Appendix V5-4J

Doris North Project Aquatic Studies 2007

TMAC RESOURCES

DORIS NORTH PROJECT
AQUATIC STUDIES
2007

DRAFT REPORT

Engineering Earth's Development, Preserving Earth's Integrity

Golder Associates

MIRAMAR PROJECT:
DORIS NORTH AQUATIC STUDIES 2007

- DRAFT REPORT -

Submitted to:

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April 2008 **07-1373-0018**

Cover Photo: Juvenile Arctic char and lake trout from the Doris North Project area.

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EXECUTIVE SUMMARY

Miramar Hope Bay Limited (MHBL) proposes to construct and operate an underground gold mine in the West Kitikmeot Region of Nunavut. The project is located 685 km northeast of Yellowknife and 125 km southwest of Cambridge Bay. The mine is on Inuit owned land, approximately 5 km south of the Arctic Ocean. The nearest communities are Umingmaktok, located 75 km to the southwest and Bathurst Inlet located 160 km to the southwest.

Additional baseline information collected during the 2007 aquatic studies program included seasonal monitoring of stream discharge; lake level monitoring; collecting water quality and limnology data in selected lakes and streams in the study area; determining fish species and relative abundance in potentially affected systems; assessing fish use of near-shore areas in Roberts Bay; conducting habitat assessments in Doris lake; quantifying Arctic char smolt out-migration to Roberts Bay; establishing index monitoring stations for annual lake trout and Arctic char population estimates in Roberts Lake and four tributary streams; and identifying potential Arctic char spawning sites in Roberts Lake. This information will be used to support the permitting and monitoring requirements for MHBL.

Hydrology

Lake water level and stream discharge monitoring in 2007 showed that the bulk of runoff was due to snowmelt. Doris, Tail, and Roberts lakes water surface elevations and Doris, Tail, Roberts, and Little Roberts outflows were monitored from the end of June to mid-September, 2007. Doris and Tail lakes water surface elevations were also monitored over the winter of 2006-2007. Measured lake levels indicate that spring melt began in the upper watersheds in early June, and peak stream discharge occurred approximately 30 June.

Snow course surveys were undertaken in the Doris North project area from 28 April to 4 May 2007 to measure the snowpack available to contribute to spring runoff. Twenty-one survey plots on seven terrain types were measured, and the mean snow water equivalent depth was 55.6 mm.

Physical Limnology and Water Quality

Lakes in the study area generally were isothermic and uniformly mixed during the open-water season, although Tail and Roberts lakes showed weak thermal stratification in July, and oxygen levels occasionally decline near the bottom in Tail, Doris and Roberts lakes. The outflow streams were well oxygenated throughout the sampling season.

Canadian Council of Ministers of the Environment (CCME 2007) water quality guidelines for aluminum, copper, iron, and selenium were exceeded in one or more water quality samples collected in selected lakes within the study area. Total phosphorus exceeded jurisdictional guideline for Northwest Territories and Nunavut on one occasion in Doris and Little Roberts lakes. Water quality guidelines were not exceeded in marine environment of Roberts Bay. Certain lake outflows were also found to exceed the CCME guidelines for pH, aluminum, cadmium, copper, and selenium on one or more occasions during the study period. Doris Outflow exceeded the total phosphorus jurisdictional guideline for Northwest Territories and Nunavut on two occasions.

Doris Lake Fish Habitat Assessment

A fish habitat assessment was conducted in the area of the proposed float plane dock and water intake in Doris Lake during the 2007 field program. This assessment indicated that the substrate in the proposed dock location includes boulder/cobble, silt/sand, and bedrock. At depths greater than two metres, boulder/cobble area is good habitat for spawning and rearing lake trout, and silt/sand provides spawning and rearing habitat for coregonids as well as feeding habitat for both lake trout and coregonids. At depths less than two meters, ice-thickness may extend to the substrate, which would prevent use of these habitats by fish over winter. The substrate under the proposed floating boat dock location is composed of sand/silt with water depths less than two metres. The proposed water intake barge and clearspan walkway location is in an area greater than two metres deep and the substrate is primarily composed of bedrock and silt.

Fish Communities

During fisheries surveys conducted in 2007, 1557 fish representing 11 species were encountered in the Doris North Project area. Fish sampling was conducted in Roberts Lake and four tributary streams, Little Roberts Outflow, Doris Lake, two small lakes in the Roberts Lake drainage (Lake 10 and Lake 32), and Roberts Bay. Fish captures included Arctic char (33.9%), lake trout (13.6%), ninespine stickleback (12.7%), cisco (12.2%), lake whitefish (10.3%), and Arctic flounder (9.3%). Pacific herring, saffron cod, least cisco, fourhorn sculpin and broad whitefish were also captured in low numbers.

Lake Communities

Fish sampling was conducted in Roberts Lake, Doris Lake and two small lakes within the Roberts Lake drainage area. Fish sampling was conducted using gill nets, minnow traps, fyke nets and backpack electrofishing. In total, 370 fish were captured in Roberts Lake and the two small lakes in the Roberts Lake drainage area. Lake whitefish dominated the catch. Lake trout, Arctic char, cisco,

ninespine stickleback, and least cisco were also captured. Gill net sampling in Doris Lake resulted in the capture of 170 fish that included cisco, lake whitefish, and lake trout.

Stream Communities

Fish sampling was conducted in Little Roberts Outflow and four small tributaries to Roberts Lake. A fish fence installed in Little Roberts Outflow between 28 June and 26 July 2007 resulted in the capture of 499 fish representing five species. Arctic char dominated the catch, followed by lake trout. Broad whitefish, lake whitefish and least cisco were also captured.

Backpack electrofishing in four tributary streams to Roberts Lake resulted in the capture of 256 fish. Ninespine stickleback was the dominant species, followed by Arctic char, and lake trout. One least cisco was captured as well.

Marine Communities

A directional Arctic fyke net was used to assess fish abundance and movements in Roberts Bay from 12 to 17 July 2007. The west bound fish contributed 62% to the total catch of 262 fish. Arctic flounder was the dominant species caught in the fyke nets. Pacific herring and saffron cod were also abundant. A small portion of the catch was comprised of fourhorn sculpin, lake trout and Arctic char. Caplin were not captured during the sampling program in 2007.Arctic Char in Roberts Lake System

Arctic Char in the Roberts Lake System

Fish sampling at the Little Roberts Outflow fish fence was conducted to quantify Arctic char smolt migration from the Roberts Lake system into the marine environment of Roberts Bay. In total, 298 Arctic char were captured moving downstream; these included 211 smolt-sized fish (less than 330 mm in fork length). Consistent with 2006 results, the larger Arctic char moved downstream earlier than the smolts.

The Roberts Lake monitoring program consisted of two distinct components: monitoring index streams and monitoring shoreline use. Backpack electrofishing was conducted in four tributary streams to Roberts Lake to estimate juvenile Arctic char and lake trout abundance within the streams. The selected streams were found to support juvenile Arctic char. Stream E14 provides exceptionally high value rearing habitat, with a population of 42 Arctic char captured in the sample reach. The second component of the monitoring program involved the use of two modified Arctic fyke nets set in Roberts Lake. Nine Arctic char were captured at each of the fyke net monitoring stations.

Thirty-three gill nets sets were used to capture Arctic char in potential spawning habitat in Roberts Lake, which had been previously identified during the 2006 fall spawning survey. Only eight Arctic char were captured during the four day spawning survey in 2007. Five large (>600 mm) pre-spawning/ripe fish were captured, confirming that anadromous Arctic char appear to spawn in Roberts Lake. The presence of Arctic char in near-spawning condition indicates that the anadromous Arctic char do spawn along the shoreline in Roberts Lake.

ACKNOWLEDGEMENTS

The authors would like to thank Terri Maloof (Manager, Environmental Permitting and Compliance) and Larry Connell (General Manager, Environment) of Miramar Mining Corporation / Miramar Hope Bay Ltd. for offering us the opportunity to work on this project.

The following Golder Associates personnel participated in the field program and/or preparation of the report:

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Nathan Schmidt	- Senior Hydrologist and Senior Reviewer
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1 INTRODUCTION

1.1 GENERAL

Miramar Hope Bay Limited (MHBL) proposes to construct and operate a new underground gold mine ("Doris North Project") in the West Kitikmeot Region of Nunavut. The project is located 685 km northeast of Yellowknife and 125 km southwest of Cambridge Bay (Figure 1.1). The mine is on Inuit owned land, approximately 5 km south of the Arctic Ocean. The nearest communities are Umingmaktok, located 75 km to the southwest, and Bathurst Inlet located 160 km to the southwest.

Environmental baseline studies within the Doris North area were carried out in 1995 (Klohn Crippen 1995), 1996 (Rescan 1997), 1997 (Rescan 1998), 1998 (Rescan 1999), and 2000 (Rescan 2001). All data collected up to 2000 were summarized in a data compilation report (RL&L/Golder 2002). Additional studies have been conducted by Golder annually since 2002 (RL&L/Golder 2003a, 2003b, Golder 2005, 2006, 2007a).

In previous years, the main focus of the fisheries studies was to investigate fish populations in Roberts Lake; monitoring use of the Roberts Lake system by Arctic char; assessing fish use of near-shore habitat in Doris, Tail, Roberts and Little Roberts lakes and Roberts Bay; habitat mapping in Roberts Lake; monitoring Arctic char upstream migration and smolt out-migration in Roberts and Little Roberts outflows; and assessing Arctic char spawning locations in Roberts Lake (RL&L/Golder 2003a, 2003b, Golder 2005, 2006, 2007a).

Previous aquatic studies included bathymetry and water quality in selected lakes and streams; snowcourse surveys and monitoring of rainfall and other meteorological parameters in the Doris Lake watershed; seasonal monitoring of water surface elevations on Doris, Tail and Roberts lakes; and seasonal monitoring of water temperature and discharge in Doris, Tail, Roberts, and Little Roberts outflows (RL&L/Golder 2003a, 2003b, Golder 2005, 2006, 2007a).

Field studies were conducted in 2007 to continue documenting baseline conditions in the Doris North Project area. The specific objectives of the 2007 field program included:

- Monitoring out-migration of Arctic char smolts in Little Roberts Outflow;
- Tagging program to help determine Arctic char fidelity to the natal system;

LEGEND

- Town/Village
- Project Location
- Capital City
- Hope Bay Belt
- Territorial Border
- Waterbodies
- Canada

125 0 125

SCALE 1:4000000 KILOMETRES

MIRAMAR HOPE BAY LTD.

Hope Bay Belt

REFERENCE

Sources: Environmental Systems Research Institute (ESRI)
Projection: Canada Lambert Conformal Conic Datum: NAD 83
This map is for information purposes only. Golder Associates Ltd. does not accept any liability arising from its misuse or misrepresentation.

TITLE

Project Location Map

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 0
DESIGN	AH	4 April 2008		
GIS	RC	7 April 2008		
CHECK	AH	11 April 2008		
REVIEW	GA	14 April 2008		

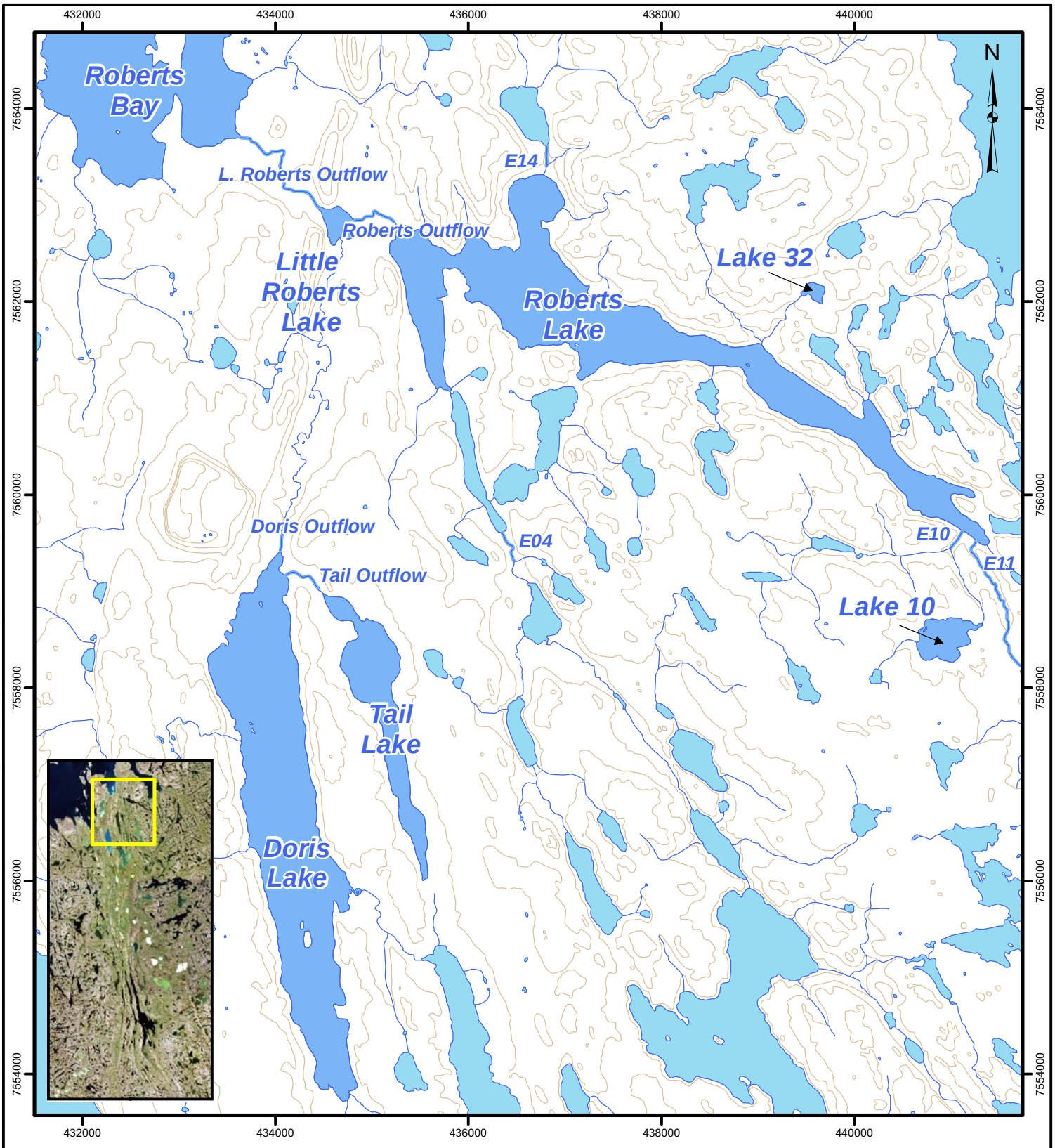
FIGURE 1.1

- Developing a standardized monitoring program in Roberts Lake to assess post habitat enhancement changes in Arctic char and lake trout abundance;
- Identifying key Arctic char spawning locations in Roberts Lake to confirm the use of Roberts Lake for spawning by anadromous Arctic char;
- Assessing fish use of Roberts Bay in the area of the jetty construction;
- Conducting a fish habitat assessment in Doris Lake prior to placement of the float plane dock and water intake structure;
- Sampling fish in Doris Lake, Roberts Lake, Lake 10 and Lake 32 in conjunction with H. Swanson's Ph.D research (Swanson and Kidd 2008, Swanson et al. 2008a);
- Sampling of water quality in selected lakes and streams (Roberts, Little Roberts, Doris, and Tail lakes; Roberts, Little Roberts, Doris, and Tail outflows; Roberts Bay), with particular emphasis on Doris Lake and Doris outflow, to provide additional baseline data for use in the water management plan;
- Snowcourse surveys in the Doris Lake watershed; and
- Seasonal monitoring of water surface elevations on Doris, Tail and Roberts lakes and discharge in Doris, Tail, Roberts and Little Roberts outflows.

The field program was conducted between 20 May and 18 September 2007. The results are summarized for each study component in the following sections.

1.2 SAMPLING PROGRAM IN 2007

Lakes that were sampled as part of the baseline studies within the project area in 2007 included Roberts, Little Roberts, Doris, and Tail lakes as well as two small tributary lakes surrounding Roberts Lake (Figure 1.2). Also sampled were Roberts, Little Roberts, Doris, and Tail outflows, as well as four small tributaries to Roberts Lake. The marine environment of Roberts Bay, the main receiving waterbody downstream of the proposed mining development, was sampled near the mouth of Little Roberts Outflow. Data collection sites and sampling methods used in 2007 are summarized in Table 1.1.



LEGEND

- Streams
- Study area streams
- Contours (20 m Interval)
- Study area waterbodies
- Waterbodies

REFERENCE

Sources: Government of Canada, Natural Resources Canada, Centre for Topographic Information.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 13N

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SCALE 1:55000 METRES

MIRAMAR HOPE BAY LTD.

Doris North Project Area

TITLE

Waterbodies Sampled, 2007

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 1
DESIGN	AH	2 April 2008		
GIS	RC	2 April 2008		
CHECK	AH	9 April 2008		
REVIEW	GA	14 April 2008		

FIGURE 1.2

Project: M:\Projects\2007\1373\0018_Miramar_Doris_North\MapDocs\Fig1_2_Waterbodies_DorisN07.mxd - Plot: M:\Projects\2007\1373\0018_Miramar_Doris_North\PDFs\Fig1_2_Waterbodies_DorisN07.pdf

Table 1.1 Doris North Project Aquatic Sampling Program, 2007

Waterbody	Discharge/ Water Level	Water Quality	Fish Capture Methods						
			Angling	Beach Seine	Electro-fishing	Fyke Net	Fish Fence	Gill Nets	Minnow Traps
Doris Lake	√	√						√	
Tail Lake	√	√							
Roberts Lake	√	√			√	√		√	
Doris Outflow	√	√							
Tail Outflow	√	√							
Roberts Outflow	√	√							
Little Roberts Outflow	√	√					√		
Roberts Lake Tributaries					√				
Small Lakes in Roberts Lake Drainage					√			√	√
Roberts Bay		√				√			

1.3 OVERVIEW OF REPORT

To facilitate subsequent integration of the 2007 data with the previous data collected, the format and organization of the present report follows closely the outline used in the previous reports (RL&L/Golder 2002, 2003a, 2003b; Golder 2005, 2006, 2007a). As such, this report is organized by major disciplines, with a separate discussion for each sampled waterbody. Environmental disciplines are presented as separate sections in the following order: hydrology, physical limnology and water quality, and fish communities. Data and analytical results are provided as appendices at the end of the report.

2 HYDROLOGY

2.1 METHODS

2.1.1 Hydrometry

Hydrographs of Doris Lake and outflow, Tail Lake and outflow, Roberts Lake and outflow, and outflow of Little Roberts Lake were derived using the following methods:

- At each hydrometric station, a KPSI 730-series solid-state pressure transducer and Optimum Instruments DD-320 data logger were installed. Each data logger was programmed to record water pressure measurements at 15-minute intervals. Each station was referenced to an elevation benchmark.
- Transducers at the Doris Lake (H74) and Tail Lake (H75) stations were left in place over the winter. The transducer and thermistor at each of these locations were installed below the bottom of the lake ice to provide lake level and temperature readings over the course of the year.
- Transducers at Doris Outflow (H71) and Tail Outflow (H76) stations were installed before the peak flow, as permitted by ice conditions and site access. Discharges prior to the installation dates were derived using upstream lake water level elevations.
- Transducers at Roberts Outflow (H72) and Little Roberts Outflow (H73) stations were installed prior to the peak flow, as permitted by ice conditions and site access. Due to high water levels at Little Roberts Outflow, which caused equipment malfunction, it was necessary to estimate the lake levels and flow data based on interpolation. The estimates can be considered reliable for monthly and annual water yields.
- During selected data logger downloads, the water surface elevations were surveyed from the permanent benchmark, and the pressure transducer readings were recorded.
- During the first and subsequent visits to stations with flowing water, stream discharge measurements were performed according to the Water Survey of Canada standard described by Terzl et al. (1994). The data loggers at each station were downloaded periodically, and pressure transducer readings coincident with each discharge measurement were noted.
- During the last site visit of 2007, the pressure transducer and data logger were removed from the flowing water stations to prevent ice damage over the winter. The pressure transducers and thermistors at Doris Lake

(H74) and Tail Lake (H75) were left in place to record measurements over the winter.

- When all data were available for flowing water stations, the record of water surface elevation versus discharge was used to check the existing stage-discharge rating curve for each station and revise it, if necessary. This rating curve was then applied to the continuous record of water surface elevations, as measured by the pressure transducer and recorded by the data logger at each station, to derive a continuous record of discharges.

2.1.2 Snow Course Surveys

Snow course surveys were undertaken from 28 April to 4 May 2007, using the following methods:

Plot Selection

Plot locations within the Doris Lake watershed were selected on the basis of terrain type. These included:

- Open Lake (flat areas on lakes);
- Exposed Lowland (flat areas at the top of slopes);
- Sheltered Lowland (flat areas at the toe of slopes); and
- North, East, South and West Aspects (slopes facing these directions).

The purpose of this was to identify differences in snow accumulation between terrain types. As much as possible, the locations used in previous years were sampled again in 2007.

Snow Depth Measurement

At each plot, 30 depth measurements were taken at randomly selected locations on a large circle with approximately 10 m between measurements. These depth measurements were taken by inserting a metal meter stick into the snowpack and reading the snowline mark.

Snow Density Measurement

Three density measurements were recorded at each plot, using a snow density sampler. The sampler was carefully inserted to avoid compacting the snowpack. The snow depth was read on the tube, when the corer reached the soil surface. The corer was then inserted and twisted into the ground to ensure that a plug of soil was extracted with the sampler to prevent granular snow from falling out.

After extracting the sampler and carefully removing the soil plug, the sampler weight was measured with and without the snow core to allow calculations of the weight of snow and snow water equivalent.

2.1.3 Lake Evaporation

The complete meteorological data set necessary do derive the evaporation data was not available at the time of the compilation of this report, and it will be included in the final version.

2.2 HYDROMETRY RESULTS

2.2.1 Doris Lake and Doris Outflow

Factsheets describing the locations of the hydrometric site and equipment installed at Doris Lake (Station H74) and Doris Outflow (Station H71) are provided in Appendix A. The appendix also contains stage-discharge data; the derived stage-discharge rating curve based on data collected from 2003 to 2007; tabulated mean daily discharge and water level data; and manual discharge measurement data and calculation sheets.

The Doris Lake hydrometric station was visited four times during the 2007 field program, and a continuous hydrograph was derived for the 1 January to 16 September 2007 period, based on continuous logger data. The Doris Outflow hydrometric station was visited four times during the 2007 field program, and a continuous hydrograph was derived for the 13 June to 12 October 2007 period. Discharges between 13 June and 22 June were derived using the measured lake water surface elevations, and discharges between 14 September and 12 October were estimated based on linear recession to freeze-up. Details of each site visit are provided in Table 2.1. The hydrographs for Doris Lake and Doris Outflow in 2007 are presented in Figure 2.1.

Table 2.1 Site Visits to Doris Lake and Outflow Hydrometric Stations, 2007

Date	Activities	Lake	Water Level (geodetic)	Outflow	Discharge
21 May	Downloaded data from Doris Lake logger and surveyed water surface elevation; ice-covered conditions	✓	21.406 m		
23 June	Measured water surface elevation at Doris Outflow			✓	
28 July	Measured discharge and water surface elevation at Doris Outflow and water surface elevation at Doris Lake	✓	21.516 m	✓	2.35 m^3/s
13 July	Measured discharge and water surface elevation at Doris Outflow			✓	1.04 m^3/s
15 August	Measured discharge and water surface elevation at Doris Outflow and water surface elevation at Doris Lake	✓	21.552 m	✓	0.441 m^3/s
14 September	Measured discharge and water surface elevation and downloaded data logger at Doris Outflow			✓	0.543 m^3/s
16 September	Water surface elevation and downloaded data logger at Doris Lake	✓	21.616 m		

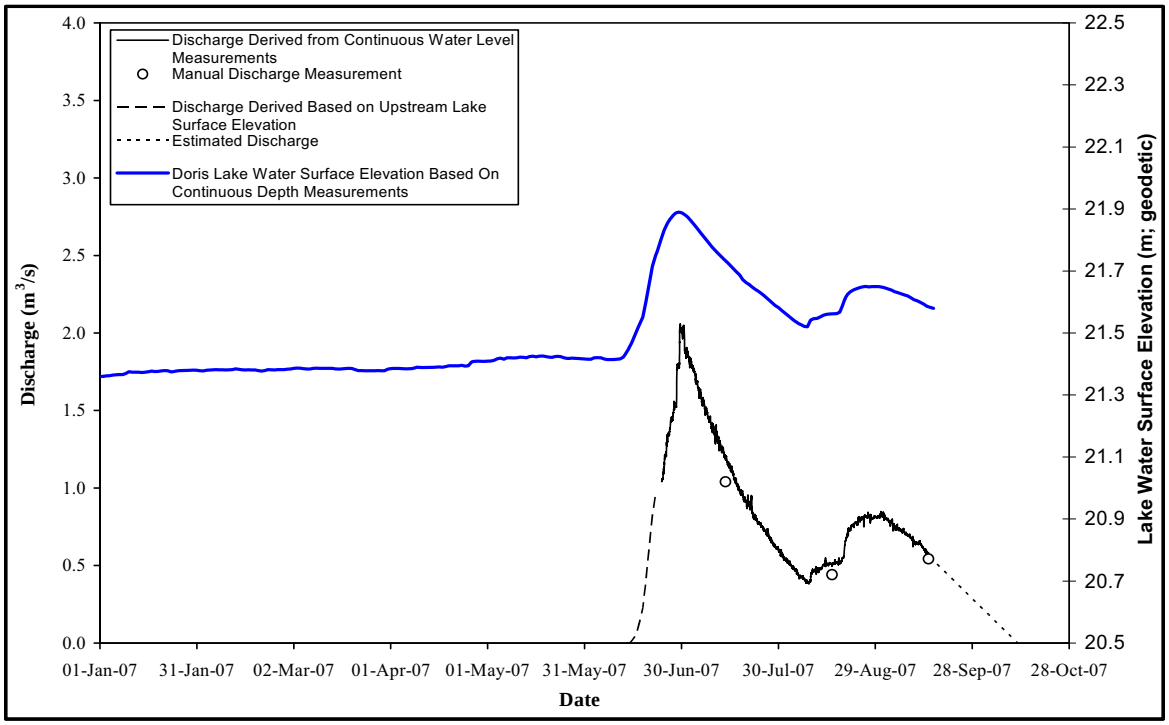


Figure 2.1 Hydrographs for Doris Lake and Outflow, 2007

2.2.2 Tail Lake and Tail Outflow

Factsheets describing the locations of the hydrometric site and equipment installed at Tail Lake (Station H75) and Tail Outflow (Station H76) are provided in Appendix A. The appendix also contains stage-discharge data; the derived stage-discharge rating curve based on data collected from 2004 to 2007; tabulated mean daily discharge and water level data; and manual discharge measurement data and calculation sheets.

The Tail Lake hydrometric station was visited three times during the 2007 field program, and a continuous hydrograph was derived for the 10 September 2006 to 9 September 2007 period. The Tail Outflow hydrometric station was visited four times during the 2007 field program, and a continuous hydrograph was derived for the 1 June to 2 October 2007 period. Discharges between 1 June and 22 June were derived using the measured lake water surface elevations, and discharges between 15 September and 2 October were estimated based on linear recession to freeze-up. Details of each site visit are provided in Table 2.2. The hydrograph for Tail Lake in 2006 is presented in Figure 2.2, showing data collected subsequent to the 2006 annual report. The hydrographs for Tail Lake and Tail Outflow in 2007 are presented in Figure 2.3.

Table 2.2 Site Visits to Tail Lake and Outflow Hydrometric Stations, 2007

Date	Activities	Lake	Water Level (geodetic)	Outflow	Discharge
23 June	Installed pressure transducer at Tail Outflow	✓			
28 June	Measured discharge and water surface elevation and downloaded data logger at Tail Outflow				0.166 m^3/s
13 July	Measured discharge and water surface elevation and downloaded data logger at Tail Outflow				0.032 m^3/s
15 August	Measured discharge and water surface elevation and downloaded data logger at Tail Outflow and Tail Lake	✓	28.616 m		0.020 m^3/s
14 September	Measured discharge and water surface elevation and downloaded data logger at Tail Outflow				0.014 m^3/s
16 September	Surveyed water surface elevation and downloaded data logger at Tail Lake and removed data logger for winter.	✓	28.630 m		

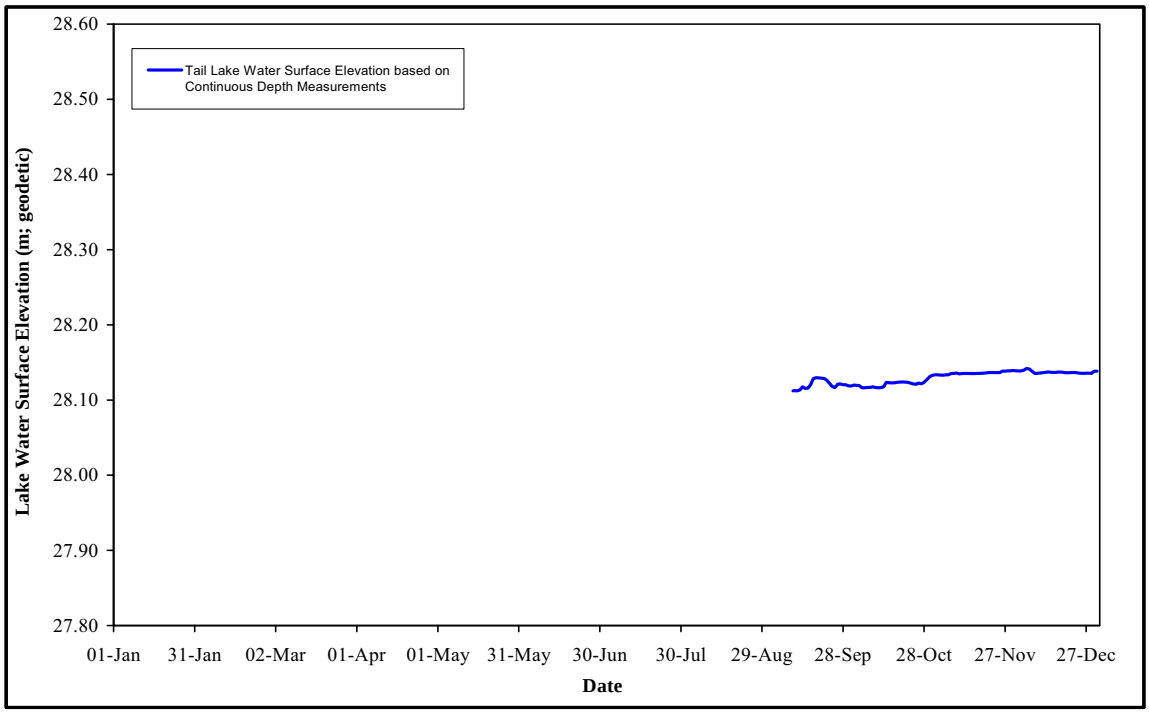


Figure 2.2 Hydrographs for Tail Lake and Outflow, 2006

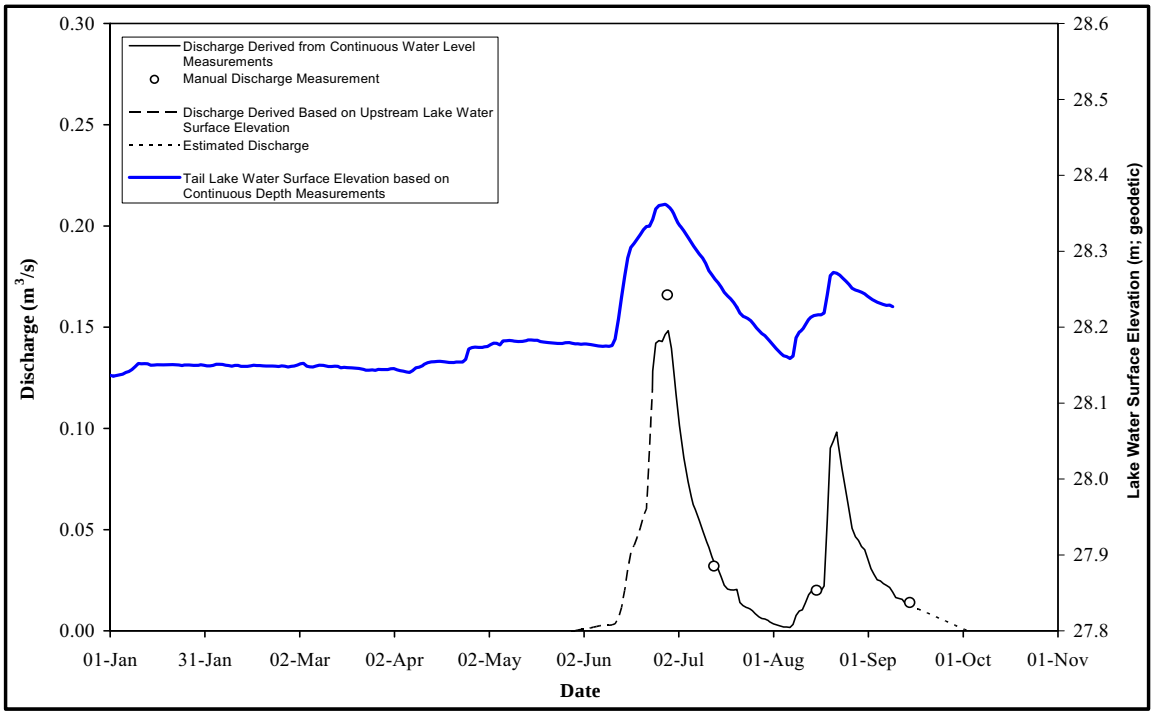


Figure 2.3 Hydrograph for Tail Lake and Outflow, 2007

2.2.3 Roberts Lake and Roberts Outflow

A factsheet describing the location of the hydrometric site and equipment installed at Roberts Lake and Roberts Outflow (Station H72) is provided in Appendix A. The appendix also contains stage-discharge data; the derived stage-discharge rating curve based on data collected from 2003 to 2007; tabulated mean daily discharge and water level data; and manual discharge measurement data and calculation sheets.

The Roberts Lake and Roberts Outflow hydrometric station was visited six times during the 2007 field program, and a continuous hydrograph was derived for the 15 June to 12 October period. Discharges between 14 September and 12 October were estimated based on linear recession to freeze-up. Details of each site visit are provided in Table 2.3. The hydrographs for this station are presented in Figure 2.4.

Table 2.3 Site Visits to Roberts Lake and Outflow Hydrometric Station, 2007

Date	Activities	Lake	Water Level (geodetic)	Outflow	Discharge
24 May	Installed transducer and logger on Roberts Lake. Surveyed lake water level on Roberts Lake. Ice-covered conditions with no discharge at the outflow.	✓		✓	
20 June	Checked transducer and logger at Roberts Lake; No discharge measurement possible, too much ice on bank and bottom of the stream.	✓		✓	
28 June	Measured discharge at Roberts Outflow. Surveyed lake water level.	✓	6.298 m	✓	3.03 m^3/s
13 July	Measured discharge at Roberts Outflow. Surveyed lake water level.	✓	6.232 m	✓	0.728 m^3/s
17 August	Surveyed lake water level on Roberts Lake and measured discharge at Roberts Outflow.	✓	6.127 m	✓	0.351 m^3/s
14 September	Surveyed lake water level on Roberts Lake and measured discharge at Roberts Outflow.	✓	6.084 m	✓	0.462 m^3/s

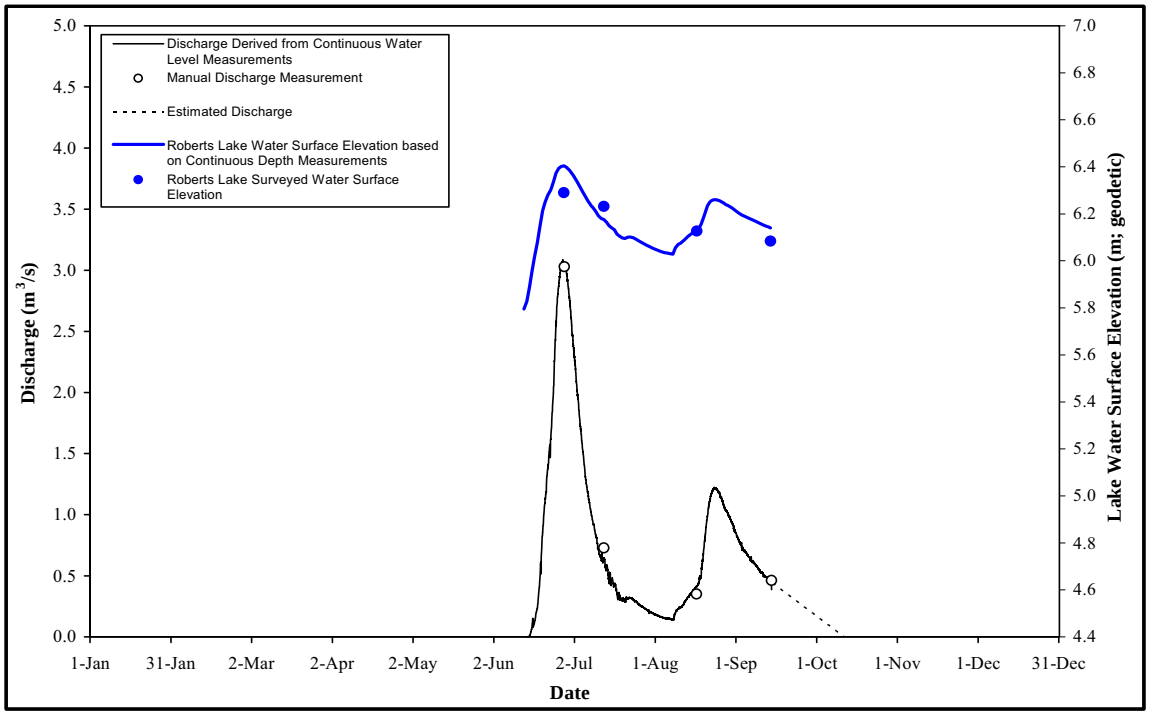


Figure 2.4 Hydrographs for Roberts Lake and Outflow, 2007

2.2.4 Little Roberts Outflow

A factsheet describing the location of the hydrometric site and equipment installed at Little Roberts Outflow (Station H73) is provided in Appendix A. The appendix also contains stage-discharge data, the derived stage-discharge rating curve, tabulated mean daily discharge and water level data, and manual discharge measurement data and calculation sheets.

The Little Roberts Outflow hydrometric station was visited six times during the 2007 field program, and a continuous hydrograph was derived for the period 13 June to 11 October. Discharges between 29 June and 7 July were estimated by interpolation because the transducer was washed out of the channel and the logger cable ripped out (it was replaced on 7 July); discharges between 15 September and 11 October were estimated based on linear recession to freeze-up. Details of each site visit are provided in Table 2.4, and the hydrograph from the station is presented in Figure 2.5.

Table 2.4 Site Visits to Little Roberts Outflow Hydrometric Station, 2007.

