APPENDIX 5

2007

Annual Geotechnical Inspection Report

by

Gartner Lee Limited

Report on Post-Closure Geotechnical Inspection of Polaris Mine Site in 2007

Prepared for
TeckCominco Metals Ltd.

Submitted by
Gartner Lee Limited

October, 2007

Gartner Lee

Report on Post-Closure Geotechnical Inspection of Polaris Mine Site in 2007

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October, 2007

Reference: **GLL 70402**

Distribution:

6 Teck Cominco Limited

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Gartner Lee Limited

October 29, 2007

Mr. Bruce Donald. P.Eng.
Reclamation Manager, Polaris Mine
Teck Cominco Limited
Bag 2000
Kimberley, BC V1A 3E1

Dear Mr. Donald:

Re: GLL 70402 – Report on 2007 Polaris Mine Post-Closure Geotechnical Inspection

Gartner Lee is pleased to present our report on the 2007 Polaris mine site geotechnical inspection. Areas included in the inspection included Garrow Lake, Little Red Dog Quarry, the Operational Landfill, the dock site shoreline, Frustration Lake water intake jetty, the North Quarry, closed mine portals, and the subsidence area.

This report presents photo documentation of the inspection, observations and recommendations. Related information on ground temperature measurements conducted by Teck Cominco Limited during the summer of 2007 is reported separately.

Should you have any questions regarding the inspection please contact the undersigned.

Yours very truly,
GARTNER LEE LIMITED

Darrin Johnson, P.Eng.
Senior Geotechnical Engineer

DCJ:lb

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Executive Summary

The 2007 post-closure geotechnical inspection of the Polaris mine site was carried out by Mr. Darrin Johnson, P.Eng., Senior Geotechnical Engineer, Gartner Lee Limited (GLL) on July 26 and 27, 2007. Mr. Johnson was accompanied by Mr. Bruce Donald, P.Eng., Reclamation Manager, Teck Cominco Limited (TCL) and two Inuit residents of Resolute who provided assistance and wildlife monitoring services. The site inspection was conducted in fair to good weather conditions, affording good visibility and coverage of all areas across the mine site.

With few exceptions, the overall condition of the site is good, with no signs of major slope instability or significant erosion of concern being observed that poses a threat to human or wildlife safety. Areas of erosion were observed where surface water drainage crosses roads or has channelled down a slope, however most eroded areas appear to be self-armouring. Some thaw settlement was observed along the shoreline of the former dock area. Natural wave and ice processes have formed a small berm of gravel across the breached section of the Garrow Lake wave break structure.

No immediate action or repairs are required based on conditions observed at the time of the July 2007 inspection. An area of exposed geotextile downstream of Garrow Lake dam should be covered with rip-rap, however the exposed geotextile does not present an immediate risk to Garrow Creek water quality. It is recommended that TCL commence annual topographic surveys of the Garrow Lake dam breach abutments and wave break structure to monitor any slope movement and material deposition, respectively.

Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

The 2007 Polaris mine post-closure geotechnical inspection was carried out by Mr. Darrin Johnson, P.Eng., Senior Geotechnical Engineer, Gartner Lee Limited (GLL) on July 26 and 27, 2007. Mr. Johnson was accompanied by Mr. Bruce Donald, P.Eng., Reclamation Manager, Teck Cominco Limited (TCL) and two Inuit residents of Resolute, Nunavut who provided assistance and wildlife monitoring services.

The decommissioned Polaris mine site is located on Little Cornwallis Island, at 75 deg 23'North, 96 deg 57' West, some 120 km northwest of Resolute, Nunavut. The overall layout of the Polaris site, based on surveys conducted during decommissioning, is shown on Figures 1 and 2.

Current conditions were compared with baseline conditions established during previous detailed inspections in 2005 and 2006. A summary of current site conditions and recommendations are presented in the following sections of this report. Photographs of current site conditions are presented in Appendix A.

The site has been sub-divided into eight areas to facilitate the inspection of the site as follows:

- Area 1 – Garrow Lake, Creek and Former Dam;
- Area 2 – Frustration Lake Jetty and Access Road;
- Area 3 – New Quarry Area;
- Area 4 – Subsidence Area;
- Area 5 – Operational Landfill;
- Area 6 – Little Red Dog (LRD) Quarry Landfill;
- Area 7 – Mine Portals; and
- Area 8 – Marine Foreshore Adjacent to Former Dock and the former tank farm area.

This inspection was conducted in accordance with requirements under Section H (6) of the Water Licence and under the requirements of the Decommissioning and Reclamation Plan approvals.

2. Site Conditions and History

The Polaris mine was operated by TCL between 1981 and 2002 and decommissioned in 2003 and 2004. Site facilities comprised an underground mine, concentrator plant, concentrate storage shed, dock, airstrip, tailings impoundment, freshwater intake on Frustration Lake, various site access roads, a limestone quarry for mine backfilling, a shale quarry, and various items of infrastructure such as fuel storage, camp, warehousing, etc. Upon completion of decommissioning and reclamation activities all structures had been demolished, soils contaminated by metals and hydrocarbons had been excavated and disposed of. At this time only the airstrip and a small

portable camp with container storage remains, located adjacent to Loon Lake. Access roads between Garrow Lake, Frustration Lake and in the immediate vicinity of the previously active mining operations were decommissioned by rounding the shoulders of the road, removing culverts, and re-establishing natural drainage patterns. The general arrangement of the site is shown in Figure 1.

The marine foreshore area and slope in the vicinity of the former concentrate storage shed on the west side of the island now comprise relatively gentle uniform slopes that were graded as part of decommissioning. The graded slopes are interrupted by access roads and ramps. The area in the immediate vicinity of the former dock structure is almost flat. The shoreline has been restored to a consistent gently sloping area. Four portals for mine access and exploration activities have been sealed, backfilled and re-graded to match the surrounding slopes. The sideslopes of two small pads located at the south end of the marine foreshore area were flattened in 2006 to approximately 2H:1V.

Little Red Dog quarry, located at the northwest end of the airstrip was backfilled partially with demolition debris and metals contaminated soils and subsequently capped with rockfill. The remnant quarry walls above the level of the capping layer are benched and serve to catch ravelling material as the slopes gradually weather. Safety berms extend around the pit perimeter, and additional safety measures in the form of a ditch and a high berm exist at the end of the airstrip. Thermistors have been installed through the rockfill capping layer and underlying landfilled materials. In 2006, TCL carried out improvements to the data collection system for these thermistors and to the insulation of the upper parts of the installations.

The Operational Landfill, located at the south end of the former facility area, was regraded and capped with rockfill during decommissioning. Thermistors had been installed in the landfill at four locations during operations. In 2005, attempts to replace the thermistors were made with thermistors designed to monitor the new cap. Difficulties were encountered removing the existing thermistors and only two of the four installations were successfully replaced. In 2006, renewed efforts were successful in restoring the function of all four thermistor installations, together with improvements to data collection and insulation at ground surface. Starting in 2007, thermistor data is being downloaded and reported annually by TCL.

East of the airstrip, the main features of disturbance are the Subsidence Area and the New Quarry. The Subsidence Area is located over top of former underground mine workings and experienced significant deformations during mine operations. Subsequently, the area has been regraded and the rate of subsidence has been decreasing since the cessation of mining. Detailed topographic survey measurements across this area are being collected annually by TCL. However, due to equipment malfunction, topographic survey measurements are not available for 2007. Visual observations were undertaken and are reported. No obvious changes from 2006 were recorded.

The New Quarry area measures some 800 m by 400 m, and was a source of shale for construction purposes. It has been reclaimed by regrading stripped materials and quarry faces. Much of the floor of the New Quarry remains as exposed shale bedrock. In 2005, several erosion gullies were identified and in 2006 two significant gullies were repaired extensively. Limestone rockfill was used to form an erosion resistant bed where Loon Lake drainage crosses erosion-susceptible soils.

A network of access roads has been decommissioned (but are still functional) across the site. As part of site decommissioning, all culverts were removed and natural drainage crossings restored. The access roads continue to provide important access for ongoing inspection and monitoring activities.

A rockfill jetty, approximately 100 m long by 10 m wide, constructed for the freshwater supply intake remains at Frustration Lake.

At Garrow Lake, the former tailings disposal area, the main impoundment dam and wave break structure were breached during decommissioning to return water levels to pre-mining levels. The central part of the main dam was removed and replaced with a rip-rap lined channel. Decommissioning of the main dam lowered the water level in Garrow Lake by approximately two and one half metres to its former level. The condition and stability of the reinstated Garrow Lake shoreline has been monitored since the dam was breached. Visual inspection of Garrow Lake shoreline continued in 2007.

