BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

INDIAN AND NORTHERN AFFAIRS CANADA

POLARIS MINE CLOSURE AND RECLAMATION PROJECT

JUNE 20 TO JUNE 22, 2004, INSPECTION TRIP REPORT

PROJECT NO.: 0131-013-01
DATE: JULY 21, 2004

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Project No. 0131-013-01
Date: July 21, 2004

Mr. Carl McLean
Manager Lands Administration and Operations
Indian and Northern Affairs Canada
Nunavut District Office, Building 918
PO Box 100
Iqaluit, NU
X0A 0H0

Re: Polaris Mine Closure and Reclamation Project- June 2004 Site Inspection Report

Dear Carl:

Please find attached one (1) copy of our above referenced report dated July 21, 2004 summarizing our site inspection of the ongoing mine closure work at Polaris during the period June 20-22, 2004.

Should you have any questions or comments, please do not hesitate to contact me at the number listed above.

Yours truly,
BGC Engineering Inc.
per:

Holger Hartmaier, M.Eng., P.Eng.
Senior Geotechnical Engineer

cc. Patrick Duxbury, NWB

HHH/slf

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LIMITATIONS OF REPORT

This report was prepared by BGC Engineering Inc. (BGC) for the account of Indian and Northern Affairs Canada. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of report preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be based on it are the responsibility of such Third Parties. BGC accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

As a mutual protection to our client, the public, and ourselves, all reports and drawings are submitted for the confidential information of our client for a specific project and authorization for use and / or publication of data, statements, conclusions or abstracts from or regarding our reports and drawings is reserved pending our written approval.

1.0 INTRODUCTION

At the request of Indian and Northern Affairs Canada (INAC), BGC Engineering Inc. (BGC) participated in a site inspection of the Polaris Mine site, currently undergoing closure and reclamation by Teck Cominco Limited (TCL). Authorization for this inspection visit was made by INAC under Standing Offer Agreement #01-03-6011, Call Up #04, effective May 1, 2004.

The BGC representative on the site visit was Mr. Holger Hartmaier, M.Eng., P.Eng., Senior Geotechnical Engineer from BGC's Calgary office. Mr. Hartmaier was accompanied by the following INAC staff from the Iqaluit office;

- Mr. James Noble, Resource Management Officer III
- Mr. Constantine Bodykevich, Water Resource Officer
- Mr. Spencer Dewar, Lands Administrator Specialist

The site inspection was carried out between June 20 and June 22, 2004, with the following overall itinerary:

- June 20- travel by charter from Resolute Bay to Polaris. Introductory meeting, inspection of underground facilities, Garrow Lake Dam, tailings thickener area, subsidence area, Operational Landfill.
- June 21- Inspection of remaining surface reclamation activities, including LRD Quarry, Main Portal area, dock cells area, barge area, product storage building footprint, marine foreshore, foldaways and temporary dock area, incinerator, tank farm. Review meeting by INAC/BGC to determine outstanding issues, meeting with GLL on contaminated sites, final debriefing meeting with site staff.
- June 22- Travel by charter from Polaris back to Resolute Bay.

Weather during the period ranged from sunny to overcast, with occasional snow squalls. Temperature ranged between -5^{o} C and 2^{o} C, with moderate wind from the north to northwest.

The following sections summarize the observations made in each area, essentially in chronological order.

Appendix I contains selected site photographs taken by BGC and INAC during the inspection.

2.0 SITE VISIT DETAILS

2.1 June 20, 2004

The inspection team arrived at Polaris at approximately 10 AM (local) time, after being delayed for about one hour by weather out of Resolute Bay. The inspection team was met by Mr. Bruce Donald, Reclamation Manager for TCL. After receiving a site safety orientation from Ed Weidhas, the TCL camp manager, a meeting was arranged by Bruce Donald with key site staff, followed by an afternoon tour of the underground facilities.

2.1.1 Introductory Meeting

An introductory meeting was held in the conference room, chaired by Bruce Donald. Project personnel present at the meeting included representatives from Cascade Management Inc. (Cascade), project managers for TCL, Gartner Lee Limited (GLL), environmental cleanup monitors for TCL and SNC Limited (SNC), the lead reclamation contractor. The following staff were present at the meeting:

- Bob Hutchinson (TCL)
- John Lees (Cascade)
- Joe Dahoy (Cascade)
- Tony Morris (Cascade)
- Arlene Laudrum (GLL)
- Kevin Larmoudin (SNC) (brief introduction only)

The purpose of the introductory meeting was:

- To review the specifics of what the inspection team would cover during the site visit.
- To provide an update of the work done to date on site.
- To review the anticipated schedule for completion.