Date	Activities	Discharge
24 May	Installed data logger and pressure transducer. No water surface, frozen to the bottom.	n/a
20 June	Surveyed water level and measured discharge at Little Roberts Outflow.	1.740 m^3/s
08 July	Surveyed water level at Little Roberts Outflow.	
13 July	Surveyed water level and measured discharge at Little Roberts Outflow.	2.011 m^3/s
17 August	Surveyed water level and measured discharge at Little Roberts Outflow.	1.101 m^3/s
14 September	Surveyed water level and measured discharge at Little Roberts Outflow. Removed transducer.	0.988 m^3/s

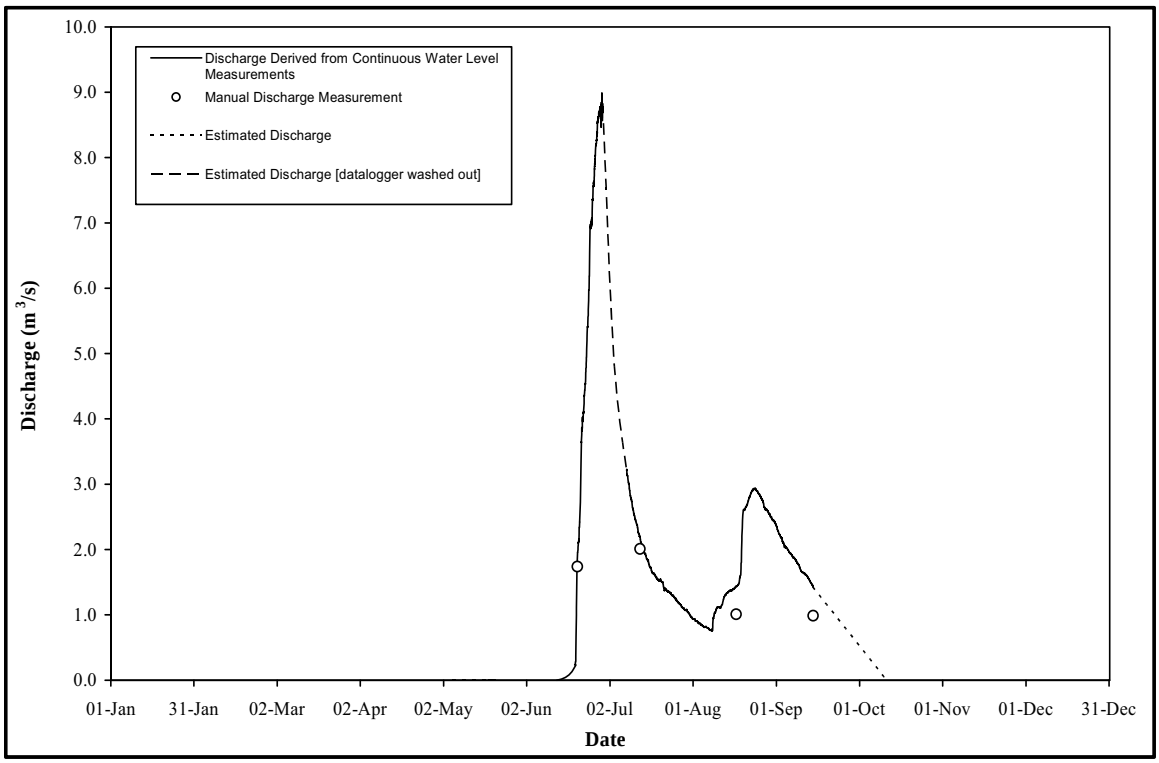


Figure 2.5 Hydrograph for Little Roberts Outflow, 2007

2.2.5 Discussion

The 2007 hydrometry program had two layers of redundancy built in to ensure that there were no significant data gaps in the event of equipment disturbance or failure. As in earlier years, the Little Roberts Outflow hydrometric station was installed as a redundant measure, to allow discharges for the Doris Outflow or Roberts Outflow hydrometric stations to be back-calculated if either of those stations was to malfunction. The Doris Lake and Tail Lake water level stations were installed in 2004. These stations provided direct measurements of lake water surface elevation, and also could provide surrogate data for discharge measurements if required. The lake water level stations were reinstalled in September 2004 into deeper water to provide year-round data.

In 2007, the Doris Lake, Doris Outflow, Tail Lake and Tail Outflow stations operated continuously with no malfunctions. A data gap occurred at the Little Roberts Outflow station due to high water levels, which caused equipment malfunction. The missing lake level and flow data were estimated based on interpolation. The estimates can be considered reliable for monthly and annual water yields.

Monthly and annual water yields for the four monitored watersheds (Doris Lake, Tail Lake, Roberts Lake and Little Roberts Lake) were calculated based on the measured hydrographs and watershed areas. These water yields are presented in Table 2.5, where the baseline mean water yield for each watershed is also shown. The data show that 2007 was a dry year compared to the Mean Annual Water Yield, exception being the Little Roberts Lake, which was very close to the annual mean value.

Table 2.5 Calculated Water Yields for Doris, Tail, Roberts and Little Roberts Watersheds

Watershed	Total Annual Discharge (m^3)[a]	Watershed Area (km^2)	Water Yield (mm)	
			2007 Annual	Mean Annual[b]
Tail Lake	358,858	4.4	81.6	111
Doris Lake	7,438,275	93.1	79.9	134
Roberts Lake	7,075,941	97.8	72.4	134
Little Roberts Lake	24,583,492	189.9	129.5	134

[a] Hydrograph estimated before and after monitoring period.

[b] Derived from Ellice River 1971 to 2000 data (AMEC 2003).

2.3 SNOW COURSE SURVEYS

The water equivalent of a snowpack (the equivalent depth of water if the snowpack is melted) is a product of snow depth and snow density. At each snow course survey plot, snow depths and snow densities were measured as described in Section 2.1.2. Appendix A presents the terrain type and snowpack measurement data collected between 28 April 2007 and 4 May 2007. The snow course survey sampling locations for the 2007 program are shown on Figure 2.6, and the snow course data are presented in Table 2.6 and Figure 2.7.

Twenty-one plots over seven terrain types were examined during the snow course survey. Measured snow densities were similar across all terrain types, whereas snow depths ranged from a mean of 22.2 cm for open lake areas to a mean of 51.8 cm for west aspect terrain. Snow water equivalents ranged from 38.1 mm of water for exposed lowland terrain to 89.6 mm for west aspect terrain.

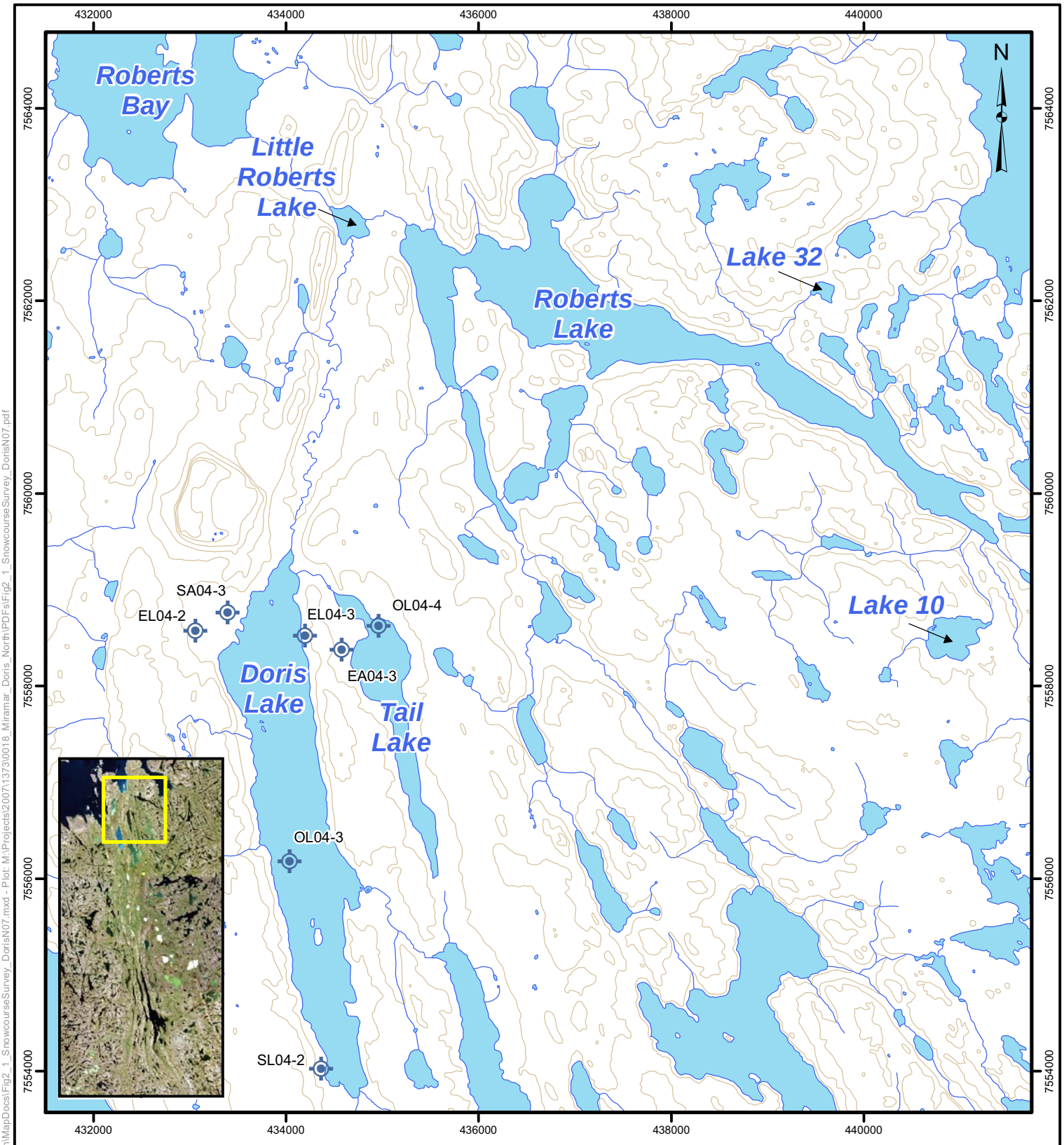
Table 2.6 Snow Course Survey Data for Doris Lake Watershed, 28 April – 4 May 2007

Terrain Type	Survey Plot Number	Snow Density (g/cm^3)[a]	Snow Depth (cm)[b]	Snow Water Equivalent (mm)
Open Lake	**OL-06-1**	0.216	22.0	74.4
	OL-06-2	0.370	26.7	98.9
	OL-06-3	0.112	17.9	20.0
	2007 Mean	**0.233**	**22.2**	**55.4**
Exposed Lowland	**EL-06-1**	0.171	40.1	68.4
	EL-06-2	0.090	36.8	33.3
	EL-06-3	0.058	21.5	12.5
	2007 Mean	**0.106**	**32.8**	**38.1**
Sheltered Lowland	**SL-06-1**	0.153	44.1	67.5
	SL-06-2	0.126	41.2	52.1
	SL-06-3	0.079	30.5	24.0
	2007 Mean	**0.119**	**38.6**	**47.9**
North Aspect	**NA-06-1**	0.191	25.4	48.6
	NA-06-2	0.152	29.3	44.6
	NA-06-3	0.267	40.4	107.9
	2007 Mean	**0.203**	**31.7**	**67.0**
East Aspect	**EA-06-1**	0.095	26.3	24.9
	EA-06-2	0.146	57.0	83.5
	EA-06-3	0.132	31.7	41.9
	2007 Mean	**0.124**	**38.3**	**50.1**
South Aspect	**SA-06-1**	0.119	35.0	41.7
	SA-06-2	0.129	24.1	31.0
	SA-06-3	0.183	28.2	51.6
	2007 Mean	**0.144**	**29.1**	**41.4**
West Aspect	**WA-06-1**	0.136	29.7	40.4
	WA-06-2	0.174	45.0	78.3
	WA-06-3	0.186	80.7	150.1
	2007 Mean	**0.165**	**51.8**	**89.6**

[a] Mean based on three density samples per plot.

[b] Mean based on 30 snow depth measurements per plot.

Wind redistributes snowfall over the course of a winter, and in general, exposed terrain, such as open lake areas, collects less snow than sheltered lowland areas. Similarly, prevailing winds redistribute snow unequally across slopes of differing aspect. These effects may result in substantial differences between terrain types in some cases. However, this study involved a limited number of sampling sites in an area with little vegetation, and broad ranges of measured values were observed within each terrain type. As such, detailed calculation of the mean snow water equivalent, based on the relative proportion of each terrain type, is not recommended. An un-weighted mean of the snow water equivalent values for various terrain types, equal to 55.6 mm in 2007, may be used in any site-specific water balance calculations.



LEGEND

- Snow course survey locations
- Contours (20 m Interval)
- Streams
- Waterbodies

2000 0 2000

SCALE 1:55000 METRES

MIRAMAR HOPE BAY LTD.

Doris North Project Area

REFERENCE

Sources: Government of Canada, Natural Resources Canada, Centre for Topographic Information.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 13N

This map is for information purposes only. Golder Associates Ltd. does not accept any liability arising from its misuse or misrepresenation.

TITLE

Snow Course Survey Plot Locations for Doris Lake Watershed, 28 April - 4 May 2007

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 1
DESIGN	AH	2 April 2008		
GIS	RC	24 April 2008		
CHECK		9 April 2008		
REVIEW		14 April 2008		

FIGURE 2.6

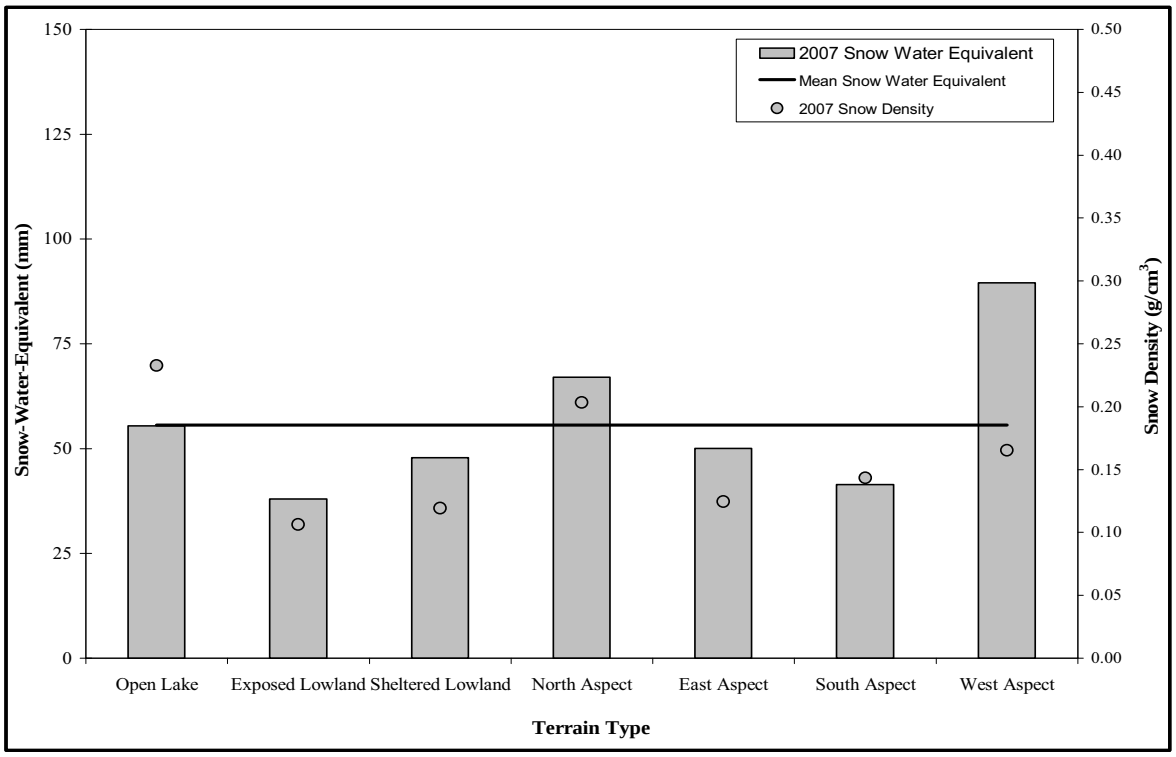


Figure 2.7 Snow Course Survey Data for Doris Lake Watershed, 28 April – 4 May 2007.

3 PHYSICAL LIMNOLOGY AND WATER QUALITY

3.1 METHODS

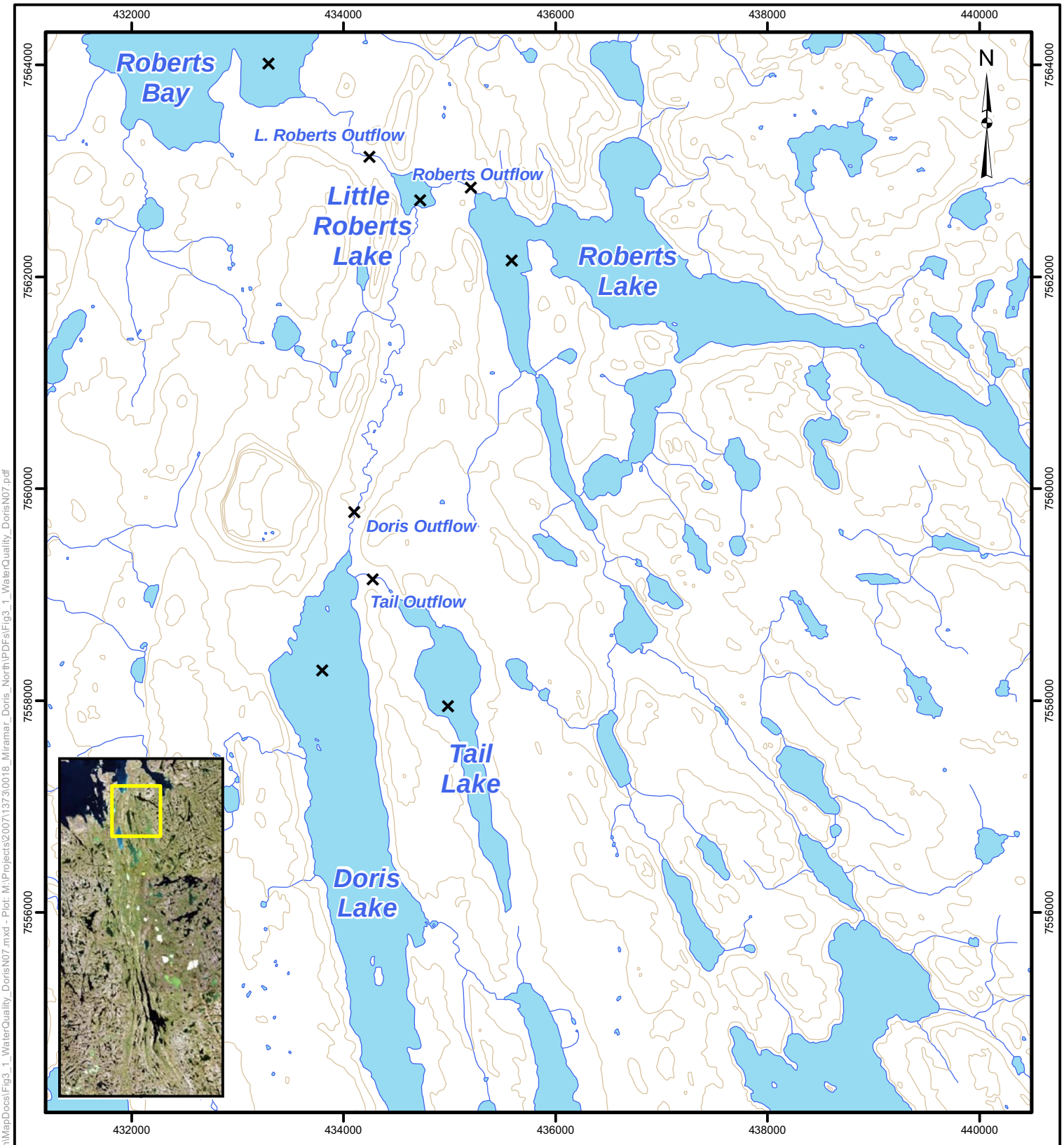
An extensive water quality program was conducted in the Doris North study area between 22 May and 16 September 2007 to provide additional baseline data, and thereby strengthen the project's water management strategy. Four lakes (Doris, Tail, Roberts and Little Roberts) were sampled under-ice in May, and during open-water in July, August and September. The corresponding outflow streams (Figure 3.1) were sampled at least once per month during open-water season from June to September; Doris and Tail outflows, the streams that would be affected by the tailings management program, were sampled 12 times over the course of this study (Table 3.1). As in previous years, one marine site in Roberts Bay was included in the water quality program because the four Doris North study streams flow into this bay and have the potential to influence its water quality. Roberts Bay was sampled under-ice in May, and during open-water in July, August and September on approximately the same dates as the lake sites (Table 3.1).

This section of the report presents information on baseline water quality conditions in 2007 for the selected lakes, outflow streams and Roberts Bay (Figure 3.1). Detailed site-specific data are presented in Appendices B1 to B6.

3.1.1 Field Sampling Locations and Procedures

Lakes and Roberts Bay

Water quality sampling stations were the same as in the 2007 study: one station located in the deep basins of each of the four lakes; one station on the outflow stream from each lake; and one station in Roberts Bay (Figure 3.1). Water quality stations were located using a Global Positioning System (hand-held Garmin 76; accuracy of ± 15 m). To prevent contamination, equipment was thoroughly rinsed with ambient water before and after sampling. Samples were collected with a Kemmerer water sampler from 1.0 m below the water surface in the lakes and 3.0 m below water surface in Roberts Bay. In addition, near-bottom samples were collected from about 0.5 m above the bottom (to prevent sediment disturbance and contamination of samples) from Roberts Bay and the study lakes, except the shallowest, Little Roberts Lake, which was only sampled mid-water column.



LEGEND

- ✕ Water Quality Sampling Stations
- Contours (20 m Interval)
- Rivers
- Waterbodies

1750 0 1750

SCALE 1:50000 METRES

MIRAMAR HOPE BAY LTD.

Doris North Project Area

REFERENCE

Sources: Government of Canada, Natural Resources Canada, Centre for Topographic Information.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 13N

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TITLE

Water Quality Sample Locations, 2007

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 1
DESIGN	AH	2 April 2008		
GIS	RC	2 April 2008		
CHECK	AH	9 April 2008		
REVIEW	GA	14 April 2008		

FIGURE 3.1

Project: M:\Projects\2007\1373\0018_Miramar_Doris_North\MapDocs\Fig3_1_WaterQuality_DorisN07.mxd - Plot: M:\Projects\2007\1373\0018_Miramar_Doris_North\PDFs\Fig3_1_WaterQuality_DorisN07.pdf

Table 3.1 Number of Water Quality Samples[a] Collected in the Doris North Project Area, 2007

Date	Doris Outflow	Doris Lake	Tail Outflow	Tail Lake	Roberts Outflow	Roberts Lake	Little Roberts Outflow	Little Roberts Lake	Roberts Bay	Total
22 May		2[b]		2						4
24 May						2		1		3
27 May									2[c]	2
20 Jun	1		1		1		1			4
07 Jul	1		1							2
14 Jul	1		1		1		1			4
15 Jul		2		2		2		1		7
21 Jul	1		1							2
23 Jul									2	2
27 Jul	1		1							2
04 Aug	1		1							2
12 Aug	1		1		1		1			4
16 Aug		2		2						4
18 Aug	1		1			2		1		5
25 Aug	1		1							2
31 Aug	1		1						2	4
09 Sep	1		1							2
13 Sep		2		2						4
14 Sep						2		1		3
15 Sep									2	2
16 Sep	1		1		1		1			4
Total	12	8	12	8	4	8	4	4	8	68

Checked by: EJ

Prepared by: CC

[a] Excluding QA/QC samples – these are listed in Table 3.3.

[b] When two samples were collected from lakes and Roberts Bay, one sample was collected near the top and one near the bottom of the water column.

[c] Laboratory analysis was incorrect, therefore no data are reported for these two samples.

Water samples were collected for analyses of standard water quality parameters including major ions, nutrients, and metals (total and dissolved). Sample bottles were provided by the laboratory, and were labeled with the sample location and date. When required, the appropriate preservative was added in the field. All samples were kept cool until delivery to the laboratory.

Field measurements of pH, temperature, dissolved oxygen (DO) and Secchi depth were taken at each sampling site. DO and temperature were measured using a field-calibrated Horiba U-22 multi-parameter probe (accuracy: ± 0.01 mg/L DO and ± 0.01°C). Dissolved oxygen and temperature profile data were collected under-ice in May and during open-water in July, August and September in the four lakes and Roberts Bay. Measurements were taken at 0.5 or 1.0 m intervals along a vertical transect from surface to near bottom. The deepest measurement for each profile was 0.5 m above the bottom to avoid

contamination of the probe by fine sediments. Field pH was measured about 0.2 m below water surface with a Horiba U-22 multi-parameter probe.

Water transparency (Secchi depth) was measured with a standard Secchi disk (20 cm diameter), and was considered to be the depth at which the disk disappeared from sight. The lower limit of the euphotic zone (approximate depth to which 1% of incident light penetrates) was calculated to be approximately twice the Secchi depth.

Streams

Stream water quality was sampled on at least four occasions, starting on 20 June 2007 (Table 3.1). The water samples were collected approximately 0.1 m below the water surface from Doris, Tail, Roberts and Little Roberts outflow streams. The samples were analyzed for the same water quality parameters as the lake samples. The sample treatments and handling was also identical to the lake samples. Field measurements included pH, temperature, and dissolved oxygen. Measurements were taken using the same methods and equipment employed at the lake sites. In addition, temperature recorders (HOBO Water Temp Pro v2) were installed at each stream water quality station (Figure 3.1). The intent was to collect continuous water temperature readings from 20 June through to 16 September. To secure the temperature recorder, the unit was attached with a rope to a stake or a shrub on the stream bank. The temperature recorder also was secured within the stream channel by attaching it to a large rock or a lead weight. The temperature was recorded at six minute intervals. If the temperature recorder was exposed to the air (by an animal or fast moving current and/or drop in water level), the readings were readily identified (much higher daily fluctuations) and excluded from the temperature time series.

3.1.2 Laboratory Analytical Procedures and QA/QC

Water quality analyses, including nutrients, major ions, metals (total and dissolved), and other standard physicochemical parameters, such as total alkalinity, total suspended solids, colour, were carried out as follows:

- For freshwater samples - the Alberta Research Council (ARC) Laboratory, Vegreville, Alberta (Table 3.3)
- For Roberts Bay samples :
  May - Maxxam Analytics Inc., Burnaby, British Columbia
  July, August, and September - ALS Laboratory Group, Vancouver, BC

Quality assurance/quality control for the water sampling program was ensured through the use of field blanks and replicate samples (Table 3.3 and Appendix B4). Field blanks were prepared by filling sample containers in the field with deionized water provided by the laboratory. Replicate samples were collected by filling

multiple containers with water at a single water quality station. All blank samples were preserved as required and given a unique name.

Table 3.2 Water Quality Parameters and Corresponding Minimum Reported Values (MRV) from Laboratory Analyses of Freshwater Samples for the Doris North Project, 2007

Parameter	Unit	MRV	Parameter	Unit	MRV	
Metals – Total (and Dissolved)			***Nutrients***			
Aluminum (Al)[a]	µg/L	0.5 (0.2)[b]	Ammonia-N[a]	mg/L	0.001	
Antimony (Sb)	µg/L	0.0005	Dissolved Organic Carbon	mg/L	0.2	
Arsenic (As)[a]	µg/L	0.002[e]	Fluoride (F)[a]	mg/L	0.01	
Barium (Ba)	µg/L	0.004	Phosphorus, Total[c]	mg/L	0.001	
Beryllium (Be)	µg/L	0.003	Sulphide	mg/L	0.001	
Bismuth (Bi)	mg/L	0.001	Total Kjeldahl Nitrogen	mg/L	0.01	
Boron (B)	µg/L	0.05 (0.03)	Total Organic Carbon	mg/L	0.8[d]	
Cadmium (Cd)[a]	µg/L	0.002	Total Suspended Solids[a]	mg/L	1	
Calcium (Ca)	mg/L	0.004				
Chromium (Cr)[a]	µg/L	0.03	***Routine Water Analysis***			
Cobalt (Co)	µg/L	0.001	Chloride (Cl)	mg/L	0.3	Checked by: EJ
Copper (Cu)[a]	µg/L	0.05	Color, True[b]	T.C.U.	1	
Cyanide, Total[a]	mg/L	0.001	Nitrate+Nitrite-N	mg/L	0.005	
Iron (Fe)[a]	µg/L	2	Nitrate-N[a]	mg/L	0.005[d]	
Lead (Pb)[a]	µg/L	0.001	Nitrite-N[a]	mg/L	0.001	
Magnesium (Mg)	mg/L	0.0001	Sulphate (SO_4)	mg/L	3	
Manganese (Mn)	µg/L	0.003				
Mercury (Hg)[a]	ng/L	0.6	***pH, Conductivity and***			
Molybdenum (Mo)[a]	µg/L	0.001	***Total Alkalinity***			
Nickel (Ni)[a]	µg/L	0.005	pH[a]	pH	0.1	
Potassium (K)	µg/L	2	Conductivity (EC)	µS/cm	0.1	Prepared by: CC
Selenium (Se)[a]	µg/L	0.1	Bicarbonate (HCO_3)	mg/L	1	
Silver (Ag)[a]	µg/L	0.0005	Alkalinity, Total (as $CaCO_3$)	mg/L	1	
Sodium (Na)	µg/L	2	Total Dissolved Solids	mg/L	0.1[c]	
Strontium (Sr)	µg/L	0.004				
Thallium (Tl)[a]	mg/L	0.0003				
Tin (Sn)	mg/L	0.03				
Uranium (U)	µg/L	0.0001				
Vanadium (V)	µg/L	0.01				
Zinc (Zn)[a]	µg/L	0.01 (0.05)				

[a] Indicates parameters that are included in the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 2007).

[b] MRV values in brackets are for dissolved metals. Metals without values in brackets indicate that total and dissolved MRVs are the same.

[c] Jurisdictional guideline for Northwest Territories and Nunavut (Statistics Canada 2006) is used for evaluations of total phosphorus concentrations.

[d] calculated

[e] May MRV = 0.02 µg/L; July, August and September MRV = 0.002 µg/L

Table 3.3 Summary of the QA/QC Samples Collected in the Doris North Project Area, 2007

Checked by: EJ
Prepared by:CC

Waterbody	QA/QC Sample Type	Number of Samples	Date	Location in Water Column	Total Metals Analyzed
Doris Lake	Replicate	2	22 May	Top	Yes
	Replicate	2	15 Jul	Top	Yes
	Replicate	2	16 Aug	Top	Yes
	Replicate	2	13 Sep	Top	Yes
Tail Lake	Field Blank	1	18 July	Top	Yes
	Field Blank	1	16 Aug	Top	Yes
	Field Blank	1	13 Sep	Top	Yes

3.1.3 Data Interpretation

Concentrations of the various substances were compared against Canadian Water Quality Guidelines (CWQG; CCME 2007). In cases where the CWQGs have not yet been developed, the Northwest Territories and Nunavut jurisdictional guidelines (Statistics Canada 2006) or the British Columbia water quality guidelines (BCMOE 2006) were used.

Aluminum

The CWQGs for aluminum depend on the pH of water. The 100 µg/L CWQG is used for waters with pH ≥ 6.5, whereas the 5 µg/L CWQG is used for waters with pH < 6.5.

Cadmium

When water hardness was between 30 to 90 mg $CaCO_3$/L, the following formula was used to derive the guideline for total cadmium:

$$CWQG=10^{\{0.86[\log(hardness)]-3.2\}}$$

where the CWQG is in µg/L and hardness is measured as $CaCO_3$ equivalents in mg/L. When water hardness is ≤30 mg/L, the CWQG for total cadmium is 0.01 µg/L. For water with hardness ≥90 mg $CaCO_3$/L, the CWQG for total cadmium is 0.03 µg/L.

Copper

The CWQGs for copper (total) are set for different water hardness levels ($CaCO_3$ concentrations) as follows:

CWQG for Total Copper (µg/L)	Water Hardness (mg $CaCO_3$/L)
2	<120
3	120–180
4	>180

Copper is a metal of special concern in the Doris North Project area since it is typically associated with gold mining. Therefore, copper concentrations are discussed for each water body.

Mercury Concentrations

Mercury concentrations are discussed for each site regardless of their value because mercury readily accumulates in aquatic biota (CCME 2007). Concentrations of this toxicant should be noted even if they do not exceed the CWQGs (16 ng/L for marine and 26 ng/L for fresh water). The main reason is that the guidelines, as yet, have not factored in mercury accumulation in aquatic biota *via* ingestion. Furthermore, the freshwater guidelines for one of the forms of mercury, namely methylmercury (MeHg), are much lower (4 ng/L); however, typical water quality analyses tend to give total and dissolved mercury concentrations, not the individual salts and species. Depending on environmental conditions, methylmercury can contribute from less than 10 to 30% of total mercury concentrations (CCME 2007).

Total Alkalinity – Acid Neutralizing Capacity

Total alkalinity is a common measure of the acid neutralizing capacity of water. As such, it provides an indication of a water body's sensitivity to acid deposition. According to Saffran and Trew (1996), acid sensitivity ranges of lakes are based on total $CaCO_3$ alkalinity. Their study was based on lake data only; no similar studies have been conducted on streams. The acid sensitivity ranges are defined as follows:

Acid Sensitivity of Lakes	Total Alkalinity (mg $CaCO_3$/L)
• high sensitivity	<10
• moderate sensitivity	11 to 20
• low sensitivity	21 to 40
• least sensitive	>40

Total Phosphorus

A CWQG for flowing waters is not presently available for total phosphorus (TP); for still waters, the Canadian Council of Ministers of the Environment (CCME) suggests a series of trigger ranges (CCME 2007). However, a number of Canadian jurisdictions have developed their own TP guidelines for lentic (still) and lotic (flowing) waters (Statistics Canada 2006). In Northwest Territories and Nunavut, a 30 µg/L TP guideline is used for both lotic and lentic waters (Statistics Canada 2006). In this report, the TP concentrations from Doris North waters are compared against the Northwest Territories and Nunavut jurisdictional guideline.

Zinc

The 30 µg/L zinc CWQG was developed in 1987 and although it is still current it does not take into account water hardness. A number of Canadian provinces (Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario and Saskatchewan) have adopted a more recent guideline (BCMOE 2001; Environment Canada 2005). Specifically, the total zinc guideline for the protection of freshwater life (used in the above Canadian jurisdictions) is 7.5 µg/L; this applies to water bodies with hardness ≤90 mg $CaCO_3$/L (Statistics Canada 2006). Zinc is a metal of special concern in the Doris North area since it is typically associated with gold mining. Therefore, zinc concentrations are discussed for each water body.

Total *vs.* Dissolved Metal Concentrations

In general, toxicity of the particulate fraction of a metal (included in the total concentration of a metal) is lower than that of the dissolved fraction. Although, the CWQGs pertain to the total metal concentrations, most of these guidelines were based on toxicological studies using dissolved metal concentrations. As such, when a dissolved metal concentration exceeds the CWQG in a natural setting, it is likely to have more serious effects on the aquatic biota than when only the total concentration of a metal exceeds the guideline. *"Of particular concern is the apparent toxicity of some ionic metals to fish due to adsorption of the metal at the gill surface. Particulate bound forms of the same metal have much reduced toxicity. This is important when comparing the laboratory toxicity results with field situations where more metal binding agents are likely to be present, thereby usually reducing the toxicity of the metal. Conversely, fish tested in the laboratory are usually not fed and do not ingest particulate metals"* (CCME 2007).

The 2007 physical limnology and water quality data for Doris North sites were also compared to data collected between 1995 and 2006 (RL&L/Golder 2002, 2003a, 2003b, Golder 2005, 2006, and 2007a).

3.2 LAKE WATER QUALITY

The analytical results for a number of parameters were outside the guideline limits in three of the four lakes during the 2007 sampling season (Table 3.4). Detailed discussions of physical limnology and water quality for each lake are provided under the respective lake headings. All field measurements of pH, dissolved oxygen, water temperature and Secchi depth are provided in Appendix B1. Temperature and dissolved oxygen profiles are in Appendix B2. The laboratory results and QA/QC data for water quality analyses are presented in Appendices B3 and B4, respectively.

Table 3.4 Summary of 2007 Lake Water Samples that Exceeded Guidelines for the Protection of Aquatic Life in Freshwater.

Site	Strata	Date	Field pH	TSS	Al (Total)		Cu (Total)	Fe (Total)	Se (Total)	TP
			CCME	CCME	CCME	CCME	CCME	CCME	CCME	Juris.[a]
			6.5-9.0	25 mg/L[b]	100 µg/L for pH≥6.5	5 µg/L for pH<6.5	2 µg/L	300 µg/L	1 µg/L	30 µg/L
Doris Lake	Top	22-May	7.8	4					***1.1***	***47***
	Bottom	22-May		<1			***2.2***[c]		***1.4***	
	Top	16-Aug	6.9	3			***2.1***			
	Bottom	16-Jul		2					***1.2***	
Roberts Lake	Top	24-May	7.3	1	***153***				***1.2***	
	Bottom	24-May		<1	***153***				***1.6***	
	Top	15-Jul	***6.1***[c]	1		***128***				
	Bottom	15-Jul		1					***1.0***	
	Top	18-Aug	6.9	2	***139***					
	Bottom	18-Aug		2	***125***		***2.1***			
Little Roberts Lake	-	24-May	6.7	11	***112***		***2.4***	***1700***	***6.6***	***45***
	-	18-Aug	6.9	3	***117***		***2.5***			

Checked by: CC
Prepared by: EJJ

Note: TSS (Total suspended solids) and field pH values are provided to help in interpretation of the values exceeding guidelines

[a] Juris. Jurisdictional guideline for total phosphorus (TP) for Northwest Territories and Nunavut (Statistics Canada 2006); there is no single CWQG value but rather a set of trigger ranges (CCME 2007).

[b] The CWQG for clear waters specify maximum increase of 25 mg/L from background levels for any short-term exposure (e.g., 24 h period). Maximum average increase of 5 mg/L from background levels for longer term exposures (e.g., inputs lasting between 24 h and 30 d).

[c] Values exceeding guidelines are ***italicized and in bold type***.

3.2.1 Doris Lake

Doris Lake was sampled for water quality on four occasions between 22 May and 13 September 2007. Samples were taken near the water surface and the substrate on each sampling date.

The dissolved oxygen (DO) profile obtained during ice-covered conditions in May (Figure 3.2) indicated that the upper 4 m of the water column below ice (i.e., 6 m total depth) were well oxygenated. DO fell below the 9.5 mg/L CWQG for the protection of early life stages of fish at 7 m depth; at 12 m and deeper, the

DO continued to decrease and was measured below the 6.5 mg/L CWQG for the protection of aquatic life. The water temperature was 0.5°C directly below the ice-cover and increased to 2.0°C at depths of 13.0 and 13.5 m (Figure 3.2).

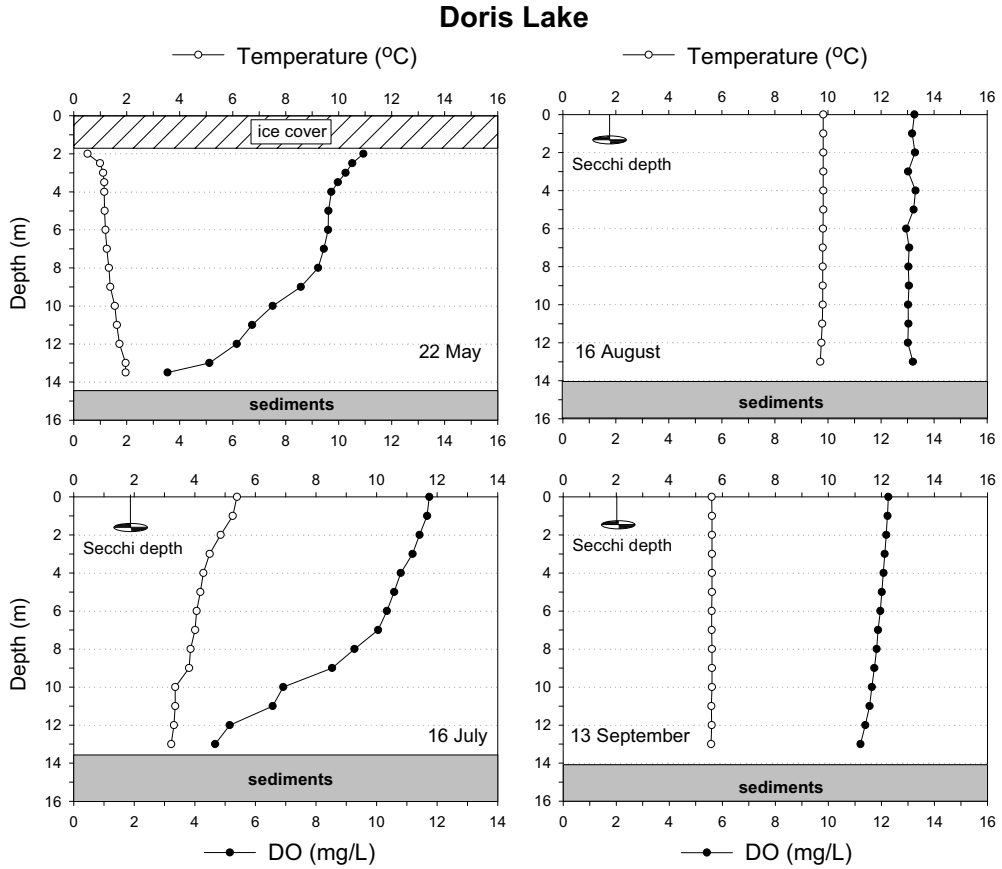


Figure 3.2 Temperature and Dissolved Oxygen (DO) Profiles and Secchi Depth for Doris Lake, 2007

The DO profile in July was similar to that in May (Figure 3.2). The upper 8 m were well oxygenated, below 8 m the DO was less than the 9.5 mg/L CWQG, and at 11 m and deeper the DO was less than the 6.5 mg/L CWQG. The July temperature gradient was very weak, with the bottom temperature at 3°C and near surface temperatures around 5°C. Doris Lake was well mixed in August and September, with well oxygenated water extending all the way to the bottom (Figure 3.2). DO concentrations in these two months were well above the 9.5 mg/L CWQG for the protection of early life stages of fish. In both August and September, the lake was isothermic, with temperatures around 9.8°C and 5.6°C, respectively (Figure 3.2).

Total phosphorus (TP) in Doris Lake exceeded the 30 µg/L jurisdictional guideline for Northwest Territories and Nunavut on one occasion. The

exceedance (47 µg/L) occurred in a top sample collected on May 22 while the lowest TP value was 13 µg/L in a bottom water sample collected on the same day (Appendix B3). The top sample had higher TSS (4 mg/L) than the bottom water sample (<1 mg/L). It is possible that some phosphorus-rich organic matter had floated from the sediments to just under the ice, or there may have been algae growing on the under-ice surface, producing this higher than usual TP concentration in the top water sample.