3. Approach to Geotechnical Inspection

The primary purpose of the geotechnical inspection is to assess the physical condition of decommissioned mine areas for evidence of slope instability or erosion that may be potentially hazardous to either humans or wildlife. The visual inspections documented in this report are supplemented by other information including thermistor data and topographic surveys reported separately by TCL. As the inspection is primarily visual, a series of annotated photographs with their locations established using GPS have been appended to this report. Photographs were generally taken at the same locations as previous annual inspections for comparison purposes. Photograph locations are shown in plan on Figures 1 and 2 and listed in Table 1.

Where significant erosion has been observed, the maximum observed depth and width of the erosion gully has been recorded to facilitate assessment of the rate of progression (i.e., from previous years and in the future). This will allow informed decisions as to whether to intervene or to allow nature to takes its course.

4. Inspection Observations and Comments

4.1 Area 1 – Garrow Lake, Creek and Dam

Garrow Lake

The water level in Garrow Lake has been lowered for the past four years and the shoreline has been exposed to several annual seasonal cycles. The perimeter beach of Garrow Lake was inspected in 2007 with no evidence of significant instability or erosion. Minor erosion was observed where natural drainages cross, however no significant erosion or indications of slope instability were observed. Photographs 60 through 68 in Appendix A illustrate typical conditions observed around the lake perimeter. Monitoring of erosion pins was discontinued in 2007 as a result of several years of consistent measurements indicating stable conditions. Routine sampling of Garrow Creek (i.e., Garrow Lake effluent) for suspended sediment continues as part of the Garrow Creek water quality monitoring program.

Garrow Lake Wave Break Structure

The original intent of the wave break structure was to extend an energy-dissipating barrier above the surface of the lake to reduce the fetch of the lake and protect the face of the main dam from wave action. To ensure the lake could drain back down to its original elevation a section of the wave break was excavated in the area of the original creek channel in early spring 2004. The lake elevation is monitored each spring and fall to determine the normal variations in elevation and confirm that the lake outlet channel is not eroding.

A ridge of gravel deposited across the breached outlet channel was initially observed during the 2006 inspection. The ridge or berm of gravel across the lake outlet appears to have grown since the 2006 inspection. Photographs 38 to 43 in Appendix A document the size and height of the gravel berm at the time of the July 2007 inspection. The mechanism creating the ridge of gravel is likely ice action. It is assumed that ice on the lake is pushed by the wind towards the south shoreline and outlet of the lake relocating gravel from the lake bottom to form a ridge or berm. The relatively coarse nature of the gravel permits a steady flow of water through the gravel ridge from the lake into the creek channel during the summer. However, the gravel ridge appears to be retaining some water and may be influencing the lake water level. As the ridge grows higher and wider, the lake outlet may naturally relocate towards the east end of the wave break structure. The growth of the berm and lake outlet location should continue to be monitored, however this appears to be a natural process that likely also occurred prior to development at the site.

Garrow Lake Dam

The sideslopes of the breach excavated through the main dam structure are in good condition, free of erosion or signs of major instability. Minor localised slumping observed in 2005 and 2006 appears unchanged. The condition of the dam breach slopes during the July 2007 inspection is documented in Photographs 20 through 25 (Appendix A). A localised section of the invert of the breach channel has a section of exposed geotextile that was observed in 2005 and 2006. The

condition of the exposed geotextile during the July 2007 inspection is documented in Photographs 18 and 19 (Appendix A). It is recommended that the exposed geotextile be covered with rip-rap.

The Garrow Creek surface water sampling station is downstream of the dam (Photograph 1 in Appendix A). Two erosion gullies were observed downstream of the sampling station (Photographs 2 and 3 in Appendix A). These erosion gullies appear to be self-armouring and are an example of natural or normal erosion processes in the area. Maximum erosion gully depth is approximately 0.5 m.

4.2 Area 2 – Frustration Lake Jetty and Access Road

During mining operations, a jetty extending into Frustration Lake supported the mine's freshwater supply pump station. The pump house and associated water lines were removed during reclamation. The site monitoring program includes a requirement to inspect the jetty on an annual basis to ensure that the rate of jetty erosion is gradual and does not contribute significant sediment loading to the lake. During the July 2007 inspection, the embankment forming the jetty was observed to be in a stable condition. Minor erosion consistent with previous inspections was observed at the end and along the sides of the embankment (Photographs 46 through 51 in Appendix A).

The access road is generally in good condition, with some localised erosion at drainage crossings (Photograph 52 and 53 in Appendix A). Significant erosion gullies identified during previous inspections were repaired in July 2006. Remedial work included regrading slopes, placement of gravel/rip-rap and construction of water bars. The repaired areas appear to be performing well (Photographs 54 through 58 in Appendix A).

4.3 Area 3 – New Quarry Area

The perimeter sideslopes and floor of the New Quarry area appear to be stable and do not pose a safety hazard to humans or wildlife. Photographs 59, 71, 87, 88 and 89 (Appendix A) illustrate the overall condition of the New Quarry during the 2007 inspection. Erosion on the perimeter sideslopes has previously resulted in some sediment being dispersed across the quarry floor. Erosion gullies at two locations were stabilized in July 2006 by slope regrading and placement of well-graded limestone rockfill as rip-rap protection. The repaired areas appear to be performing well (Photographs 69 through 70 in Appendix A).

4.4 Area 4 – Subsidence Area

The mine subsidence area was inspected during the July 2007 inspection and does not appear to have changed significantly from previous geotechnical inspections. Teck Cominco conducts a detailed topographic survey annually (reported under separate cover by TCL). No features in the area were observed during the July 2007 inspection that present a risk to either humans or wildlife.

Photographs 72 and 74 (Appendix A) document previously observed settlement tension cracks with maximum depth and width of about 0.15 m.

Photographs 73 and 75 (Appendix A) illustrate the general overall condition of the subsidence area with small areas of shallow ponded water.

Photograph 76 (Appendix A) is an observed settlement area surrounded by minor tension cracks that is approximately 5 m by 5 m in size.

4.5 Area 5 – Operational Landfill

No indications of slope instability were observed at the Operational Landfill during the July 2007 inspection. Indications of slumping or creep were not observed on the landfill slope (Photographs 90 and 91 in Appendix A). No tension cracks or settlement depressions were observed on the landfill crest (Photographs 4 and 5 in Appendix A). Erosion gullies on the slope above the Operational Landfill observed during previous inspections appear to be unchanged and self-armouring. The previously photographed erosion gully at OLF GUL2 (above the landfill) was photographed in July 2007 (Photographs 6 and 7 in Appendix A) and appears to be unchanged with a maximum depth of 0.5 m.

Some minor seepage from the toe of the landfill and associated white precipitate was observed during the July 2007 inspection (Photographs 8 through 10 in Appendix A).

The temperature profile of the landfill cover and waste is monitored by means of thermistors installed at four locations. The purpose of the thermistors is to monitor the establishment of permafrost through the full thickness of landfilled waste and to verify that the active layer does not extend into waste (i.e., below the final cover). Thermistor results are reported by TCL under separate cover.

4.6 Area 6 – Little Red Dog (LRD) Quarry Landfill

The rockfill cover at the LRD Quarry Landfill was inspected and shows no indications of instability or settlement. The quarry walls above the final cover do not exhibit indications of instability. Photographs 26 through 28 (Appendix A) document the conditions observed during the July 2007 inspection. During the recent inspection, a 1 m wide by 1 m deep gap was observed along the northeast quarry wall where it appears that rockfill was not placed to final cover grade along the quarry wall. At the time of the inspection there was a small pile of collected debris (e.g., metal and wood) in the southcentral area of the quarry that we understand will be buried beneath a layer of rockfill prior to final abandonment of the site. The gap along the northeast wall could be filled to grade with rockfill when the debris is being buried.

The temperature profiles of the landfill cover and waste is monitored by means of thermistors installed at four locations. The purpose of the thermistors is to monitor the establishment of permafrost through the full thickness of the landfilled waste and to verify that the active layer does not extend into waste (i.e., below the final cover). Thermistor results are reported by TCL under separate cover.

During the July 2007 inspection seepage was observed emerging at surface near the quarry entrance and then infiltrating into the ground. The seepage was clear and no staining was observed. The surface water seep is sampled for Total Suspended Solids (TSS) and metals on an annual basis. We understand this sampling was completed in 2007 and the data will be reported by TCL.

4.7 Area 7 – Mine Portals

The Polaris Mine was an underground mining operation. There were four portals used to access the mine and/or to convey ore out of the mine. As part of the mine decommissioning and reclamation activities, the portals were sealed to prevent the public from accessing the underground mine workings.

The objective of the annual geotechnical inspection is to look for evidence of settlement, erosion, or instability at the four mine portals that might present a safety risk to humans or wildlife. All of the portals are in good condition, free of any signs of instability or erosion, as documented on Photographs 77, 84, 85 and 86 (Appendix A).