The following notes summarize the key items discussed:

In general, the inspection team wanted to visit all areas of the mine site, with specific interest in the areas worked since the September 2003 site visit. These areas included Garrow Lake dam, the marine foreshore area and the concentrate storage shed footprint.

Joe Dahoy gave an update of the progress to date and anticipated schedule to completion:

- Approximately 119 people are currently on site, with work going on 24 hours per day/7 days/week.
- The target shipping date is in the period August 25 to September 5, 2004. This date was chosen to coincide with the remainder of the ice-free shipping window. Since the dock has now been decommissioned, the remaining equipment on site will have to be transferred to the ship using lightering barges Since these barges cannot operate through ice, the effective shipping window has been significantly reduced from the late October-early November dates that applied to the ships loading and unloading at the dock.
- The shipping date means that by mid-August all work at the site should be completed so that the equipment can be moved down to the shoreline and prepared for shipping.
- As a result, if INAC wants to inspect the site again and have sufficient time for any follow-up work to be carried out, the best time would be in the third week of July. Since the camp will be moved from the accommodation complex to a temporary camp on the beach, with limited facilities, TCL recommend that the site visit be no longer than one day, with no overnight stay at the mine site.
- To view the site after all work is completed would then require another visit some time after the first week of September, however, there is a good chance that the site would be covered by snow at this time.
- Work on the shoreline area is well underway. The sheet pile cells in the dock area have been removed and the access ramps are being taken out. The removal of the sheet pile cells, with the assistance of divers took about 8 weeks to complete. This was longer than expected due to problems cutting the cells underwater, due to the presence of soil against the inner face of the pile and the need to cut the piles longitudinally in order to remove them.
- Most of the north part of the beach area has been reclaimed. The powerhouse still needs to be knocked down and contaminated soil removed underneath. This will commence later this week.
- Two of the three foldaways have been removed and contaminated soils are being removed. The third foldaway will be removed in the next two weeks, including removal of hydrocarbon contaminated soils.
- The product storage building remediation is mostly complete except for the removal of concrete footings along the west side, which will occur in July.
- The south tank in the tank farm has been emptied and cleaned out and will be removed by the end of June.
- The other tank was cleaned last year and has been re-filled with about 900,000 liters of diesel fuel, which is intended to last until the end of the project.
- Garrow Lake Dam has been breached and the rip rap placed. More grading remains to be done after the spring melt when the ground dries up, probably in late July- early August.
- The accommodation complex will be demolished by late July. Approximately 2 weeks will be required.

- Incineration of waste oils is continuing but will have to be completed by August 1, since it will take about 3 weeks to dismantle the incinerator and prepare it for shipping off site.
- The temporary camp and shipping laydown area is located at the south end of the mine site on Polaris Bay. Initially, the temporary camp will be used by 40-50 site staff for about 1-2 weeks, then the size of the camp will be reduced by half, with 20-30 staff. Finally, a staff of about 12 will remain for the final shipping and clean up at the end of August.
- Filling of Little Red Dog (LRD) Quarry is progressing, with the metals contaminated soils being placed around the outer perimeter, leaving a central hole for the accommodation complex. Sufficient limestone has now been blasted for the capping material, scheduled to be placed by mid-August.
- The exploration portal has been closed off, leaving three portals that still need to be closed.
- There is no schedule for closing the portal, as they will be required until all the hydrocarbon contaminated soils have been placed underground. The main and north portals are being used to haul material underground now as the stopes that were accessible by raise bore holes have been filled. The vent raises must be kept open to maintain ventilation underground. About 3 more weeks of time is required to haul the remaining 18,000 cubic metres of hydrocarbon contaminated soils underground.
- Most of the metals contaminated soils are in the LRD Quarry now, with about 10,000 cubic metres remaining to be placed.
- As the LRD quarry approaches its final level, TCL are beginning to finalize where the cap will go. Waste materials have been placed in the LRD quarry that need to be cut up with the shears, including sea containers and other items. Once the snow disappears, other items remaining on surface will be cleaned up.