The Doris Lake waters were clear, with typical total suspended solids (TSS) concentrations of 2 to 3 mg/L throughout the season (Table 3.4). The Secchi depth ranged between 1.2 to 1.7 m (Figure 3.2).

Laboratory conductivity in Doris Lake, measured in top and bottom samples on each of the four sampling dates, ranged from 263 to 324 µS/cm (Appendix B3). The field pH ranged from pH 6.5 in September to 7.8 in May (ice-covered) remaining within the CWQG range of pH 6.5 to 9.0 (Appendix B1).

Total alkalinity ranged from 27.9 to 33.6 mg $CaCO_3$/L (Appendix B3). Based on the Saffran and Trew (1996) classification, Doris Lake has a low sensitivity (susceptibility) to acidification.

In 2007, in all but two samples, total copper concentrations in Doris Lake were below the 2 µg/L CWQG for waters with hardness <120 mg/L. On 22 May, the bottom sample in Doris Lake had a total copper concentration of 2.24 µg/L and a dissolved copper concentration of 2.04 µg/L. On 16 August, the top sample had a total concentration of 2.10 µg/L (Table 3.4), whereas the dissolved copper concentration was below the CWQG (1.53 µg/L; Appendix B3). Total copper concentrations in the remaining water samples ranged from 1.26 to 1.70 µg/L (Appendix B3).

Total selenium concentrations in Doris Lake in 2007 ranged from 0.49 to 1.43 µg/L (Appendix B3). Values exceeded the CWQG (1 µg/L) at top (1.13 µg/L) and bottom (1.43 µg/L) samples of the water column on 22 May, and at the bottom sample on 15 July (1.20 µg/L; Table 3.4). Dissolved selenium concentrations exceeded the guideline in the bottom samples on 22 May (1.13 µg/L) and 15 July (1.19 µg/L; Appendix B3).

3.2.2 Tail Lake

Tail Lake was sampled for water quality on four occasions between 22 May and 13 September 2007. Samples were taken near the water surface and the substrate on each sampling date. With the exception of dissolved oxygen concentrations, Tail Lake met the CWQGs.

Tail Lake was well oxygenated throughout the 2007 open-water sampling season. During the under-ice sampling event, only the bottom depth had a DO reading just below the 6.5 mg/L CWQG for the protection of aquatic life (Figure 3.3); the rest of the water column was just below or at the 9.5 mg/L CWQG for the protection of early life stages of fish.

In May, water temperature increased from 0.2°C at 1.5 m depth to 2.6°C at 4.2 m depth (Figure 3.3). A thermocline was present in July, with a decrease in temperature from 14.0°C to 7.8°C between depths of 2.0 and 4.5 m. The lake was isothermic on the remaining sampling dates, indicating that Tail Lake was well mixed (Figure 3.3; isothermic at approximately 9.5°C in August and 3.5°C in September).

Tail Lake waters were very clear, with TSS concentrations either equal to or less than the 1 mg/L detection limit throughout the season (Appendix B3). Secchi depths also indicate that Tail Lake is typically very clear, with values ranging from 3.2 to 4.4 m (Appendix B1). Tail Lake laboratory conductivity measurements during the sampling period in 2007 ranged from 154 to 257 µS/cm (Appendix B3).

Measurements of pH in the field during 2007 ranged between pH 6.8 to 7.3 (Appendix B1). These values were within the CWQG range of pH 6.5 to 9.0. Total alkalinity was between 26.7 and 27.2 mg $CaCO_3$/L (Appendix B3) during open-water season and 46 mg/L in under-ice samples. Based on the Saffran and Trew (1996) classification, Tail Lake has a low sensitivity to acidification between July and September and the least sensitivity in ice-covered conditions.

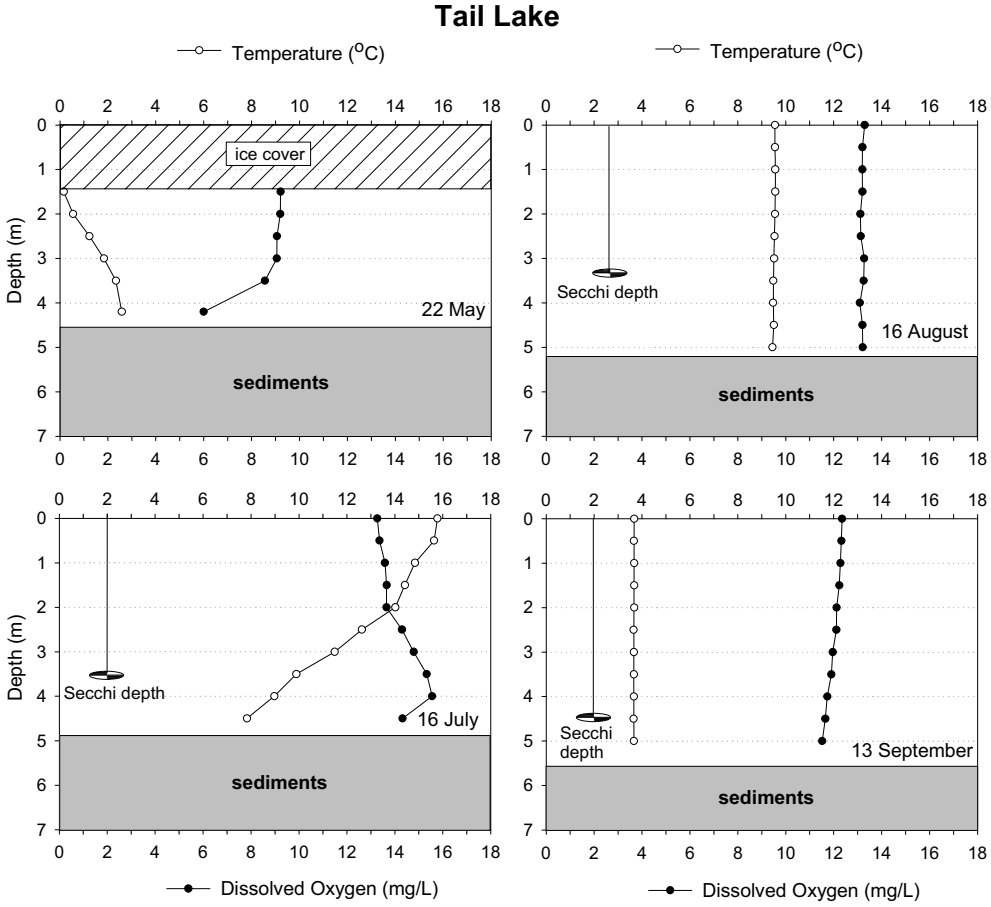


Figure 3.3 Temperature and Dissolved Oxygen (DO) Profiles and Secchi Depth for Tail Lake, 2007

3.2.3 Roberts Lake

Roberts Lake was sampled for water quality on four occasions between 24 May and 14 September 2007. Samples were taken near the water surface and the substrate on each sampling date.

On all four sampling events in 2007 (May, July, August and September), Roberts Lake was well oxygenated throughout the water column (Figure 3.4) except for one DO measurement on 22 May. Near the bottom of Roberts Lake (4.5 m depth) the DO concentration was 9.3 mg/L, just below the 9.5 mg/L CWQG for the protection of early stages of fish.

During under-ice conditions in May, Roberts Lake water temperature increased from 0.2°C below the ice (2 m) to 2.2°C at the bottom (4.5 m). The water column was stratified between 0.5 and 2.0 m, where the temperature dropped from

15.4°C to 6.6°C on 15 July. On 18 August 2007 and 13 September 2007, the lake was isothermic, with temperatures at 9.2°C and 3.8°C, respectively (Figure 3.4).

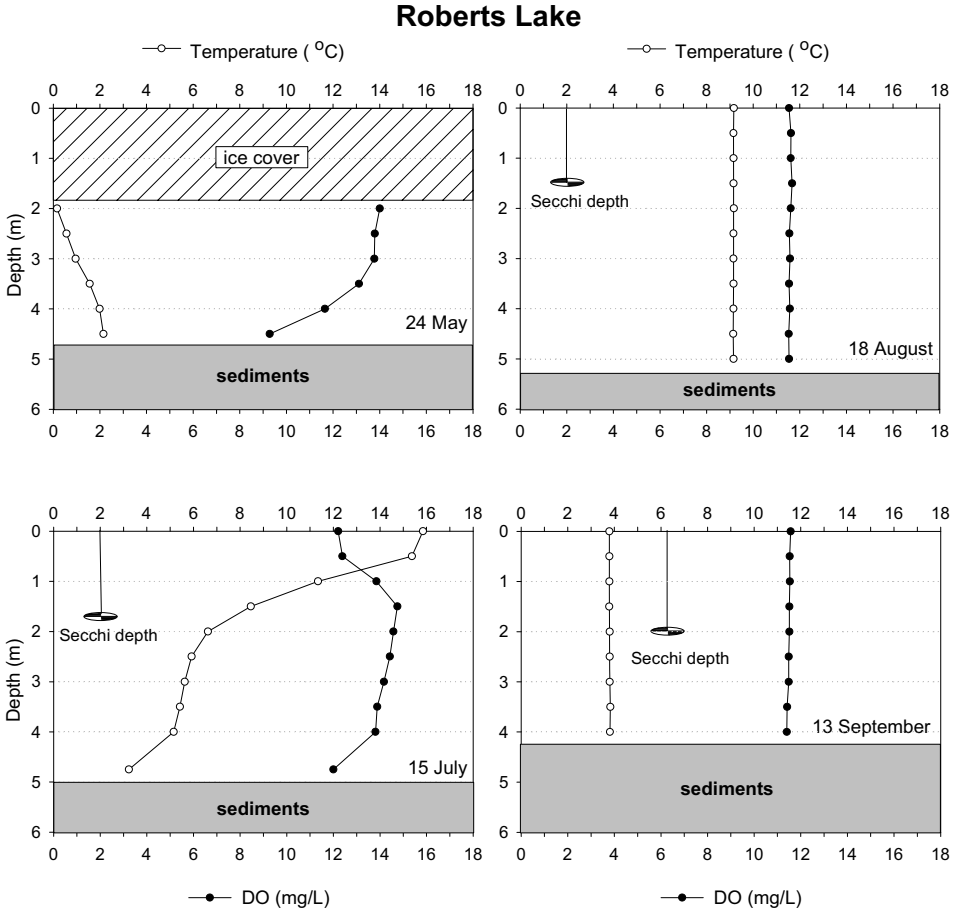


Figure 3.4 Temperature and Dissolved Oxygen (DO) Profiles and Secchi Depth for Roberts Lake, 2007

The TSS concentration in Tail Lake ranged from <1 to 4 mg/L throughout the sampling period. The Secchi depth measurements in 2007 ranged from 1.5 m to 2 m (Figure 3.4; Appendix B1).

Conductivity values measured in the laboratory ranged from 199 to 339 µS/cm (Appendix B3). The field measurement of pH on 15 July was pH 6.1, which is below the pH 6.5 to 9.0 CWQG range (Table 3.4). Field pH measurements on 24 May (pH 7.3) and 18 August (pH 6.9) were within the CWQG range. Field pH was not measured on 14 September due to probe failure in freezing temperatures.

Total alkalinity during the four sampling events ranged from 14.2 to 29.9 mg $CaCO_3$/L. Based on the Saffran and Trew (1996) classification, Tail Lake has a low to moderate sensitivity to acidification.

The total aluminum concentrations exceeded the 100 µg/L CWQG (when pH ≥ 6.5) on two sampling occasions in 2007. On 24 May, the total aluminum concentration was 153 µg/L in both top and bottom samples. On 18 August, the concentration was 139 µg/L in the top sample and 125 µg/L in the bottom sample (Table 3.4). On 15 July, when pH was below pH 6.5, total aluminum concentration at both top (128 µg/L) and bottom (60.2 µg/L) samples exceeded the pH ≤ 6.5 guideline of 5 µg/L.

Concentration of copper in Roberts Lake exceeded the 2 µg/L CWQG (for waters with hardness < 120 mg $CaCO_3$/L) in the bottom sample on 18 August (2.1 µg/L; Table 3.4). Total copper concentrations were below 2 µg/L in the remaining samples. Dissolved copper ranged from 1.14 to 1.67 µg/L during the four sampling events (Appendix B3).

Total mercury concentrations in Roberts Lake did not exceed the 26 ng/L CWQG at any time. The water samples had total mercury concentrations ranging from below the 0.6 ng/L detection limit to 2.2 ng/L (Appendix B3).

Total selenium concentrations in Roberts Lake exceeded the CWQG of 1 µg/L on two sampling dates (Table 3.4). The highest total selenium concentrations occurred on 24 May 2007 in the top (1.2 µg/L) and bottom (1.6 µg/L) samples.

3.2.4 Little Roberts Lake

Little Roberts Lake was sampled for water quality on four occasions between 24 May and 14 September 2007. Due to the shallow depth of this lake, this water sample was collected at mid-column.

The sampling location used on 24 May was 1.9 m deep, with only about 0.4 m of free water below the ice. In this layer, the DO under-ice conditions were anoxic (0.0 mg/L). On the remaining dates (July, August, September), DO was constant with depth, and the lake was well oxygenated (approximately 14 mg/L in July, 11.5 mg/L in August, and 11 mg/L in September). These concentrations are well above the 9.5 mg/L CWQG for early life stages of fish. Based on the uniform DO and temperature profiles recorded during the three sampling events, Little Roberts Lake was well mixed during the open-water season (Figure 3.5). On 15 July, water temperature ranged from 9.6°C at 2 m depth to 13.8°C at the surface. The temperature was constant around 9.4°C on 11 August, and 3°C on 13 September.

The TP concentrations in Little Roberts Lake during the 2007 sampling period ranged from 18 to 45 µg/L. Only the maximum concentration measured (45 µg/L on 24 May) exceeded the 30 µg/L jurisdictional guideline (Table 3.4). The May under-ice sample was collected from the 0.4 m layer of free water under-ice. The under-ice sample was anoxic, which increases phosphorus release from sediments (Golterman 2001). In addition, the 11 mg/L of TSS in this sample was likely the main source of TP.

All of the dissolved inorganic forms of nitrogen measured were well below the CWQGs.

The TSS in Little Roberts Lake during the open-water season was measured between 1 and 3 mg/L (Table 3.4). The under-ice sample was more turbid with 11 mg/L of TSS, likely due to stirring of the sediments during the drilling of the hole through the ice, with only 0.4 m of free water under the ice. The Secchi depth in 2007 ranged from 1.3 m to 1.5 m (Figure 3.5). Laboratory conductivity measurements in the 2007 open-water season ranged from 256 to 273 µS/cm. An atypically high conductivity of 1160 µS/cm was recorded in the under-ice sample. Similarly, unusual spikes in the concentrations of calcium, magnesium, potassium, sodium, strontium, chloride and carbonates were present in the same sample (also see copper and iron concentrations below).

Field pH measurements ranged between pH 6.7 and 6.9, remaining within the CWQG range of pH 6.5 to 9.0. Due to pH probe malfunction as a result of freezing temperatures, pH was not measured on 14 September 2007.

Total alkalinity ranged from 23.6 to 25.8 mg $CaCO_3$/L during the open-water season. In the under-ice sample, total alkalinity was unusually high (similar to conductivity and other above mentioned parameters) for Little Roberts Lake at the concentration of 105 mg $CaCO_3$/L. Based on the open-water results only and according to the Saffran and Trew (1996) classification, Little Roberts Lake has a low susceptibility to acidification.

The total aluminum concentration exceeded the 100 µg/L CCME guideline (when $pH \geq 6.5$) on two occasions in 2007. These concentrations were 112 µg/L on 24 May and 117 µg/L on 18 August (Table 3.4).

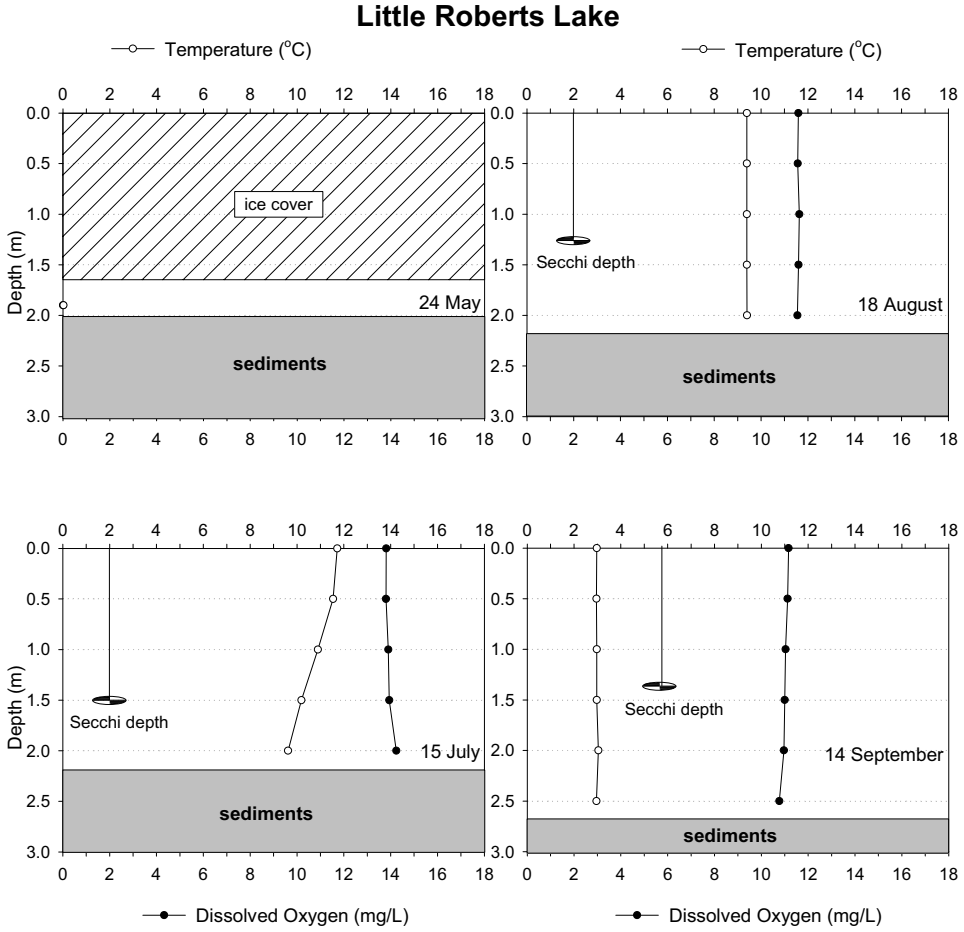


Figure 3.5 Temperature and Dissolved Oxygen (DO) Profiles and Secchi Depth for Little Roberts Lake, 2007

Total copper concentration in Little Roberts Lake exceeded the 2 µg/L CWQG applicable to waters with hardness <120 mg/L on two occasions. Total copper concentrations were 2.4 µg/L on 24 May and 2.5 µg/L on 18 August.

Total iron concentrations exceeded the 300 µg/L CWQG with a concentration of 1700 µg/L on 24 May 2007. Iron concentration on the remaining sampling occasions ranged from 60 to 120 µg/L, well below the guideline. As described above, this may be due to sediment disturbance during the drilling of the hole in the ice over shallow water.

Total mercury concentrations in Little Roberts Lake in 2007 were well below the 26 ng/L CWQG, ranging from below 0.6 ng/L (detection limit) to 4.3 ng/L.

In 2007, the total selenium concentration exceeded the CWQG concentration (1 µg/L) on 24 May, with a concentration of 6.6 µg/L, and a dissolved selenium

concentration of 3.97 µg/L (Table 3.4). This is the maximum total selenium concentration recorded at Little Roberts Lake, and may have resulted from sediment contamination of the sample.

3.2.5 Summary

Doris Lake, Tail Lake, and Roberts Lake are characterized by generally low TSS (between <1 and 6 mg/L), and conductivities ranging from 151 to 339 µS/cm. Little Roberts Lake has similar values for both parameters, with the exception of those recorded on 24 May 2007 (TSS of 11 mg/L and conductivity of 1160 µS/cm). The high, under-ice conductivity value coincided with similar spikes in the concentrations of carbonates, chloride, calcium, magnesium, potassium, sodium, strontium and iron (copper and selenium also exceeded their CWQGs in this sample). It is possible that these elevated ion concentrations were due to fractionation of ions during ice formation into the small volume of free water under-ice (0.4 m), the release of these ions from the sediments under anoxic conditions and additional release of ions due to stirring up of the sediments with the auger. This combination of small volume of water under-ice, anoxic conditions and stirring up of bottom sediments would have a greater impact on ionic concentrations in Little Roberts Lake than in deeper lakes (with greater under-ice free water volumes). Nevertheless, these pronounced spikes in concentrations of a very discrete set of parameters were also measured in some of the Boston expansion lakes in 2007 (Golder 2008) and sporadically in a number of lakes in the past. It would be prudent (and helpful for planning of future monitoring programs) to investigate the cause of these sporadic increases in these parameters.

In 2007, pH readings at the various lake sample sites were typically within the pH 6.5 to 9.0 CWQG range. The maximum pH recorded for the study lakes was pH 7.8 (Doris Lake, 24 May 2007). Based on the Saffran and Trew (1996) classification that uses total alkalinity values, the Doris North lakes have a low susceptibility to acidification.

Most of the lakes were well oxygenated in July, August and September during the open-water season. Except in Doris Lake in July where the DO in the bottom half of the water column declined, first, below 9.5 mg/L CWQG for the protection of early life stages of fish and then, at greater depths, below the 6.5 mg/L CWQG for protection of aquatic life. In under-ice conditions, DO in Doris and Tail lakes fell below 6.5 mg/L near the bottom of the lakes, and Tail Lake DO was below the 9.5 mg/L CWQG for the protection of early life stages of fish. Also in May, Roberts Lake DO was below the minimum level for the protection of early life stages of fish (9.5 mg/L) at the lake bottom (Figure 3.4).

With two exceptions, change in water temperature with depth in May and July was gradual for all lakes (i.e., no stratification). Both Tail and Roberts lakes showed weak thermal stratification in July (Figures 3.3 and 3.4). Temperature in Tail Lake decreased from 14.0°C to 7.8°C between depths of 2.0 and 4.5 m. Roberts Lake was stratified between 0.5 and 2.0 m, where the temperature dropped from 15.4°C to 6.6°C. Temperature profiles in August and September were generally isothermic for all lakes, with temperatures around 9°C or 10°C in August and between 3 and 6°C in September, depending on the lake.

Total phosphorus concentration exceeded the 30 µg/L jurisdictional guideline for Northwest Territories and Nunavut on two occasions in 2007. In Doris Lake, the total phosphorus concentration was 47 µg/L in the top sample under-ice on 22 May. In Little Roberts Lake, the total phosphorus concentration was 45 µg/L under-ice on 24 May.

Total aluminum concentrations exceeded the CWQG in Roberts and Little Roberts lakes. The guideline of 100 µg/L (for pH ≥ 6.5) was exceeded in Roberts Lake at top and bottom samples on 24 May and 18 August, and at the top sample on 15 July. In Little Roberts Lake, this guideline was exceeded on 24 May and 18 August (Table 3.4).

The 2 µg/L CWQG for copper was exceeded on a number of occasions in Doris, Roberts and Little Roberts lakes. In Doris Lake, 2 µg/L was exceeded in a bottom sample collected on 22 May for total copper (2.2 µg/L) and equaled the guideline for dissolved copper (2.0 µg/L). The guideline was also exceeded in a top sample on 16 August (2.1 µg/L). In Roberts Lake, the guideline was only exceeded in the bottom sample on 18 August (2.1 µg/L). Finally, at Little Roberts Lake, total (2.4 µg/L) and dissolved (2.2 µg/L) copper concentrations exceeded the guideline on 24 May, and total copper exceeded the guideline on 18 August (2.5 µg/L; Table 3.4).

Little Roberts Lake was the only lake where the 300 µg/L total iron CWQG was exceeded. In the under-ice sample with exceptionally high conductivity and spikes in a specific suite of parameters (see discussion of conductivity above), the concentration of total iron also spiked at 1700 µg/L. The remaining Little Roberts Lake samples had total iron concentrations ranging from 60 to 120 µg/L.

Total selenium concentrations exceeded the 1 µg/L CWQG in Doris Lake in top (1.1 g/L) and bottom (1.4 µg/L) samples on 22 May, and in the bottom sample on 15 July (1.2 µg/L). In Roberts Lake, the total selenium concentration exceeded or equaled the guideline value on two separate dates. On 24 May, the concentration was 1.2 µg/L in the top sample and 1.6 µg/L in the bottom sample. On 15 July, the concentration was 1.0 µg/L in the bottom sample (Table 3.4). In the high

conductivity, under-ice sample from Little Roberts Lake, total selenium concentrations also spiked with a concentration of 6.6 µg/L.

3.3 STREAM WATER QUALITY

During the 2007 sampling season, several parameters were outside the guideline limits; exceedance values occurred in each of the four outflow streams (Table 3.5).

Detailed discussions of physical characteristics and water quality are provided below. Field data (pH, dissolved oxygen and water temperature) are provided in Appendix B1; laboratory analytical results for water quality are presented in Appendix B3 and B4.

3.3.1 Doris Outflow

Doris Outflow was sampled for water quality on 12 occasions between 20 June and 16 September 2007 (Table 3.1).

Doris Outflow was well oxygenated throughout the sampling season (Appendix B1), with all DO measurements above the 9.5 mg/L CWQG for protection of early life stages of fish. DO values ranged from 10.2 to 12.3 mg/L (Appendix B1). Continuous water temperature data are not available due to malfunction of the temperature logger (the batteries stopped functioning) installed in the stream. Data were obtained for four days only (20 to 23 June), with a maximum temperature of 4.3°C and a minimum temperature of -0.09°C (Appendix B1).

Total phosphorus concentrations in the outflow ranged from 18 to 40 µg/L (Appendix B3); the 30 µg/L jurisdictional guideline was exceeded twice and equaled once (Table 3.5). The exceedances (37 µg/L and 40 µg/L) occurred only in August. All of the dissolved inorganic forms of nitrogen were well below the CWQGs.

Doris Outflow TSS concentrations ranged from <1 to 8 mg/L throughout the season (Appendix B3). Doris Outflow's laboratory conductivity was similar to that of Doris Lake, ranging from 199 to 324 µS/cm (Doris Lake: 263 to 324 µS/cm; Appendix B3). Field pH ranged from pH 6.1 to 7.1. The pH was measured outside the CWQG range of pH 6.5 to 9.0 on two dates (7 July and 12 Aug; Table 3.5 and Appendix B1).

Total aluminum concentrations exceeded the CWQG of 100 µg/L (for pH≥6.5) on one occasion, 31 August (159 µg/L; Table 3.5). In addition, total aluminum

concentrations were above the 5 µg/L CWQG (when pH<6.5) on 7 July and 12 August (Table 3.5).

Total copper concentrations in Doris Outflow exceeded the 2 µg/L CWQG for waters with hardness <120 mg/L on one occasion. This occurred on 20 June when a concentration of 3.3 µg/L was recorded (Table 3.5). Dissolved copper concentration exceeded the guideline in the same sample, with the concentration being 3.1 µg/L (Appendix B3). During the 2007 sampling period, total copper concentrations in the Doris Outflow water samples ranged from 1.1 to 3.3 µg/L (Appendix B3).

Table 3.5 Summary of 2007 Stream Water Samples that Exceeded Guidelines for the Protection of Aquatic Life in Freshwater

Site	Date	Field pH	TSS	Al (Total)		Cd (Total)	Cu (Total)	Se (Total)	TP
		CCME 6.5 – 9.0	CCME 25 mg/L[b]	CCME 100 µg/L (pH≥6.5)	CCME 5 µg/L (pH<6.5)	CCME 0.014 µg/L[c]	CCME 2 µg/L	CCME 1 µg/L	Juris.[a] 30 µg/L
Doris Outflow	20-Jun	7.1	<1				***3.3***		
	07-Jul	***6.1***[d]	3		***78.5***				
	14-Jul	6.8	2					***1.2***	
	27-Jul	7.5	2					***1.3***	
	12-Aug	***6.2***	3		***67***				***37***
	18-Aug	7	3						***40***
	31-Aug	-	8	***159***					30
Tail Outflow	07-Jul	***5.8***	<1		***30.2***				
	27-Jul	***6.2***	<1		***15.1***				
	12-Aug	***6.2***	<1		***10.2***				
	18-Aug	***6.3***	<1		***23.4***				
	25-Aug	***6.3***	<1		***15.8***				
	09-Sep	***6.1***	1		***21.9***				
Roberts Outflow	20-Jun	7	1	***241***				***1.4***	
	12-Aug	6.7	3	***241***		***0.027***	***2.4***		
	16-Sep	7	3	***104***					
Little Roberts Outflow	20-Jun	6.8	2	***155***				***1.2***	
	14-Jul	6.8	1			***0.0339***			
	12-Aug	6.9	4	***179***					

Checked by:EJJ

Prepared by: CC

Note: TSS (Total suspended solids) and field pH values are provided to help in interpretation of the values exceeding guidelines

[a] Juris. Jurisdictional guideline for total phosphorus (TP) for Northwest Territories and Nunavut (Statistics Canada 2006); there is no single CWQG value but rather a set of trigger ranges (CCME 2007).

[b] The CWQGs for clear waters specify maximum increase of 25 mg/L from background levels for any short-term exposure (e.g., 24 h period). Maximum average increase of 5 mg/L from background levels for longer term exposures (e.g., inputs lasting between 24 h and 30 d).

[c] The 0.014 µg/L CWQG was calculated using hardness values (35.9 mg/L for Little Roberts Outflow and 37.7 mg/L for Roberts Outflow) for the samples with concentrations of total cadmium >0.01 µg/L.

[d] Values exceeding guidelines are ***italicized and in bold type***.

Total selenium concentrations in Doris Outflow exceeded the 1 µg/L CWQG on two occasions. The total selenium concentration was 1.2 µg/L on 14 July and 1.3 µg/L on 27 July (Table 3.5). Dissolved selenium concentration also exceeded the guideline on 14 July (1.1 µg/L; Appendix B3). Total selenium concentration in 2007 outflow samples ranged from 0.4 µg/L to 1.3 µg/L (Appendix B3).

3.3.2 Tail Outflow

Tail Outflow was sampled for water quality on 12 occasions between 20 June and 16 September 2007 (Table 3.1).

Tail Outflow was well oxygenated throughout the 2007 sampling season, with the DO levels ranging from 7.8 to 14.9 mg/L (Appendix B1). Although four of these measurements (three in July, one in August) were below the 9.5 mg/L CWQG for protection of early life stages of fish, none were below the 6.5 mg/L CWQG for the protection of aquatic life. Data from the temperature recorder installed in the stream during the open-water period showed that the water temperature in Tail Outflow was warmest in July and coolest in September (Figure 3.6). The temperature reached a maximum of 19.4°C on 21 July. The maximum temperature in 2006 was also reached on 21 July (Golder 2007a). The minimum temperature (0.7°C) was recorded on 11 September.

Due to temperature logger problems in Doris (battery malfunction) and Roberts (logger out of water) outflows, Tail Outflow can only be compared to Little Roberts Outflow (see section 3.3.3). Tail Outflow showed a greater difference in minimum and maximum temperatures recorded than Little Roberts, especially in June and July. In 2007, mean daily temperatures in Tail Outflow were, on average, 3°C warmer than Little Roberts Outflow until approximately 17 July. After this date the average daily temperatures were similar.

TP concentrations in Tail Outflow ranged from 5 to 27 µg/L during the 2007 sampling period and did not exceed the 30 µg/L jurisdictional guideline for Northwest Territories and Nunavut (Appendix B3). All of the dissolved inorganic forms of nitrogen in 2007 were well below the guideline (Appendix B3). Similar to Tail Lake, Tail Outflow was very clear on most sampling occasions, with TSS levels of <1 mg/L recorded during 9 of 12 sampling events. The highest TSS concentration recorded in Tail Outflow (14 mg/L) on 16 September was also the highest recorded for all project area streams.

Laboratory conductivity in Tail Outflow ranged from 158 to 182 µS/cm, and was the lowest of the four Doris North Project streams (Appendix B3). These values were similar to that of Tail Lake (150 to 257 µS/cm). Field pH readings at Tail Outflow (ranging from pH 5.8 to 7.0) tended to be more acidic than values recorded at the other streams (Appendix B1), likely due to the small size of the stream and drainage through wetland areas. The pH was below (outside) the CWQG range of pH 6.5 to 9.0 on 7 and 27 July, 12, 18 and 25 August, and 7 September 2007 (exceedance values ranged from pH 5.8 to 6.3; Appendix B1).

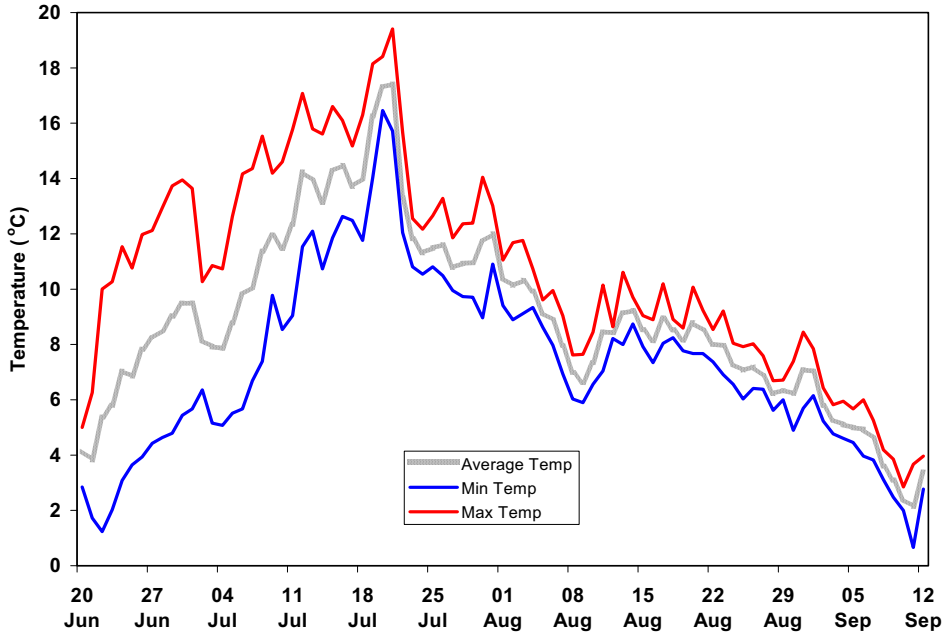


Figure 3.6 Tail Outflow Daily Maximum, Minimum and Average Temperature, June to September, 2007

The total aluminum concentration exceeded the 5 µg/L CWQG (for pH<6.5) on all sampling dates, with values ranging from 15.1 to 30.2 µg/L (Table 3.5). The same 5 µg/L CWQG (for pH<6.5) was also exceeded for dissolved aluminum on 7 July (5.2 µg/L) and 9 September (6.8 µg/L; Appendix B3).

The total copper concentrations were well below the 2 µg/L CWQG (Appendix B3). Total mercury concentrations ranged from <0.6 to 4.9 ng/L, thereby not exceeding the 26 ng/L CWQG.

3.3.3 Roberts Outflow

Roberts Outflow was sampled for water quality on four occasions between 20 June and 16 September 2007 (Table 3.1).

Roberts Outflow was well oxygenated throughout the sampling season; all DO measurements were above the 9.5 mg/L CWQG for protection of early life stages of fish (Appendix B1). The temperature logger installed in Roberts Outflow was exposed to the air from 11 July to 19 August; therefore, stream temperature data are not available for that time period. From the data that were obtained, a minimum temperature of 2.0°C was recorded on 23 June 2007, and a maximum temperature of 9.3°C was recorded on 21 August 2007 (Figure 3.7).

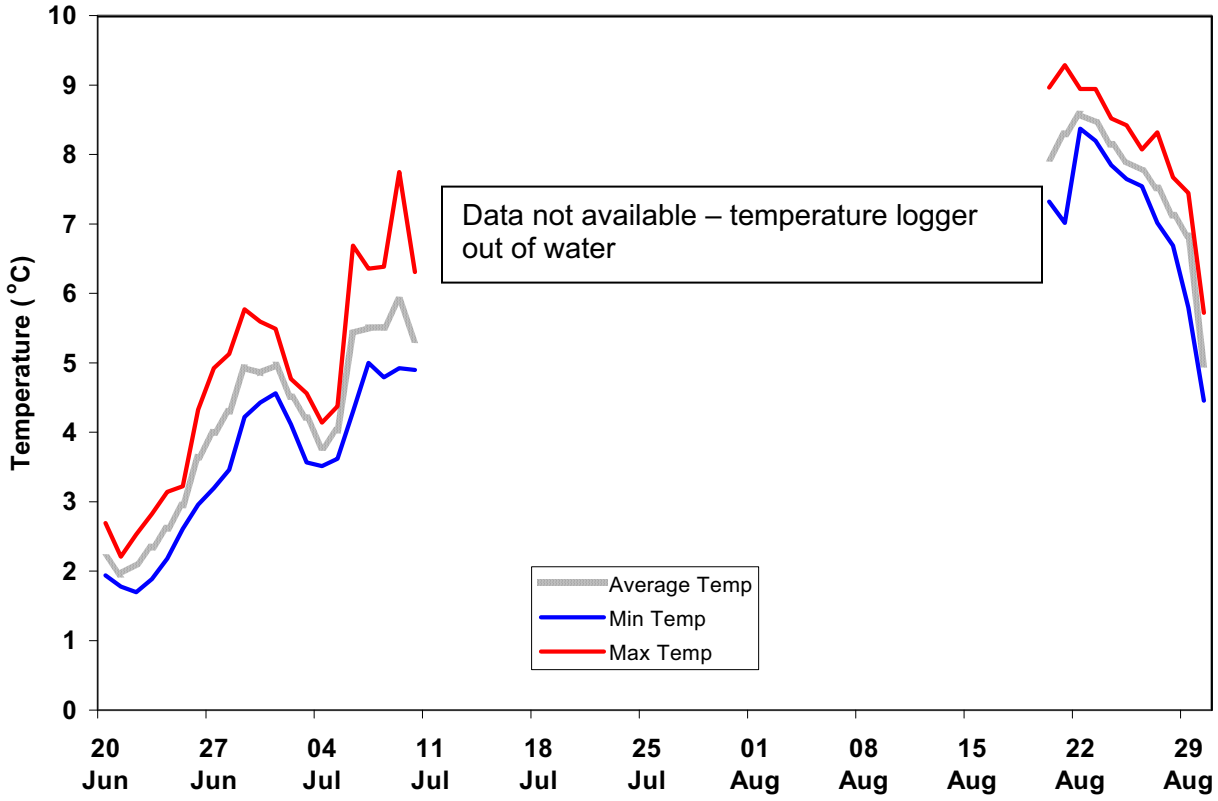


Figure 3.7 Roberts Outflow Daily Maximum, Minimum and Average Temperature, June to September, 2007

TP concentrations in Roberts Outflow ranged from 16 to 18 µg/L, well below the 30 µg/L jurisdictional guideline for Northwest Territories and Nunavut (Appendix B3). All of the dissolved inorganic forms of nitrogen were also below the CCME guidelines.

Roberts Outflow was clear, with TSS concentrations ranging from 1 to 3 mg/L on the sampling dates. The laboratory conductivity ranged from 233 to 279 µS/cm, similar to that of Roberts Lake (199 to 339 µS/cm; Appendix B3). Field pH ranged from pH 6.7 to 7.1 which is within the CCME (2006) guideline of pH 6.5 to 9.0 (Appendix B3).

The total aluminum concentrations exceeded the CCME guideline of 100 µg/L (for pH≥6.5) on three of the four sampling dates in 2007: 20 June (482 µg/L), 12 August (241 µg/L), and 16 September (104 µg/L; Table 3.5).

Total cadmium concentration exceeded the 0.014 µg/L CWQG determined for the specific hardness of the sample (37.7 mg $CaCO_3$/L) on 12 August 2007 only, with a concentration of 0.027 µg/L.

Total copper concentration exceeded the 2 µg/L CWQG for waters with hardness <120 mg/L with a concentration of 2.4 µg/L on 12 August 2007 (Table 3.5). The total copper concentrations in the remaining samples ranged from 1.35 µg/L to 1.8 µg/L (Appendix B3).

3.3.4 Little Roberts Outflow

Little Roberts Outflow was sampled for water quality on four occasions between 20 June and 16 September 2007 (Table 3.1).

Little Roberts Outflow was well oxygenated throughout the sampling season, with all DO measurements well above the 9.5 mg/L CWQG for protection of early life stages of fish, ranging from 11.5 to 12.7 mg/L (Appendix B1). Data from the temperature logger installed in the stream showed that water temperatures in 2007 were warmest in July (Figure 3.8). The maximum temperature, 18.1°C, was reached on 21 July. The minimum temperature of 0.4°C was recorded on 21 June (Figure 3.8).

TP concentrations in Little Roberts Outflow ranged from 18 to 23 µg/L during the 2007 sampling period (Appendix B3). The 30 µg/L jurisdictional guideline (Statistics Canada 2006) was not exceeded. All of the dissolved inorganic forms of nitrogen were well below the CWQGs (Appendix B3).