4.8 Area 8 – Marine Foreshore Adjacent to Former Dock

The shoreline and slopes adjacent to the former dock structure were inspected in July 2007. No signs of slope instability or significant erosion were observed (Photographs 79 and 80 in Appendix A). During the July 2007 inspection, a gravel bar about 2 to 10 m from the shoreline (Photograph 78 in Appendix A) and several areas with ponded water as a result of settlement (Photographs 81 through 83 in Appendix A) were observed. The observed changes appear to be related to rearrangement of shoreline gravel by ice-action and thaw-related settlement, respectively. The water adjacent to the shoreline was very clear indicating negligible sediment deposition as a result of erosion activity.

5. Recommendations

The July 2007 geotechnical inspection identified several minor erosion features, most of which had been previously identified and appear to be self-armouring. Previously identified erosion features of concern in the New Quarry area and along the Frustration Lake access road were stabilised in 2006 and appear to be performing as intended. These features should continue to be monitored during annual geotechnical inspections. Ongoing annual geotechnical inspections of the landfills and disturbed areas at the site are recommended.

No immediate action or repairs are required based on conditions observed at the time of the July 2007 inspection. An area of exposed geotextile downstream of Garrow Lake dam should be covered with rip-rap as soon as practicable, however the exposed geotextile does not present an immediate risk to Garrow Creek water quality. An unfilled gap along the northeast wall of LRD quarry should be filled to grade with rockfill when the debris pile is being buried beneath a layer of rockfill. We understand that TCL intends to bury the collected debris pile prior to final abandonment of the site.

It is recommended that TCL commence annual topographic surveys of the Garrow Lake dam breach abutments and wave break structure to monitor any slope movement and material deposition, respectively.

Report Prepared By:	**Report Reviewed By:**
Darrin Johnson, P. Eng. Senior Geotechnical Engineer	Arlene Laudrum, P. Geo. Project Manager

Figures

Date Revised: month dd, yyyy Revision: 0

Date Plotted: October 12, 2007 File Location: E:\GIS\GIS_proj\Y2007\70402_Polaris 2007_Geotechnical_Inspection\By1-Draft-Oct07\70402-By1-01.dwg

FRUSTRATION LAKE
LOIS LAKE
NORTH BAY
LOON LAKE
POLARIS BAY
GARROW LAKE
GARROW BAY
UNNAMED LAKE
GARROW CREEK
RIDDLE POINT
CROZIER STRAIT

WATER INTAKE CAUSEWAY
LITTLE RED DOG LANDFILL
NORTH PORTAL
NEW QUARRY EXTENSION
NEW QUARRY
SUBSIDENCE AREA
RECLAIMED SHORELINE
OPERATIONAL LANDFILL
WAVE BREAK STRUCTURE
SITE OF DECOMMISSIONED DAM

18 (46,47,48,49, 50, 51)
19 (52, 53)
20 (54)
21 (55)
22 (56)
23 (57)
24 (58)
25 (59)
31 (65)
32 (66)
33 (67)
30 (64)
29 (63)
48 (87,88,89)
40 (77)
39 (75, 76)
38 (74)
37 (72, 73)
16 (32,33,34)
15 (29,30,31)
14 (26,27,28)
35 (69)
36 (70,71)
7 (13)
6 (11,12)
17 (35,36)
2 (37)
47 (86)
45 (84)
46 (85)
44 (83)
43 (82)
42 (81)
41 (78,79,80)
4 (6,7)
3 (4,5,90,91)
5 (8,9,10)
8 (14)
28 (62)
27 (61)
26 (60)
34 (68)
9 (15)
13 (38-43)
10 (16)
11 (17)
12 (18 - 25)
1 (1,2,3)

8372000N
8371000N
8370000N
8369000N
8368000N
8367000N
559000E
559500E
560000E
560500E
561000E
562000E
563000E

Map Sources / Notes:

0 100 200 400 600 800 1000 m

1 : 25,000
UTM Zone 14N, NAD83

File Name: 70402-By1-01.dwg
Reviewed by: DJ Prepared by: CCL
Date Issued: Oct, 2007 Project Number: 70-402

Legend

ROADS

44 (83) 2007 FIELD INSPECTION LOCATION
PHOTO #
WAYPOINT #

teckcominco

Project: Polaris Mine
Location: Nunavut

Polaris Mine 2007
Geotechnical Site Inspection

Gartner Lee

Figure 1
Version 1

Date Revised: month dd, yyyy Revision 0

Date Plotted: October 12, 2007 File Location: E:\GIS\GIS_proj\Y2007\70402_Polaris 2007_Geotechnical_Inspection\By1-Draft-Oct07\70402-By1-01.dwg

8370000N

8369000N

8368000N

8367000N

558000E

559000E

NORTH BAY

LOCAL MINE NORTH

TRUE NORTH

NEW QUARRY EXTENSION

NEW QUARRY

NORTH PORTAL

SUBSIDENCE AREA

TEMPORARY CAMP

LITTLE RED DOG LANDFILL

LOON LAKE

EAST PORTAL

MAIN PORTAL

CONVEYOR PORTAL

AIRSTRIP

RECLAIMED SHORELINE

CROZIER STRAIT

POLARIS BAY

OPERATIONAL LANDFILL

48 (87,88,89)

25 (59)

40 (77)

39 (75, 76)

38 (74)

37 (72, 73)

16 (32,33,34)

15 (29,30,31)

14 (26,27,28)

35 (69)

36 (70, 71)

6 (11,12)

17 (35,36)

2 (37)

47 (86)

45 (84)

46 (85)

44 (83)

43 (82)

42 (81)

41 (78,79,80)

4 (6,7)

3 (4,5,90,91)

5 (8,9,10)

Map Sources / Notes:

N W E S

0 50 100 200 300 400 m

1 : 10,000

UTM Zone 14N, NAD83

File Name: 70402-By1-01.dwg

Reviewed by: DJ Prepared by: CCL

Date Issued: Oct, 2007 Project Number: 70-402

Legend

ROADS

44 (83) 2007 FIELD INSPECTION LOCATION

PHOTO #

WAYPOINT #

teckcominco

Project: Polaris Mine

Location: Nunavut

Polaris Mine 2007 Geotechnical Site Inspection - Detail of Mine Area

Gartner Lee

Figure 2

Version 1

Tables

Table 1. 2007 Polaris Geotechnical Inspection Waypoints

Area	Photo Number	2007 GPS Waypoint	Position[1]		Elevation[2]
			Northing	Easting	
Garrow Creek	1,2,3	1	8,366,835	561,659	7 m
Camp	37	2	8,368,409	558,521	48 m
Operational Landfill	4,5,90,91	3	8,367,368	558,792	33 m
Operational Landfill	6,7	4	8,367,615	558,780	33 m
Operational Landfill	8,9,10	5	8,367,408	558,917	9 m
Road to Garrow Lake	11,12	6	8,368,751	559,743	46 m
Road to Garrow Lake	13	7	8,368,786	559,998	49 m
Road to Garrow Lake	14	8	8,367,721	560,837	57 m
Road to Garrow Lake	15	9	8,367,395	561,197	36 m
Road to Garrow Lake	16	10	8,367,277	561,320	38 m
Road to Garrow Lake	17	11	8,366,999	561,582	25 m
Garrow Lake Dam	18 - 25	12	8,366,909	561,646	15 m
Wave Break Structure	38-43	13	8,367,425	561,582	11 m
Little Red Dog Quarry	26,27,28	14	8,368,783	557,689	30 m
Road to Little Red Dog Quarry	29,30,31	15	8,368,863	557,713	38 m
Road to Little Red Dog Quarry	32,33,34	16	8,368,953	558,103	24 m
Road to Little Red Dog Quarry	35,36	17	8,368,499	558,491	49 m
Frustration Lake Intake	46,47,48,49, 50, 51	18	8,372,047	560,319	11 m
Frustration Lake Access Road	52, 53	19	8,371,827	560,363	22 m
Frustration Lake Access Road	54	20	8,371,151	560,166	52 m
Frustration Lake Access Road	55	21	8,371,050	560,133	55 m
Frustration Lake Access Road	56	22	8,371,018	560,120	57 m
Frustration Lake Access Road	57	23	8,370,978	560,105	60 m
Frustration Lake Access Road	58	24	8,370,930	560,085	61 m
New Quarry	59	25	8,369,149	559,429	61 m
Garrow Lake Perimeter	60	26	8,367,677	561,474	15 m
Garrow Lake Perimeter	61	27	8,367,746	561,496	10 m
Garrow Lake Perimeter	62	28	8,368,000	561,481	11 m
Garrow Lake Perimeter	63	29	8,368,908	561,101	10 m
Garrow Lake Perimeter	64	30	8,369,180	560,963	8 m
Garrow Lake Perimeter	65	31	8,370,531	561,988	10 m
Garrow Lake Perimeter	66	32	8,369,654	562,780	10 m
Garrow Lake Perimeter	67	33	8,369,224	562,763	12 m
Garrow Lake Perimeter	68	34	8,367,553	561,865	9 m
New Quarry	69	35	8,368,702	558,670	36 m
New Quarry	70, 71	36	8,368,665	558,789	32 m
Subsidence Area	72, 73	37	8,368,922	558,543	25 m
Subsidence Area	74	38	8,368,977	558,445	18 m
Subsidence Area	75, 76	39	8,369,058	558,442	18 m
North Portal	77	40	8,369,078	558,020	12 m
Foreshore	78,79,80	41	8,367,592	558,074	4 m
Foreshore	81	42	8,367,708	557,983	3 m
Foreshore	82	43	8,367,758	557,943	6 m
Foreshore	83	44	8,367,851	557,877	4 m
Main Portal	84	45	8,368,046	557,865	6 m
Conveyor Portal	85	46	8,367,963	557,922	8 m
Exploration Portal	86	47	8,368,182	557,829	23 m
New Quarry	87,88,89	48	8,369,328	559,184	26 m

Notes:

1) Northing and Easting coordinates are referenced UTM 83-14 projection.
2) Elevations are referenced to geodetic datum.