Arlene Laudrum presented a progress summary of the soils remediation program:

- The snow dump area is one of the remaining high metals contaminated areas still waiting to be remediated- waiting for snow to melt.
- Remediation of hydrocarbon contaminated soils underneath the outer two foldaway buildings is underway.
- Clean up needs to be done around the lube oil storage area and under the incinerator after it is removed. Clean up around the incinerator area has been done.
- There are some metals contaminated areas along the tailings line in front of the accommodation complex.
- The areas adjacent to the north and south ends of the product storage building footprint have been cleaned up.
- In the dock cell area, the surface metals have been cleaned up. The last area of hydrocarbon contamination is awaiting lab results to confirm that it has been cleaned up.

- A significant quantity of hydrocarbon contaminated soil was removed from the barge area. Remediation is ongoing in some small areas of residual contamination. There is no information regarding the amount of contamination under the powerhouse area, which will have to await dismantling, scheduled to start this week.
- Some hydrocarbon contaminated soil remains to be excavated to the north of the sewer line which will be removed once the accommodation complex goes down.
- Minor metals contaminated soil remains in the former ore stockpile area adjacent to the main portal.
- Hydrocarbon contamination remains to be remediated at the firehall site.
- Some hydrocarbon contamination will be removed at the north end of the accommodation complex.
- The close-out reports for all these areas are not ready as they are all interlinked. TCL is aware that INAC requested these reports as they are done, rather than waiting to put them into the quarterly reports. It is likely that none of these will be ready until the end of the job.

Ian Dickie gave an update on the underground disposal of contaminated soils:

- An isometric sketch was presented at the meeting showing the underground mine workings that were backfilled with contaminated soils.
- Essentially everything has now been filled including the main decline ramp up to about the 820 level.
- Approximately another 18,000 cubic metres of hydrocarbon contaminated soils remain to be placed underground. This material has to be hauled in by truck and placed with the scoop trams, which takes longer than dropping it down the raise bore holes and moving it underground with the scoop trams.

2.1.2 Underground Mine Tour

Garry Bruce (SNC) led the underground mine tour, which included the INAC/BGC inspectors plus Bruce Donald and Ian Dickie. Hydrocarbon contaminated soils are now being placed into the main decline ramp since all the side drifts and stopes are full. The main vent raises are still open to provide ventilation for the underground workings. Two fully operational scooptrams move the soil into place at a rate of about 1000 cubic metres per day. At this rate there is about 3 weeks work left to move the estimated remaining 18,000 cubic metres of soil from the areas still to be remediated at the surface.

The underground shop is used for routine maintenance and lubrication. The underground lunch room/refuge station is still operational. The ANFO plant will be disassembled once there is no need for further explosives use on the site.

Once the soils have all been placed underground, the portals will be closed off. The next portal will probably be closed during the third week of July. The remaining site equipment that will be disposed of underground will be drained of fluids and moved underground.

2.1.3 Garrow Lake Dam

The dam was breached during the spring. Rip rap was placed in the channel bottom and sides. TCL extended the rock lining another 5-10 m upslope to cover the exposed core of the dam so that the soils would not erode into the rip rap as the snow and ice was melting. A channel was cut through the lake ice upstream of the dam to ensure that the water was directed into the excavated channel through the dam as the lake ice melted. At the time of the inspection there was no flow from Garrow Lake through the breach as Garrow Lake remained ice covered.

On the downstream side of the dam, significant volumes of meltwater were flowing overland from the right bank area into the natural channel section. TCL had erected two silt curtains in this reach, however the suspended sediment laden water continued to flow past these installations.

TCL intend to finish grading the downstream area later in the summer when the ground dries out and is able to support equipment traffic. On the upstream side of the dam, regrading and re-sloping will be required once the drifted snow has melted away.

2.1.4 Tailings Thickener Area

The tailings thickener area was mostly covered with snow drifts. a small portion of the former overflow lagoon was exposed. This area was recontoured last fall and metals contaminated soils removed from inside the lagoon area. TCL will check the area once the snow is gone and will finish cleaning up the surface of any remaining demolition debris once the snow cover has melted.

2.1.5 Subsidence Area

The subsidence area has been covered with shale rockfill and has been contoured into a gentle swale. Cracks were evident in the rockfill cover, indicating that subsidence movements are still occurring. TCL have hired Golder Associates to undertake a review of the historical subsidence data and to prepare an assessment report. In the meantime, TCL will conduct surface monitoring of subsidence movements using a locally based GPS system. The monitoring will take place over the rest of this summer and is planned to take place annually, during the snow free period, over the next 5 years. TCL believes that the subsidence movements are slowing down. The Golder review as well as the ongoing monitoring will provide information from which to assess the long-term management of this area.