TSS in Little Roberts Outflow varied between 1 and 4 mg/L on the sampling dates. The conductivity ranged from 237 to 265 µS/cm (Appendix B3). Field pH varied from pH 6.8 to 6.9 remaining within the CWQG range of pH 6.5 to 9.0 (Appendix B1).

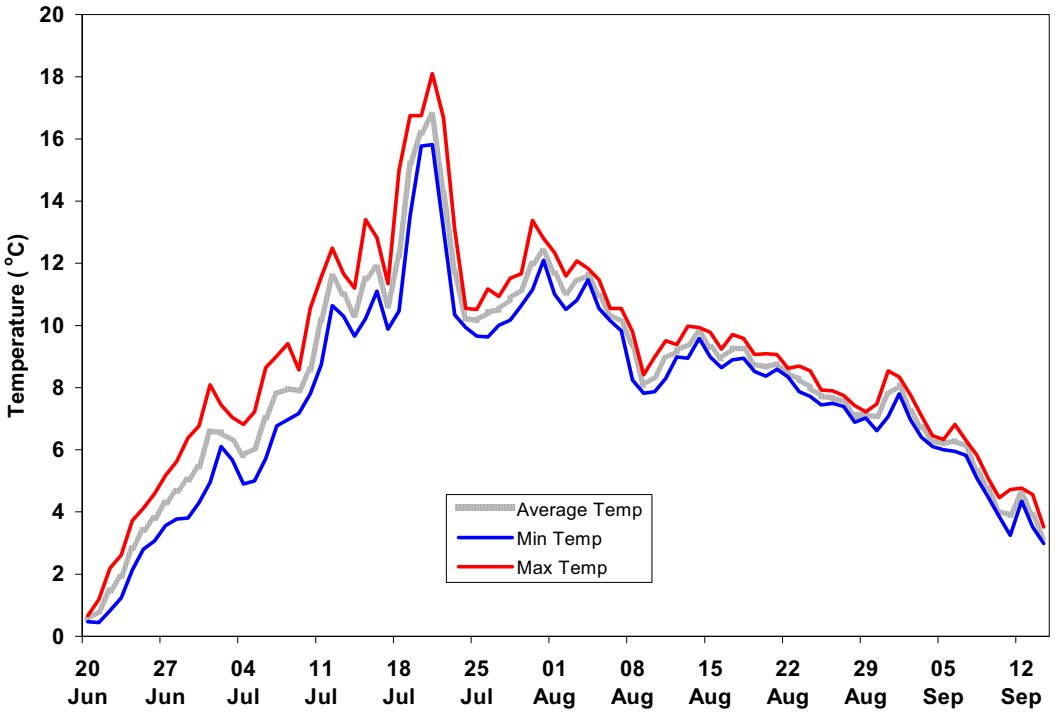


Figure 3.8 Little Roberts Outflow Daily Maximum, Minimum and Average Temperature, June to September, 2007

The total aluminum concentrations exceeded the 100 µg/L CWQG (for pH≥6.5) on two occasions: 20 June (155 µg/L) and 12 August (179 µg/L) (Table 3.5). The remaining values were 49 µg/L and 75.2 µg/L (Appendix B3).

The CWQG of 0.014 µg/L for total cadmium concentration, with water hardness of 36 mg$CaCO_3$/L, was exceeded on 20 June (0.034 µg/L; Table 3.5). The remaining cadmium values ranged from <0.002 to 0.008 µg/L (Appendix B3).

Total selenium concentrations exceeded the 1 µg/L CWQG on one of the four 2007 sampling dates (Table 3.5). On 20 June, the total selenium concentration was 1.2 µg/L, and on the remaining dates, the concentration ranged from 0.6 to 0.98 µg/L (Appendix B3).

3.3.5 Summary

Doris Outflow, Tail Outflow, Roberts Outflow, and Little Roberts Outflow are typically clear, freshwater streams with conductivities ranging from 158 to 324 µg/L (Appendix B3). These conductivities reflect the marine origin of the sediments within these watersheds.

The outflow streams were well oxygenated throughout the sampling season; DO measurements were above the 9.5 mg/L CWQG for protection of early life stages of fish at all sites except for Tail Outflow, where the DO concentration occasionally slipped below this guideline (Appendix B1). The slower flow and higher organic content (i.e., vegetation) of Tail Outflow, compared to other three streams, are the most likely causes of the occasional decrease in DO concentrations. Nevertheless, even in Tail Outflow, the DO concentrations were always measured above the 6.5 mg/L guideline for protection of aquatic life (CCME 2007).

Temperature logger readings showed a similar trend of peak temperature in mid-July 2007 for two (Tail and Little Roberts) of the four streams (Figures 3.6 and 3.8). The temperature loggers for the remaining two streams (Doris and Roberts outflows) malfunctioned during the summer; therefore, a full-season temperature profile was not obtained for either outflow. The maximum temperature was reached on 21 July for both Tail (19.4°C) and Little Roberts (18.1°C) outflows.

The field pH measurements of the stream sites were occasionally below the pH 6.5 to 9.0 CWQG range. Tail Outflow was slightly more acidic than the other three sites, with an average pH of 6.4 (Appendix B1), reflecting the small size and vegetated wetland areas along the stream channel. Overall, the field pH of the streams ranged from pH 5.7 to 7.9.

Doris Outflow was the only site that either equaled or exceeded the 30 µg/L TP jurisdictional guideline for Northwest Territories and Nunavut (Table 3.5). The guideline exceedances occurred on two sampling dates, with TP concentrations of 37 and 40 µg/L. The TP concentration for the remaining streams ranged from 5 to 27 µg/L. Tail Outflow had the greatest range in TP values (5 to 27 µg/L). All of the dissolved inorganic forms of nitrogen were well below the CWQG in all of the studied streams (Appendix B3).

Total aluminum concentrations were above the 5 µg/L CWQG (for pH<6.5) and the 100 µg/L CWQG (for pH≥6.5) in all four streams at various times during the 2007 sampling period (Table 3.5). In Tail Outflow, only the 5 µg/L CWQG was exceeded in 2007. In Doris Outflow both guidelines were exceeded. Finally, in Roberts and Little Roberts outflows, only the 100 µg/L (for pH≥6) aluminum guideline was exceeded. Dissolved aluminum concentrations exceeded the 5 µg/L CWQG on one date in each Doris and Tail outflows (Appendix B3).

Total cadmium concentration exceeded the 0.014 µg/L CWQG (site specific calculation) once in each of Roberts and Little Roberts outflows (Table 3.5).

Total copper concentrations exceeded the 2 µg/L CWQG for waters with hardness <120 mg/L on one sampling date in both Doris and Roberts outflows

(Table 3.5). During the 2007 sampling period, total copper concentrations in the four Doris North streams ranged from 0.5 to 3.3 µg/L (Appendix B3). Dissolved copper concentration exceeded the 2 µg/L CWQG once in 2007 (Doris Outflow).

Total selenium concentrations exceeded the 1 µg/L CWQG in three of the four streams. The guideline was exceeded twice in Doris Outflow (with values of 1.2 and 1.3 µg/L), once in Roberts Outflows (1.4 µg/L) and once in Little Roberts Outflow (1.2 µg/L; Table 3.5).

3.4 MARINE WATER QUALITY

Only pH in Roberts Bay was outside the CWQGs for the protection of aquatic life in marine waters during the 2007 sampling season. Discussion of physical limnology and water quality for this marine site is provided below under the Roberts Bay heading. All field measurements of pH, dissolved oxygen, water temperature and Secchi depth are provided in Appendix B1. Temperature and dissolved oxygen profiles are in Appendix B2. Laboratory results of water quality analyses for the 2007 sampling program are presented in Appendix B5.

3.4.1 Roberts Bay

Roberts Bay, the one marine site included in this study, was sampled for water quality on four occasions between 27 May 2007 and 14 September 2007. Conductivity during the sampling events ranged from 10 280 to 76 400 µS/cm.

During the open-water period in 2007, Roberts Bay was well oxygenated throughout the water column. The minimum DO concentration of 8.3 mg/L was above the 8.0 mg/L CWQG for the protection of aquatic life in marine waters. The coldest temperature was recorded in May (-2.0°C), and the warmest in July (11.6°C at the surface). The coolest temperature profile was recorded in September, with a maximum temperature of 4.4°C at 4 m depth. The warmest temperature profile occurred in July with the temperature relatively constant temperature (11.6°C) throughout the water column, with the exception of the surface temperature that was 10.8°C (Figure 3.9). The Secchi depth varied from 1.0 m in July and September to 2.3 m in August (Figure 3.9).

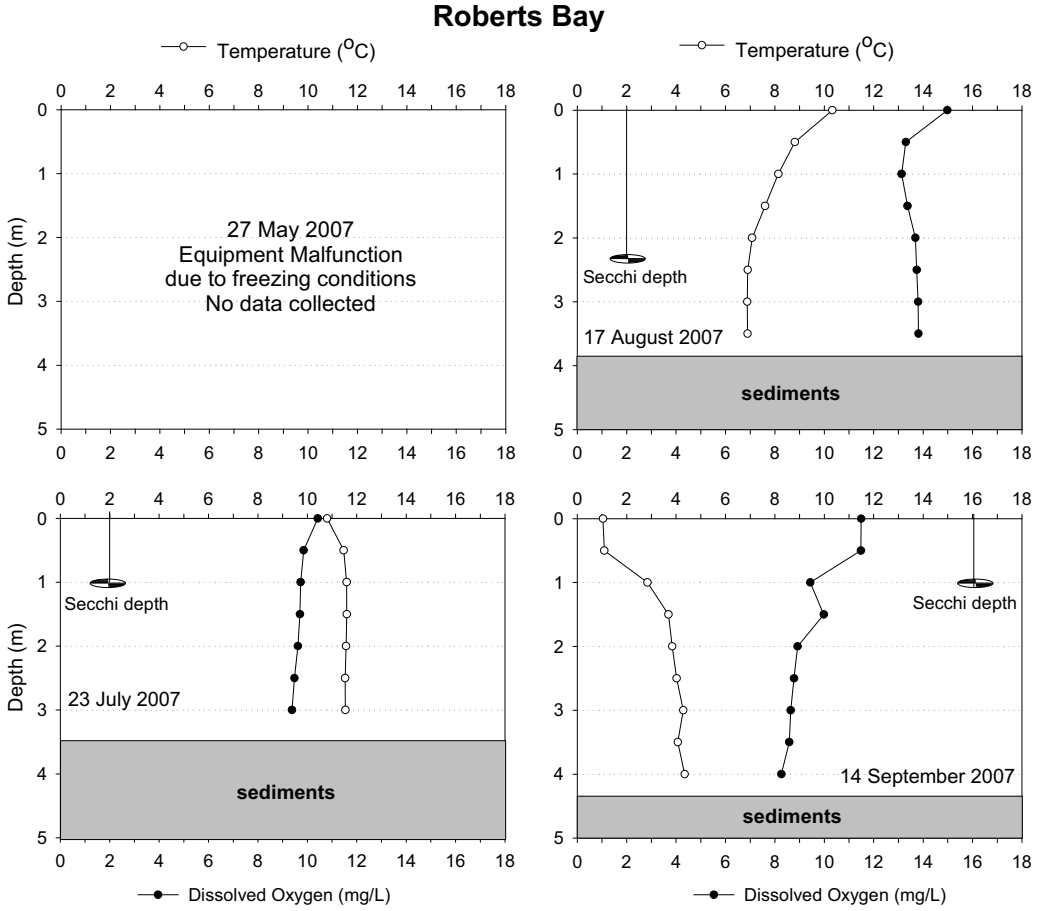


Figure 3.9 Temperature and Dissolved Oxygen (DO) Profiles and Secchi Depth for Roberts Bay, 2007

Field pH for Roberts Bay was measured on three occasions and ranged from pH 7.6 to 7.9. During the 14 September sampling date, the pH meter malfunctioned due to freezing temperatures; therefore, the lab pH value of 7.0 is reported, which is at the lower end of the CWQG range (pH 7.0 to 8.7). According to the CWQGs for marine and estuarine waters, the pH should fall within the range of 7.0 to 8.7 units unless it can be demonstrated that such a pH is a result of natural processes. Within this range, pH should not vary by more than 0.2 pH units from the natural pH expected at that time. The results of the 2007 sampling in Roberts Bay indicate a naturally highly variable pH compared to the types of marine waters for which the CWQG of pH 7.0 to 8.7 was proposed.

The CCME is still in the process of developing guidelines for many of the parameters for which environmental toxicity is well established in freshwater, but very poorly known for marine environments. Roberts Bay did not exceed any of the CWQGs that currently exist for marine waters.

4 FISH HABITAT

4.1 DORIS LAKE FISH HABITAT ASSESSMENT

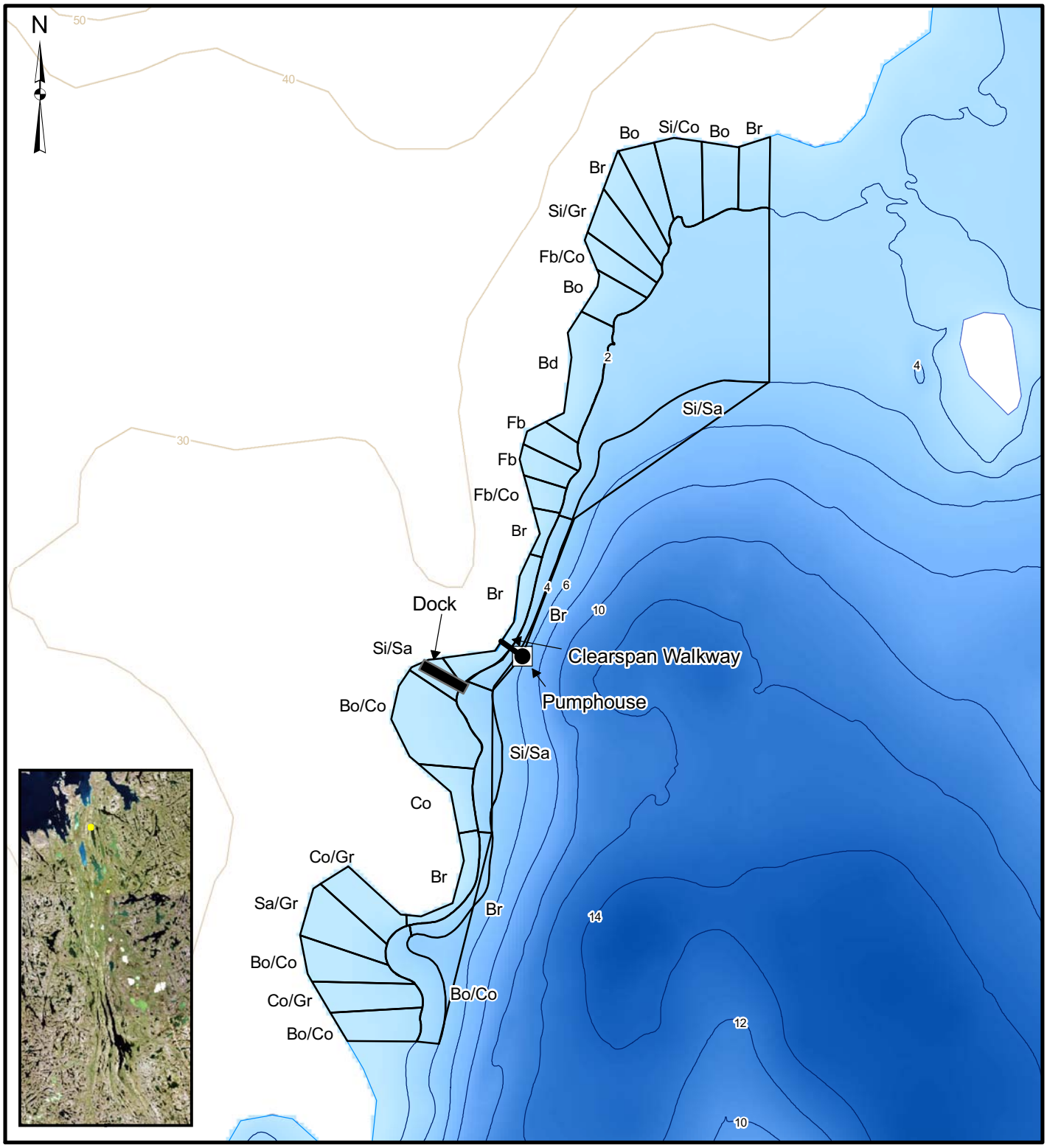
MHBL proposes to construct a float plane and boat dock at the northwest end of Doris Lake, and install a floating pump house barge to house the water intake system approximately 25 m east of the dock (MHBL 2007). The floating dock and water intake structures were changed from earlier designs to reduce the potential for fish habitat loss.

The previous design for the float plane and boat dock consisted of a rock-filled structure approximately 40 m along the shoreline and extending 10 m out into the lake to a depth of 3 m. The current design for the dock is a pre-fabricated modular floating dock, approximately 25 m long by 4 m wide. The dock will be held in place by six permanently installed bollards (MHBL 2007).

In early 2007, the water intake system design consisted of a pump house located on the shoreline near the float plane and boat dock. A 100 mm diameter high density polyethylene (HDPE) pipe was to be set on the bottom of the lake and extend approximately 25 m from shore (MHBL 2007). Clean rock fill would be placed over the pipe to anchor it in place and prevent ice scour.

Based in part on concerns raised by DFO, current plans for the water intake system avoid placing a pipeline along the lake bottom. The current design is for a pump house barge with a 10 m^2 platform located 25 m from shore and connected by a 15 m long by 1.5 m wide clear-span walkway (MHBL 2007). The hose line from the floating pump house will be braced alongside the walkway to shore, where it will follow the roadway to the Doris North operations.

Based on the earlier design of the water intake system and float plane dock, an assessment of fish habitat in the vicinity of the structures was required. A fish habitat assessment was completed in July 2007 (Figure 4.1). Detailed shoreline substrate information was recorded along with information on slope, vegetation, bank stability and depths. Substrate information was collected by observation when walking the shoreline, and using an Ekman sampler and an Accu-vue underwater camera in deeper off-shore areas.



LEGEND

- Contours (10 m Interval)
- Isobaths (2 m Interval)
- Streams
- Waterbodies

REFERENCE

Sources: Government of Canada, Natural Resources Canada, Centre for Topographic Information.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 13N

This map is for information purposes only. Golder Associates Ltd. does not accept any liability arising from its misuse or misrepresenation.

100 0 100
SCALE 1:3000 METRES

MIRAMAR HOPE BAY LTD.

Doris North Project Area

TITLE

Doris Lake Bathymetry and Near-shore Substrate in the Vicinity of the Boat Dock and Water Intake

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 1
DESIGN	AH	2 April 2008		
GIS	BR	21 April 2008		
CHECK	AH	21 April 2008		
REVIEW	GA	23 April 2008		

FIGURE 4.1

Project: M:\Projects\2007\1373\0018\MapDocs\Fig4_1_DorisBathy_DorisN07.mxd - Plot: M:\Projects\2007\1373\0018\PDFs\Fig4_1_DorisBathy_DorisN07.pdf

The substrate was classified into the following categories: bedrock, fractured bedrock, boulder, cobble, gravel, sand, and silt. The dominant and subdominant types of substrate were identified. Fish habitat quality is based on the potential for supporting spawning, rearing, and foraging for fish species that inhabit Doris Lake.

In the area of the proposed float plane dock and water intake system, the shoreline alternates between steeper sloping bedrock banks to more gradually sloping bays (Figure 4.2 and 4.3). The majority of the shoreline is covered with either bedrock or cobble (Figure 4.4); however, there are several areas where gravel and cobble substrates are resting on very soft silt resulting in an unstable lake bottom (Figure 4.5). At water depths greater than 2 m, the substrate becomes a more uniform silt/sand material with some scattered cobble (Figure 4.1). The substrate is generally silt, or silt covered at greater depths in the area of the dock and water intake.

Figure 4.2 Shoreline Transition from Steep Bedrock to Gentle Sloped Bays

Figure 4.3 Shoreline at the Proposed Dock and Pump House Location

Figure 4.4 Stable Cobble-boulder Substrate

Figure 4.5 Gravel-cobble Substrate Overlying Silt Substrate

In the immediate vicinity of the proposed dock location, the shoreline is composed of vegetated organic material or silt/sand substrate (Figure 4.6 and 4.7). Most of the habitat the dock would cover is sand/silt less than 2 m deep (Figure 4.1).

Figure 4.6 Vegetated Shoreline in the Area of the Proposed Dock Location

Figure 4.7 Silt-sand Substrate in the Area of the Proposed Dock Location

The water intake system is located at depths greater than 2 m (Figure 4.1). The walkway and barge extend over an area which transitions from bedrock to silt. Bedrock provides limited fish habitat. The substrate further from the shoreline, at water depths greater than 2 m, consists primarily of silt covered bedrock.

Gravel, cobble and boulder substrates provide excellent habitat for spawning, rearing and feeding for lake trout. These substrates are generally found within the first 2 m of water depth along the shoreline in the vicinity north and south of the proposed dock and pump house. During winter, the ice thickness can be as great as 2 m, which would result in these gravel and cobble areas being frozen to the substrate. For this reason, the coarse substrate areas of the float plane dock would not provide suitable habitat for spawning or overwintering of eggs.

Silt/sand habitat greater than 2 m deep provides rearing and feeding habitat for coregonids as well as feeding habitat for lake trout. Bedrock has low suitability for spawning, rearing or feeding habitat for coregonids or lake trout. Fractured bedrock may provide cover for small lake trout, and feeding habitat for larger lake trout; however, the overall habitat quality is low.

Previous fisheries sampling has shown that there is limited use of the habitat in the area of the proposed dock and barge (RL&L/Golder 2003a). The dock and its footings may provide overhead cover for juveniles though the extent to which fish would use this cover is unknown. It is also unknown to what extent fish would use the pump house barge and walkway for cover as it is a smaller structure located farther from the shore.

5 FISH POPULATIONS

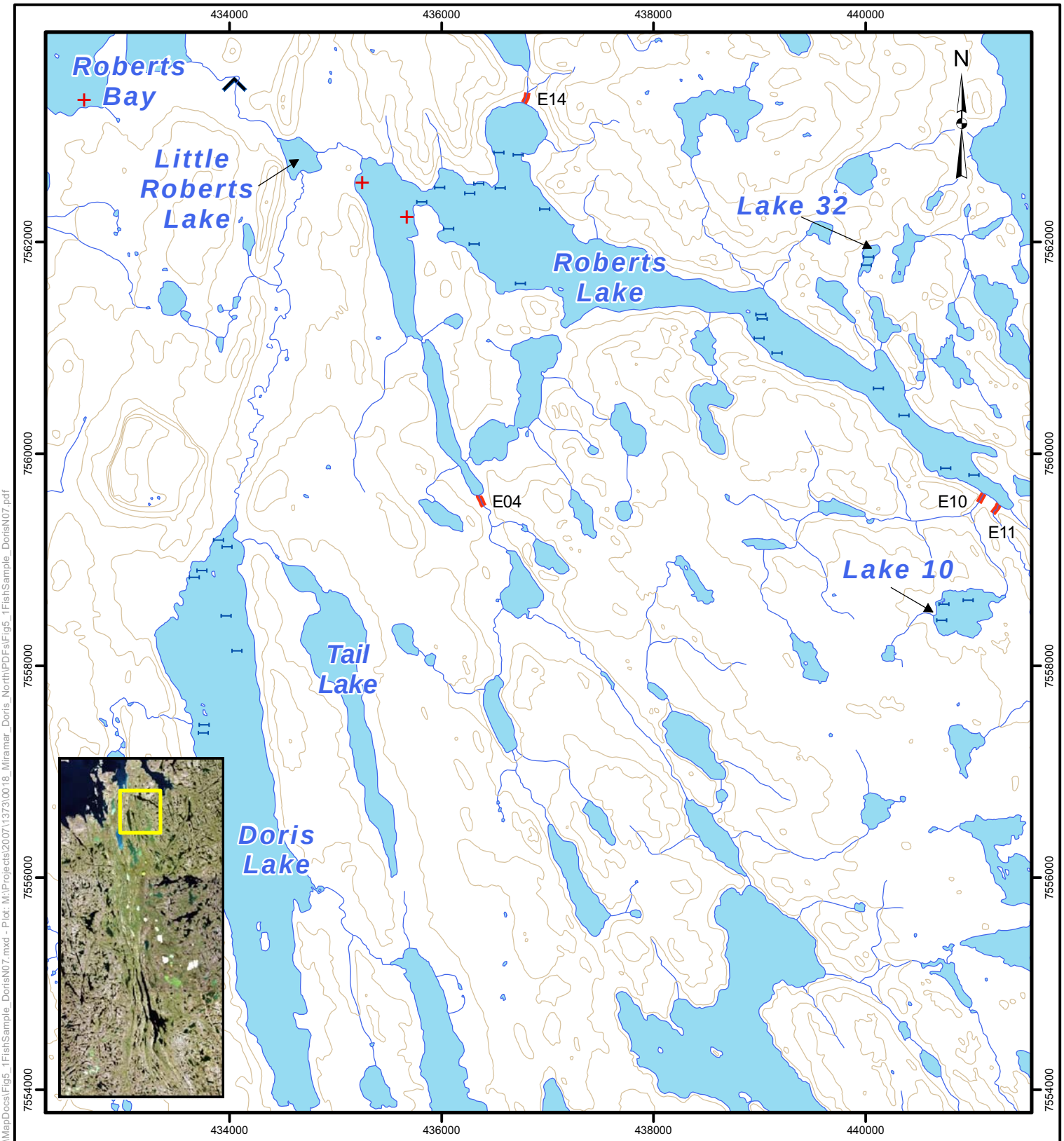
Fish sampling was conducted in selected lakes and streams within the Doris North Project area to gather additional baseline data for the fisheries compensation monitoring requirements, as identified in the "No Net Loss" Plan (NNLP) Revision 6 for the Doris North Project in December 2007 (Golder 2007b). Specific objectives of the 2007 study program to assess fish populations included the following:

- Monitoring the Arctic char migration in Little Roberts Outflow;
- Tagging program to help determine Arctic char fidelity to the natal system;
- Developing a standardized monitoring program in Roberts Lake to assess post habitat enhancement changes in Arctic char and lake trout abundance;
- Identifying key Arctic char spawning locations in Roberts Lake to confirm the use of Roberts Lake for spawning by anadromous Arctic char;
- Assessing fish use of Roberts Bay in the area of the jetty construction; and
- Sampling to provide additional baseline information on fish populations in the Doris North Project area; conducted in conjunction with Ms. H. Swanson as part of her Ph.D research program.

5.1 METHODS

Figure 5.1 identifies the fish sampling locations and methods used during the 2007 program. Fish sampling in Little Roberts Outflow was targeted primarily at monitoring out-migrating fish (including Arctic char smolts). In Roberts Bay, a directional fyke net was used to sample fish to provide information on fish distribution and abundance in the area of the Roberts Bay jetty, which was being constructed in July 2007. In Roberts Lake, fish sampling was conducted using fyke nets, gill nets and backpack electrofishing. Gill nets and backpack electrofishing were used to sample Doris Lake, Lake 10 and Lake 32. Backpack electrofishing was conducted in a defined reach of four tributary streams to Roberts Lake to generate population estimates of fish inhabiting these reaches of stream.

The field program on Roberts Lake, Doris Lake, Lake 10 and Lake 32 was a joint program with Ms. Heidi Swanson, who was partially funded by the Natural Sciences and Engineering Research Council and the Northern Scientific Training Program. In addition to providing additional baseline data relating to the Doris



LEGEND

- Gill Net
- Fish Fence
- Fyke Net
- Backpack electrofishing
- Contours (20 m Interval)
- Streams
- Waterbodies

1700 0 1700

SCALE 1:50000 METRES

REFERENCE

Sources: Government of Canada, Natural Resources Canada, Centre for Topographic Information.
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 13N

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MIRAMAR HOPE BAY LTD.

Doris North Project Area

TITLE

Fish Sampling Locations, 2007

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0018			SCALE AS SHOWN	REV. 1
DESIGN	AH	2 April 2008		
GIS	RC	2 April 2008		
CHECK	AH	9 April 2008		
REVIEW	GA	14 April 2008		

FIGURE 5.1

North Project, these data will be used in a future Ph.D thesis and one or more primary publications by H. Swanson.

5.1.1 Fish Fence

A fish fence with one upstream trap and one downstream trap was installed in Little Roberts Outflow to collect fish, including Arctic char smolts, as they move from the Roberts Lake drainage into the marine environment of Roberts Bay and back again. The fence and traps were installed on 28 June 2007, after a late spring break-up. Due to high water levels causing erosion along the banks, as well as movement of large ice flows, the fence was removed from 1 to 5 July 2007. The fence was functional again on 6 July and remained operational until 26 July 2007 when the Arctic char smolt out-migration appeared to be finished.

The fence consisted of eight rigid panels (each 3.1 m in length and 1.5 m in height) and two box traps (Figure 5.2). The panels consisted of aluminum frames with removable conduit rods (1.8 cm diameter). The spacing between the rods was 1.3 cm. The panels were supported by wooden "A" frames and held in position with large weighted buckets. Fish migrating downstream were funneled into the trap located near the right downstream bank. Fish migrating upstream were funneled into the trap adjacent to the left downstream bank.

The box trap consisted of an aluminum frame (1.8 m long, 1.2 m wide and 1.5 m high) with removable conduit rods (1.8 cm diameter) at 1.3 cm spacing. The entrance to the trap consisted of a conduit funnel, similar in construction to the trap walls, allowing the opening width to be adjusted to maximize capture and minimize escape.

The traps were checked each day to monitor daily movement patterns of fish. Information recorded during each check included date, time of day, water temperature, and life history data from captured fish. A fish tagging program was implemented in 2007, which will help to assess fish movements and growth through subsequent recaptures. All fish passing through the fence in either direction were scanned with a hand held scanner, and were injected with a PIT (passive integrated transponder) tag. In addition, fish greater than 500 mm in length also were given a uniquely numbered Hallprint^{TM} T-bar anchor tag. Fish migrating downstream were released immediately downstream of the fence, and fish migrating upstream were released immediately upstream of the fence.

Figure 5.2 Fish Fence Set-up in Little Roberts Outflow

5.1.2 Fyke Nets

Arctic fyke nets, or modifications of these nets, were used to sample fish depending on the study objective for each waterbody. In Roberts Bay, the Arctic fyke net consisted of two trap nets, two 15 m wings, and a 60 m lead to shore. The trap nets were 3.7 m long and 0.9 m wide, contained two throats (15 × 25 cm each) and were constructed of 1.27 cm stretched mesh dark grey knotless nylon. Wings and lead were also constructed of 2.54 cm stretched mesh dark grey knotless nylon, and were 1.7 m deep. The lead net panel was set perpendicular to shore and separated the two trap nets. Wing net panels were attached to either side of the trap entrances and were stretched parallel to shore. The combination of the lead panel and wings acted to confine and guide fish into the traps. Using two separate trap nets allowed directional catch data to be obtained.

Modified Arctic fyke nets were used for index monitoring of small fish populations in Roberts Lake. These fyke nets were set away from the inflows of tributary stream in shallow areas of Roberts Lake in areas of potential Arctic char juvenile rearing habitat. Each net consisted of a single trap net, two 7.6 m wings, and a 7.6 m lead to shore. The trap was 0.9 m wide and contained two throats (7.5 x 7.5 cm each). The trap, wings and lead were constructed of 1.0 cm

stretched mesh dark grey knotless nylon. The wings and lead were 0.9 m deep. Wing net panels were attached to either side of the trap entrance and were stretched parallel to shore. Fyke net sets were held in place by steel T-bar posts driven into the substrate.

Fyke nets were checked daily. Information recorded during each net check included date, time of day, water temperature and life history data from captured fish.

5.1.3 Backpack Electrofishing

A Smith-Root Model 12B backpack electrofisher was used to collect fish in four tributary streams to Roberts Lake and along the shoreline of Roberts Lake, Lake 10 and Lake 32. The streams included E04, E10, E13, and E14 (Figure 5.1). In the lakes, the operator waded along the shore while shocking to cover a distance of 50 to 100 m. A section of each stream was delineated near its inflow to Roberts Lake and blocked at the upstream and downstream end of the section using a 2.54 cm stretched mesh barrier net. The operator waded upstream while shocking along the marked section of stream; the netter collected stunned fish and placed them in a holding bucket. A minimum of three electrofishing passes were carried out within each defined reach of stream. If catches on any pass was greater than the proceeding pass, additional electrofishing passes were performed until catches showed a consistent decline or reached zero. In the field, capture results were entered into Microfish™ software to calculate the population estimate and confidence intervals. Captured fish were not returned to the stream until all passes had been completed. Recorded information at each site included UTM coordinates at the beginning and end of the sampled section, date and time of sampling, distance sampled, sampling effort (seconds), and electrofisher settings. Captured fish were processed for life history information, and subsequently released near the capture location.

5.1.4 Gill Nets

Variable mesh experimental gill nets were employed to sample fish in Roberts Lake, Doris Lake, Lake 10 and Lake 32. Each experimental gill net was comprised of three panels, each measuring 15.2 m long by 1.8 m high. Mesh sizes were 3.8, 5.1 and 6.4 cm. Set times were kept short (less than 2 h) to minimize capture related mortalities. Information recorded at each gill net site included UTM coordinates, date and time of set and lift, water depth, and the number and species of fish captured.

5.1.5 Minnow Trapping

Gee™ minnow traps were used to sample small fish in Lake 32. The traps (40 cm long, 23 cm diameter in the middle, 19 cm diameter at each end) were two-piece wire enclosures with inverted funnel openings. They were baited with pet food or sardines and were set in near-shore habitats. Date, time, UTM coordinates, depth, water temperature, and substrate type were recorded for all minnow trap sets, and life history information was recorded for all captured fish.

5.1.6 Habitat Surveys in the Roberts Lake Drainage

The instream habitat types were assessed visually at each index stream site using an established classification and rating system (O'Neil and Hildebrand 1986). This system divides habitat into four primary meso-habitat types and assigned quality classes to run, pool, riffle and flat habitat, with Class 1 being the highest quality. The quality of habitat types is based on depth and availability of cover.

5.1.7 Life History Data Collection

Life history information was collected from all fish captured. Fish were identified to species, measured for length (fork length or total length to the nearest mm), and weigh (g). Fish greater than 500 mm fork length were tagged with a uniquely numbered Hallprint™ T-bar anchor tag in the dorsal muscle tissue between the ptergiophores below the dorsal fin. All lake trout and Arctic char had PIT tags inserted into the body cavity. Tag number and tag colour were recorded for all recaptured fish.

Additional life history data were collected from fish that succumbed during sampling; these included collection of ageing structures (e.g., scales, otoliths, fin rays), determination of sex, maturity, and reproductive status, and evaluation of stomach contents. Fin rays collected from Arctic char and lake trout captured in Roberts Lake and at the fish fence in Little Roberts Outflow will be analyzed for sulfur isotope ratios to help assess the prevalence of seaward migrations within the individuals sampled as part of H. Swanson's Ph.D research (data not available for inclusion in this report). In addition, selected otoliths from fish that have migrated to the ocean will be analyzed for strontium (Sr) content. Differences in Sr concentrations between marine and freshwater systems are reflected in otolith composition and can provide information about anadromous behaviour.

To facilitate data recording and presentation of results, all captured fish were assigned a four-letter species code. The common and scientific names of fish

species captured in 2006, as well as their coded abbreviations, are presented in Table 5.1.

Table 5.1 Common and Scientific Names of Fish Species Captured in the Doris North Project Area, 2007

Family	Common Name	Scientific Namea	Code
Clupeidae	Pacific herring	Clupea pallasii Valenciennes	PCHR
Cottidae	Fourhorn sculpin	Myoxocephalus quadricornis (Linnaeus)	FRSC
Gasterosteidae	Ninespine stickleback	Pungitius pungitius (Linnaeus)	NNST
Gadidae	Saffron cod	Eleginus gracilis (Tilesius)	SFCD
Salmonidae	Arctic char	Salvelinus alpinus (Linnaeus)	ARCH
	Lake trout	Salvelinus namaycush (Walbaum)	LKTR
	Lake whitefish	Coregonus clupeaformis (Mitchill)	LKWH
	Broad whitefish	Coregonus nasus (Pallas)	BRWH
	Cisco	Coregonus artedi Lesueur	CISC
	Least cisco	Coregonus sardinella Valenciennes	LSCS

[a] From Nelson et al. (2004).

5.1.8 Data Analysis

All life history data from individual fish were submitted to a thorough QA/QC procedure and consolidated into a table (Appendix C1). The data were then used to calculate life history statistics for each species and waterbody that included:

- length-frequency distributions;
- length-weight relationships; and
- mean length, weight, and condition factor data that include standard deviation, sample size, as well as minimum and maximum values.

Summary statistics for length, weight and condition factor, and length-weight regressions were calculated using Microsoft Excel 2003. SigmaPlot 8.0 was used to calculate the length-weight regressions for fish captured in Roberts Bay.

Fish condition factors were calculated as follows:

$$K = (W * 10^5) / L^3$$

Where K = Fulton's condition factor, W = weight in grams, and L = fork length in millimetres.

As an index of relative abundance, catch-per-unit effort (CPUE) values were calculated for each sampling method. CPUE values for fyke net, minnow trap, and fish fence catches are reported as number of fish captured per 24 hours of trap/net operation. CPUE values for gill net sets are reported as number of fish captured per 100 m^2 of each mesh size panel set for the equivalent of 24 hours. CPUE values for angling are reported as number of fish captured per hour of angling with one rod. Backpack electrofishing CPUE values are reported as number of fish per 100 seconds of electrofisher operation, and beach seining CPUE units are reported as number of fish per 100 m^2 of area seined.

5.2 DORIS LAKE

This section of the report summarizes fish capture and life history data collected in Doris Lake in 2007 as part of H. Swanson's Ph.D research. Fish were captured using gill nets.

A summary of catch and sampling effort conducted in Doris Lake is presented in Appendix C7. Size statistics for fish sampled are summarized in Appendix C4, and data from individual fish are presented in Appendix C2.

5.2.1 Species Composition and Relative Abundance

Fish sampling in Doris Lake yielded a total of 170 fish representing three species (Table 5.14). Cisco dominated the overall catch (84.1%), followed by lake whitefish (10.6%), and lake trout (5.3%). The catch-per-unit-effort (CPUE) was highest for cisco, followed by lake whitefish and lake trout (Table 5.2).

Table 5.2 Catch-Per-Unit Effort (CPUE[a]) for Fish Captured in Doris Lake, 2007

Capture Method	Effort	Cisco		Lake trout		Lake whitefish		Total	
		n	CPUE	n	CPUE	n	CPUE	n	CPUE
Gill nets	17.9 h	143	233.8	9	14.7	18	29.4	**170**	**278.0**
Composition		**84.1%**		**5.3%**		**10.6%**		**100.0%**	

[a] CPUE units: gill net = fish/100 m^2/24 h

5.2.2 Life History Data

Lake Trout

Nine lake trout were captured in Doris Lake. Life history data were collected for two individual fish. Fork lengths for retained specimens were 488 and 579 mm (Appendix C4). The condition factors for individual fish were 0.96 and 0.97

(Appendix C4). Fish released without measuring were reported to be less than 450 mm (H. Swanson, unpub data).

Lake Whitefish

Eighteen lake whitefish were captured in Doris Lake. Life history data were collected for five individual fish. Fork lengths for captured specimens ranged from 335 to 475 mm; the mean length was 388 mm (Appendix C4). The mean condition factor for lake whitefish in Doris Lake was 1.34. Condition factors for individual fish ranged from 1.24 to 1.48 (Appendix C4).

Cisco

One hundred forty-three cisco were captured in Doris Lake. Life history data were collected for five individual fish. Fork lengths for captured specimens ranged from 165 to 245 mm; the mean length was 225 mm (Appendix C4). Condition factors for individual fish ranged from 0.89 to 1.09 (mean 1.00; Appendix C4).

5.3 FISH MIGRATIONS IN LITTLE ROBERTS OUTFLOW

This section of the report focuses primarily on evaluating the downstream migration of Arctic char smolts in Little Roberts Outflow. Anadromous populations of Arctic char are known to make annual feeding migrations through Little Roberts Outflow to the marine environment of Roberts Bay (RL&L/Golder 2002, 2003a, 2003b; Golder 2005, 2006, 2007a). The proposed habitat compensation strategy, as outlined in the "No Net Loss" Plan Revision 6 (Golder 2007b), is expected to provide greater access to the overwintering, spawning, and rearing habitats in the freshwater system of Roberts Lake. Increasing production of Arctic char in the Roberts Lake system will allow larger numbers of fish to take advantage of productive ocean habitats.

To monitor the current number of fish migrating downstream from the Roberts Lake system, a fish fence was installed in Little Roberts Outflow (see Section 5.1.1). Predicted increases in Arctic char abundance in Roberts Lake can be confirmed by documenting the number of Arctic char smolts undertaking the annual seaward migration to Roberts Bay. Information collected at the fish fence in 2007 will continue to provide baseline data for comparison with post enhancement monitoring.