Appendix A

Photographic Record of 2007 Geotechnical Inspection

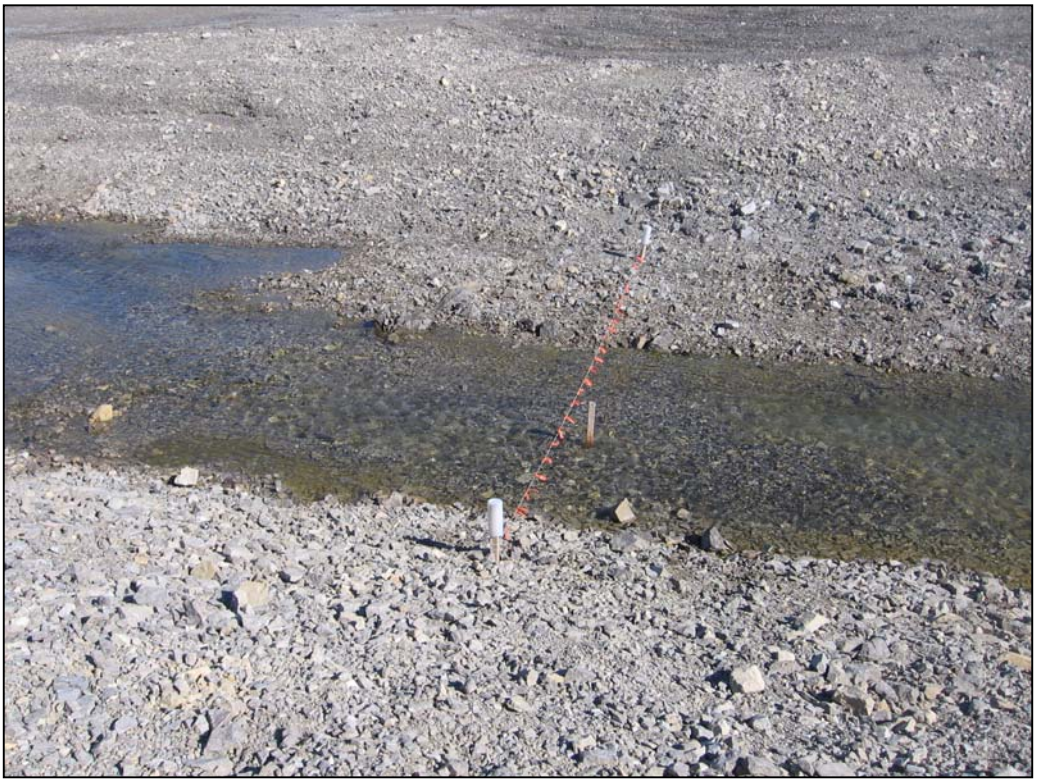

Photo 1 - Northing: 8366835 Easting: 561659 Elevation: 7 m.
Garrow Creek Sampling Station

Photo 2 - Northing: 8366835 Easting: 561659 Elevation: 7 m.
First erosion gully south of sampling location

Photo 3 - Northing: 8366835 Easting: 561659 Elevation: 7 m.
Second erosion gully south of the sampling location

Photo 4 - Northing: 8367368 Easting: 555462 Elevation: 33 m.
Operational landfill; South end crest of operational landfill

Photo 5 - Northing: 8367368 Easting: 555462 Elevation: 33 m.
Operational landfill; View from south end towards south thermistor.

Photo 6 - Northing: 8367615 Easting: 558780 Elevation: 33 m.
Operational landfill; View of erosion gully on slope above the landfill

Photo 7 - Northing: 8367615 Easting: 558780 Elevation: 33 m.
Operational landfill; View of erosion gully on slope above the landfill
(Scale: Wrench is 0.3 m)

Photo 8 - Northing: 8367408 Easting: 558917 Elevation: 9 m.
Operational landfill; South toe

Photo 9 - Northing: 8367408 Easting: 558917 Elevation: 9 m.
Operational landfill; Seepage from toe and white precipitate

Photo 10 - Northing: 8367408 Easting: 558917 Elevation: 9 m.
Operational landfill; Seepage from toe and white precipitate

Photo 11 – View of Operational Landfill; facing South from road

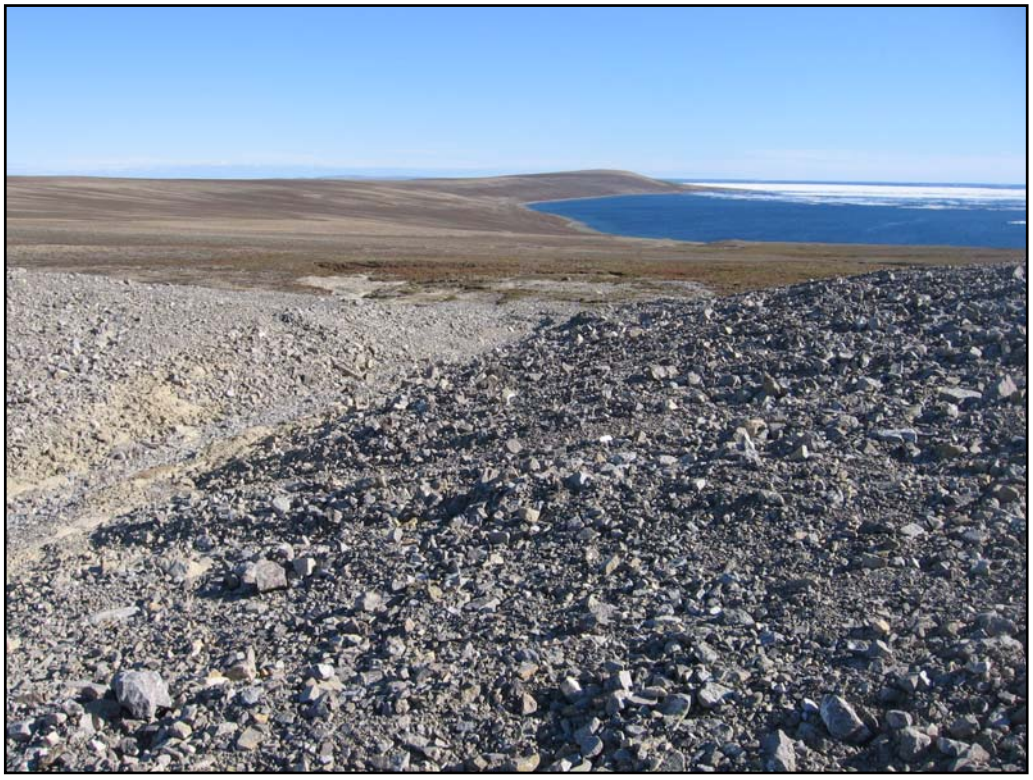

Photo 12 - Northing: 8368751 Easting: 559743 Elevation: 46 m.
Drainage crossing through road with downstream erosion

Photo 13 - Northing: 8368786 Easting: 559998 Elevation: 49 m.
Drainage crossing through road with downstream erosion

Photo 14 - Northing: 8367721 Easting: 560837 Elevation: 57 m.
Tension crack along road

Photo 15- Northing: 8367395 Easting: 561197 Elevation: 36 m.
Road drainage crossing