In response to INAC concerns, TCL will excavate some test pits within the subsidence area to confirm the minimum cover thickness over the waste that was placed in this area. It is expected that TCL will report on the results of these investigations by late July- early August so that any remedial measures can be undertaken before equipment is removed from site.

2.1.6 Operational Landfill

The final cover has been placed on the Operational Landfill. The cover consists of a nominal 0.6 m of limestone obtained by blasting from the LRD Quarry. Specifications called for well graded material with a maximum particle size of 300 mm and a fines content of less than 10 %.

Several areas were noted where the cover consisted mainly of the segregated finer portion of the cover material. These areas were located on the side slopes of the cover and would be susceptible to erosion. TCL has indicated that some regrading will be carried out on the cover and that additional coarser grained cover material would be placed into those areas not meeting the cover material specifications.

2.1.7 Little Red Dog Quarry

A stockpile of blasted limestone cover material was located on the upper benches of the quarry along the south side. Previously placed construction debris has been covered and formed a ring around the outer perimeter of the quarry. The central “hole” will be used to contain the demolition debris from the accommodation complex, foldaway buildings, tank farm and powerhouse. Some bulky materials were placed into the LRD quarry that are awaiting cutting up, such as sea cans.

Approximately 10,000 m^3 of metals contaminated soils remain to be placed into LRD quarry. This material will be placed as backfill to minimize voids during the placement of the remaining demolition debris.

2.1.8 Main Portal Area

Some regrading will be required. Some metals contaminated soils remain in the former ore stockpile area. The adjacent generator building has contaminated soils that will be removed after the building has been demolished. The bridge structure between the accommodation complex and the barge area still carries services (camp sewage and power) and will be removed when the accommodation complex is demolished.

2.1.9 Dock Area

Some regrading is required. A significant quantity of hydrocarbon contaminated soil was removed. Check samples were still outstanding to confirm that this area has been remediated.

2.1.10 Barge Area

The barge site has been backfilled with about 4 m of beach gravel to final grade. The conveyor portal from underground remains to be sealed. The culvert section that contained the conveyor between the mill barge and the product storage area remains to be removed.

2.1.11 Product Storage Area

The footprint of the product storage building was excavated to bedrock and covered with a nominal 0.5 m of beach gravel. In bedrock depressions, TCL noted that the cover may be up to 1 m thick. The concrete and steel footings remain to be removed along the west side of the building. Some metals contaminated soils remain to be removed between the product storage building and the foreshore area. The final beach slope grading was being done in the reach south of the dock area.

All metals contaminated soils were removed from the product storage area footprint, except for a localized area where some relict metals persisted within cracks in the bedrock surface. It was not possible to remove this material, despite over-excavating into the upper bedrock surface.

TCL was requested to prepare a letter describing the remediation protocol adopted for the product storage area as a follow-up to previous INAC/BGC concerns that were expressed as a result of the review of the 2003 third and fourth quarterly reports. The footprint of the product storage area lies well above the maximum water level for the final foreshore and should therefore not be subjected to disturbance by wave action and erosion. The letter should explain that the relict concentration of metals within the bedrock surface, even if mixed within the active zone, will not increase the surface concentration of metals above the required remediation metals targets.

2.1.12 Foreshore and Foldway Buildings

Removal of hydrocarbon contaminated soils was underway in the footprint of the north foldaway building. The excavation of the south foldaway building was essentially completed and was awaiting final confirmatory testing. Excavation was being done with a hoe ram to break up the frozen soils. The soils were then carried by mine trucks for disposal underground.

The temporary dock was removed over the winter. Soils were excavated and the sheet piles were cut off below the water line.

2.1.13 Incinerator

Waste oils and glycol are being burned at a rate of 500 gal/day. TCL noted that the incinerator was not operated during the winter period and that the schedule for incinerating the remaining products is very tight, now that the shipping window has been advanced. A tight balance must be met going into the final closure period to ensure that there are sufficient products to complete the required reclamation and decommissioning, yet minimize the material that remains to be barreled and shipped out after the incinerator is shutdown.