Fisheries monitoring, with a focus on Arctic char upstream migrations in Roberts Outflow, was conducted by Golder Associates Ltd. from 2002 to 2005 in which fish fences were installed at the downstream and upstream end of the boulder

garden section of Roberts Outflow (RL&L/Golder 2003a, 2003b; Golder 2005, 2006). Based on discussions with DFO Science Branch researchers, in 2006, the program was modified to assess Arctic char smolt out-migration from the Roberts Lake system. A new fish fence location was selected in Little Roberts Outflow to document the downstream migration of smolts and to ensure that fish captured moving downstream were in fact continuing to Roberts Bay rather than remaining in Little Roberts Lake (Golder 2007a). In 2007, the fish fence was installed in the same location in Little Roberts Outflow as in the 2006 sampling program.

The fish fence was installed on 28 June and was removed from the Outflow on 26 July. Due to high water levels causing erosion along the stream banks as well as large ice flows, the fence was not operational from 1 to 5 July.

Fish were processed moving both downstream and upstream from the fence. The catch rates and size statistics for fish species sampled at the fish fence are summarized in Appendices C3 and C4; data from individual fish are presented in Appendix C2.

5.3.1 Species Composition and Relative Abundance

In total, 499 fish representing five species were captured at the fish fence in Little Roberts Outflow during the 21 days of operation (Table 5.3). Arctic char was the predominant species in the overall catch (75.2%), followed by lake trout (23.8%), lake whitefish (0.4%), broad whitefish (0.4%) and least cisco (0.2%). Individual fish were sometimes captured more than once moving in the downstream direction at the fish fence without being captured in the upstream trap. These were typically small fish that were able to pass through spaces between the vertical rods of the fish fence panels. Despite continued efforts by field staff to eliminate gaps through which small fish could pass, 20 Arctic char and one lake trout were recaptured moving in the same direction (Appendix C2).

Table 5.3 Number of Fish Encountered at the Fish Fence in Little Roberts Outflow, 2007

Species	Single Captures		Same Year Recaptures		Total Captures	
	n	%	*n*	%	*n*	%
Arctic char	348	74.8	27	79.4	**375**	**75.2**
Lake trout	112	24.1	7	20.5	**119**	**23.8**
Lake whitefish	2	0.4			**2**	**0.4**
Broad whitefish	2	0.4			**2**	**0.4**
Least cisco	1	0.2			**1**	**0.2**
Total	**465**	**100.0**	**34**	100.0	**49975.2**	**100.0**

5.3.2 Fish Movement

Arctic Char

Most Arctic char (78%) were documented moving downstream; only 22% of captured Arctic char were moving in the upstream direction (Appendices C2, C3). The number of Arctic char moving downstream in Little Roberts Outflow varied widely on a daily basis (Figure 5.3). The maximum number of Arctic char that passed through the downstream trap in a single day was 39; this occurred on 22 July. The mean number of downstream migrants was approximately 15 fish per day (Appendix C3). This is a large increase compared to 2006, when the mean number of downstream migrants was approximately five fish per day (Golder 2007a). The majority of Arctic char (75%) moved downstream on or after 10 July. This again is different from 2006, when the majority of fish had moved downstream prior to 2 July (Golder 2007a). The later migration period in 2007 likely reflects later open-water and break-up.

Numbers of upstream-moving Arctic char were consistently low throughout the monitoring session. An average of four fish were captured moving upstream on a daily basis, and the maximum number of Arctic char captured moving upstream in a single day was nine fish; this occurred on 9 and 11 July. The upstream migration of Arctic char typically occurs later in the season (i.e., after a period spent feeding in the marine environment; Golder 2005) and likely peaked after the fish fence was removed from the stream.

A bimodal size distribution is typical of anadromous populations of Arctic char in this region (Johnson 1989) and is evident in the length-frequency plots for Arctic char captured in Little Roberts Outflow in 2007 (Figure 5.4). The majority of downstream migrants was in the size range of 200-300 mm. Many of these fish likely were first-time migrants because Arctic char in this region typically smoltify between the lengths of 180 and 330 mm (Johnson 1989). The modal size for upstream migrants was approximately 700 mm (Figure 5.4). At this size, both males and females are likely sexually mature (Johnson 1980, 1989). The length-frequency plots show that smaller fish dominated the downstream migration whereas larger fish dominated the upstream migration during the monitoring period (Figure 5.4). This reflects the time period chosen for monitoring. In the spring, the largest Arctic char tend to move to sea first. These fish may even move under-ice cover (Johnson 1980). Smaller fish follow later, when the largest fish are often beginning to move back upstream. Smolts and smaller, immature, fish do not usually move back upstream until August or early September (Golder 2005).

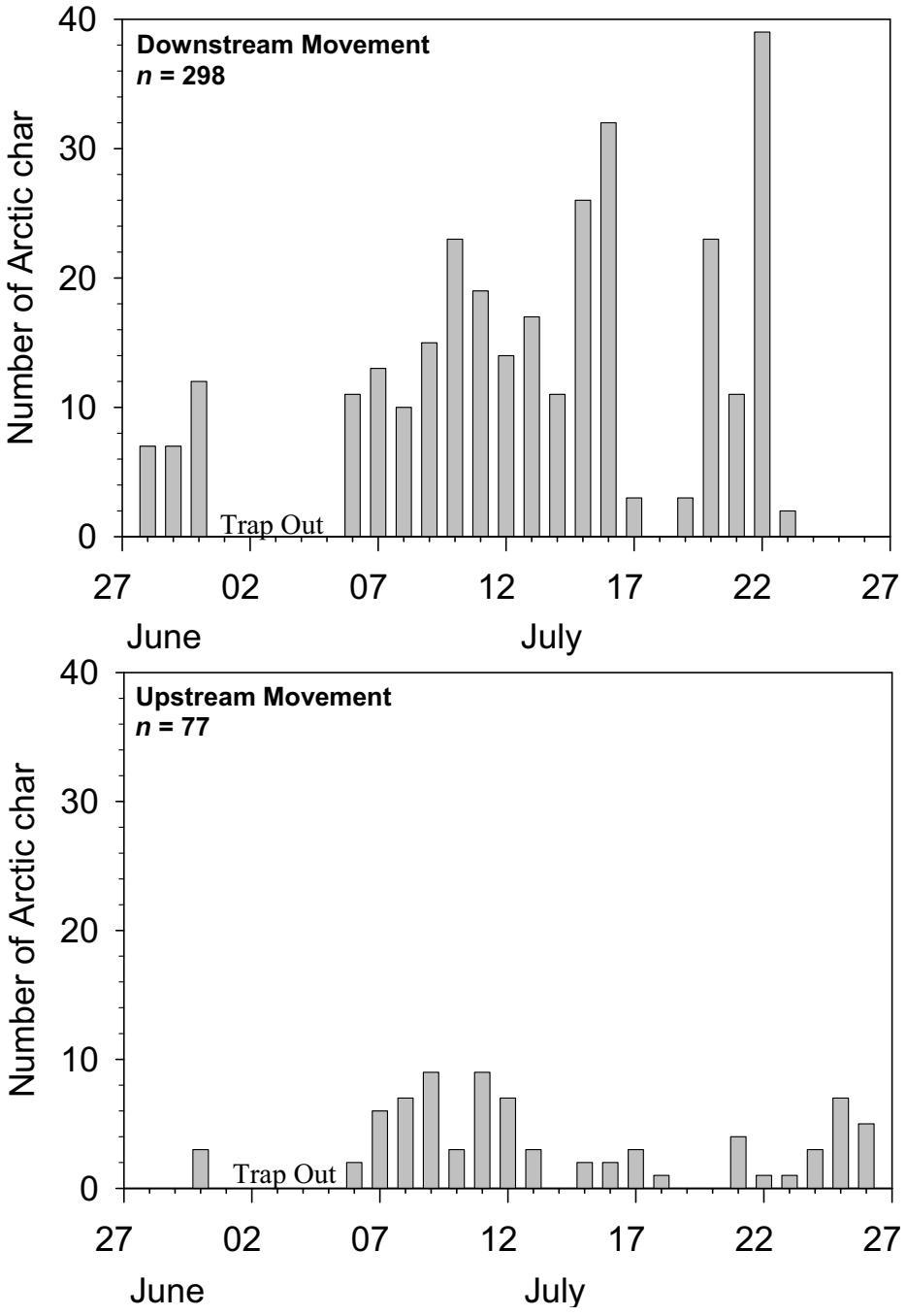


Figure 5.3 Daily Catches of Arctic Char Moving Downstream and Upstream in Little Roberts Outflow, 2007

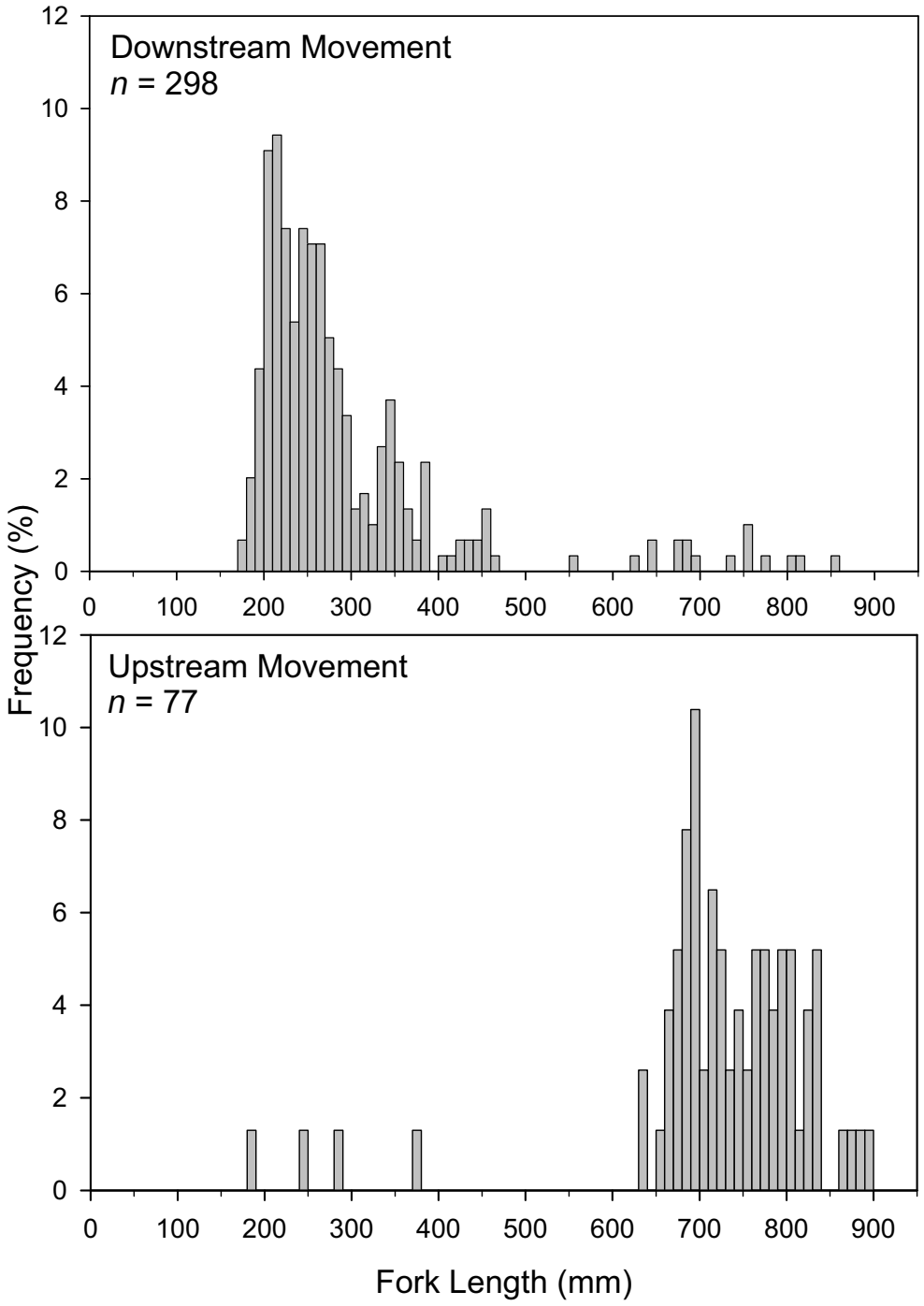
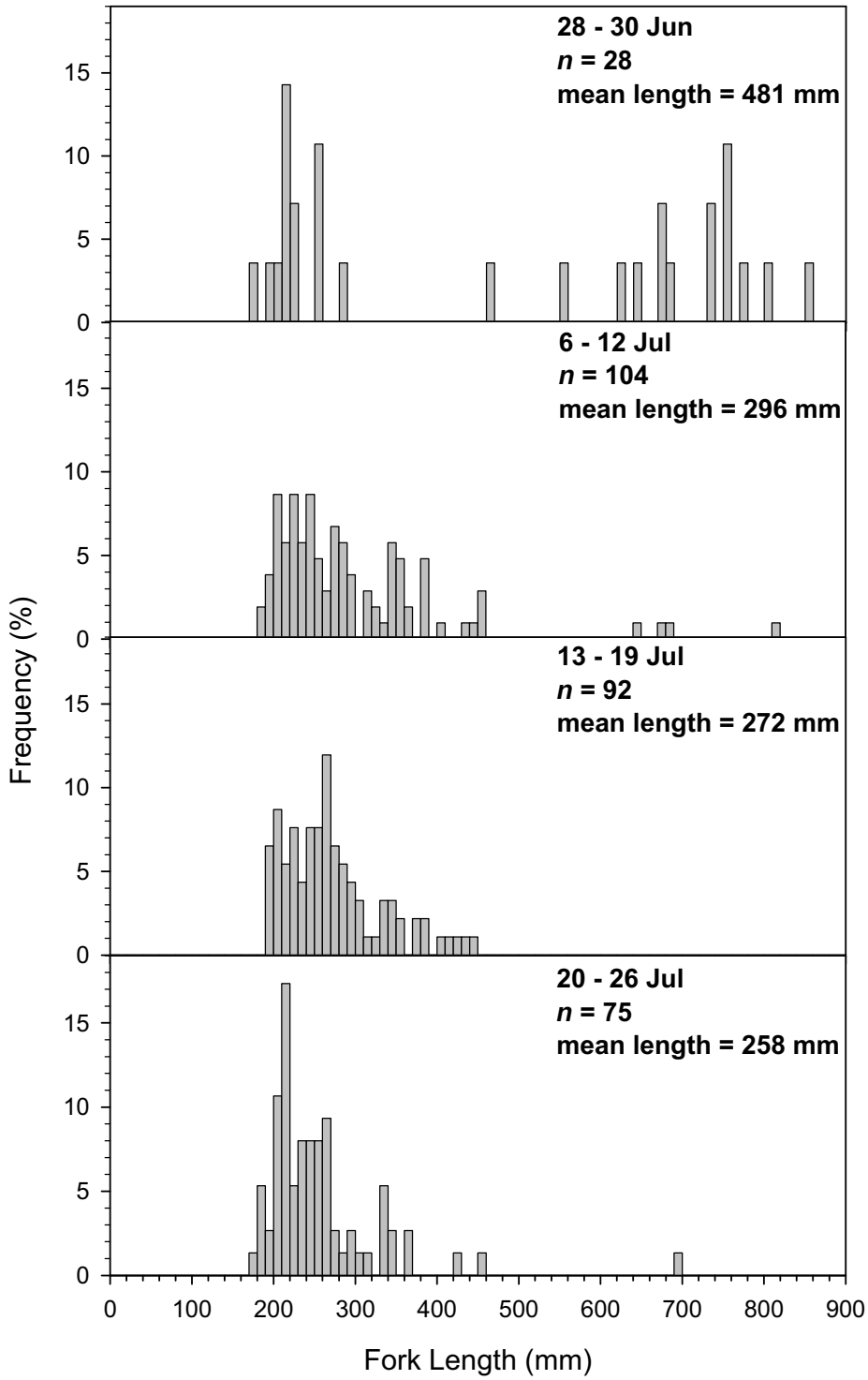


Figure 5.4 Length-Frequency Distribution of Arctic Char Moving Downstream and Upstream in Little Roberts Outflow, 2007

As a result of this size-dependency for migration, the size distribution of Arctic char moving downstream varied through the sampling period (Figure 5.5). Larger size-classes (>500 mm fork length) were present in the greatest numbers from 28-30 June (Figure 5.5); fewer were caught between 6 and 12 July, and the larger fish were virtually absent thereafter. Consistent with results obtained in 2006 and previous studies in the region (Johnson 1989), mean length of Arctic char migrating downstream became progressively smaller throughout the sampling period (Figure 5.5).

Juvenile Arctic char typically spend several years in freshwater before their first seaward migration. The age at first migration varies among populations and individuals within a population but is thought to be between four and five years in the majority of systems (Johnson 1980). The definition of Arctic char smoltification is not always a clear; individual fish may make more than one seaward migration while remaining in the smolt size range. In addition, downstream movement of small fish does not necessarily indicate movement to the sea as small char may migrate downstream but remain in the river below the fish fence. Analyses of otolith microchemistry are often necessary to distinguish between smolts that have made true migrations to sea and smolt-sized fish that have migrated downstream but remained in freshwater. Preliminary analyses of five otoliths collected from fish captured in 2006 indicate that the age of first migration for Arctic char in the Roberts Lake system varies between three and seven years (Swanson and Kidd 2008). This is very close to the age of first migration observed by Johnson (1989) at Nauyuk Lake, Nunavut; in this system, Arctic char underwent smoltification between three and eight years of age.

The number of smolts migrating downstream is often extremely variable between years (Johnson 1989). In general, Arctic char smolts comprise the smallest modal size-class present in the seaward migration (Johnson 1980). To be consistent with previous studies and after analyses of curve shapes in length-frequency distributions (Figure 5.4), Arctic char with fork lengths between 180 and 330 mm were considered to be smolts. Based on this assumption, 211 smolts were encountered in the downstream trap in Little Roberts Outflow in 2007. This is a considerable increase from 2006 when 86 smolt-sized Arctic char were enumerated. In 2007, the smolt numbers are likely an underestimate for the following reasons: 1) the trap was not functional between 1 July and 5 July; 2) some small smolts were able to move through the fence because of the spacing between the conduits; and 3) some smolts may have migrated before 28 June or after 26 July.



note changes to y-axis

Figure 5.5 Temporal Changes in Length-Frequency Distribution of Arctic Char Moving Downstream in Little Roberts Outflow, 2007

Lake Trout

Anadromy (migration from fresh to salt water) is often a defining characteristic of salmonid fishes; however, these seaward migration patterns are expressed in differing degrees among salmonid species (Quinn and Myers 2004). Based on an anadromous classification, which considers distance of migration, duration of stay at sea, state of maturity attained at sea, spawning strategies, and occurrence of freshwater forms, lake trout have been ranked as the least anadromous of all salmonid species (Quinn and Myers 2004). In the Roberts Lake system, however, a portion of the lake trout population undergos a migration into the marine system. Since the initiation of the studies using the fish fence in 2002, a portion of the lake trout population has been documented to undertake a seasonal migration each spring from Roberts Lake to the marine environment of Roberts Bay (RL&L/Golder 2003a). This strategy of partial anadromy of a population is likely maintained by the environmental instability in the area (Jonsson and Jonsson 1993). Individuals that migrate to the ocean likely gain access to high quality food sources in the marine environment that result in increased growth rates and higher reproductive potential (Jonsson and Jonsson 1993). Documenting the occurrence of this life history strategy in lake trout may provide some insight into the selective pressures that influence migration patterns and favour partial anadromy.

Similar to 2006, most of the lake trout encountered at the fish fence in 2007 were moving upstream (Figure 5.6; Golder 2007a). In 2006, lake trout were only captured moving downstream before 1 July (Golder 2007a). In 2007, however, the number of lake trout moving downstream was fairly uniform throughout the sampling period (the exception was 22 July when a high of six fish were captured; Figure 5.6). The mean number of lake trout moving downstream was 1.8 fish per day, and the mean number moving upstream was approximately five fish per day. Most of these fish were captured toward the end of the sampling period; 69 of 97 upstream-moving lake trout were captured between 19 and 26 July (Figure 5.6).

Lake trout moving downstream during the sampling period generally were smaller than those moving upstream. Lake trout moving downstream ranged from 239 to 650 mm fork length (mean 456 mm; $n = 21$) whereas lake trout moving upstream ranged from 330 to 885 mm fork length (mean 609 mm; Figure 5.7).

5.3.3 Recapture Frequency

The number of first-time captures that passed through the fish fence during the 2007 monitoring session included 332 Arctic char, 64 lake trout, 2 lake whitefish, and 1 least cisco. The lake whitefish and least cisco were new encounters (i.e.,

these species had not been captured at the trap in previous years). Recaptures from previous years (i.e., 1997, 2000, 2002, 2003, 2004, 2005, and 2006) accounted for 4.6% of Arctic char and 42.9% of lake trout captures in 2007 (Table 5.4). In 2006, recaptures from previous years were 21% for Arctic char and 35% for lake trout captures. Data from both years suggest that lake trout may have higher fidelity to the system than Arctic char. It also appears that the fidelity of Arctic char to the system could vary substantially among years, although this cannot be accurately assessed because 2007 was the first year that small fish were tagged. A previous study in the region reported significant among-year variation in fidelity. Fidelity was also size-dependent, with smolts and large fish having lower fidelity than intermediate-sized fish (Gyselman 1994). The PIT tagging program initiated in 2007 will ensure better estimates of growth and fidelity in future years. Knowledge of the baseline range of natural variation for these parameters will be important when evaluating the success of the habitat enhancement in Roberts Outflow.

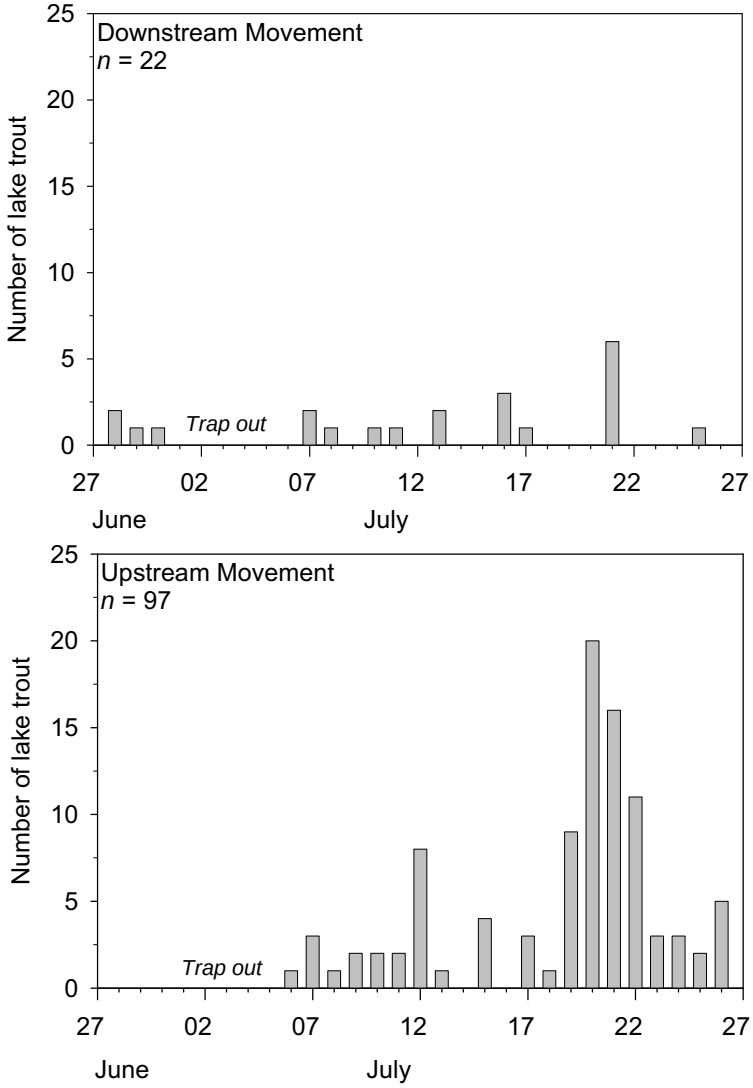
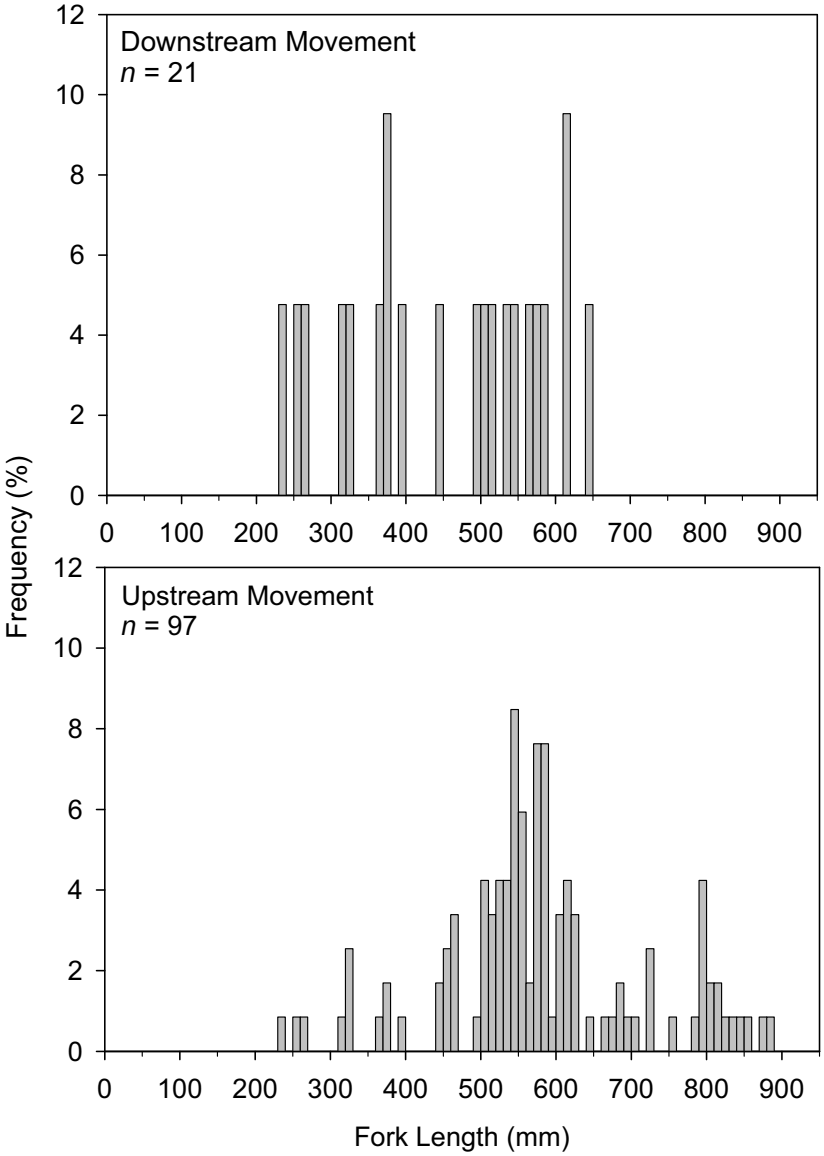


Figure 5.6 Daily Catches of Lake Trout in Little Roberts Outflow, 2007.



Note: one downstream migrating fish escaped prior to measuring

Figure 5.7 Length-Frequency Distribution of Lake Trout in Little Roberts Outflow, 2007

A local fisherman (Robert Akoluk) captured a tagged Arctic char (floy tag number 4666) at Bathurst Inlet on 27 August 2007. This Arctic char was first caught and tagged 28 June 2006 moving downstream through the fish fence in Little Roberts Outflow. The capture location was approximately 200 km (via ocean through Melville Sound and Bathurst Inlet) from the tagging location in Little Roberts Outflow.

As reported in a previous section, a number of small fish were recaptured multiple times moving in the downstream direction. This occurred despite considerable effort by field crews to address any holes or gaps in the fence on a daily basis and may suggest that some of the smallest fish are not migrating to the ocean but remaining in Little Roberts Outflow.

Table 5.4 Number of Fish Captured and Recaptured in Little Roberts Outflow, 2007

Species	Initial Captures in 2007	Tag Year for Recaptured Fish								Total Captures in 2007
		2007	2006	2005	2004	2003	2002	2000	1997	
Arctic char	332	27	7	5	2	2				375
Lake trout	64	7	17	10	16	1	1	2	1	119
Lake whitefish	2									2
Broad whitefish			1			1				2
Least cisco	1									1
Total	**399**	**34**	25	15	18	**4**	**1**	**2**	**1**	499

5.3.4 Feasibility of Quantifying Smolt Out-migration

The general timing of fish fence sampling in Little Roberts Outflow in 2007 appeared to encompass most of the smolt out-migration period. Larger size classes (> 600 mm in fork length) of Arctic char would have migrated downstream earlier in June as many were captured moving upstream during the sampling period. Unlike 2006, the number of smolts moving downstream increased in the second half of July. This likely reflected the later open-water time observed in 2007. At the time the fence was removed, no downstream-moving fish had been captured in three days.

The fence was not operational from 1 to 5 July due to high stream flows and large blocks of drifting ice. This likely led to an underestimate of the number of smolts moving downstream through Little Roberts Outflow. Weather controlled circumstances such as these are difficult to avoid. The only other attempt to enumerate Arctic char smolts in the region reported similar difficulties (Gyselman and Broughton 1991) and the authors concluded after six years of monitoring that accurately determining the number of downstream-moving smolts was not possible (Johnson 1980). It is possible, however, to gain estimates of growth and fidelity because problems with fence operation will affect tagged and untagged fish equally. Also, large inter-annual differences in the number of smolts will likely be detectable even with confounding factors such as ice and potential fence disturbance by wildlife.

5.3.5 Size Characteristics of Migrating Fish

A summary of the lengths, weights and condition factors of fish moving downstream in Little Roberts Outflow is provided in Table 5.5; similar parameters for upstream migrating fish are provided in Table 5.6.

Table 5.5 Summary Statistics for Fish Moving Downstream in Little Roberts Outflow, 2007.

Species	Fork Length (mm)				Weight (g)				Condition Factor			
	n	**Mean**	SD	Range	*n*	**Mean**	SD	Range	*n*	**Mean**	SD	Range
Arctic char	*272*[a]	**290**	120	175-855	268	**361**	751	50-5170	268	**0.90**	0.13	0.62 – 1.62
Lake trout	*18*[a]	**440**	134	239-650	17	**1000**	815	135-2695	17	**0.98**	0.10	0.82 - 1.16
Lake whitefish	*1*	**425**	-	-	1	**1125**	-	-	1	**1.47**	-	-
Least cisco	*1*	**96**	-	-	-	**-**	-	-	-	**-**	-	-

[a] Same-year recaptures were excluded.

Table 5.6 Summary Statistics for Fish Moving Upstream in Little Roberts Outflow, 2007.

Species	Fork Length (mm)				Weight (g)				Condition Factor			
	n	**Mean**	SD	Range	*n*	**Mean**	SD	Range	*n*	**Mean**	SD	Range
Arctic char	*76*[a]	**723**	124	187- 898	*76*	**4376**	1496	57 - 7060	*76*	**1.07**	0.13	0.77 - 1.36
Lake trout	*93*[a]	**611**	117	330 - 885	*92*	**2887**	1586	361-7350	*92*	**1.16**	0.15	0.85 - 1.55
Lake whitefish	*1*	**349**	-	-	*1*	**460**	-	-	*1*	**1.08**	-	-
Broad whitefish	*2*	**521**	31	499-543	*2*	**1935**	7.1	1930-1940	*2*	**1.24**	0.25	1.21-1.56

[a] Same-year recaptures were excluded.

Arctic Char

Size Distribution

The fork length of Arctic char captured moving downstream in Little Roberts Outflow (*n* = 272; 2007 recaptures excluded) ranged from 175 to 855 mm (mean of 290 mm; Table 5.5). Arctic char moving upstream (*n* = 76; 2007 recaptures excluded) were much larger (mean fork length of 723 mm). The overall length-frequency distribution for Arctic char displayed a bi-modal pattern, with peaks at approximately 220 and 700 mm (Figure 5.4).

Length-Weight Relationship

The length-weight regression equation for Arctic char captured moving downstream in Little Roberts Outflow (Figure 5.8) was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 1.63 \times 10^{-5} * L^{2.898} \qquad (n = 272; r^2 = 0.97)$$

The length-weight regression for Arctic char moving upstream was:

$$W = 3.15 \times 10^{-6} * L^{3.185} \qquad (n = 76; r^2 = 0.98; \text{Figure 5.9})$$

The mean condition factor for Arctic char moving downstream was 0.90 (Table 5.5); this was very similar to the result of 0.85 found in 2006. Also similar to 2006, Arctic char moving upstream had a higher condition factor (mean 1.07; Table 5.6) than those moving downstream. This likely reflected the increased weight and fat reserves accumulated during feeding in the marine environment.

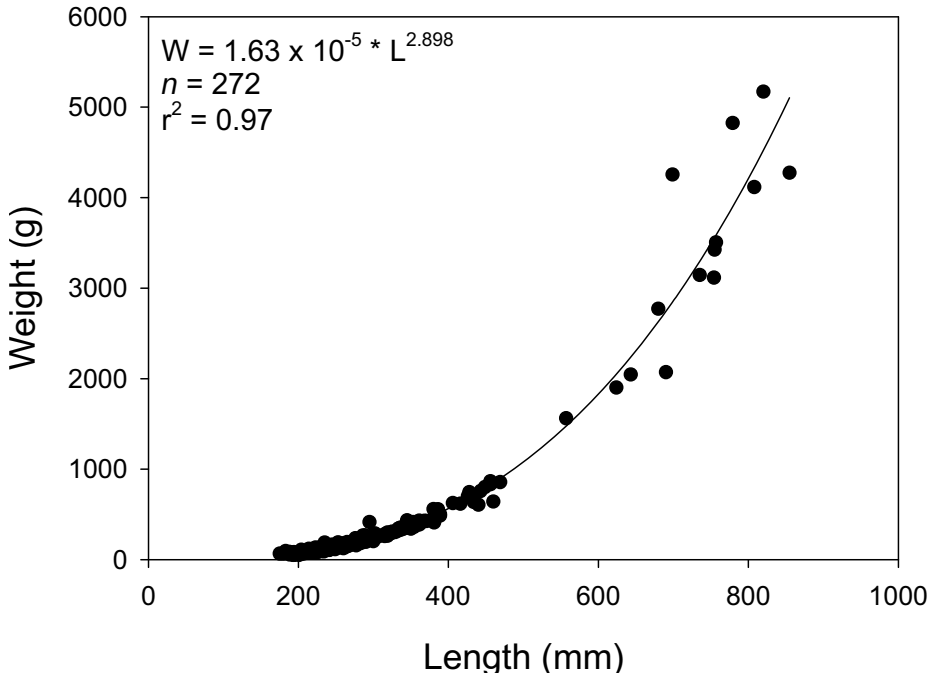


Figure 5.8 Length-Weight Relationship of Arctic Char Moving Downstream in Little Roberts Outflow, 2007

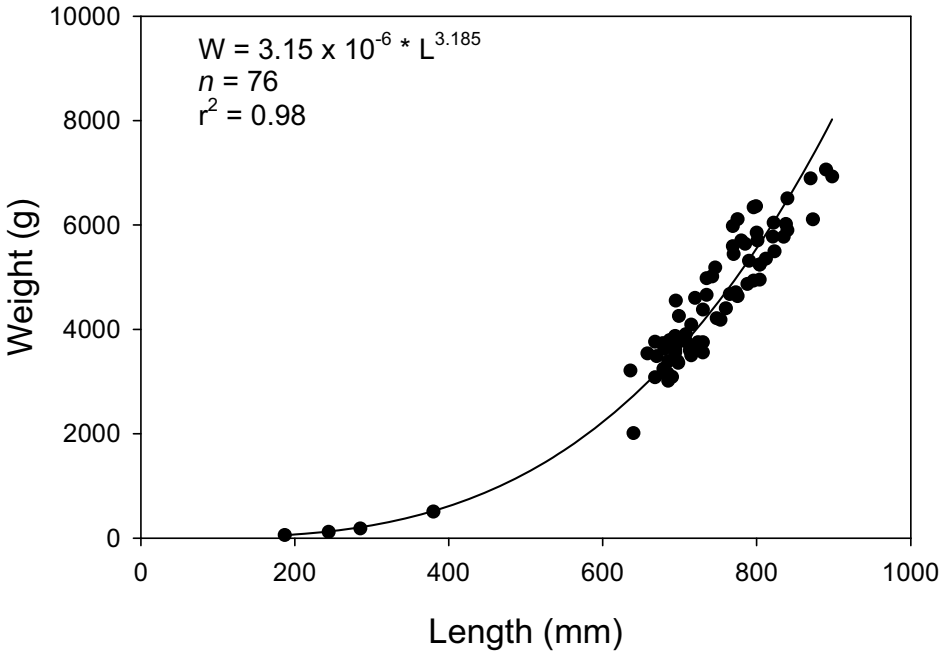


Figure 5.9 Length-Weight Relationship of Arctic Char Moving Upstream in Little Roberts Outflow, 2007

Lake Trout

Size Distribution

Lake trout that were captured at the fish fence moving downstream ranged from 239 to 800 mm in fork length (mean 459 mm; Table 5.5). Lake trout moving upstream were larger than those moving downstream and ranged from 330 to 885 mm (mean 609 mm; Table 5.6). The length-frequency distribution of all lake trout encountered at the fish fence indicates that the modal size was approximately 550 mm (Figure 5.7); this is a slightly smaller modal size than was observed in 2006.

Length-Weight Relationship

Although only 19 lake trout were captured moving downstream in Little Roberts Outflow (same year recaptures excluded), length explained 99% of the variation in weight in a power regression. The results are thus presented below and graphically illustrated in Figure 5.10.

The length-weight relationship for lake trout moving downstream was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 8.98 \times 10^{-6} * L^{3.014} \qquad (n = 17;\ r^2 = 0.99)$$

The length-weight regression equation for lake trout caught moving upstream in Little Roberts Outflow (Figure 5.11) was described by:

$$W = 3.57 \times 10^{-5} * L^{2.823} \qquad (n = 92;\ r^2 = 0.95)$$

The mean condition factor for fish moving downstream was 0.99 (Table 5.5) whereas the mean condition factor for fish moving upstream was 1.16 (Table 5.6). Similar to Arctic char, this difference between upstream and downstream moving fish was most likely a reflection of increased weight and fat reserves accumulated during marine feeding.

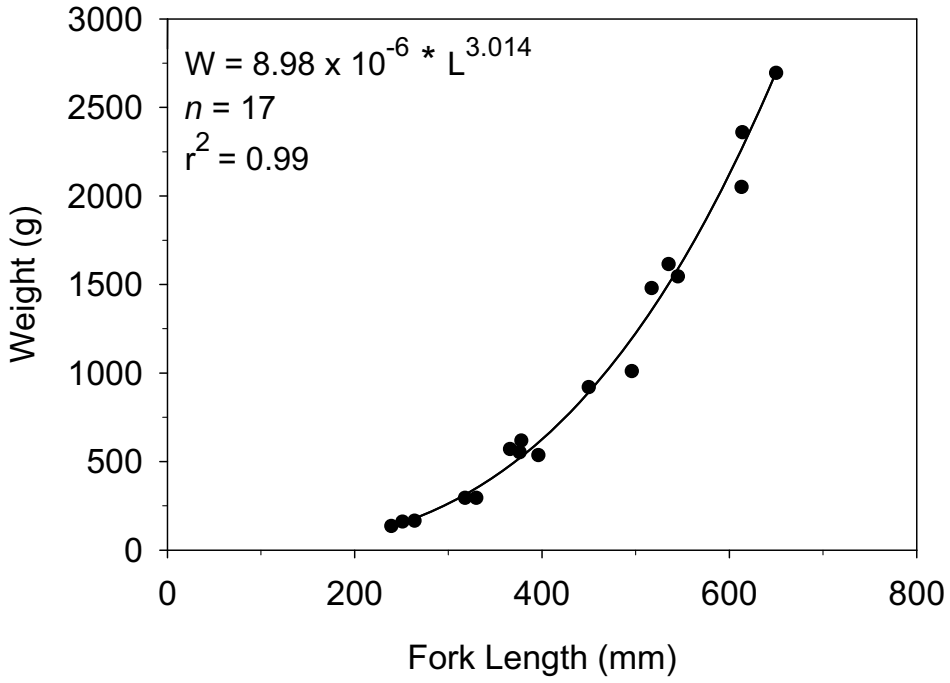


Figure 5.10 Length-Weight Relationship of Lake Trout Moving Downstream in Little Roberts Outflow, 2007

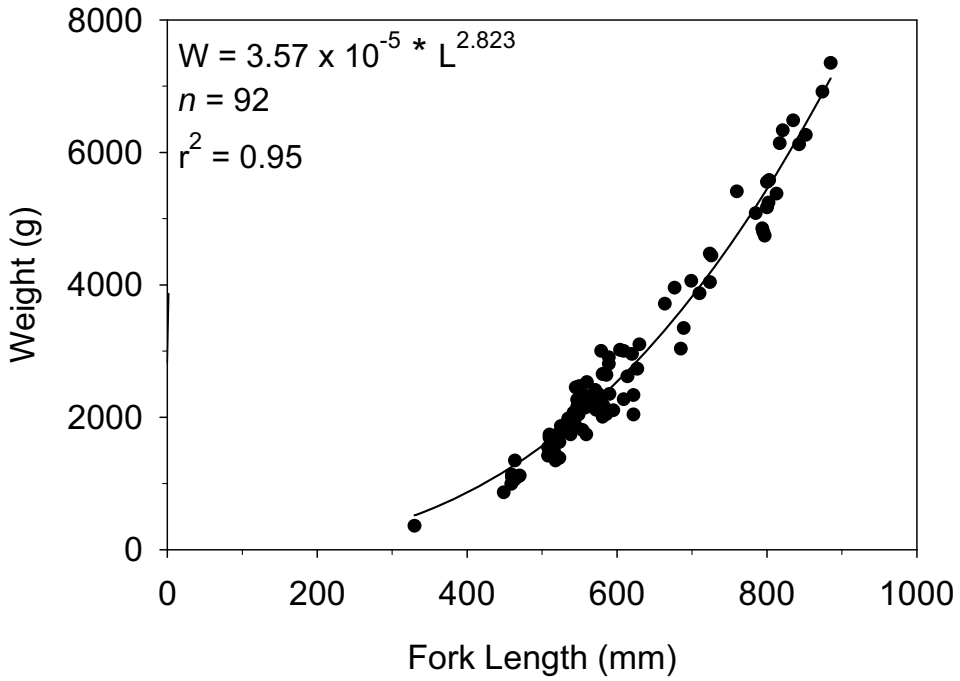


Figure 5.11 Length-Weight Relationship of Lake Trout Moving Upstream in Little Roberts Outflow, 2007

Lake Whitefish

Two lake whitefish were captured in Little Roberts Outflow. One fish was moving upstream (fork length 349 mm) and the other was moving downstream (fork length 425 mm; Table 5.5 and 5.6).