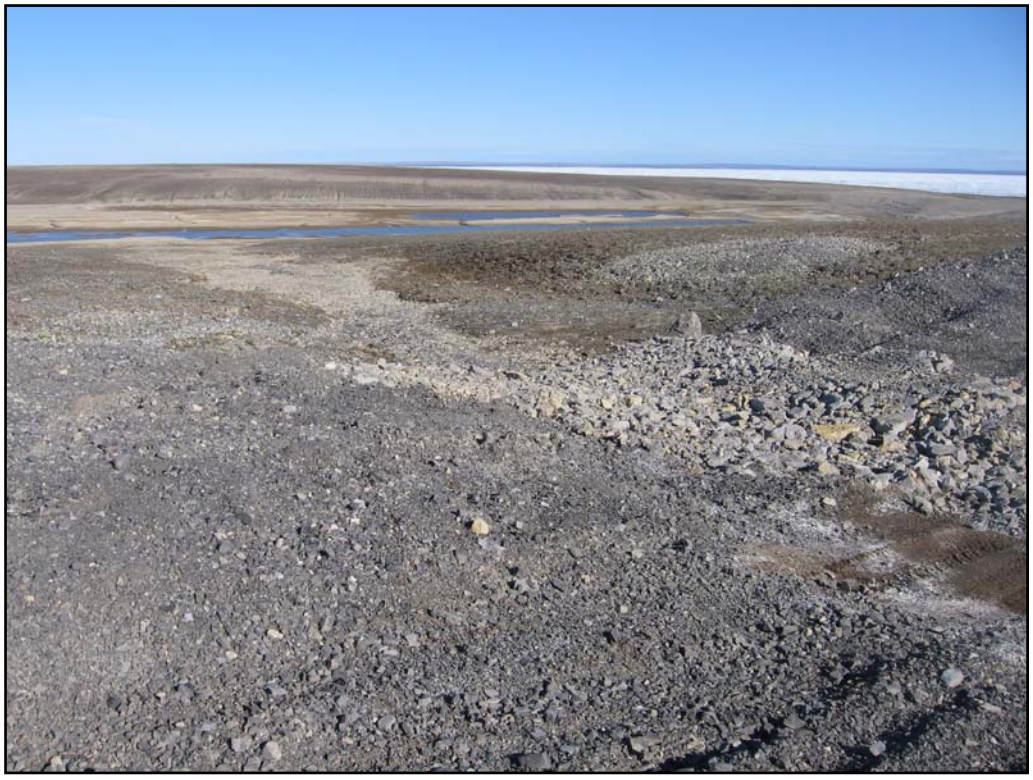

Photo 16- Northing: 8367277 Easting: 561320 Elevation: 38 m.
Repaired road drainage crossing

Photo 17- Northing: 8366999 Easting: 561582 Elevation: 25 m.
View from benchmark 80 looking North towards Garrow Lake

Photo 18- Northing: 8366909 Easting: 561646 Elevation: 15 m.
Garrow dam; exposed geotextile

Photo 19- Northing: 8366909 Easting: 561646 Elevation: 15 m.
Garrow dam; exposed geotextile

Photo 20- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; view of Southeast abutment from Northwest abutment

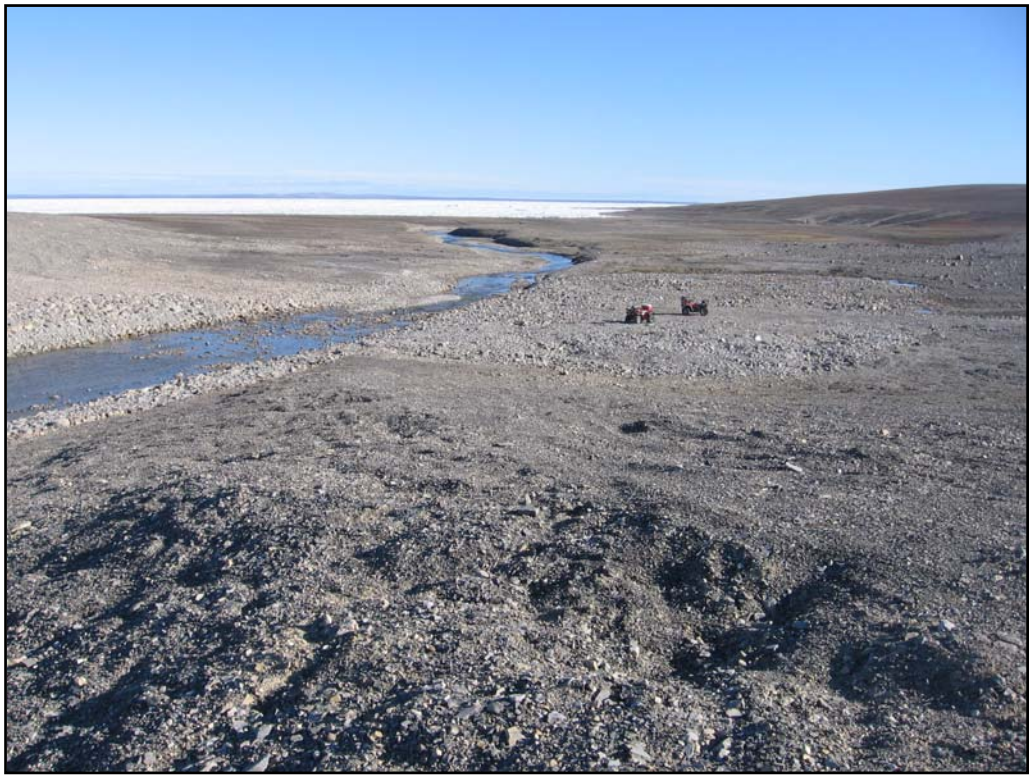

Photo 21- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; view of Garrow Creek towards ocean

Photo 22- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; view of Northwest abutment from Southeast abutment

Photo 23- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; hummocky / bumpy crest of Southeast abutment

Photo 24- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; loose evidence of settling / movement on Southeast abutment above rip-rap

Photo 25- Northing: 8366999 Easting: 561646 Elevation: 15 m.
Garrow dam; lower bumpy slope from snow / ice fill or slope movement

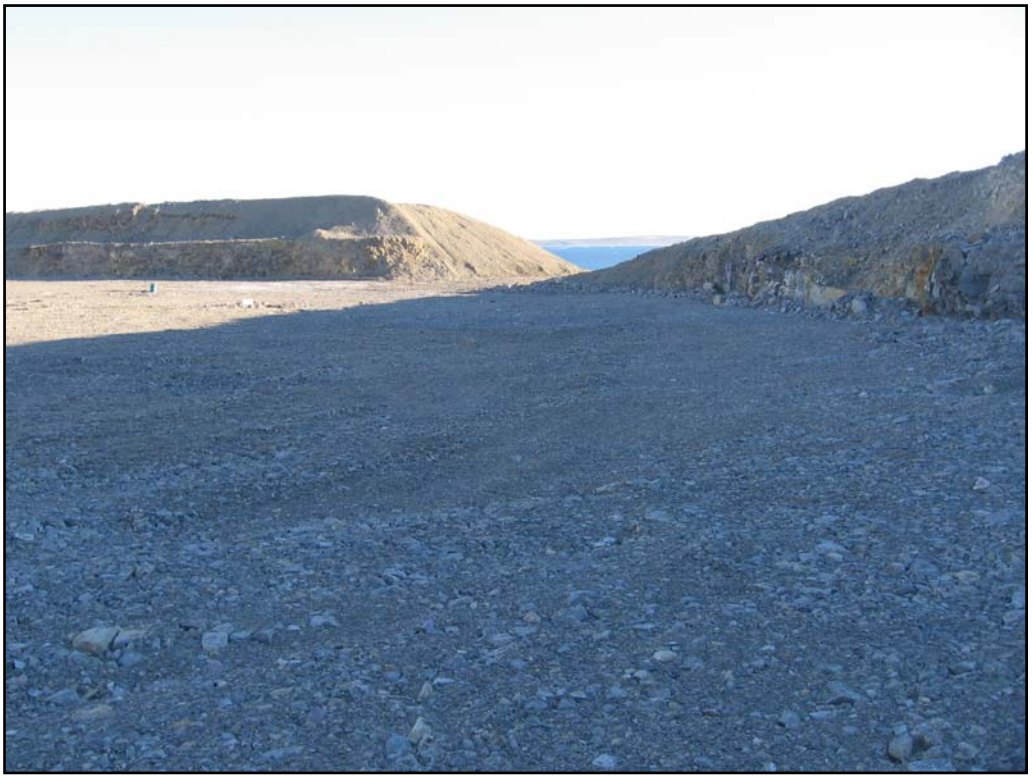

Photo 26- Northing: 8368783 Easting: 557689 Elevation: 30 m.
Little Red Dog Quarry; facing north

Photo 27- Northing: 8368783 Easting: 557689 Elevation: 30 m.
Little Red Dog Quarry; facing southwest

Photo 28- Northing: 8368783 Easting: 557689 Elevation: 30 m.
Little Red Dog Quarry; facing southeast

Photo 29- Northing: 8368863 Easting: 557713 Elevation: 38 m.
Subsidence/slumping along road to Little Red Dog Quarry

Photo 30- Northing: 8368863 Easting: 557713 Elevation: 38 m.
Subsidence/slumping along road to Little Red Dog Quarry

Photo 31- Northing: 8368863 Easting: 557713 Elevation: 38 m.
Subsidence/slumping along road to Little Red Dog Quarry

Photo 32- Northing: 8368368953 Easting: 558103 Elevation: 24 m.
View of shoreline and subsidence area from road

Photo 33- Northing: 8368368953 Easting: 558103 Elevation: 24 m.
View of new quarry from road