2.1.14 Tank Farm

The south tank has been cut open and cleaned and is ready for demolition. The north tank still contains about 900,000 litres of diesel which may or may not be all used up by the end of decommissioning.

3.0 RECOMMENDATIONS

As a result of the site inspection, the following items were identified for follow-up by TCL. These were discussed with TCL staff in the debriefing meeting held on site on June 21, 2004:

- Garrow Lake Dam- regrade and fix up soft areas on downstream side of dam. Final grading on upstream side of dam after snow melts. Monitor cut slopes in dam for erosion.
- Subsidence zone- initiate monitoring of surface movements using GPS. TCL to forward report by Golder assessing subsidence data to INAC as soon as possible. TCL should be prepared to initiate any long-term, post-closure mitigation measures that may be required.
- Excavate test pits to confirm cover thickness over debris placed into Subsidence Zone landfill.
- Operational Landfill- Replace fine-grained cover materials with materials meeting design specifications.
- Product storage area- TCL to write letter explaining testing protocol and presence of minor relict amounts of metals contaminated soil within the bedrock crevices. Justify cover materials and indicate that mixing of metals contaminated soils with cover would not

exceed site remediation target concentrations.

4.0 CLOSURE

In general, the site reclamation and decommissioning is proceeding to meet the target date of completion by early September, 2004. Several outstanding concerns remain to be addressed by TCL, as noted in Section 3. Bruce Donald of TCL requested that INAC conduct at least one more inspection prior to completion of the project so that any last minute issues could still be addressed, while equipment was still on site. At the present time, BGC/INAC had planned to make a one more trip in 2004, after TCL was offsite, sometime in September.

We trust that this report meets with your requirements at this time. Should you have any questions, or require additional information, please do not hesitate to contact the undersigned.

BGC Engineering Inc.
Per:

Holger Hartmaier, M.Eng., P.Eng.
Senior Geotechnical Engineer

APPENDIX 1 - PHOTOGRAPHS

Photos by H. Hartmaier:

June 20, Polaris Mine Site general view, looking NE.

View looking E along shoreline in vicinity of tank farm and former dock area.

Photos by H. Hartmaier:

View of shoreline area in vicinity of mill barge and dock cells. Accommodation complex in back.

Shoreline area north of dock cells.

Photos by H. Hartmaier:

View of Little Red Dog (LRD) quarry

Polaris Mine Site, view to southeast.

Photos by H. Hartmaier:

Polaris Mine Site, view to south with LRD quarry in foreground.

Polaris Mine Site, re-contoured area around subsidence zone and North Portal.

Photos by H. Hartmaier:

Polaris Mine Site, view to southwest from subsidence zone area.

View of shoreline of North Bay, looking west towards LRD quarry.

Photos by H. Hartmaier:

View of accommodation complex and Leon Lake looking west.

View of Operational Landfill.

Photos by H. Hartmaier:

Foreshore area, looking north. Visible is backfilled area of product storage shed and mill barge.

View of foreshore area, former dock cells, mill barge and product storage shed.

Photos by H. Hartmaier:

Underground ANFO plant.

Underground ANFO plant.

Photos by H. Hartmaier:

Underground ANFO plant.

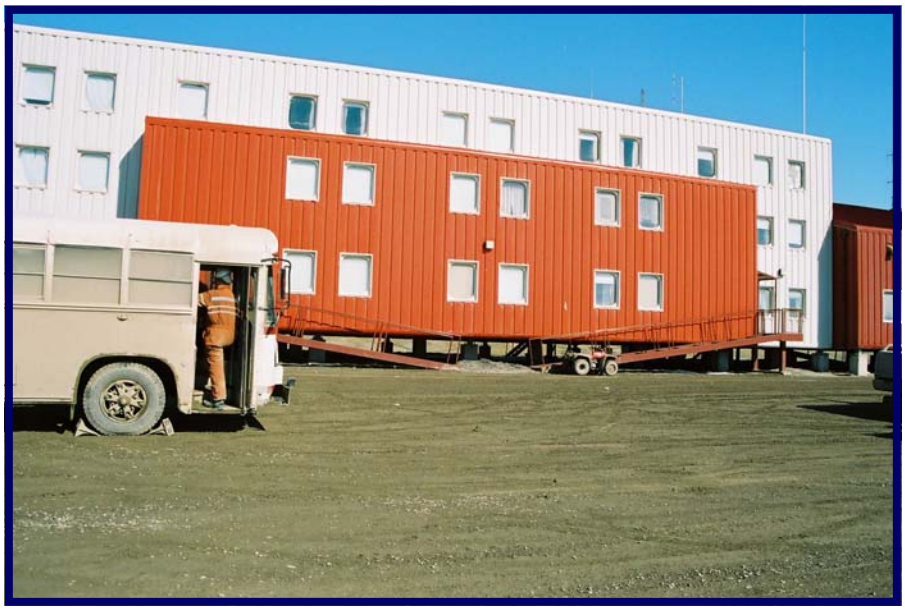
View of dock cell area and powerhouse.