Broad Whitefish

Two broad whitefish were captured in Little Roberts Outflow moving upstream. These fish were very similar in size to each other and to the individual that was captured in 2006 (mean length 2007 = 521 mm, mean length 2006 = 545 mm; Table 5.6; Golder 2007a).

Least cisco

One least cisco was captured in Little Roberts Outflow moving upstream. This fish was 96 mm in length (Table 5.5).

5.4 ROBERTS LAKE

This section of the report summarizes capture and life history data from fish collected in Roberts Lake in 2007. Fish capture methods included fyke nets and gill nets.

A summary of catch and sampling effort conducted in Roberts Lake is presented in Appendices C5 to C8. Size statistics for fish sampled are summarized in Appendix C4, and data from individual fish are presented in Appendix C1.

5.4.1 Species Composition and Relative Abundance

Fish sampling in Roberts Lake yielded a total of 306 fish representing six species (Table 5.7). Lake whitefish dominated the overall catch (46.1%), followed by lake trout (19.7%), cisco (20.7%), Arctic char (10.2%), and ninespine stickleback (3.3%). Gill nets were the most successful sampling methods for obtaining a wide range of species. The catch-per-unit-effort (CPUE) values for the various capture methods and fish species are presented in Table 5.8.

Table 5.7 Number of Fish Captured in Roberts Lake, 2007

Capture Method	Arctic char	Lake trout	Lake whitefish	Cisco	Ninespine Stickleback	Total
Backpack electrofishing[a]	5	2	-	-	2	**9**
Fyke nets[b]	18	6	10	16	8	**58**
Gill nets[a]	8	52	130	47	-	**237**
Total	**31 (10.2%)**	**60 (19.7%)**	**140 (46.1%)**	**63 (20.7%)**	**10 (3.3%)**	**304 (100.0%)**

[a] Sampling conducted as part of the fall spawning survey; [b]sampling conducted as part of the no-net-loss monitoring program

Table 5.8 Catch-Per-Unit Effort (CPUE[a]) for Fish Captured in Roberts Lake, 2007

Capture Method	Effort	Arctic char	Lake trout	Lake whitefish	Cisco	Ninespine Stickleback	Total
Backpack electrofishing	700 s	0.7	0.3	-	-	0.3	**1.3**
Fyke nets	187 h	2.3	0.8	1.3	2.1	1.0	**7.4**
Gill nets	74.3 h	3.1	20.5	51.2	18.5	-	**93.3**

[a] CPUE units: fyke net = fish/24 h; gill net = fish/100 m^2/24 h; backpack electrofishing = fish/100 s

5.4.2 Life History Data

Arctic Char

Length Frequency Distribution

Thirty-one Arctic char were captured in Roberts Lake. Life history data were collected for 28 individual fish. The majority (71%) of captured Arctic char were juveniles (i.e., individuals smaller than 300 mm in fork length). The presence of juveniles indicates that Arctic char are rearing in Roberts Lake, or in nearby stream habitats. Fork lengths for captured specimens ranged from 74 to 820 mm; the mean length was 260 mm (Figure 5.12; Appendix C4).

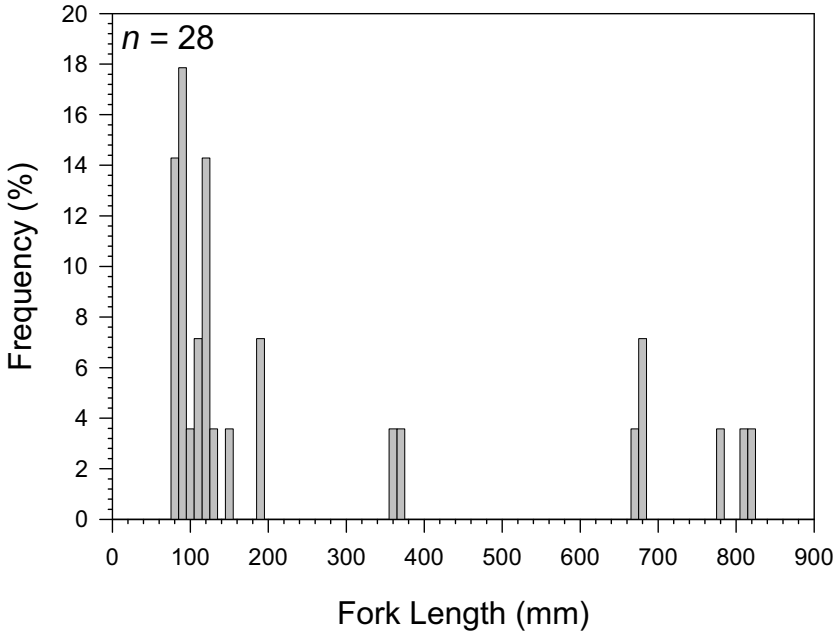


Figure 5.12 Length-Frequency Distribution of Arctic Char in Roberts Lake, 2007

Length-Weight Relationship

The length-weight relationship for Arctic char captured in Roberts Lake (Figure 5.13) was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 3.16 \times 10^{-6} * L^{3.195} \qquad (n = 24, r^2=0.99)$$

The mean condition factor for Arctic char in Roberts Lake was 0.91. Condition factors for individual fish ranged from 0.59 to 1.50 (Appendix C4).

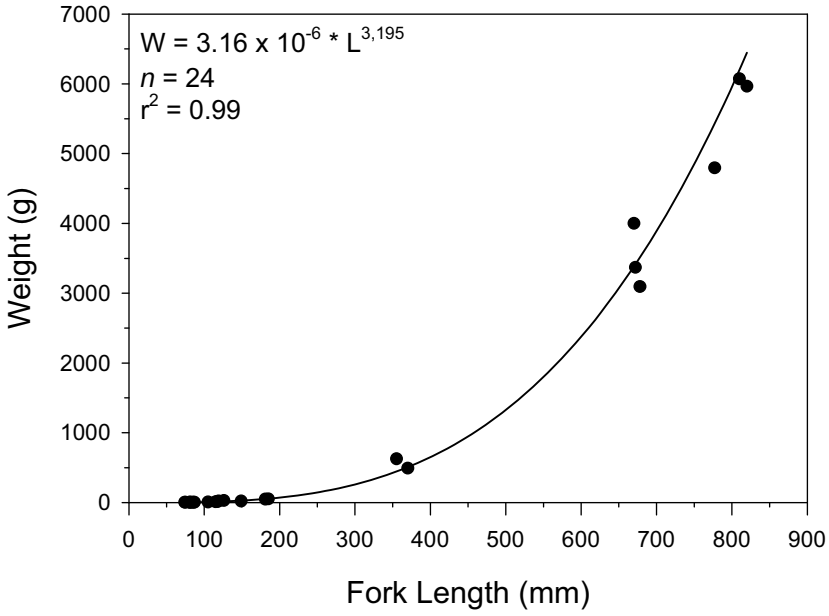


Figure 5.13 Length-Weight Relationship of Arctic Char in Roberts Lake,

Lake Trout

Length Frequency Distribution

Sixty lake trout were captured in Roberts Lake. Fork lengths (n = 42) ranged from 115 to 880 mm (mean of 482 mm); the majority (72%) of the catch was smaller than 500 mm (Figure 5.14).

Length-Weight Relationship

The length-weight relationship for lake trout captured in Roberts Lake (Figure 5.15) was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 6.17 \times 10^{-6} * L^{3.093} \qquad (n = 40, r^2=0.99)$$

The mean condition factor for lake trout in Roberts Lake was 1.10. Condition factors for individual fish ranged from 0.89 to 1.51 (Appendix C4).

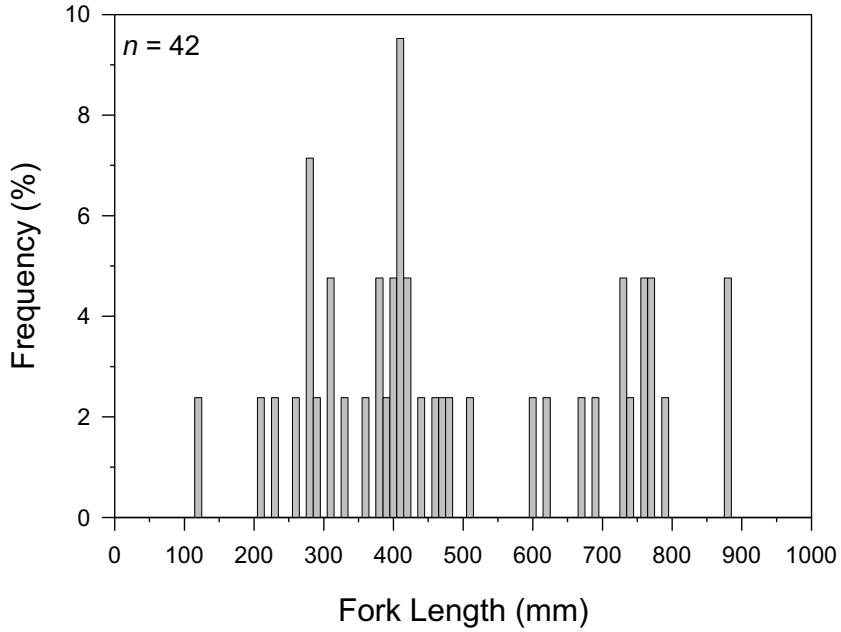


Figure 5.14 Length-Frequency Distribution of Lake Trout in Roberts Lake, 2007

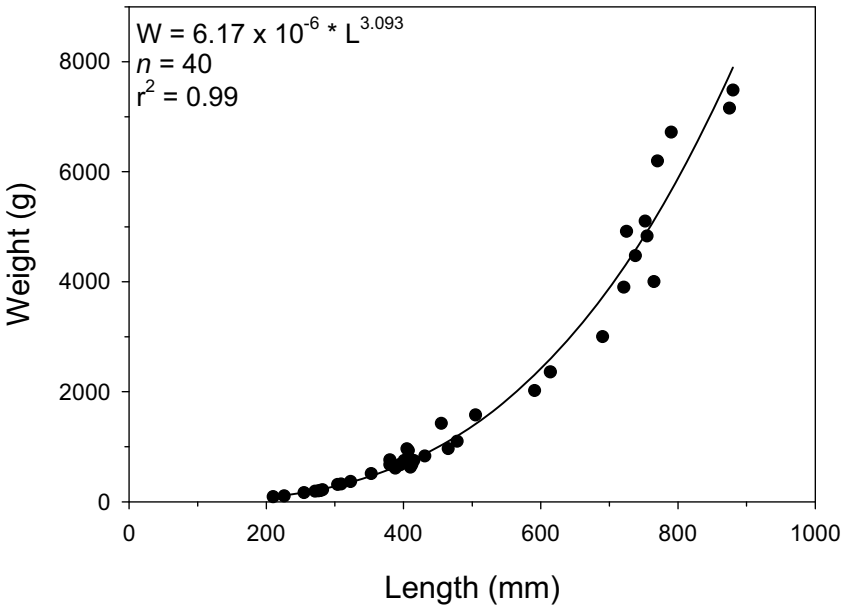


Figure 5.15 Length-Weight Relationship of Lake Trout in Roberts Lake, 2007

Lake Whitefish

Length Frequency Distribution

One hundred forty lake whitefish were captured in Roberts Lake. Fork lengths (*n* = 71) ranged from 166 to 531 mm; the mean fork length of the sample was 387 mm (Appendix C4). The sampled fish showed a unimodal size distribution (Figure 5.16).

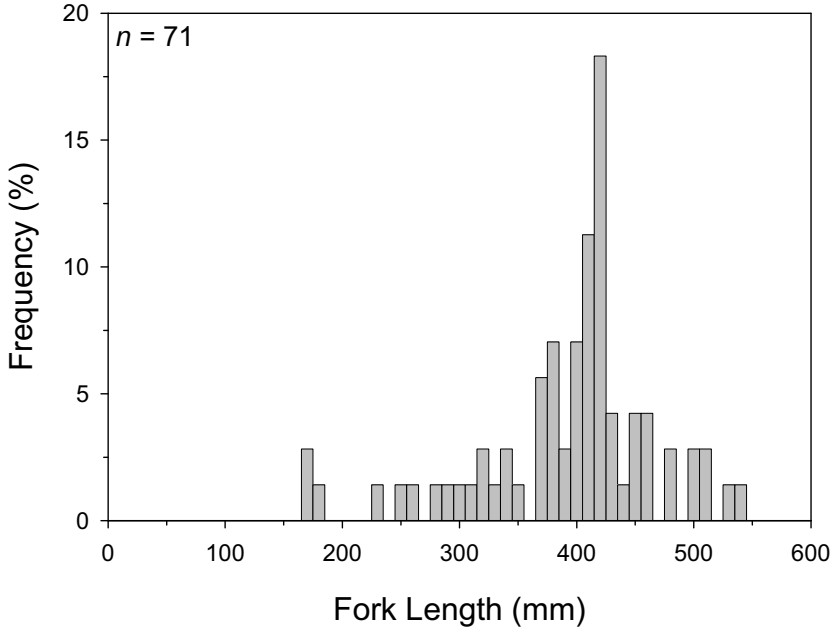


Figure 5.16 Length-Frequency Distribution of Lake Whitefish in Roberts Lake, 2007

Length-Weight Relationship

The length-weight relationship for lake whitefish captured in Roberts Lake (Figure 5.17) was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 4.38 \times 10^{-7} * L^{3.577} \qquad (n = 69, r^2 = 0.98)$$

The mean condition factor was 1.35, with individual fish ranging between 0.61 and 1.71 (Appendix C4).

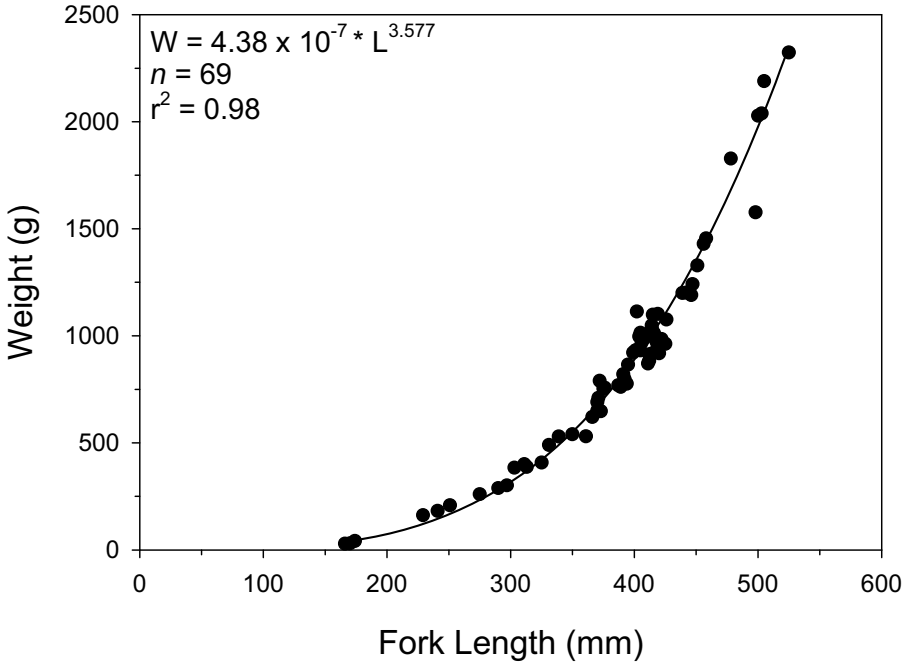


Figure 5.17 Length-Weight Relationship of Lake Whitefish in Roberts Lake, 2007

Cisco

Length Frequency Distribution

Forty-seven cisco were captured in Roberts Lake. Fork lengths (n = 36) ranged from 85 to 385 mm (mean 257 mm; Appendix C4). The majority (61%) of the fish were smaller than 300 mm fork length (Figure 5.18).

Length-Weight Relationship

The length-weight relationship for cisco captured in Roberts Lake (Figure 5.19) was described by the following equation, where W is weight in grams and L is fork length in millimetres:

$$W = 7.35 \times 10^{-6} * L^{3.074} \qquad (n = 36, r^2=0.97)$$

The mean condition factor for cisco in Roberts Lake was 1.12 (range 0.59 to 1.61; Appendix C4).

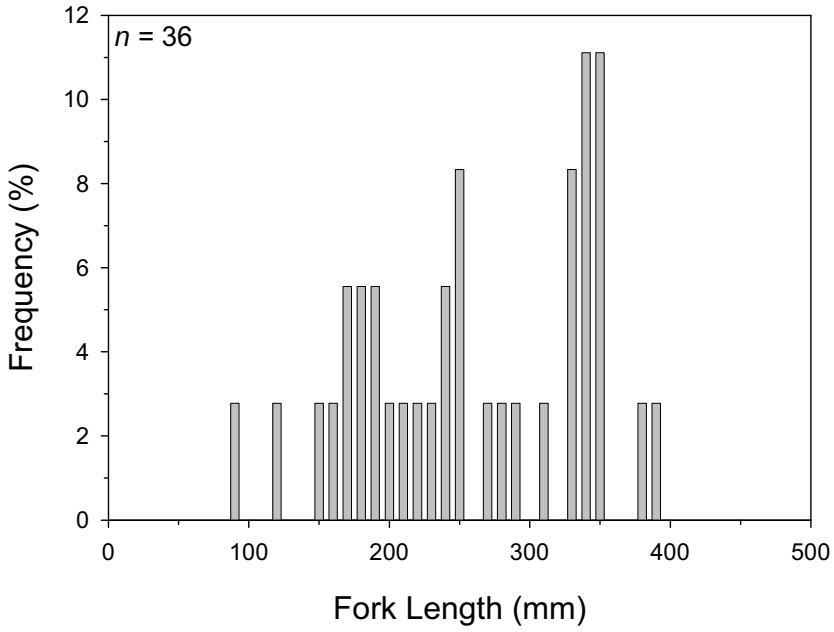


Figure 5.18 Length-Frequency Distribution of Cisco in Roberts Lake, 2007

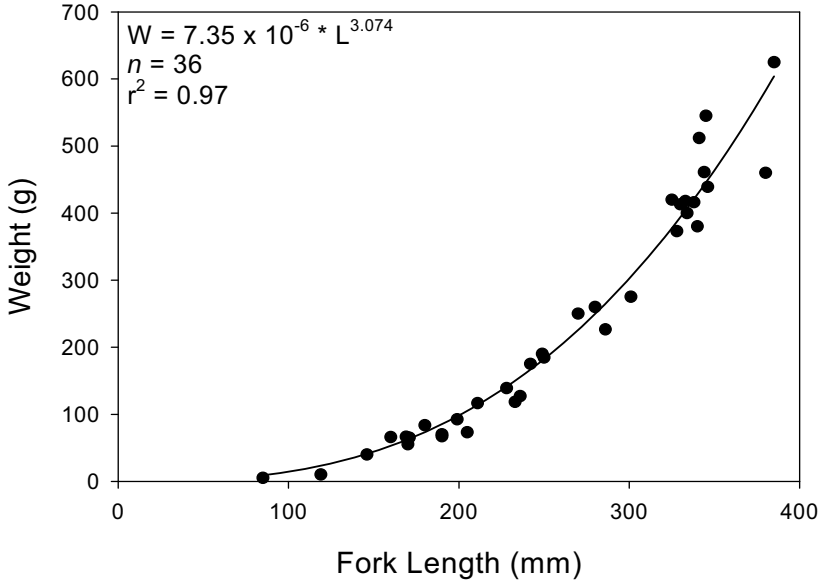


Figure 5.19 Length-Weight Relationship of Cisco in Roberts Lake, 2007

Ninespine Stickleback

In total, 10 ninespine stickleback were captured by backpack electrofishing and fyke netting in Roberts Lake. The mean length (total length) of the measured sample (n = 10) was 51 mm, and the range was 40 to 71 mm (Appendix C4). The mean condition factor (n = 4) was 0.63 (range 0.56 to 0.71; Appendix C4).

5.4.3 Arctic Char Fall Spawning Survey in Roberts Lake

To complement previous efforts to identify Arctic char spawning sites in Roberts Lake, gill netting was carried out at suspected spawning locations on 26 to 27 August 2007 and from 9 to 11 September 2007 (Figure 5.1). Catch-per-unit effort data are presented in Table 5.7 and illustrate that Arctic char were much less abundant than lake trout, lake whitefish, and cisco in Roberts Lake. These data are consistent with those obtained in previous years (Golder 2005; Golder 2007a). The poor catch success for Arctic char and relatively high bycatch suggest that obtaining reliable information on spawning site locations and estimates of the number of spawning Arctic char may not be possible with traditional capture techniques such as gill netting and fyke netting. Surveys in future years may have to involve techniques such as visual observation (e.g., underwater cameras, remote-operated underwater vehicles) and hydro-acoustics.

Eight adult Arctic char were captured over four days of fishing during the fall spawning survey; five of these fish were relatively large (>600 mm) and in pre-spawning/ripe condition (Figure 5.20), whereas the remainder were smaller and likely immature. Five of the eight captured fish were sacrificed and dissected for analyses of stable isotopes, contaminants, and fecundity (Swanson et al 2008b, in prep.). Dissected fish included four mature individuals and one immature individual. Length, weight, stomach contents, and parasites were recorded on dissected fish and samples of dorsal muscle tissue, liver, and otoliths were collected.

Pre-spawning females ranged in fork length from 670 to 777 mm and pre-spawning males ranged in fork length from 810 mm to 820 mm. These results are consistent with surveys of spawning Arctic char carried out on nearby Nauyuk Lake, Nunavut in the 1970s and 1980s (Johnson 1989). Pre-spawning males and females captured at Roberts Lake displayed spawning colouration and males also had well-developed kypes (Figure 5.20). All of the pre-spawning fish that were sacrificed and dissected had empty stomachs and three of four dissected fish had parasites on the stomach, liver, and/or skin.

Figure 5.20 Pre-spawning/ripe male Arctic char captured in Roberts Lake

Preliminary results on migration patterns are available for three of the captured pre-spawning Arctic char. Migration patterns were determined through analysis of otolith microchemistry. Differences in strontium (Sr) concentrations between marine and freshwater systems are reflected in otolith composition and can provide information about anadromous (migrations to sea) behaviour (Babaluk et al. 1998). Strontium concentrations were determined along a continuous transect in the otolith from the nucleus to the outer edge using laser ablation with inductively-coupled plasma mass spectrometry. All analyses were performed by Heidi Swanson (graduate student) at the University of Manitoba microprobe lab. Results are preliminary but indicate that the age of first migration among the three pre-spawning fish was 4-5 years. Following this, the fish migrated to sea for approximately 8-9 years before remaining in freshwater to spawn in 2007 (Swanson and Kidd 2008).

5.4.4 Roberts Lake No-Net-Loss Monitoring

A standardized index monitoring program at Roberts Lake was established in 2007 to provide baseline data to which future post habitat enhancement changes in Arctic char and lake trout abundance can be compared. This was the first year of the program and the monitoring is expected to continue annually for ten years. The sampling protocols employed in 2007 will be replicated in future years. To assess the effectiveness of compensatory fish habitat enhancement within the Roberts Lake area, baseline results collected in 2007 will be used for comparative purposes in following years.

The Roberts Lake monitoring program consisted of two distinct components: monitoring index streams and monitoring shoreline use. Backpack electrofishing was conducted in four tributary streams to Roberts Lake to estimate juvenile Arctic char and lake trout abundance within the streams. The streams were selected based on their ability to support juvenile Arctic char. In addition to a tape measurement of the total length of the section, UTM coordinates were collected at the start and end points of each isolated stream section (Table 5.9).

The second component of the monitoring program involved the use of two modified Arctic fyke nets set in Roberts Lake to establish juvenile Arctic char use of littoral habitat. The nets were set at the north end of the lake (Figure 5.1, Table 5.9).

Table 5.9 Roberts Lake Index Monitoring Site Locations

Index Monitoring Site	Start UTM Coordinates			Stop UTM Coordinates			Stream Section Length (m)
	Zone	Easting	Northing	Zone	Easting	Northing	
Stream E04	13 W	436462	7559325	13 W	436445	7559190	50
Stream E10	13 W	434101	7559781	13 W	441266	7559503	100
Stream E11	13 W	441259	7559502	13 W	441248	7559485	30
Stream E14	13 W	434246	7563140	13 W	441079	7559546	70
Fyke Net Site 1	13 W	430632	7561923	-	-	-	-
Fyke Net Site 2	13 W	430649	7562168	-	-	-	-

5.4.5 Stream E04

Stream E04 is situated on the southwest side of Roberts Lake and connects Lake 04 to a small lake attached to the west basin of Roberts Lake (Figure 5.1). Although much of the stream length consists of deep Flat habitat (F2) and moderately deep Run habitat (R2), the area selected for the habitat monitoring program was a 50 m length of stream with shallow Run habitat (R3) and Riffle habitat (RF) (Figure 5.21). The habitat and bed material within this section of stream was unique compared to the remainder of the watercourse. The wetted channel width was 2.7 m and the bankfull width was 3.0 m. The bed material was composed of cobble (40%), boulder (35%), gravel (20%) and sand (5%). The maximum water depth within the monitoring area was 0.40 m. Cover was provided by large boulders, aquatic vegetation and overhanging willow.

Baseline monitoring of Stream E04 was conducted on 24 July. Four passes with the backpack electroshocker were performed (combined time 2164 s). In total, 157 fish representing four species were captured (Appendix C4). Both juvenile and adult Arctic char and lake trout were found within the monitoring area, as well as least cisco and ninespine stickleback (Figure 5.22). Based on calculations performed by Microfish™ software, the estimated fish population within the isolated section of stream was 171 individuals. The 95% confidence interval was 157 to 184 fish, and the confidence range plus/minus the population estimate was 7.6%. The capture probability was 0.46.

Figure 5.21 View Upstream at the Stream E04

Figure 5.22 Arctic Char (Top) and Lake Trout (Bottom) Captured in Stream E04

5.4.6 Stream E10

Stream E10 flows from Lake 10 to Roberts Lake (Figure 5.1). Lake 10 provides overwintering habitat for populations of Arctic char and lake trout. An index monitoring site was established from the stream outflow into Roberts Lake to a point 100 m upstream (Figure 5.23). The wetted channel width within the survey area was 1.7 m and the bankfull width was 2.0 m. The habitat within the stream was comprised of shallow Pool habitat (P3; 61% by area), Boulder Garden habitat (BG; 22%), shallow Flat habitat (F3; 9%) and shallow Run habitat (R3; 8%). In order of abundance, the bed material was composed of boulder (55% by area), cobble (28%), gravel (13%), sand (4%) and trace amount of bedrock. Good quality cover for rearing fish was provided by large boulders, and dense overhanging willow (Figure 5.24).

Figure 5.23 Aerial View of Stream E10. The Index Monitoring Site is the First 100 m of Stream from Roberts Lake

Figure 5.24 View Upstream of Typical Stream Characteristics Within the Index Monitoring Site

The index monitoring site encompasses the steepest reach of the stream as the watercourse quickly decreases in gradient as it descends towards Roberts Lake. Drops over boulder or bedrock ranging from 0.3 to 0.5 m were common along the length of the monitoring area. Although not entirely preventing the possibility of upstream fish movement, the steep gradient, drops, and boulder gardens are expected to significantly impair upstream movement of both adult and juvenile fish. There is the possibility that the fish captured within Stream E10 are downstream migrants from resident populations within Lake 10. Upstream of the monitoring area the gradient becomes flatter and the stream characteristics change to long sections of shallow run habitat; in places the channel becomes undefined as it flows through thick sedge punctuated by large (5 m wide) deep pools (> 1.5 m deep).

Baseline monitoring of Stream E10 was conducted on 23 July. Three passes with the backpack electroshocker were performed (combined time 1535 s). Arctic char (n = 6), lake trout (n = 2), and ninespine stickleback (n = 2) were utilizing habitat within the monitoring site (Appendix C4). Ten fish were captured and the estimated fish population within the isolated section of stream was also 10 individuals. The 95% confidence interval was 10 to 11 fish and the confidence range plus/minus the population estimate was 10%. The capture probability was 0.71.

5.4.7 Stream E11

Stream E11 is a small stream east of Stream E10 (Figure 5.1). An index monitoring site (30 m length) was established between Roberts Lake and a large bedrock outcrop (Figure 5.25). The bedrock outcrop is a barrier to all upstream fish movement. The stream exhibited a very poorly defined channel near the edge of Roberts Lake. Much of the flow was braided through terrestrial vegetation. The channel only became defined and continuous as the gradient steepened towards the bedrock outcrop. The average wetted width of the stream was 0.5 m and the average bankfull width was 0.6 m. The maximum water depth was 0.25 m. Within the portion of the watercourse displaying confined channel characteristics, fish habitat was comprised of shallow Pool habitat (P3; 59% by area), shallow Run habitat (R3; 28%), and Riffle habitat (RF; 13%). The stream substrate was 43% cobble, 41% gravel, 13% boulder, and 3% sand. Overhanging willow was the primary source of stream cover. The quality of habitat within the reach was considered marginal for Arctic char rearing.

Baseline monitoring of Stream E11 was conducted on 25 July. Three passes with the backpack electroshocker were performed (combined time 267 s). Two Arctic char were captured in small residual pools near the base of the bedrock outcrop (Figure 5.26). These fish were 100 mm and 138 mm fork length. Due to the poor

connectivity to Roberts Lake (discontinuous channel) and the bedrock outcrop limiting further upstream movement, the fish were effectively stranded in a small section of stream. The fish probably enter the stream during high flows in the spring. Based on the results of each sampling pass, the estimated population within isolated section of stream was two individuals.

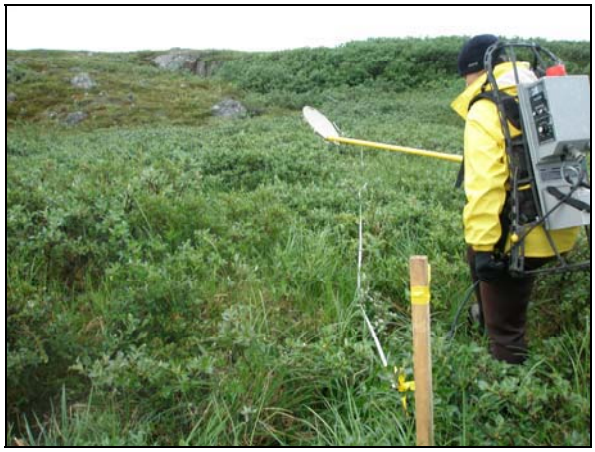


Figure 5.25 **View Upstream at the Stream E11 Index Monitoring Site. The Stream Flows Over the Bedrock Outcrop in the Background**

Figure 5.26 **Arctic Char were Captured in Small Residual Pools Such as the one Photographed Here**

5.4.8 Stream E14

Stream E14 flows into a large bay located on the northwest side of Roberts Lake (Figure 5.1). The stream originates from Lake 14. Downstream of the outflow from Lake 14, the stream is completely overgrown with willows and is high gradient. Approximately 70 m upstream of the monitoring site, the stream cascades over a 1.5 m vertical bedrock outcrop onto large boulders, preventing fish passage upstream into Lake 14 from Roberts Lake. From field investigations in 2006, Lake 14 does not support a resident Arctic char population (Golder 2007a).

The E14 index monitoring site was established from the edge of Roberts Lake to a point 70 m upstream. The average wetted channel width within the survey area was 0.9 m and the average bankfull width was 1.5 m. The habitat within the stream was comprised primarily of a series of shallow Pool habitat (P3; 61% by area) and shallow Run habitat (R3; 36%; Figure 5.27), with one small section of shallow Flat habitat (F3; 3%). In order of abundance, the bed material was composed of sand (48% by area), silt (35%), gravel (12%), and cobble (5%). Good quality cover for rearing fish was provided by overhanging willow,

instream emergent vegetation and pool depth. The majority of Arctic char captured during the monitoring session were from the pool habitats. Upstream of the monitoring site the stream becomes braided as it flows through very dense willow. Often the stream flow is over mats of organic material with series of drops onto cobble and boulder.

Baseline monitoring of Stream E14 was conducted on 25 July. Five passes with the backpack electroshocker were performed (combined time 2196 s). Sixty-two fish were captured during sampling, 42 of which were Arctic char (Figure 5.28) and 20 were ninespine stickleback (Appendix C4). The estimated population within the isolated section of stream was 66 individuals, and the 95% confidence interval was 62 to 73 fish. The confidence range was 10.6% and the capture probability was 0.42. The number of juvenile Arctic char captured within the monitoring site indicates that this reach provides exceptionally high value rearing habitat in comparison to other tributary streams entering Roberts Lake.

Figure 5.27 View Facing Downstream at Typical Pool Run Habitat Within the Stream E14 Index Monitoring Site

Figure 5.28 Juvenile Arctic Char Sampled in the Lower Reach of Stream E14

5.4.9 Roberts Lake Index Fyke Net Sites

Two index monitoring fyke net sites were established within Roberts Lake (Figure 5.1). The first index site (Fyke Net Site 1) was located along the east shore of the west arm of Roberts Lake, opposite of Roberts Lake outflow. The second index site (Fyke Net Site 2) was located along the west shore of the west arm of Roberts Lake, approximately 200 m south of Roberts Lake outflow. Each net was set for four days from 20 July to 24 July 2007.

5.4.9.1 Fyke Net Site 1

Fyke Net Site 1 was set on gravel (25%) – cobble (40%) lake bed material, interspersed with large boulders (35%). Below the surface layer of coarse material, the lake bottom consisted of fine soft lacustrine silt and clay (Figure 5.29). The lake bottom exhibited a gentle slope away from shore. Significant shoreline cover features were absent (e.g., no overhanging vegetation). Some boulder cover was present; however the boulders were typically embedded into the lake bottom. In total, 42 fish were captured at the site, consisting of Arctic char (*n* = 9), lake trout (*n* = 5), lake whitefish (*n* = 8), cisco (*n* = 16), and ninespine stickleback (*n* = 4; Table 5.10). Both adult and juvenile Arctic char were captured (see Figure 5.30).

Figure 5.29 View Facing North at Fyke Net Site 1. Note the Suspended Sediment in the Foreground from Disturbance to the Underlying Layer of Lacustrian Silt

Figure 5.30 View of an Arctic Char Captured in the Fyke Net

Table 5.10 Summary Statistics and CPUE for Fish Captured in Fyke Net 1, 2007

Species	Fork Length (mm)				Weight (g)				Condition Factor				CPUE
	n	Mean	SD	Range	*n*	Mean	SD	Range	*n*	Mean	SD	Range	
Arctic char	*9*	**170**	194	75-678	*9*	**355**	1028	Mar-95	*9*	**0.73**	0.13	0.59-0.99	2.3
Lake trout	*5*	**305**	118	210-505	*5*	**458**	633	89-1578	*5*	**1.03**	0.13	0.91-1.22	1.3
Lake whitefish	*8*	**363**	76	229-447	*8*	**754**	399	163-1241	*8*	**1.4**	0.08	1.33-1.53	2.0
Cisco	*16*	**195**	58	85-301	*16*	**103**	76	5-275	*16*	**1.14**	0.25	0.59-1.61	4.0
Ninespine stickleback	*4*	**57**	13	45-71	*1*	2	-	-	*1*	**0.56**	-	-	1.0

CPUE units = fish/24 h

5.4.9.2 Fyke Net Site 2

The second fyke net was set in an area with a lake bottom comprised primarily of coarse sand (95%) with a small component of cobble (5%). The lake bottom had a consistent gentle slope from shore, very similar to Fyke Net Site 1. The area was devoid of significant cover features such as overhanging vegetation, or boulders (Figure 5.31). During the sampling period, 16 fish were captured (Table 5.11). Although fewer fish were captured at this site compared to Site 1, captures at both sites included the same number of Arctic char. All of the Arctic char captured at Fyke Net Site 2 were juvenile fish (Figure 5.32).

Figure 5.31 View Facing East at Fyke Net Site 2. Note the Coarse Sand Lake Bed Material and the Lack of Cover

Figure 5.32 A Juvenile Arctic Char Captured at Fyke Net Site 2

Table 5.11 Summary Statistics and CPUE for Fish Captured in Fyke Net Site 2, 2007

Species	Fork Length (mm)				Weight (g)				Condition Factor				CPUE
	n	Mean	SD	Range	*n*	Mean	SD	Range	*n*	Mean	SD	Range	
Arctic char	*9*	**107**	35	74-185	*8*	**17**	16	Mar-50	*8*	**0.9**	0.3	0.60-1.50	2.3
Lake trout	*1*	**255**	-	-	*1*	**165**	-	-	*1*	**1**	-	-	0.3
Lake whitefish	*2*	**400**	18	387-412	*2*	**841**	103	769-914	*2*	**1.32**	0.01	1.31-1.33	0.5
Ninespine stickleback	*4*	**50**	6	42-55	*3*	1	0	01-Jan	*3*	0.65	0.06	0.60-0.71	1.0

CPUE units = fish/24 h

5.5 LAKE 10

This section of the report summarizes fish capture and life history data collected in Lake 10 in 2007 as part of H. Swanson's Ph.D research. Fish capture methods included gill nets and backpack electrofishing.

A summary of catch and sampling effort conducted in Lake 10 is presented in Appendices C5, and C7. Size statistics for fish sampled are summarized in Appendix C4, and data from individual fish are presented in Appendix C2.

5.5.1 Species Composition and Relative Abundance

Fish sampling in Lake 10 yielded a total of 18 fish representing three species (Table 5.12). Ninespine stickleback dominated the overall catch (50%) and had the highest CPUE, followed by Arctic char (38.9%), and lake trout (11.1%; Table 5.12).

Table 5.12 Catch-Per-Unit Effort (CPUE[a]) for Fish Captured in Lake 10, 2007

Capture Method	Effort	Arctic char		Lake Trout		Ninespine stickleback		Total	
		n	CPUE	*n*	CPUE	*n*	CPUE	*n*	CPUE
Backpack electrofishing	947 s	1	0.11	-	-	9	1.0	**10**	**1.1**
Gill nets	14.3 h	6	12.3	2	4.1	-	-	**8**	**16.4**
Total		**7 (38.9%)**	**-**	**2 (11.1%)**	**-**	**9 (50.0%)**	**-**	**18 (100.0%)**	**-**

[a] CPUE units: backpack electrofishing = fish/100 s; gill net = fish/100 m^2/24 h

5.5.2 Life History Data

Arctic Char

Seven Arctic char were captured in Lake 10. Life history data were collected for seven individual fish. Fork lengths for captured specimens ranged from 59 to 451 mm; the mean length was 379 mm (Appendix C4). The mean condition factor for Arctic char in Lake 10 was 1.05. Condition factors for individual fish ranged from 0.96 to 1.21 (Appendix C4).

Lake Trout

Two lake trout were captured in Lake 10. One lake trout escaped before life history measurements could be obtained. The fork length for the other specimen

was 440 mm, the weight was 910 g and the condition factor was 1.07 (Appendix C4).

Ninespine Stickleback

Nine ninespine stickleback were captured in Lake 10. Fork lengths for captured specimens (n = 9) ranged from 32 to 62 mm; the mean length was 46 mm (Appendix C4). Weights were not recorded for captured ninespine stickleback.

5.6 LAKE 32

This section of the report summarizes fish capture and life history data collected in Lake 32 in 2007 as part of H. Swanson's Ph.D research. Fish capture methods included gill nets and backpack electrofishing.

A summary of catch and sampling effort conducted in Lake 32 is presented in Appendices C5, and C7. Size statistics for fish sampled are summarized in Appendix C4, and data from individual fish are presented in Appendix C2.

