16. ሂሳብ ለገንዘብ ልዩነት ለመግለጽ የሚያገለግል የሂሳብ ስርዓት

[illegible]

17. ዲሞክራሲያዊ የሰላም ርዕይና ልማት ርዕይና ሌሎችም ርዕዮተዊ ጥያቄዎችን

ᐅᓂᑲᑦᐅᓂᑦᑲ ᑦᑲᐅᓯᓴᓂᐅᑦᐅᑦᑦ ᑦᑲᓂᐱᑦᐅᑦᑲᑦᑲ ᓂᑦᑦᑦ ᐱᑦᑲᑦᑦᑦ ᓴᓯᑦᐅᑲᓂᑦᑦᑦ.