Photos by H. Hartmaier:

View of shoreline in vicinity of former product storage building.

Shoreline area, view towards foldaway buildings and tank farm.

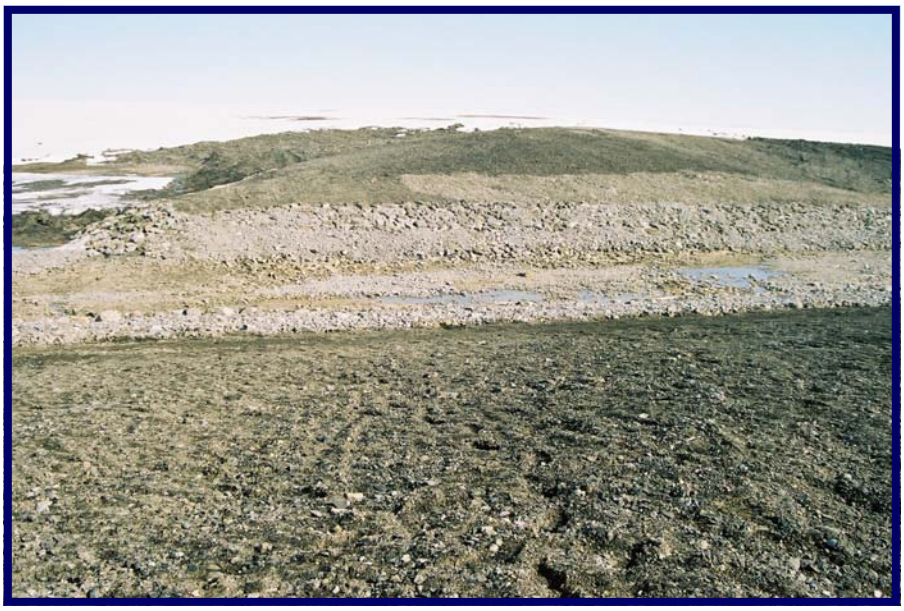
Photos by H. Hartmaier:



Accommodation complex.

Garrow Lake Dam, riprap lined channel.

Photos by H. Hartmaier:



Garrow Lake Dam, view along centreline to the east.

Garrow Lake Dam, view upstream at ice cover on Garrow Lake.

Photos by H. Hartmaier:

Channel cut into ice of Garrow Lake upstream of dam to channel flow towards breach.

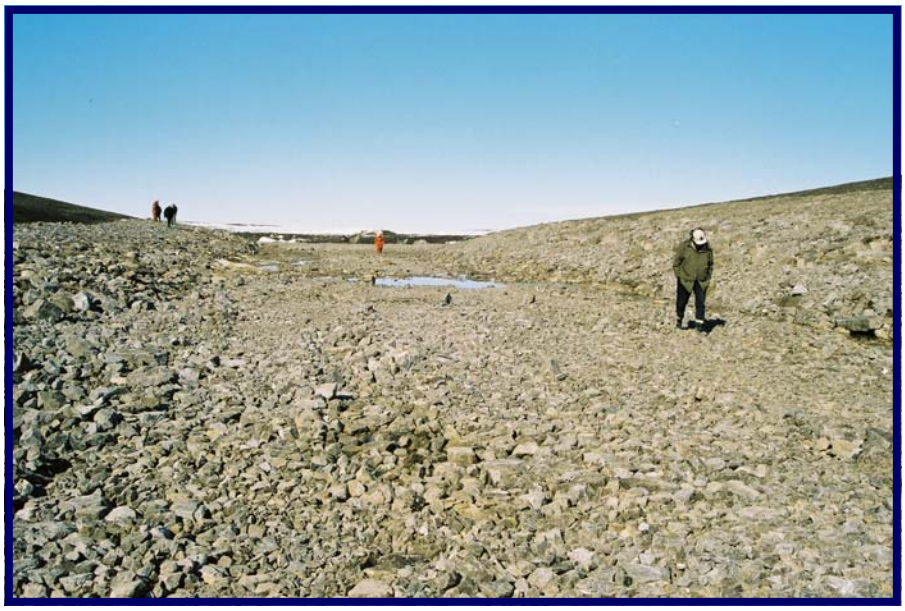
View looking downstream along riprap lined channel through Garrow Lake Dam.