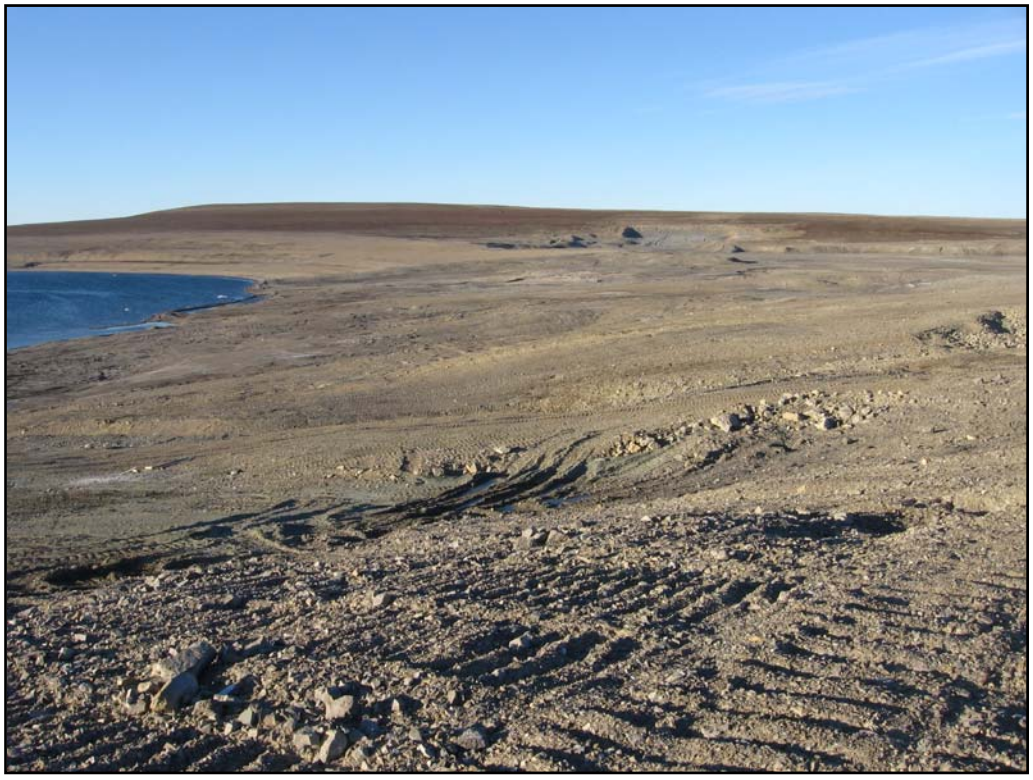

Photo 34- Northing: 8368368953 Easting: 558103 Elevation: 24 m.
View of new quarry from road

Photo 35- Northing: 8368499 Easting: 558491 Elevation: 49 m.
Crack / settlement in middle of road likely from melting of entrained snow or ice

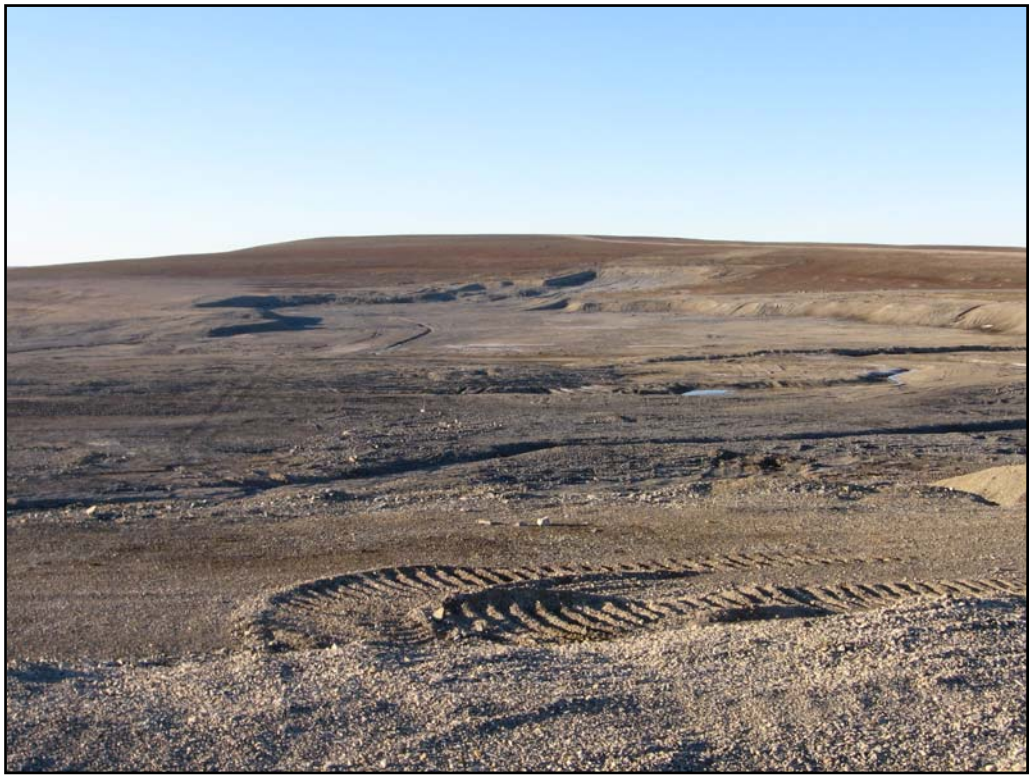

Photo 36- Northing: 8368499 Easting: 558491 Elevation: 49 m.
View of new quarry

Photo 37- Northing: 8368409Easting: 558521 Elevation: 48 m.
View of camp

Photo 38- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; west end (person standing at former outlet)

Photo 39- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; west end facing west

Photo 40- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; west end facing east

Photo 41- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; east end facing west

Photo 42- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; east end downstream

Photo 43- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Wave break structure; west end at former lake outlet

Photo 44- Frustration Lake; view from top of hill on road down to lake

Photo 45- View from top of hill on road to Frustration Lake

Photo 46- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake; South side of jetty

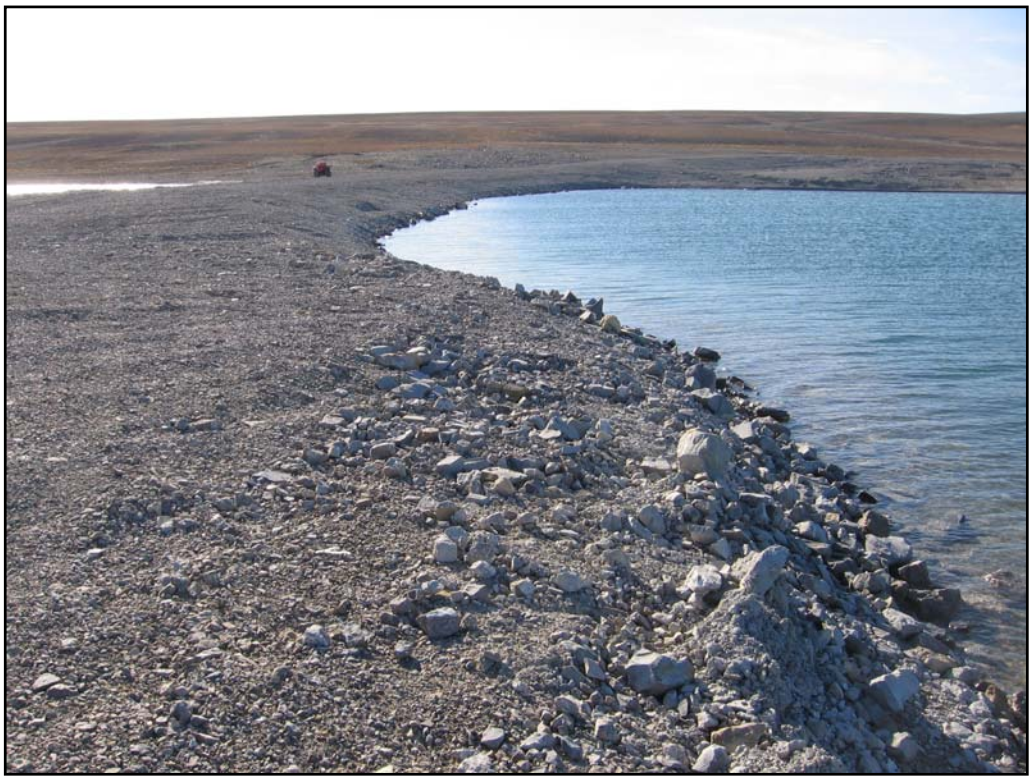

Photo 47- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake; tip of jetty

Photo 48- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake; end of jetty

Photo 49- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake, end of jetty

Photo 50- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake; North side of jetty facing shore

Photo 51- Northing: 8367425 Easting: 561582 Elevation: 11 m.
Frustration Lake Intake; looking up road from jetty