5.6.1 Species Composition and Relative Abundance

Fish sampling in Lake 32 yielded a total of 48 individual fish representing three species. Arctic char dominated the overall catch (62.5%), followed by lake trout (18.8%), and ninespine stickleback (18.8%; Table 5.13).

Table 5.13 Catch-Per-Unit Effort (CPUE[a]) for Fish Captured in Lake 32, 2007.

Capture Method	Effort	Arctic char		Lake Trout		Ninespine stickleback		Total	
		n	CPUE	*n*	CPUE	*n*	CPUE	*n*	CPUE
Backpack electrofishing	313 s	2	0.64	2	0.64	6	1.9	**10**	**3.2**
Minnow Trap	50.5	-	-	-	-	3	1.4	**3**	**1.4**
Gill nets	3.2 h	28	258.5	7	64.6	-	-	**35**	**323.2**
Total		**30 (62.5%)**	**-**	**9 (18.8%)**	**-**	**9 (18.8%)**	-	**48 (100.0%)**	**-**

[a] CPUE units: gill net = fish/100 m^2/24 h; minnow trap = fish/24 h; backpack electrofishing = fish/100 s

5.6.2 Life History Data

Arctic Char

Thirty Arctic char were captured in Lake 32. Life history data were collected for 12 individual fish. Fork lengths for captured specimens ranged from 95 to 412 mm; the mean length was 325 mm (Appendix C4). The mean condition factor was 0.94. Condition factors for individual fish ranged from 0.80 to 1.05 (Appendix C4).

Lake Trout

Nine lake trout were captured in Lake 32. Life history data were collected for eight individual fish. Fork lengths for captured specimens ranged from 100 to 393 mm; the mean length was 329 mm (Appendix C4). The mean condition factor was 1.15. Condition factors for individual fish ranged from 1.04 to 1.40 (Appendix C4).

Ninespine Stickleback

Nine ninespine stickleback were captured in Lake 32. Life history data were collected for six individual fish. Fork lengths for captured specimens ranged from 29 to 52 mm; the mean length was 42 mm (Appendix C4). Weights were not recorded for ninespine stickleback.

5.7 ROBERTS BAY

A rock fill jetty was constructed during early July 2007 at the south end of Roberts Bay for barge loading and off-loading. Fish sampling was conducted near the jetty during construction in 2007 to determine if spawning migrations of capelin began prior to the completion of the jetty (15 July). Arctic fyke nets were used to sample fish in Roberts Bay between 12 and 17 July 2007. To compare the catches of east and west bound fish, the fyke net was composed of two side-by-side traps separated by a lead extending to the shore.

The catch and size statistics for fish sampled in Roberts Bay are summarized in Appendix C4 and Appendix C6; data from individual fish are presented in Appendix C1.

4.3.1 Species Composition and Relative Abundance

The fyke net catch in Roberts Bay included 262 fish that were represented by six species. Arctic flounder was the predominant species in the catch (55%), followed by Pacific herring (21%), saffron cod (13%), fourhorn sculpin (4%), lake trout (3%), and Arctic char (2%; Table 5.14). Caplin were not captured during the sampling period.

Directional movement data from the fyke nets indicated some differences in fish species numbers moving east and west (Table 5.14). The catch of east bound fish (n = 99) was comprised mainly of Arctic flounder (51%) and Pacific herring (31%), followed by fourhorn sculpin (7%), saffron cod (5%), lake trout (4%), and Arctic char (2%). The catch of west bound fish (n = 163) was comprised of Arctic flounder (58%), saffron cod (15%), Pacific herring (14%), fourhorn sculpin (6%), Arctic char (3%), and lake trout (2%).

Table 5.14 Number of Fish Captured in the Fyke Nets in Roberts Bay, 2007.

Fyke Net Direction	Arctic flounder	Pacific herring	Lake trout	Arctic char	Saffron cod	Fourhorn sculpin	Total
East Bound	50	31	4	2	7	5	**99**
West Bound	95	23	3	4	29	9	**163**
Total	**145 (55.3%)**	**54 (20.6%)**	**7 (2.7%)**	**6 (2.3%)**	**34 (13.0%)**	**16 (6.1%)**	**262 (100.0%)**

4.3.2 Life History Data

Arctic Flounder

Size Distribution

In total, 145 Arctic flounder were captured in Roberts Bay. The mean total length was 173 mm, with the lengths ranging from 45 to 368 mm (Appendix C4). Almost 92% of the Arctic flounder captured had total lengths from 89 mm to 230 mm (Figure 5.33).

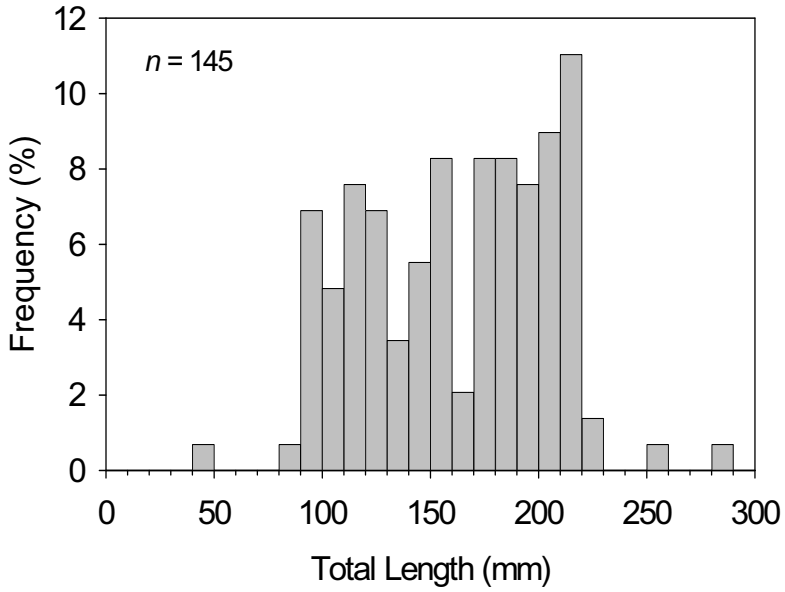


Figure 5.33 Length-Frequency Distribution of Arctic Flounder in Roberts Bay, 2007

Length-Weight Relationship

The length-weight relationship for Arctic flounder captured in Roberts Bay (Figure 5.34) was described by the following equation, where W is weight in grams and L is total length in millimetres:

$$W = 3.920 \times 10^{-5} * L^{2.798} \qquad (n = 145, r^2=0.99)$$

The mean condition factor for Arctic flounder in Roberts Bay was 1.28, with condition factors ranging between 0.84 and 1.65 (Appendix C4).

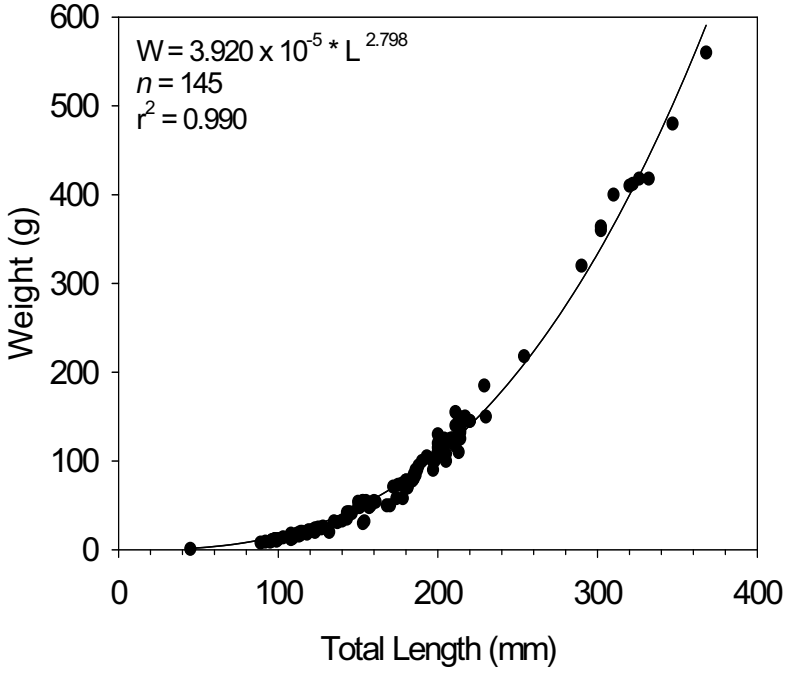


Figure 5.34 Length-Weight Relationship of Arctic Flounder in Roberts Bay, 2007

Lake Trout

Seven lake trout were captured in Roberts Bay. Fork lengths ranged from 316 to 719 mm, with a mean length of 619 mm. The sample size was too small to calculate the length-weight relationship for lake trout in Roberts Bay. The mean condition factor was 1.09 and the range was 0.92 to 1.25 (Appendix C4).

Arctic Char

Six Arctic char were captured in Roberts Bay. Fork lengths ranged from 116 to 246 mm, with a mean length of 204 mm. The sample size was too small to calculate the length-weight relationship for Arctic char in Roberts Bay. The mean condition factor was 0.79 and the range was 0.64 to 0.92 (Appendix C4).

Pacific Herring

Fifty-four Pacific herring were captured in Roberts Bay. The fish were all small in size; the mean fork length was 74 mm and the lengths ranged between 66 and 86 mm. The mean condition factor was 0.52 and the range was 0.25 to 0.77 (Appendix C4).

Saffron Cod

Thirty-four saffron cod were caught in Roberts Bay. The mean total length was 144 mm and the range was 73 to 269 mm (Appendix C4). The mean condition factor was 0.61 and the range was 0.44 to 1.19 (Appendix C4).

Fourhorn Sculpin

Sixteen fourhorn sculpin were captured in Roberts Bay. The mean total length was 100 mm and the range was 70 to 143 mm. The mean condition factor was 1.02 and the range was 0.81 to 1.24 (Appendix C4).

5.8 SUMMARY

During fisheries surveys conducted in 2007, 1557 fish representing 11 species were encountered in the Doris North Project area. Fish sampling was conducted in Roberts Lake and four tributary streams, Little Roberts Outflow, Doris Lake, two small lakes in the Roberts Lake drainage (Lake 10 and Lake 32), and Roberts Bay. Overall, the most common fish species captured was Arctic char (33.9%), followed by lake trout (13.6%), ninespine stickleback (12.7%), cisco (12.2%), lake whitefish (10.3%), Arctic flounder (9.3%), Pacific herring (3.5%), and saffron cod (2.2%). The remaining 2.3% was composed of least cisco, fourhorn sculpin and broad whitefish (Table 5.15).

Lake Communities

Fish sampling was conducted in Roberts Lake, Doris Lake and two small lakes within the Roberts Lake drainage area. Fish sampling was conducted using gill nets, minnow traps, fyke nets and backpack electrofishing. In total, 370 fish were captured in Roberts Lake and the two small lakes in the Roberts Lake drainage area. Lake whitefish dominated the catch (37.8%), followed by lake trout (19.2%), Arctic char (18.4%), cisco (12.7%), ninespine stickleback (7.6%), and least cisco (4.3%; Table 5.15).

Fish sampling in Doris Lake resulted in the capture of 170 fish that included cisco (84.1%), lake whitefish (10.6%) and lake trout (5.3%; Table 5.15).

Stream Communities

Fish sampling was conducted in Little Roberts Outflow and four small tributaries to Roberts Lake. A fish fence installed in Little Roberts Outflow between 28 June and 26 July 2007 resulted in the capture of 499 fish representing five species.

Table 5.15 Summary of Fish Encountered in the Doris North Project Area, 2007.

Species	Roberts Bay	Roberts Lake	Little Roberts Outflow	Small Streams in Roberts Drainage	Small Lakes in Roberts Drainage	Doris Lake	Total	% Composition
Arctic char	6	31	375	79	37		**528**	**33.9**
Arctic flounder	145						**145**	**9.3**
Broad whitefish			2				**2**	**0.1**
Cisco		47				143	**190**	**12.2**
Fourhorn sculpin	16						**16**	**1.0**
Lake trout	7	60	119	6	11	9	**212**	**13.6**
Lake whitefish		140	2			18	**160**	**10.3**
Least cisco		16	1	1			**18**	**1.2**
Ninespine stickleback		10		170	18		198	**12.7**
Pacific herring	54						54	**3.5**
Saffron cod	34						34	**2.2**
Total	**262**	**304**	**499**	**256**	**66**	**170**	**1557**	**100.0**

Arctic char (75.2%) dominated the catch, followed by lake trout (23.8%). Two broad whitefish, two lake whitefish and one least cisco were also captured (Table 5.15).

Fish sampling in four tributary streams to Roberts Lake resulted in the capture of 256 fish. Ninespine stickleback was the dominant species (66.4%), followed by Arctic char (30.9%), lake trout (2.3%), and least cisco (0.4%; Table 5.15).

Marine Communities

A directional Arctic fyke net was used to assess fish movements in Roberts Bay from 12 to 17 July 2007. The west bound fish contributed 62% to the total catch of 262 fish. Arctic flounder was the dominant species caught in the fyke nets (55.3%), followed by Pacific herring (20.6%) and saffron cod (13%; Table 5.15). The remaining 11% was comprised of fourhorn sculpin, lake trout and Arctic char. Lake trout were represented by larger size classes, whereas Arctic char, Arctic flounder, Pacific herring, saffron cod, and fourhorn sculpin were from smaller size classes. Caplin were not captured during the sampling period.

Arctic Char in the Roberts Lake System

Fish sampling at the Little Roberts Outflow fish fence was conducted to quantify Arctic char smolt migration from the Roberts Lake system into the marine environment of Roberts Bay. In total, 298 Arctic char were captured moving downstream; these included 211 smolt-sized fish (less than 330 mm in fork length). Consistent with 2006 results, the larger Arctic char moved downstream earlier than the smolts. The number of downstream Arctic char smolts in 2007 (211) was substantially larger than in 2006 (86; Golder 2007a).

The Roberts Lake monitoring program consisted of two distinct components: monitoring index streams and monitoring shoreline use. Backpack electrofishing was conducted in four tributary streams to Roberts Lake to estimate juvenile Arctic char and lake trout abundance within the streams. The selected streams were found to support juvenile Arctic char. Stream E14 provides exceptionally high value rearing habitat with a population of 42 Arctic char captured in the sample reach. The second component of the monitoring program involved the use of two modified Arctic fyke nets set in Roberts Lake. Nine Arctic char were captured at each of the fyke net monitoring stations.

Thirty-three gill nets sets were used to capture Arctic char in potential spawning habitat in Roberts Lake, which had been previously identified during the 2006 fall spawning survey (Golder 2007a). Only eight Arctic char were captured during the four day spawning survey in 2007. Five large (>600 mm) pre-spawning/ripe fish were captured. The presence of these Arctic char in near-spawning condition indicates that the anadromous Arctic char do spawn along the shoreline in Roberts Lake.

6 CLOSURE

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Report prepared by: Report reviewed by:

7 REFERENCES

AMEC. 2003. Meteorology and hydrology baseline report. Doris North Project, Revision 1, Supporting Document "D" to the Final Environmental Impact Statement. Prepared for Miramar Hope Bay Ltd. By AMEC Earth and Environmental, Burnaby, BC, August 2003.

Babaluk, J.A., Halden, N.M., Reist, J.D., Kristofferson, A.H., Campbell, J.L. and W.J. Teesdale. 1998. Evidence for non-anadromous behaviour of Arctic charr (*Salvelinus alpinus*) from Lake Hazen, Ellesmere Island, Northwest Territories, Canada, based on scanning proton microprobe analysis of otolith strontium distribution. Arctic 50: 224-233.

BC Ministry of Environment (BCMOE). 2001. British Columbia Approved Water Quality Guidelines (criteria) 1998 Edition. Environmental Protection Division, British Columbia Ministry of Environment. Victoria, BC. Updated August 24, 2001.

BC Ministry of Environment (BCMOE). 2006. British Columbia Approved Water Quality Guidelines (criteria) 1998 Edition. Environmental Protection Division, British Columbia Ministry of Environment. Victoria, BC. Updated August 2006. http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html

Canadian Council of Ministers of the Environment. 2007. Canadian water quality guidelines for the protection of aquatic life: Summary table and fact sheets. *In:* Canadian environmental quality guidelines, 2007, Canadian Council of Ministers of the Environment, Winnipeg.

Environment Canada. 2005. Recommended water quality guidelines for the protection of aquatic life for use in the 2005 national water quality indicators under the Canadian Environmental Sustainability Indicators (CESI) initiative [draft]. National Guidelines and Standards Office, Environment Canada, Gatineau, Quebec. June 23, 2005.

Golterman, H.L. 2001. Phosphate release from anoxic sediments or `What did Mortimer really write?'. Hydrobiologia 450: 99-106.

Golder Associates Ltd. 2005. Doris North Project Aquatic Studies 2004. Prepared for Miramar Hope Bay Ltd. Golder Report No. 04-1373-009: 82 p. + 3 app.

Golder Associates Ltd. 2006. Doris North Project Aquatic Studies 2005. Prepared for Miramar Hope Bay Ltd. Golder Report No. 05-1373-014: 108 p. + 3 app.

Golder Associates Ltd. 2007a. Doris North Project Aquatic Studies 2005. Prepared for Miramar Hope Bay Ltd. By Golder Associates Ltd., Edmonton, AB. Golder Report No. 06-1373-026: 123 p. + 3 app.

Golder Associates Ltd. 2007b. Doris North Project "No Net Loss" Plan – Revision 6 Final Report – December 2007. Prepared for Miramar Hope Bay Ltd. Golder Report No. 07-1373-0018-1200F: 89 p. + 8 photographic plates + 6 app.

Golder Associates Ltd. 2008. Miramar Expansion: Boston and Madrid aquatic studies 2006 - 2007. Prepared for Miramar Hope Bay Ltd., North Vancouver, BC by Golder Associates Ltd., Edmonton, AB. Golder Report No. 06-1373-026/07-1373-0019.

Gyselman, E. 1994. Fidelity of anadromous Arctic char (*Salvelinus alpinus*) to Nauyuk Lake, Canada. Canadian Journal of Fisheries and Aquatic Sciences 51:1927-1934.

Gyselman, E., and K. E. Broughton. 1991. Data on the anadromous Arctic charr, (*Salvelinus alpinus*) of Nauyuk Lake, Northwest Territories, 1974-1988. Canadian Data Report of Fisheries and Aquatic Sciences No. 815, Winnipeg, MB.

Johnson, L. 1980. The arctic charr, *Salvelinus alpinus*. in E. K. Balon, editor. Charrs: Salmonid fishes of the genus Salvelinus. Dr. W. Junk bv Publishers, The Hague, Netherlands.

Johnson, L. 1989. The anadromous Arctic charr (*Salvelnius alpinus*) of Nauyuk Lake, N.W.T., Canada. Physiology and Ecology Japan Special Volume 1:201-227.

Jonsson, B., and N. Jonsson. 1993. Partial migration: niche shift versus sexual maturation in fishes. Reviews in Fish Biology and Fisheries 3:348-365.

Klohn-Crippen Consultants Ltd. 1995. Doris Lake Project, NWT 1995 environmental study. Report submitted to BHP Minerals Canada Ltd., Vancouver.

Miramar Hope Bay Ltd. (MHBL). 2007. Revised water license application support document Doris North Project Nunavut, Canada. Prepared by Miramar Mining Corporation. 453 p. + 24 app.

Nelson, J.S. E.J. Crossman, H. Espinosa-Pérez, L.T. Findley, C.R. Gilbert, R.N. Lea, and J.D Williams. 2004. Common and scientific names of fishes from the United States, Canada, and Mexico. American Fisheries Society, Special Publication 29, Bethesda, Maryland.

O'Neil, J. and L. Hildebrand. 1986. Fisheries resources upstream of the Oldman River dam. Prepared for Alberta Environment, Planning Division by RL&L Environmental Services Ltd. RL&L Report No. 181: 131 p. + 7 app.

Rescan. 1997. 1996 Environmental Baseline Studies Report. Prepared for BHP World Minerals by Rescan Environmental Services Ltd.

Rescan. 1998. 1997 Environmental Data Report. Prepared for BHP World Minerals by Rescan Environmental Services Ltd.

Rescan. 1999. 1998 Environmental Data Report. Prepared for BHP World Minerals by Rescan Environmental Services Ltd.

Rescan. 2001. 2000 Supplemental Environmental Baseline Data Report. Prepared for the Hope Bay Joint Venture by Rescan Environmental Services Ltd.

RL&L Environmental Services Ltd./Golder Associates Ltd. (RL&L/Golder). 2002. Aquatic Baseline Studies – Doris Hinge Project Data Compilation Report 1995-2000. Prepared for Miramar Hope Bay Ltd. RL&L/Golder Report No. 022-7009: 329 p. + 5 app.

RL&L Environmental Services Ltd./Golder Associates Ltd. (RL&L/Golder). 2003a. Doris North Project Aquatic Studies 2002. Prepared for Miramar Hope Bay Ltd. RL&L/Golder Report No. 022-7010: 67 p. + 4 app.

RL&L Environmental Services Ltd./Golder Associates Ltd. (RL&L/Golder). 2003b. Doris North Project Aquatic Studies 2003. Prepared for Miramar Hope Bay Ltd. RL&L/Golder Report No. 03-1370-007: 72 p. + 4 app.

Saffran, K.A., and D.O. Trew. 1996. Sensitivity of Alberta lakes to acidifying deposition: an update of sensitivity maps with emphasis on 109 northern lakes. Alberta Environmental Protection, Edmonton, Alberta. 75 pp.

Statistics Canada. 2006. Canadian environmental sustainability indicators: freshwater quality indicator – data sources and methods. Catalogue number 16-256-XWE2006000. http://www.statcan.ca/english/freepub/16-256-XIE/16-256-XIE2007000.pdf

Swanson, H. K. and K.A. Kidd. 2008. A preliminary investigation of the effects of anadromous Arctic charr (*Salvelinus alpinus*) on food web structure and nutrient transport in coastal arctic lakes.Proceedings of the 2nd International Scientific Symposium on Diadromous Fishes, June 2007. Accepted with revision, December 2007. Revisions submitted January 2008.

Swanson, H.K., K.A. Kidd, J.A. Babaluk, R. Wastle, and J.D. Reist. 2008a. Evidence for marine migrations in lake trout (*Salvelinus namaycush*) in the central Canadian Arctic. In preparation.

Swanson, H.K., K.A. Kidd, and J.D. Reist. 2008b. The effect of anadromous Arctic charr (*Salvelinus alpinus*) on concentrations of mercury and trace metals in coastal Arctic lakes. In preparation.

Swanson, H.K., K.A. Kidd, D.C.G. Muir, and J.D. Reist. 2009. The effect of anadromous Arctic charr (*Salvelinus alpinus*) on concentrations of legacy and emerging organic contaminants in coastal Arctic lakes. In preparation.

Terzl, F.A., T. Winkler and B. Routledge. 1994. Hydrometric Field and Related Manuals, Water Survey of Canada. Environment Canada, Ottawa.

Quinn, T. P., and K. W. Myers. 2004. Anadromy and the marine migrations of Pacific salmon and trout: Rounsefell revisisted. Reviews in Fish Biology and Fisheries 14:421-442.

APPENDIX A

HYDROLOGY DATA

This appendix contains hydrology data referenced in the body of the report. A table of contents for the appendix follows:

DORIS LAKE OUTFLOW HYDROMETRIC STATION

H71

FACTSHEET

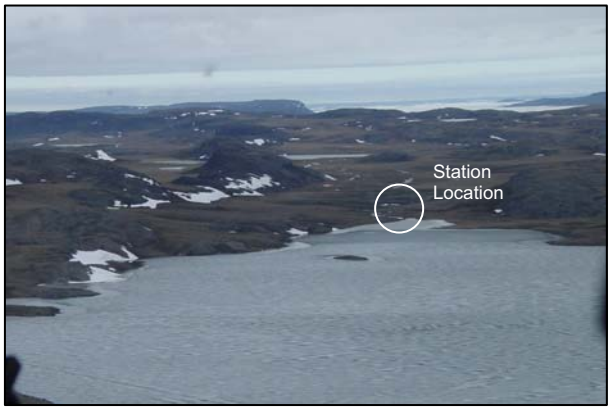
LOCATION AND DETAILS

Located on the right downstream bank of Doris Lake outflow, approximately 50 m downstream of the lake.

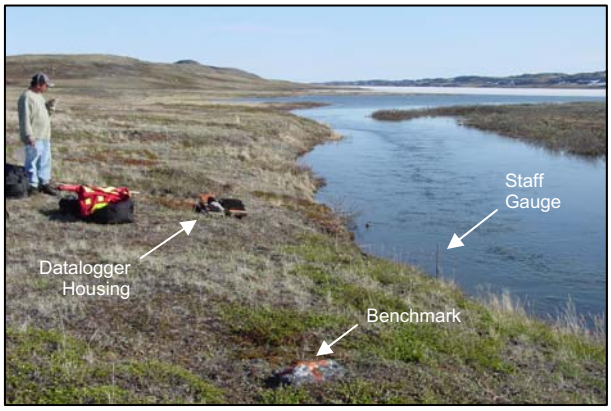
Operational:	2003	2004	2005	2006	2007	2008	2009
	30/6-9/9	8/6-11/9	27/6-17/9	26/6-8/9	23/6-14/9		

Benchmark: Top of embedded boulder; 22.593 m (geodetic)
Coordinates: UTM: 434072 m E, 7559504 m N (NAD83)
Datalogger: Optimum Instruments #1384

Drainage Area: 93.1 km^2
Lat/Long: 68°08'30" N, 106°35'14" W
Transducer: KPSI #0402786 (5 psi; 15 m)



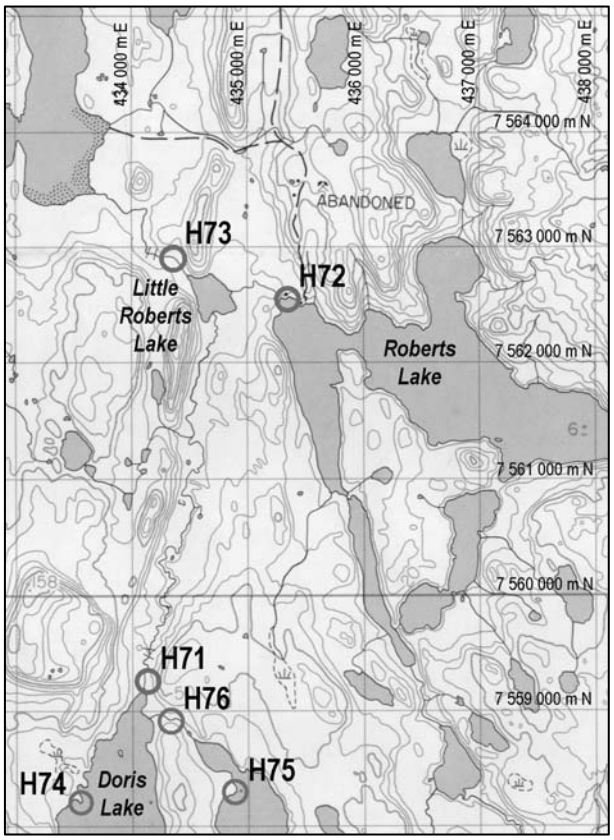
Aerial view of Doris Creek looking north along outlet channel.



Doris Creek looking south from Station H71 to lake outlet.

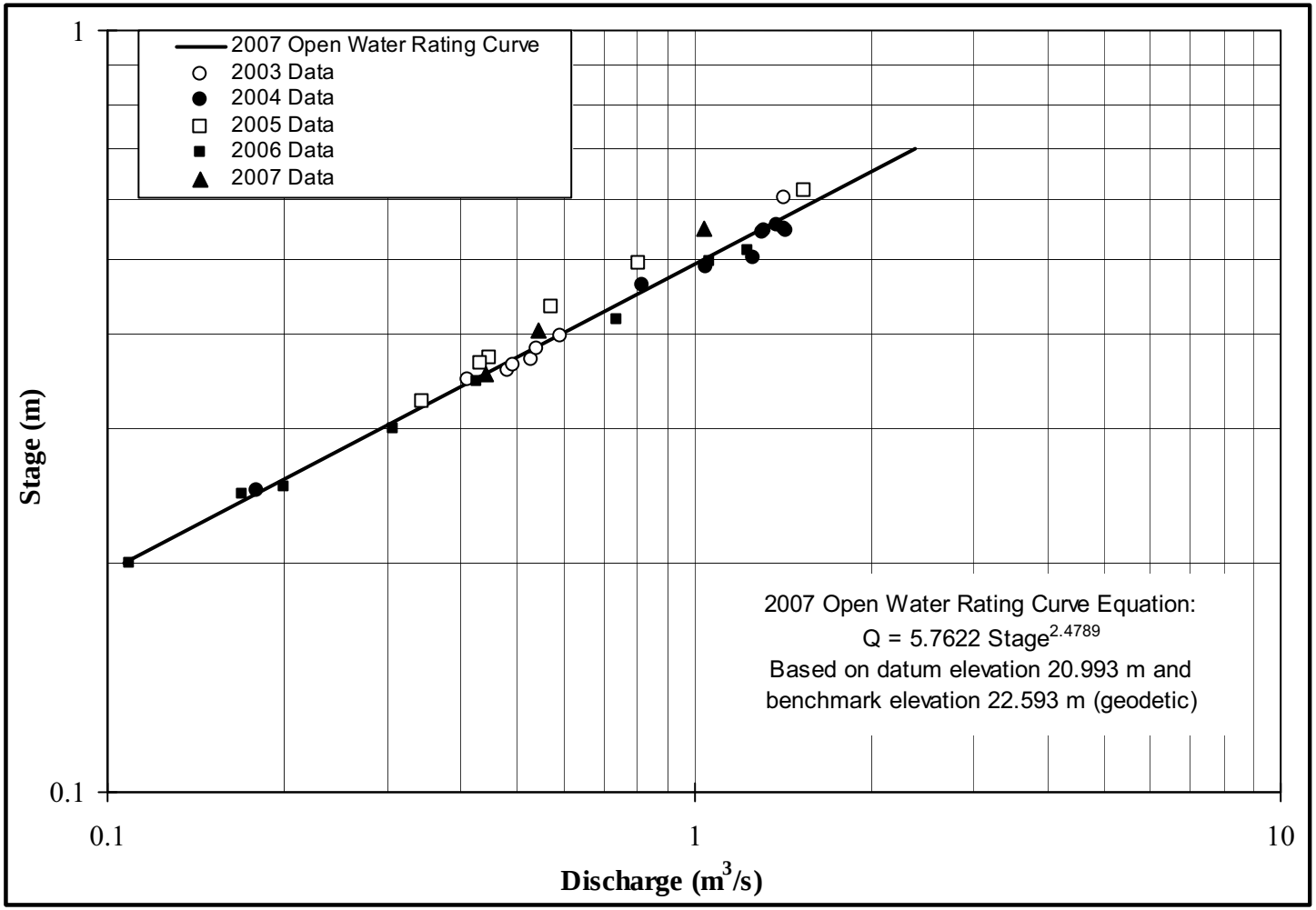

Station H71 from RDB looking northwest.


Station H71 from RDB looking southeast.



NTS Mapping of Area.

FACT-H71-2007.DOC



Doris Outflow Station H71 - Stage-Discharge Rating Curve (2007)

Doris Outflow Station H71 – Stage-Discharge Data (2003-2007)

Stage Datum 20.993 m

Date & Time	Transducer Reading (m)	Transducer Elevation (m)	Average Transducer Elevation (m)	Staff Gauge Reading (m)	Water Surface Elevation (m)	Stage (m)	Measured Discharge (m^3/s)
30/06/2003 16:24	0.6414	20.953		0.615	21.594	0.604	1.423
06/08/2003 19:09	0.3941	20.962		0.377	21.356	0.357	0.480
08/08/2003 17:24	0.3843	20.953		0.358	21.337	0.347	0.411
18/08/2003 16:54	0.4015	20.962		0.384	21.363	0.364	0.493
20/08/2003 15:54	0.4070	-			21.363	0.370	0.526
28/08/2003 15:54	0.4201	20.939		0.380	21.359	0.383	0.538
05/09/2003 9:24	0.4336	20.960		0.415	21.394	0.397	0.592
09/09/2003 8:24	0.4474	20.964	20.956	0.432	21.411	0.410	n/a
08/06/2004 0:00	n/a	-			21.443	-	-
09/06/2004 10:38	0.3768	21.024			21.401	-	-
19/06/2004 15:43	0.5512	20.980			21.531	0.503	1.258
02/07/2004 9:40	0.6034	20.950			21.553	0.555	1.383
03/07/2004 12:00	0.5943	20.960			21.554	0.546	1.430
04/07/2004 13:05	0.5976	20.948			21.546	0.549	1.426
05/07/2004 0:00	0.5959	20.945			21.541	0.547	1.321
06/07/2004 9:25	0.5931	20.971			21.564	0.545	1.304
07/07/2004 15:19	0.5870	20.930			21.517	0.538	-
16/07/2004 12:16	0.5385	20.942			21.480	0.490	1.046
20/07/2004 14:07	0.5125	20.929			21.442	0.464	0.814
11/09/2004 12:55	0.2975	20.925	20.944		21.223	0.249	0.180
27/06/2005 15:45	0.8069	20.795			21.602	0.617	1.543
18/07/2005 13:00	0.6854	20.778			21.463	0.495	0.803
8/5/2005 20:00	0.6231	-			21.426	0.433	0.572
8/21/2005 17:00	0.5613	-			21.364	0.371	0.447
9/1/2005 11:15	0.5555	-			21.358	0.365	0.433
15/09/2005 14:45	0.5157	20.835	20.803		21.351	0.325	0.343
25/06/2006 13:51	0.7509	20.756			21.507	0.514	1.236
27/06/2006 13:30	0.7673		20.756		21.523	0.530	-
	transducer shifted upwards by 0.032 m on 27/06/2006 13:30						
27/06/2006 13:45	0.7231				21.508	0.515	-
30/06/2006 10:06	0.7056	-			21.490	0.497	1.059
07/07/2006 9:30	0.6443	20.766			21.410	0.417	0.736
21/07/2006 16:00	0.5545				21.339	0.346	0.426
28/07/2006 12:00	0.5090				21.294	0.301	0.306
07/08/2006 14:20	0.4603				21.245	0.252	0.200
11/08/2006 8:30	0.4546	-			21.239	0.246	0.170
25/08/2006 17:20	0.4082				21.193	0.200	0.109
01/09/2006 12:00	0.3711				21.156	0.163	0.064
08/09/2006 11:20	0.3576	20.803	20.785		21.161	0.168	0.067
06/28/2007 14:15	0.8069		20.805		*21.612*	0.619	2.350
	transducer shifted upwards by 0.122 m on 30/06/2007 22:00						
07/13/2007 14:27	0.7213	20.822			21.543	0.550	1.040
08/15/2007 14:00	0.5570	20.789			21.346	0.353	0.441
09/14/2007 13:00	0.5925		20.805		*21.398*	0.405	0.543

H71 - DORIS OUTFLOW - 2007

MEAN DAILY DISCHARGE (m^3/s)

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	1.875	0.533	0.802	0.225 E	-	-
2	-	-	-	-	-	-	1.831	0.513	0.781	0.205 E	-	-
3	-	-	-	-	-	-	1.778	0.487	0.764	0.184 E	-	-
4	-	-	-	-	-	-	1.704	0.464	0.743	0.164 E	-	-
5	-	-	-	-	-	-	1.626	0.431	0.734	0.143 E	-	-
6	-	-	-	-	-	-	1.564	0.422	0.723	0.123 E	-	-
7	-	-	-	-	-	-	1.505	0.401	0.704	0.102 E	-	-
8	-	-	-	-	-	-	1.452	0.394	0.691	0.082 E	-	-
9	-	-	-	-	-	-	1.395	0.456	0.666	0.061 E	-	-
10	-	-	-	-	-	-	1.347	0.470	0.645	0.041 E	-	-
11	-	-	-	-	-	-	1.297	0.475	0.644	0.020 E	-	-
12	-	-	-	-	-	-	1.257	0.489	0.623	0.000 E	-	-
13	-	-	-	-	-	-	1.204	0.511	0.594	-	-	-
14	-	-	-	-	-	0.000 E	1.154	0.510	0.580 P	-	-	-
15	-	-	-	-	-	0.025 E	1.113	0.510	0.555 E	-	-	-
16	-	-	-	-	-	0.055 E	1.057	0.518	0.532 E	-	-	-
17	-	-	-	-	-	0.135 E	1.007	0.522	0.512 E	-	-	-
18	-	-	-	-	-	0.227 E	0.969	0.530	0.491 E	-	-	-
19	-	-	-	-	-	0.406 E	0.928	0.612	0.471 E	-	-	-
20	-	-	-	-	-	0.623 E	0.906	0.708	0.450 E	-	-	-
21	-	-	-	-	-	0.832 E	0.886	0.746	0.430 E	-	-	-
22	-	-	-	-	-	0.960 E	0.815	0.767	0.409 E	-	-	-
23	-	-	-	-	-	1.042 P	0.786	0.783	0.389 E	-	-	-
24	-	-	-	-	-	1.122	0.762	0.800	0.368 E	-	-	-
25	-	-	-	-	-	1.283	0.734	0.803	0.348 E	-	-	-
26	-	-	-	-	-	1.397	0.709	0.820	0.327 E	-	-	-
27	-	-	-	-	-	1.486	0.672	0.809	0.307 E	-	-	-
28	-	-	-	-	-	1.653	0.638	0.810	0.287 E	-	-	-
29	-	-	-	-	-	1.926	0.614	0.813	0.266 E	-	-	-
30	-	-	-	-	-	2.002	0.592	0.822	0.246 E	-	-	-
31	-	-	-	-	-	-	0.557	0.823	-	-	-	-
MIN	-	-	-	-	-	0.000	0.557	0.394	0.246	-	-	-
MEAN	-	-	-	-	-	0.892	1.121	0.605	0.536	-	-	-
MAX	-	-	-	-	-	2.002	1.875	0.823	0.802	-	-	-

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 22.593 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	21.629	21.376	21.444	-	-	-
2	-	-	-	-	-	-	21.623	21.370	21.439	-	-	-
3	-	-	-	-	-	-	21.615	21.362	21.435	-	-	-
4	-	-	-	-	-	-	21.605	21.355	21.431	-	-	-
5	-	-	-	-	-	-	21.593	21.344	21.428	-	-	-
6	-	-	-	-	-	-	21.584	21.341	21.426	-	-	-
7	-	-	-	-	-	-	21.575	21.334	21.421	-	-	-
8	-	-	-	-	-	-	21.566	21.332	21.418	-	-	-
9	-	-	-	-	-	-	21.557	21.352	21.412	-	-	-
10	-	-	-	-	-	-	21.549	21.357	21.406	-	-	-
11	-	-	-	-	-	-	21.541	21.358	21.406	-	-	-
12	-	-	-	-	-	-	21.534	21.363	21.401	-	-	-
13	-	-	-	-	-	-	21.525	21.369	21.393	-	-	-
14	-	-	-	-	-	-	21.516	21.369	21.389 P	-	-	-
15	-	-	-	-	-	-	21.508	21.369	-	-	-	-
16	-	-	-	-	-	-	21.498	21.371	-	-	-	-
17	-	-	-	-	-	-	21.488	21.372	-	-	-	-
18	-	-	-	-	-	-	21.480	21.375	-	-	-	-
19	-	-	-	-	-	-	21.472	21.397	-	-	-	-
20	-	-	-	-	-	-	21.467	21.422	-	-	-	-
21	-	-	-	-	-	-	21.463	21.431	-	-	-	-
22	-	-	-	-	-	-	21.447	21.436	-	-	-	-
23	-	-	-	-	-	21.495 P	21.441	21.440	-	-	-	-
24	-	-	-	-	-	21.510	21.435	21.444	-	-	-	-
25	-	-	-	-	-	21.538	21.428	21.445	-	-	-	-
26	-	-	-	-	-	21.557	21.422	21.448	-	-	-	-
27	-	-	-	-	-	21.572	21.413	21.446	-	-	-	-
28	-	-	-	-	-	21.597	21.404	21.446	-	-	-	-
29	-	-	-	-	-	21.635	21.398	21.447	-	-	-	-
30	-	-	-	-	-	21.646	21.392	21.449	-	-	-	-
31	-	-	-	-	-	-	21.383	21.449	-	-	-	-
MIN	-	-	-	-	-	21.495	21.383	21.332	21.389	-	-	-
MEAN	-	-	-	-	-	21.569	21.502	21.393	21.418	-	-	-
MAX	-	-	-	-	-	21.646	21.629	21.449	21.444	-	-	-

E- ESTIMATED P – PARTIAL DAILY

PROJECT NAME: Miramar/Hope Bay Belt/Doris North
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Doris Creek
LOCATION: Outlet of Doris Lake
COORDINATES: 434108 m E, 7559274 m N (NAD 27)

MEASUREMENT DATE: 28 June 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE
COMPUTATIONS BY: TY/DC

MEASUREMENT START TIME: 1415 h
MEASUREMENT END TIME:1545 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.00		0.03			0.00	1.000	0.000
1	2.00		0.12			0.00	2.000	0.000
2	4.00		0.20			0.01	2.000	0.004
3	6.00		0.50			1.19	2.000	1.190
4	8.00		0.56			1.01	2.000	1.131
5	10.00		0.28			0.00	2.000	0.000
6	12.00		0.26			0.00	2.000	0.000
7	14.00		0.26			0.03	2.000	0.016
8	16.00		0.22			0.02	2.000	0.009
15	18.00		0.19			0.00	2.000	0.000
Right Bank	20.00		0.05			0.00	1.000	0.000
								2.350

PROJECT NAME: Miramar/Hope Bay Belt/Doris North
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Doris Creek
LOCATION: Outlet of Doris Lake
COORDINATES: 434108 m E, 7559274 m N (NAD 27)

MEASUREMENT DATE: 13 July 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: NS
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME:1427 h
MEASUREMENT END TIME:1438 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	5.70		0.12			0.12	0.200	0.003
1	5.30		0.14			0.00	0.250	0.000
2	5.20		0.17			0.00	0.100	0.000
3	5.10		0.41			0.13	0.200	0.011
4	4.80		0.44			0.70	0.300	0.092
5	4.50		0.42			0.94	0.300	0.118
6	4.20		0.43			0.64	0.300	0.083
7	3.90		0.38			0.79	0.300	0.090
8	3.60		0.39			0.87	0.300	0.102
9	3.30		0.36			0.85	0.300	0.092
10	3.00		0.34			0.83	0.300	0.085
11	2.70		0.30			0.88	0.300	0.079
12	2.40		0.26			0.88	0.300	0.069
13	2.10		0.35			0.94	0.300	0.099
14	1.80		0.32			0.89	0.300	0.085
15	1.50		0.30			0.54	0.200	0.032
16	1.40		0.32			0.02	0.150	0.001
17	1.20		0.30			0.00	0.250	0.000
18	0.90		0.09			0.00	0.350	0.000
Right Bank	0.50		0.03			0.00	0.200	0.000
								1.040

PROJECT NAME: Miramar/Hope Bay Belt/Doris North
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Doris Creek
LOCATION: Outlet of Doris Lake
COORDINATES: 434108 m E, 7559274 m N (NAD 27)

MEASUREMENT DATE: 15 August 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME:1400 h
MEASUREMENT END TIME:1430 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	5.00		0.19			-0.04	0.100	-0.001
1	4.80		0.18			-0.03	0.200	-0.001
2	4.60		0.20			0.02	0.200	0.001
3	4.40		0.15			0.46	0.200	0.014
4	4.20		0.20			0.74	0.200	0.030
5	4.00		0.20			0.62	0.200	0.025
6	3.80		0.20			0.35	0.200	0.014
7	3.60		0.19			0.55	0.200	0.021
8	3.40		0.16			0.56	0.200	0.018
9	3.20		0.20			0.46	0.200	0.018
10	3.00		0.19			0.65	0.200	0.025
11	2.80		0.22			0.55	0.200	0.024
12	2.60		0.22			0.55	0.200	0.024
13	2.40		0.26			0.75	0.200	0.039
14	2.20		0.29			0.45	0.200	0.026
15	2.00		0.30			0.63	0.200	0.038
16	1.80		0.30			0.34	0.200	0.020
17	1.60		0.28			0.56	0.200	0.031
18	1.40		0.33			0.51	0.200	0.034
19	1.20		0.34			0.36	0.200	0.024
20	1.00		0.33			0.25	0.200	0.017
21	0.80		0.06			-0.03	0.150	0.000
Right Bank	0.70		0.03			0.00	0.050	0.000
								0.441

PROJECT NAME: Miramar/Hope Bay Belt/Doris North
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Doris Creek
LOCATION: Outlet of Doris Lake
COORDINATES: 434108 m E, 7559274 m N (NAD 27)

MEASUREMENT DATE: 14 September 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE
COMPUTATIONS BY: DC

MEASUREMENT START TIME:1300 h
MEASUREMENT END TIME:1330 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.00		0.00			0.00	0.125	0.000
1	0.25		0.24			0.00	0.250	0.000
2	0.50		0.31			0.03	0.250	0.002
3	0.75		0.20			0.34	0.250	0.017
4	1.00		0.18			0.62	0.250	0.028
5	1.25		0.26			0.57	0.250	0.037
6	1.50		0.22			0.60	0.250	0.033
7	1.75		0.24			0.39	0.250	0.023
8	2.00		0.24			0.70	0.250	0.042
9	2.25		0.21			0.64	0.250	0.034
10	2.50		0.22			0.71	0.250	0.039
11	2.75		0.27			0.68	0.250	0.046
12	3.00		0.28			0.61	0.250	0.043
13	3.25		0.24			0.63	0.250	0.038
14	3.50		0.36			0.41	0.250	0.037
15	3.75		0.36			0.68	0.250	0.061
16	4.00		0.37			0.47	0.250	0.043
17	4.25		0.35			0.23	0.250	0.020
18	4.50		0.06			0.00	0.250	0.000
Right Bank	4.75		0.06			0.00	0.125	0.000
								0.543

ROBERTS LAKE AND OUTFLOW HYDROMETRIC STATION

H72

FACTSHEET

LOCATION AND DETAILS

Located on the right downstream bank of Roberts Lake, approximately 20 m upstream of the lake outlet.