Photos by H. Hartmaier:

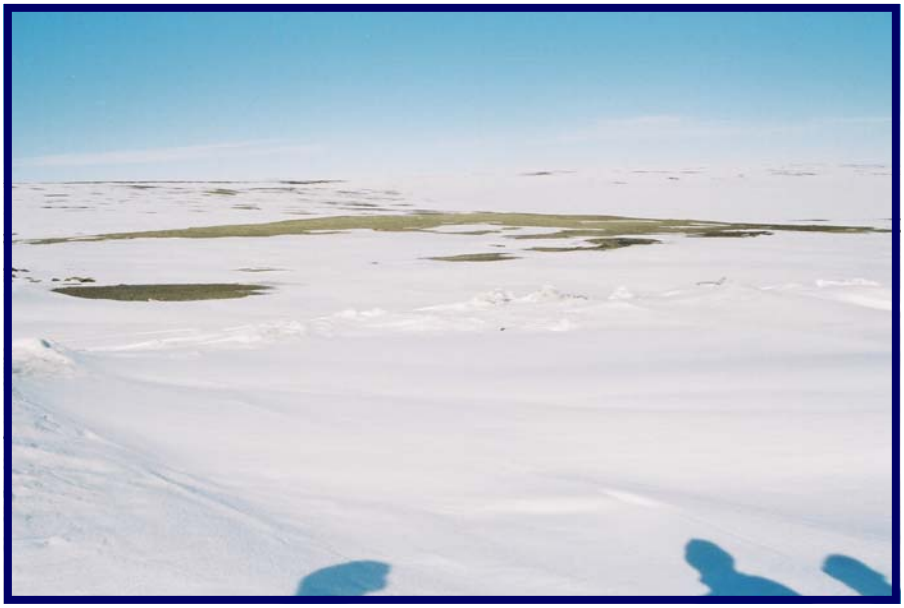
View looking downstream along east (left bank) side of channel.

View of upstream face of dam with drifted snow and spoil. This area needs to be re-graded after the snow melts.

Photos by H. Hartmaier:



View looking upstream along center of channel.



Tailings thickener area - reclaimed dump pond site, mostly covered in snow.

Photos by H. Hartmaier:

Subsidence area, looking north. Note cracks in backfill material.

Close-up of cracks in subsidence area. Note rock hammer for scale.

Photos by H. Hartmaier:

Operational Landfill, seaward sloping aspect of cover. Note finer grained nature compared with cover at the top of the slope.

Operational Landfill - minor gully erosions/ subsidence in cover material on seaward facing slope.

Photos by H. Hartmaier:

Laydown area for final sealift, located adjacent to Operational Landfill.

LRD quarry with cover of metals contaminated soils. Stockpiles of final cover consisting of blasted limestone visible on left.

DIAND Photos

Demolition debris from foldaway buildings in LRD quarry.

LRD quarry, materials that remain to be cut up prior to disposal into quarry.

DIAND Photos

LRD quarry, large materials that remain to be cut up. Casing pipe is for installation of thermistor after quarry is closed.

Main portal area.

DIAND Photos

View of powerhouse and former mill barge area.

View of looking north along shoreline to north of main portal.

DIAND Photos

View of former dock area.

Sorbent boom in dock cell area to contain minor hydrocarbon contamination.

DIAND Photos

Bridge structure leading to former mill/barge area.

Beach gravel backfill over mill/barge and product storage shed area.

DIAND Photos

Beach gravel cover over product storage shed area.

Backslope of product storage area. Some metals contaminated soils remain to be removed from this area.

DIAND Photos

Foreshore area north of foldaway buildings.

Excavation of hydrocarbon contaminated soils from footprint of north foldaway buildings.

DIAND Photos

Excavation of contaminated soils down to frozen soils in footprint of south foldaway building.

Inside of incinerator building.

DIAND Photos

Inside bermed area at tank farm.

Shoreline area south of foldaway buildings, view looking north.