Photo 52- Northing: 8371827 Easting: 560363 Elevation: 22 m.
Frustration Lake access road; erosion gully facing upstream of road

Photo 53- Northing: 8371827 Easting: 560363 Elevation: 22 m.
Frustration Lake access road; erosion gully facing downstream of road

Photo 54- Northing: 8371151 Easting: 560166 Elevation: 52 m.
Frustration Lake access road; repaired erosion gully

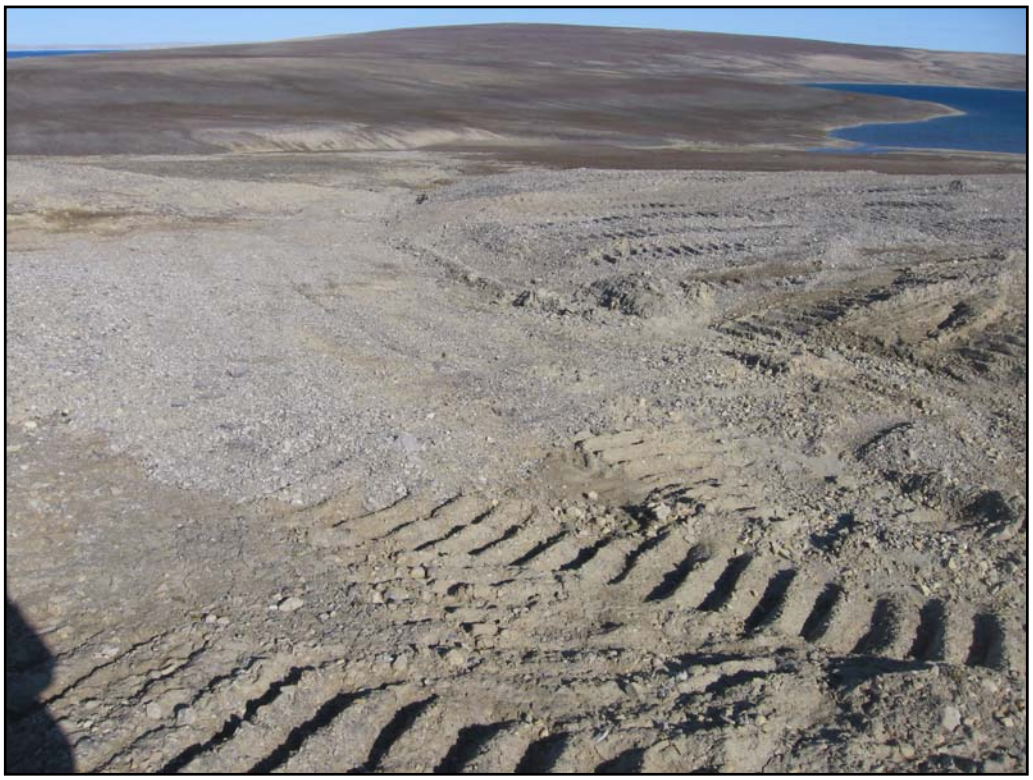

Photo 55- Northing: 8371050 Easting: 560133 Elevation: 22 m.
Frustration Lake access road; repaired erosion gully facing downstream of road

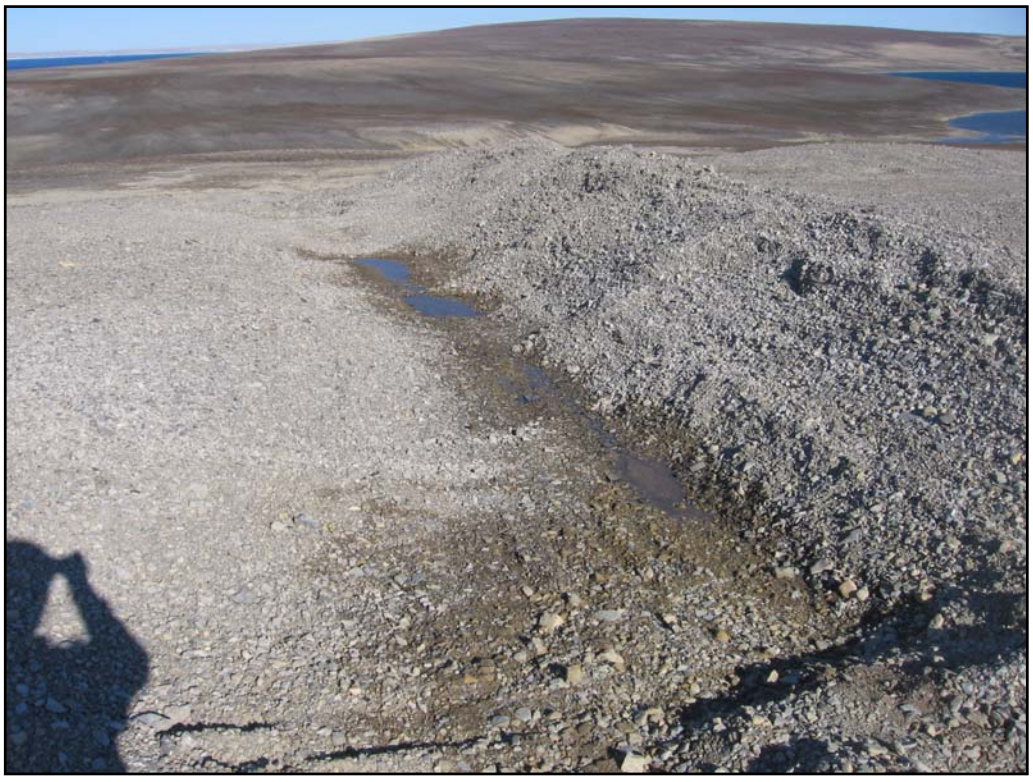

Photo 56- Northing: 8371018 Easting: 560120 Elevation: 57 m.
Frustration Lake access road; repaired erosion gully with water bar

Photo 57- Northing: 8370978 Easting: 560105 Elevation: 60 m.
Frustration Lake access road; repaired erosion gully with water bar

Photo 58- Northing: 8370930 Easting: 560085 Elevation: 61 m.
Frustration Lake access road; repaired erosion gully with water bar

Photo 59- Northing: 8369149 Easting: 559429 Elevation: 61 m.
View of new quarry from Frustration Lake access road

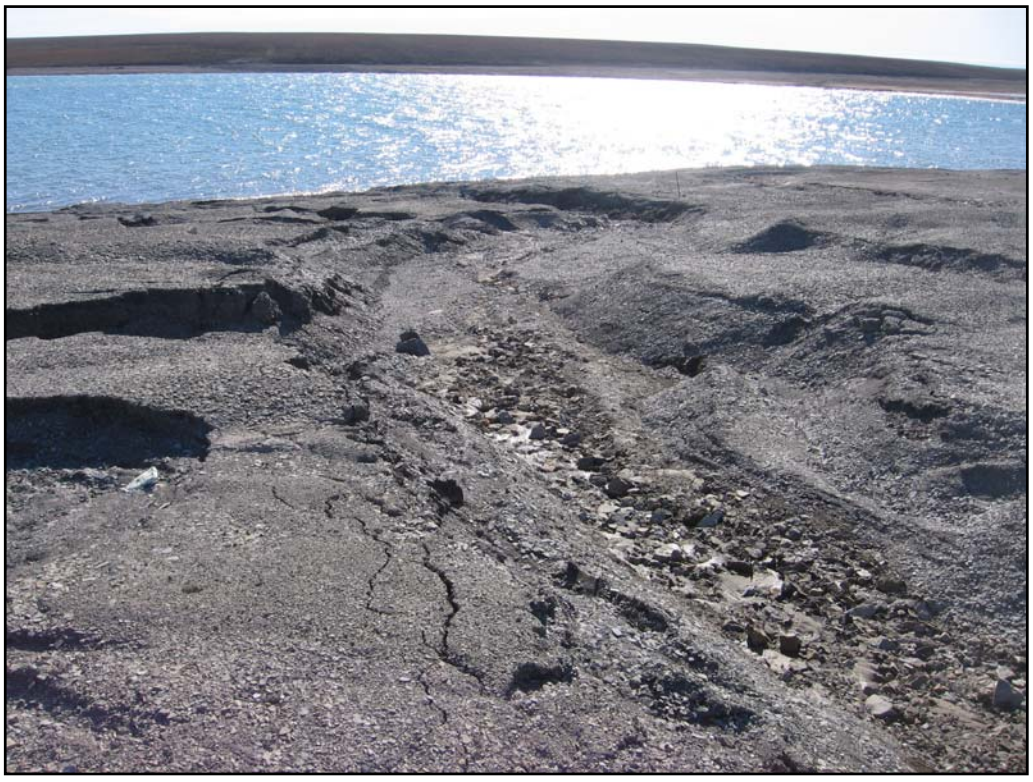

Photo 60- Northing: 8367677 Easting: 561474 Elevation: 15 m.
Garrow Lake perimeter; erosion gullies

Photo 61- Northing: 8367746 Easting: 561496 Elevation: 10 m.
Garrow Lake perimeter; new gravel bar

Photo 62- Northing: 8368000 Easting: 561481 Elevation: 11 m.
Garrow Lake perimeter; thick gravel deposit on shoreline

Photo 63- Northing: 8368908 Easting: 561101 Elevation: 10 m.
Garrow Lake perimeter; erosion near boat launch

Photo 64- Northing: 8369180 Easting: 560963 Elevation: 8 m.
Garrow Lake perimeter, erosion channels

Photo 65- Northing: 8370531 Easting: 561988 Elevation: 10 m.
Garrow Lake perimeter; small gravel accretion bar along North shore

Photo 66- Northing: 8369654 Easting: 562780 Elevation: 10 m.
Garrow Lake perimeter; Northeast shoreline

Photo 67- Northing: 8369224 Easting: 562763 Elevation: 12 m.
Garrow Lake perimeter; East quad pin shoreline

Photo 68- Northing: 8367553 Easting: 561865 Elevation: 9 m.
Garrow Lake perimeter; Southeast shore near wave break

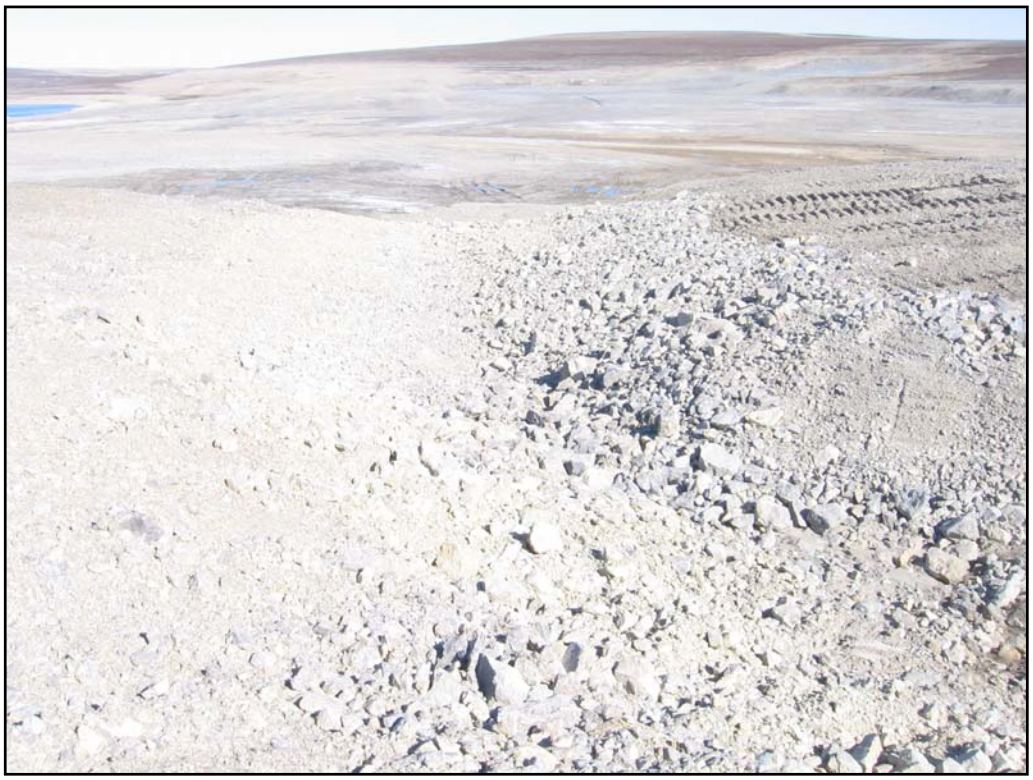

Photo 69- Northing: 8368702 Easting: 558670 Elevation: 36 m.
New quarry; rip-rap repaired gully

Photo 70- Northing: 8368665 Easting: 558789 Elevation: 32 m.
New quarry; rip-rap repaired gully

Photo 71- New quarry; facing northeast

Photo 72- Northing: 8368922 Easting: 558543 Elevation: 25 m.
Subsidence area; previously observed tension crack (no change)

Photo 73- Northing: 8368922 Easting: 558543 Elevation: 25 m.
Subsidence area; view towards Ocean

Photo 74- Northing: 8368977 Easting: 558445 Elevation: 18 m.
Subsidence area; previously observed tension crack (no change)

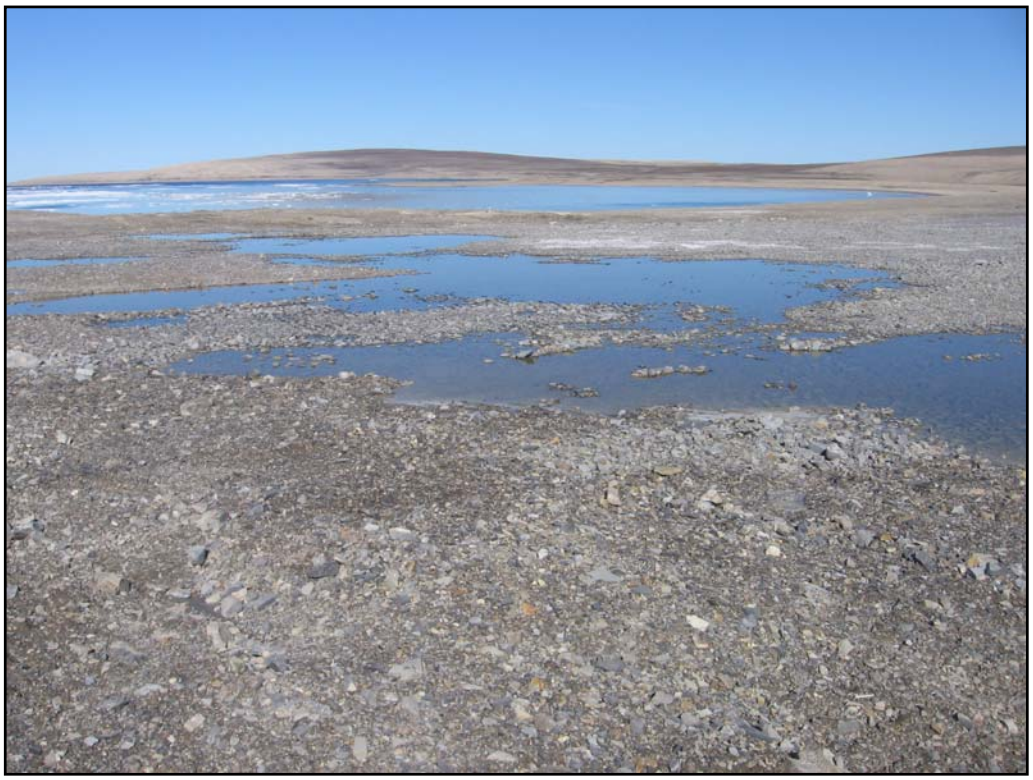

Photo 75- Northing: 8369058 Easting: 558442 Elevation: 18 m.
Subsidence area; ponded area

Photo 76- Northing: 8369058 Easting: 558442 Elevation: 18 m.
Subsidence area; previously observed settlement area (no change)

Photo 77- Northing: 8369078 Easting: 558020 Elevation: 12 m.
North portal

Photo 78- Northing: 8367592 Easting: 558074 Elevation: 4 m.
Foreshore; gravel bar formation

Photo 79- Northing: 8367592 Easting: 558074 Elevation: 4 m.
Foreshore; concentrate storage building slope facing northeast

Photo 80- Northing: 8367592 Easting: 558074 Elevation: 4 m.
Foreshore; concentrate storage building slope facing southeast

Photo 81- Northing: 8367708 Easting: 557983 Elevation: 3 m.
Foreshore; large ice thaw settlement

Photo 82- Northing: 8367758 Easting: 557943 Elevation: 6 m.
Foreshore; ice thaw settlement

Photo 83- Northing: 8367851 Easting: 557877 Elevation: 4 m.
Foreshore; ice thaw settlement

Photo 84- Northing: 8368046 Easting: 557865 Elevation: 6 m.
Main portal

Photo 85- Northing: 8367963 Easting: 557922 Elevation: 8 m.
Conveyor portal

Photo 86- Northing: 8368182 Easting: 557829 Elevation: 26 m.
Exploration portal

Photo 87- Northing: 8369328 Easting: 559184 Elevation: 26 m.
New quarry; facing east

Photo 88- Northing: 8369328 Easting: 559184 Elevation: 26 m.
New quarry; facing north

Photo 89- Northing: 8369328 Easting: 559184 Elevation: 26 m.
New quarry; facing west

Photo 90- Operational landfill slope; facing northeast

Photo 91- Northing: 8367368 Easting: 558792 Elevation: 33 m.
Operational landfill slope; facing southwest