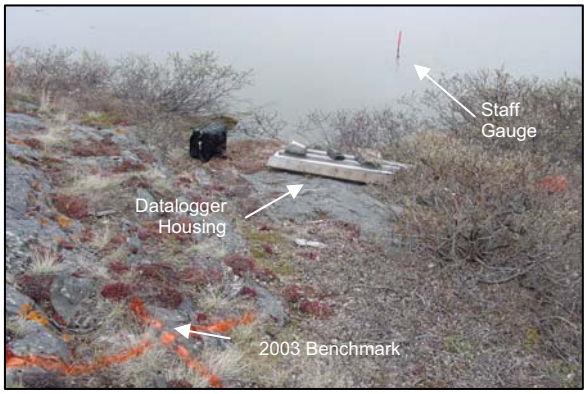
Operational:	2003	2004	2005	2006	2007	2008	2009
	30/6-9/9	9/5-13/9	29/6-17/9	29/6-6/9	5/6-14/9		

Benchmark: Rock bolt in bedrock; 6.958 m (geodetic)
Coordinates: UTM: 435274 m E, 7562790 m N (NAD83)
Datalogger: Optimum Instruments #1383

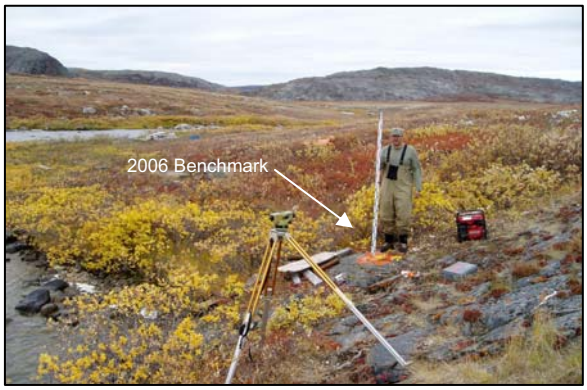
Drainage Area: 97.8 km^2
Lat/Long: 68°10'10" N, 106°33'32" W
Transducer: KPSI #0202697 (5 psi, 15 m)

Aerial view of Roberts Lake Outlet looking northeast.

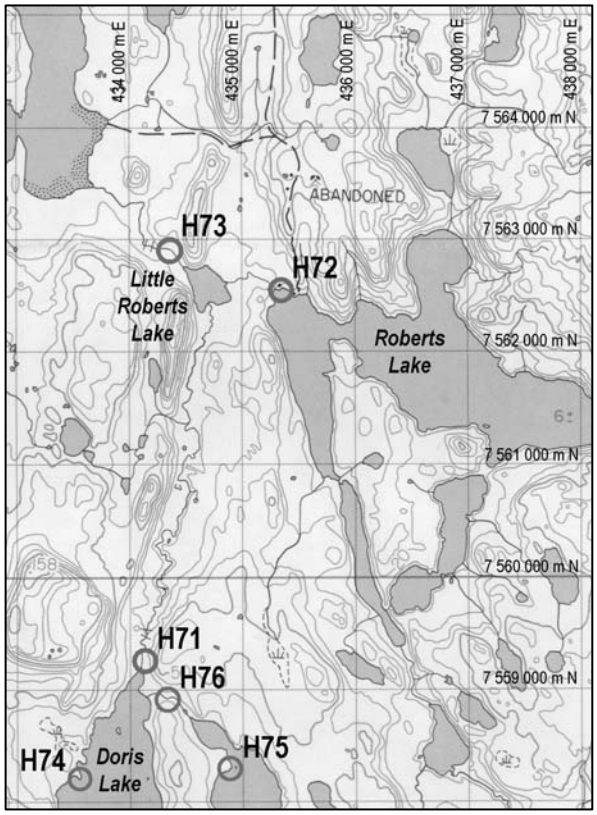

Station H72 from lake looking northwest.



Station H72 from bank looking southeast.

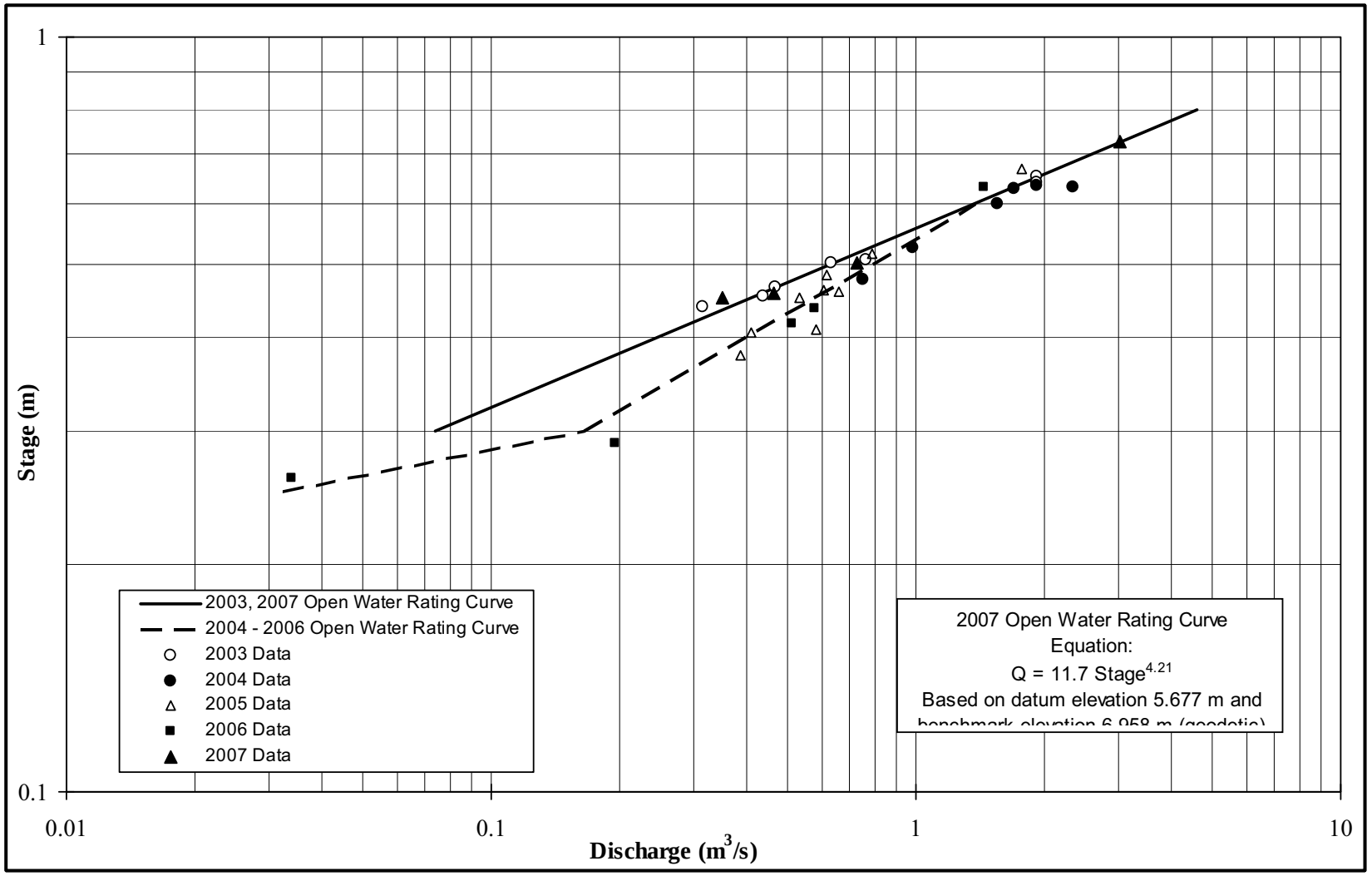


Station H72 from bank looking west at new benchmark.



NTS Mapping of Area.

FACT-H72-2007.DOC



Roberts Lake and Outflow Station H72 - Stage-Discharge Rating Curve (2007)

Roberts Lake and Outflow Station H72 – Stage-Discharge Data (2003-2007)

Stage Datum 5.677 m (geodetic)

Date & Time	Transducer Reading (m)	Transducer Elevation (m)	Average Transducer Elevation (m)	Staff Gauge Reading (m)	Water Surface Elevation (m)	Stage (m)	Measured Discharge (m^3/s)
6/30/2003 11:30	0.6500	5.676		0.596	6.326	0.652	1.932
7/1/2003 13:30	0.6380	5.678		0.586	6.316	0.640	1.929
8/6/2003 15:00	0.4509	5.684		0.405	6.135	0.453	0.436
8/9/2003 13:30	0.4373	5.673		0.380	6.110	0.440	0.314
8/14/2003 13:45	0.4643	5.674		0.408	6.138	0.467	0.467
8/19/2003 11:30	0.5043	5.676		0.450	6.180	0.507	0.764
8/28/2003 13:00	0.4991	5.681		0.450	6.180	0.501	0.630
9/9/2003 9:30	0.4716	5.693	5.679	0.435	6.165	0.474	n/a
5/9/2004 16:00	n/a	n/a			-	-	-
6/5/2004 0:00	n/a	n/a			-	-	-
6/6/2004 0:00	n/a	n/a			-	-	-
6/7/2004 0:00	n/a	n/a			-	-	-
6/8/2004 0:00	n/a	n/a			-	-	-
6/9/2004 13:00	n/a	n/a			6.151	0.474	-
7/3/2004 9:40	0.6884	5.623			6.311	0.634	2.354
7/4/2004 10:05	0.6789	5.635			6.314	0.637	1.925
7/5/2004 12:00	0.6688	5.639			6.308	0.631	1.700
7/7/2004 13:30	0.6495	5.628			6.277	0.600	1.562
7/17/2004 9:21	0.5607	5.642			6.203	0.526	0.983
7/21/2004 10:21	0.5264	5.629			6.155	0.478	0.752
9/13/2004 9:38	0.3544	5.625	5.631		5.979	0.302	0.104
6/29/2005 11:24	0.6970	5.649		0.633	6.346	0.669	1.768
7/21/2005 13:40	0.5484	5.645		0.510	6.193	0.516	0.786
8/5/2005 14:00	0.5231	-		-	6.162	0.485	0.619
8/16/2005 16:45	0.5011	-		-	6.140	0.463	0.609
8/22/2005 11:30	0.4893	-		-	6.128	0.451	0.531
8/31/2004 14:30	0.4982	-		-	6.137	0.460	0.656
9/6/2005 14:50	0.4486	-		-	6.087	0.410	0.580
9/13/2004 14:35	0.4447	-		-	6.083	0.406	0.411
9/17/2004 10:55	0.4337	5.622	5.639	0.389	6.056	0.379	0.388
30/05/2006 10:00	0.8170	-			6.371	-	-
21/06/2006 15:05	-	-			6.311	0.634	1.447
09/07/2006 11:00	0.5592	-			6.114	0.437	0.579
12/07/2006 14:00	0.5401	-			6.094	0.417	0.512
10/08/2006 9:30	0.4356	5.531			5.967	0.290	0.196
08/09/2006 9:15	0.3596	5.577	5.554		5.937	0.260	0.034
06/28/2007 14:30	0.674920	-			-	0.727	3.03
07/13/2007 10:35	0.449895	5.782			6.232	0.555	0.728
08/17/2007 09:52	0.399145	5.728			6.127	0.450	0.351
09/14/2007 14:30	0.406181	5.678	5.729		6.084	0.407	0.462

H72 – ROBERTS LAKE AND OUTFLOW - 2007

MEAN DAILY DISCHARGE (m^3/s)

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	2.527	0.186	0.834	-	-	-
2	-	-	-	-	-	-	2.277	0.178	0.784	-	-	-
3	-	-	-	-	-	-	2.017	0.168	0.740	-	-	-
4	-	-	-	-	-	-	1.771	0.161	0.704	-	-	-
5	-	-	-	-	-	-	1.548	0.154	0.676	-	-	-
6	-	-	-	-	-	-	1.336	0.151	0.644	-	-	-
7	-	-	-	-	-	-	1.178	0.147	0.618	-	-	-
8	-	-	-	-	-	-	1.046	0.144	0.595	-	-	-
9	-	-	-	-	-	-	0.935	0.198	0.566	-	-	-
10	-	-	-	-	-	-	0.832	0.229	0.535	-	-	-
11	-	-	-	-	-	-	0.711	0.243	0.513	-	-	-
12	-	-	-	-	-	-	0.652	0.268	0.493	-	-	-
13	-	-	-	-	-	-	0.627	0.303	0.475	-	-	-
14	-	-	-	-	-	-	0.567	0.333	0.458 P	-	-	-
15	-	-	-	-	-	0.010 P	0.498	0.361	0.501 E	-	-	-
16	-	-	-	-	-	0.082	0.458	0.387	0.482 E	-	-	-
17	-	-	-	-	-	0.132	0.428	0.414	0.464 E	-	-	-
18	-	-	-	-	-	0.253	0.357	0.463	0.445 E	-	-	-
19	-	-	-	-	-	0.490	0.330	0.578	0.427 E	-	-	-
20	-	-	-	-	-	0.858	0.306	0.787	0.408 E	-	-	-
21	-	-	-	-	-	1.134	0.298	0.982	0.390 E	-	-	-
22	-	-	-	-	-	1.398	0.316	1.121	0.371 E	-	-	-
23	-	-	-	-	-	1.618	0.319	1.196	0.353 E	-	-	-
24	-	-	-	-	-	2.013	0.308	1.216	0.334 E	-	-	-
25	-	-	-	-	-	2.536	0.292	1.195	0.315 E	-	-	-
26	-	-	-	-	-	2.867	0.272	1.151	0.297 E	-	-	-
27	-	-	-	-	-	3.022	0.254	1.089	0.278 E	-	-	-
28	-	-	-	-	-	3.060	0.240	1.037	0.260 E	-	-	-
29	-	-	-	-	-	2.976	0.226	0.997	0.241 E	-	-	-
30	-	-	-	-	-	2.787	0.208	0.949	0.223 E	-	-	-
31	-	-	-	-	-	-	0.199	0.891	-	-	-	-
MIN	-	-	-	-	-	0.010	0.199	0.144	0.223	-	-	-
MEAN	-	-	-	-	-	1.577	0.753	0.570	0.481	-	-	-
MAX	-	-	-	-	-	3.060	2.527	1.216	0.834	-	-	-

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 6.958 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	6.372	6.051	6.211	-	-	-
2	-	-	-	-	-	-	6.355	6.047	6.203	-	-	-
3	-	-	-	-	-	-	6.336	6.042	6.196	-	-	-
4	-	-	-	-	-	-	6.316	6.038	6.190	-	-	-
5	-	-	-	-	-	-	6.295	6.034	6.185	-	-	-
6	-	-	-	-	-	-	6.274	6.033	6.179	-	-	-
7	-	-	-	-	-	-	6.257	6.031	6.174	-	-	-
8	-	-	-	-	-	-	6.240	6.029	6.170	-	-	-
9	-	-	-	-	-	-	6.226	6.056	6.164	-	-	-
10	-	-	-	-	-	-	6.211	6.070	6.158	-	-	-
11	-	-	-	-	-	-	6.191	6.075	6.153	-	-	-
12	-	-	-	-	-	-	6.181	6.085	6.148	-	-	-
13	-	-	-	-	-	-	6.176	6.097	6.144	-	-	-
14	-	-	-	-	-	-	6.164	6.106	6.140 P	-	-	-
15	-	-	-	-	-	5.889 P	6.149	6.115	-		-	-
16	-	-	-	-	-	5.958	6.140	6.122	-	-	-	-
17	-	-	-	-	-	6.020	6.133	6.129	-	-	-	-
18	-	-	-	-	-	6.078	6.113	6.141	-	-	-	-
19	-	-	-	-	-	6.146	6.105	6.166	-	-	-	-
20	-	-	-	-	-	6.214	6.098	6.203	-	-	-	-
21	-	-	-	-	-	6.251	6.095	6.232	-	-	-	-
22	-	-	-	-	-	6.281	6.101	6.250	-	-	-	-
23	-	-	-	-	-	6.302	6.102	6.259	-	-	-	-
24	-	-	-	-	-	6.335	6.098	6.261	-	-	-	-
25	-	-	-	-	-	6.372	6.093	6.259	-	-	-	-
26	-	-	-	-	-	6.393	6.086	6.253	-	-	-	-
27	-	-	-	-	-	6.402	6.080	6.246	-	-	-	-
28	-	-	-	-	-	6.404	6.074	6.239	-	-	-	-
29	-	-	-	-	-	6.399	6.069	6.234	-	-	-	-
30	-	-	-	-	-	6.388	6.061	6.228	-	-	-	-
31	-	-	-	-	-	-	6.057	6.219	-	-	-	-
MIN	-	-	-	-	-	5.889	6.057	6.029	6.140	-	-	-
MEAN	-	-	-	-	-	6.240	6.169	6.140	6.173	-	-	-
MAX	-	-	-	-	-	6.404	6.372	6.261	6.211	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE E – ESTIMATED

PROJECT NAME: Miramar Doris North/ Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Roberts Lake Outflow
LOCATION: Ouflow of Roberts Lake
COORDINATES: 435291 m E, 7562793 m N (NAD 27)

MEASUREMENT DATE: 28 June 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: DC

MEASUREMENT START TIME: 1440 h
MEASUREMENT END TIME:1505 h

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Right Bank	0.00		0.02			0.00	0.900	0.000
1	1.80		0.08			0.04	1.800	0.006
2	3.60		0.36			0.19	1.800	0.123
3	5.40		0.49			0.22	1.800	0.194
4	7.20		0.48			0.97	1.800	0.838
5	9.00		0.78			0.56	1.800	0.786
6	10.80		0.68			0.45	1.800	0.551
7	12.60		0.59			0.29	1.800	0.308
8	14.40		0.36			0.26	1.800	0.168
9	16.20		0.28			0.12	1.800	0.060
Left Bank	18.00		0.02			0.00	0.900	0.000

3.03

PROJECT NUMBER: 07-1373-0018.4000

DISCHARGE DATA

STREAM NAME: Roberts Lake Outflow
LOCATION: Ouflow of Roberts Lake
COORDINATES: 435291 m E, 7562793 m N (NAD 27)

MEASUREMENT DATE: 13 July 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: NS
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1035 h
MEASUREMENT END TIME: 1109 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	2.20		0.00			0.00	0.150	0.000
1	2.50		0.10			0.00	0.300	0.000
2	2.80		0.20			0.04	0.350	0.003
3	3.20		0.29			0.23	0.400	0.027
4	3.60		0.44			0.36	0.400	0.063
5	4.00		0.43			0.50	0.350	0.075
6	4.30		0.42			0.49	0.300	0.062
7	4.60		0.32			0.70	0.300	0.067
8	4.90		0.41			0.54	0.300	0.066
9	5.20		0.42			0.49	0.300	0.062
10	5.50		0.44			0.67	0.300	0.088
11	5.80		0.44			0.48	0.300	0.063
12	6.10		0.44			0.56	0.200	0.049
13	6.20		0.30			0.71	0.150	0.032
14	6.40		0.43			0.65	0.250	0.070
15	6.7		0.42			0.69	0.300	0.087
16	7.00		0.38			0.62	0.300	0.071
17	7.30		0.37			0.47	0.300	0.052
18	7.60		0.34			0.58	0.300	0.059
19	7.90		0.38			0.61	0.300	0.070
20	8.20		0.29			0.18	0.300	0.016
21	8.50		0.24			0.16	0.300	0.012
22	8.80		0.17			0.12	0.300	0.006
23	9.10		0.13			0.00	0.550	0.000
Right Bank	9.90		0.00			0.00	0.400	0.000
								0.728

PROJECT NAME: Miramar Doris North/ Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Roberts Lake Outflow
LOCATION: Ouflow of Roberts Lake
COORDINATES: 435291 m E, 7562793 m N (NAD 27)

MEASUREMENT DATE: 17 August 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1022 h
MEASUREMENT END TIME:1136 h

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Right Bank	5.80		0.00			0.00	0.100	0.000
1	6.00		0.08			-0.02	0.200	0.000
2	6.20		0.10			-0.02	0.200	0.000
3	6.40		0.12			-0.02	0.200	0.000
4	6.60		0.12			-0.01	0.200	0.000
5	6.80		0.15			0.00	0.200	0.000
6	7.00		0.26			0.69	0.200	0.036
7	7.20		0.26			0.83	0.200	0.043
8	7.40		0.24			0.79	0.200	0.038
9	7.60		0.22			0.76	0.200	0.033
10	7.80		0.26			0.78	0.200	0.041
11	8.00		0.26			0.72	0.200	0.037
12	8.20		0.25			0.70	0.200	0.035
13	8.40		0.30			0.78	0.200	0.047
14	8.60		0.28			0.75	0.200	0.042
15	8.8		0.28			0.7	0.200	0.039
16	9.00		0.30			0.83	0.200	0.050
17	9.20		0.28			0.68	0.200	0.038
18	9.40		0.25			0.66	0.200	0.033
19	9.60		0.23			0.61	0.200	0.028
20	9.80		0.24			0.61	0.200	0.029
21	10.00		0.22			0.74	0.200	0.033
22	10.20		0.21			0.74	0.200	0.031
23	10.40		0.20			0.76	0.200	0.030
24	10.60		0.20			0.76	0.200	0.030
25	10.80		0.18			0.80	0.200	0.029
26	11.00		0.17			0.75	0.200	0.025
27	11.20		0.16			0.38	0.200	0.012
28	11.40		0.14			0.26	0.200	0.007
29	11.60		0.14			0.03	0.200	0.001
30	11.80		0.16			-0.03	0.200	-0.001
31	12.00		0.08			-0.03	0.200	0.000
Left Bank	12.20		0.04			0.00	0.100	0.000
								0.351

PROJECT NAME: Miramar Doris North/ Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Roberts Lake Outflow
LOCATION: Ouflow of Roberts Lake
COORDINATES: 435291 m E, 7562793 m N (NAD 27)

MEASUREMENT DATE: 14 September 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: DC

MEASUREMENT START TIME: 1430 h
MEASUREMENT END TIME:1450 h

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.00		0.02			0.00	0.300	0.000
1	0.60		0.11			0.00	0.600	0.000
2	1.20		0.17			0.68	0.600	0.069
3	1.80		0.17			0.67	0.600	0.068
4	2.40		0.21			0.52	0.600	0.066
5	3.00		0.25			0.53	0.600	0.080
6	3.60		0.26			0.57	0.600	0.089
7	4.20		0.24			0.63	0.600	0.091
8	4.80		0.18			0.60	0.600	0.065
9	5.40		0.14			0.09	0.600	0.008
Right Bank	6.00		0.04			0.00	0.300	0.000
								0.462

LITTLE ROBERTS LAKE OUTFLOW HYDROMETRIC STATION

H73

FACTSHEET

LOCATION AND PURPOSE

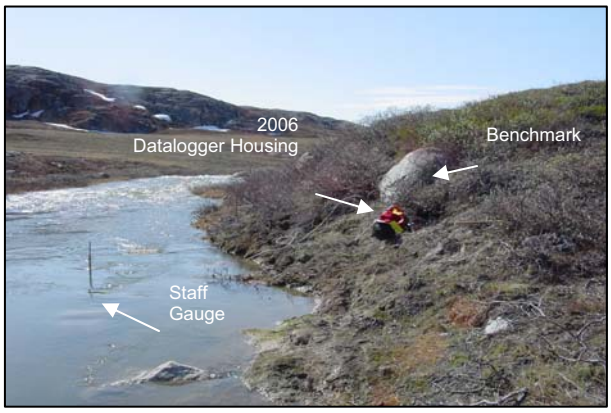
Located on the Little Roberts Lake outflow, approximately 200 m downstream of the lake.

Operational:	2003	2004	2005	2006	2007	2008	2009
	30/6-9/9	6/6-7/9	28/6-17/9	30/5-8/9	12/6-14/9		

Benchmark: Top of embedded boulder; 100.000 m (local)
Coordinates: UTM: 434284 m E, 7562920 m N (NAD83)
Datalogger: Optimum Instruments #0949

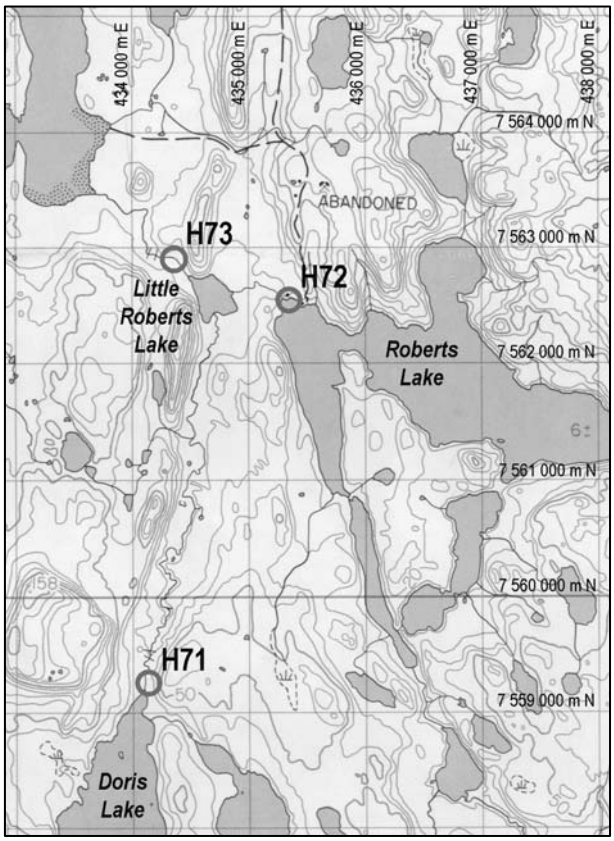
Drainage Area: 198.9 km^2
Lat/Long: 68°10'20" N, 106°34'59" W
Transducer: KPSI #0402788 (5 psi, 15 m)

Panoramic view of H73 from LDB looking west.



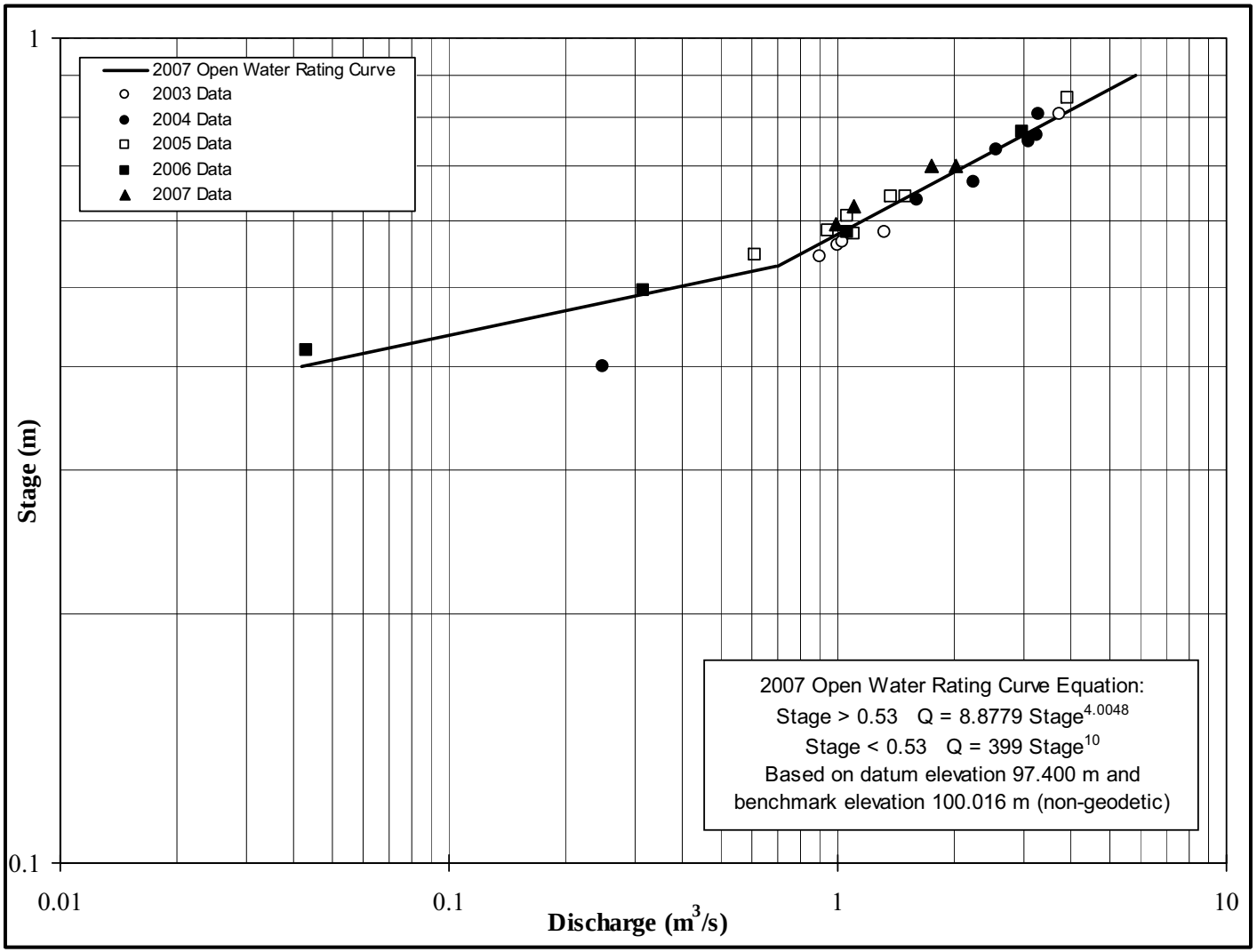
Station H73 from RDB looking downstream.

Station H73 from bank looking east.



NTS Mapping of Area.

FACT-H73-2007.DOC



Little Roberts Outflow Station H73 - Stage-Discharge Rating Curve (2007)

Little Roberts Outflow Station H73 – Stage-Discharge Data (2003-2007)

					Stage Datum	97.400 m	(assumed)
Date & Time	Transducer Reading (m)	Transducer Elevation (m)	Average Transducer Elevation (m)	Staff Gauge Reading (m)	Water Surface Elevation (m)	Stage (m)	Measured Discharge (m^3/s)
6/30/03 14:33	0.6581	97.558		0.585	98.216	0.819	3.906
7/1/03 11:48	0.6464	97.563		0.578	98.209	0.808	3.714
8/5/03 20:33	0.3818	97.559		0.310	97.941	0.543	0.901
8/15/03 20:03	0.3995	97.561		0.330	97.961	0.561	0.999
8/28/03 15:03	0.4053	-		-	97.631	0.567	1.025
9/5/03 11:18	0.4209	97.562		0.352	97.983	0.582	1.323
9/9/03 9:03	0.4263	97.565	97.561	0.359	97.991	0.588	n/a
6/6/2004 12:00	n/a	n/a			97.889	ice effects	0.161
6/7/2004 12:00	n/a	n/a			97.959	ice effects	0.412
6/8/2004 12:00	n/a	n/a			97.837	ice effects	0.274
6/9/2004 13:54	n/a	n/a			97.791	ice effects	0.164
6/23/2004 20:24	0.5262	97.465			97.991	0.591	3.239
7/3/2004 12:00	0.5047	97.532			98.037	0.637	3.276
7/4/2004 11:15	0.4916	97.483			97.975	0.575	3.112
7/5/2004 12:00	0.4751	97.485			97.982	0.582	3.100
7/7/2004 9:01	0.4571	97.439			97.960	0.560	2.562
7/17/2004 14:55	0.3827	97.513			97.896	0.496	2.230
7/21/2004 8:36	0.3411	97.523			97.864	0.464	1.598
9/7/2004 12:20	0.1511	97.476	97.490		97.627	0.227	0.249
6/28/2005 11:31	n/a			0.770	98.246	0.846	3.901
7/17/2005 10:15	0.4104			0.595	98.044	0.644	n/a
7/17/2005 16:45	0.4097	97.633		0.600	98.043	0.643	1.502
8/5/2005 16:45	0.3744			-	98.008	0.608	1.375
8/19/2005 14:45	n/a			0.502	97.978	0.578	1.055
8/31/2005 10:20	n/a			0.509	97.985	0.585	1.104
9/14/2005 15:25	n/a			0.469	97.945	0.545	0.944
9/17/2005 11:49	n/a		97.633	0.464	97.992	0.592	0.614
30/05/2006 16:30	0.3383	97.570			97.908		-
01/06/2006 4:16	0.5046	-	97.501				-
transducer shifted downwards by 0.121 m due to unknown forces between 04:16 and 05:01 on 1 June 2006							
01/06/2006 5:01	0.6260	-					-
13/06/2006 17:46	0.9138	-	97.380				-
transducer shifted upwards by 0.132 m due to unknown forces between 17:46 and 18:31 on 13 June 2006							
13/06/2006 18:31	0.7815	-					-
21/06/2006 13:45	0.6366	97.534			98.171	0.771	2.984
09/07/2006 10:22	0.4700	-			97.982	0.582	1.062
10/08/2006 16:05	0.3890	97.506			97.895	0.495	0.315
08/09/2006 10:16	0.3233	97.495	97.512		97.818	0.418	0.043
06/20/2007 12:30	0.5620	97.539			98.10	0.701	1.74
transducer shifted downwards by0.154 m due to unknown forces between 19:59 and 20:14 on 11 June 2007 on 29 June the data logger washed out, cable ripped out. Stopped recording on 30June, reinstalled on 8 July							
07/08/2007 11:35	0.665	97.564			98.229		
07/13/2007 09:40	0.593	97.508			98.101	0.701	2.011
08/17/2007 13:01	0.524	97.500			98.024	0.624	1.101
09/14/2007 16:00	0.522	97.472	97.511		97.994	0.594	0.988

H73 – LITTLE ROBERTS OUTFLOW - 2007

MEAN DAILY DISCHARGE (m^3/s)

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	7.539	0.950	2.322	-	-	-
2	-	-	-	-	-	-	6.358	0.922	2.217	-	-	-
3	-	-	-	-	-	-	5.517	0.890	2.129	-	-	-
4	-	-	-	-	-	-	4.808	0.860	2.041	-	-	-
5	-	-	-	-	-	-	4.312	0.824	1.990	-	-	-
6	-	-	-	-	-	-	3.952	0.812	1.932	-	-	-
7	-	-	-	-	-	-	3.632	0.786	1.876	-	-	-
8	-	-	-	-	-	-	3.137	0.773	1.822	-	-	-
9	-	-	-	-	-	-	2.931	0.997	1.749	-	-	-
10	-	-	-	-	-	-	2.690	1.101	1.663	-	-	-
11	-	-	-	-	-	-	2.490	1.113	1.630	-	-	-
12	-	-	-	-	-	-	2.324	1.182	1.587	-	-	-
13	-	-	-	-	-	0.729 P	2.155	1.298	1.516	-	-	-
14	-	-	-	-	-	1.098	2.013	1.346	1.455 P	-	-	-
15	-	-	-	-	-	0.917	1.903	1.370	1.422 E	-	-	-
16	-	-	-	-	-	0.745	1.797	1.395	1.369 E	-	-	-
17	-	-	-	-	-	0.446	1.689	1.433	1.316 E	-	-	-
18	-	-	-	-	-	0.324	1.625	1.500	1.264 E	-	-	-
19	-	-	-	-	-	0.278	1.563	2.026	1.211 E	-	-	-
20	-	-	-	-	-	1.715	1.529	2.613	1.158 E	-	-	-
21	-	-	-	-	-	2.756	1.495	2.692	1.106 E	-	-	-
22	-	-	-	-	-	4.019	1.393	2.817	1.053 E	-	-	-
23	-	-	-	-	-	4.691	1.362	2.904	1.000 E	-	-	-
24	-	-	-	-	-	5.761	1.332	2.922	0.948 E	-	-	-
25	-	-	-	-	-	6.990	1.290	2.875	0.895 E	-	-	-
26	-	-	-	-	-	7.659	1.235	2.804	0.842 E	-	-	-
27	-	-	-	-	-	8.301	1.184	2.699	0.790 E	-	-	-
28	-	-	-	-	-	8.687	1.134	2.610	0.737 E	-	-	-
29	-	-	-	-	-	8.720	1.089	2.554	0.684 E	-	-	-
30	-	-	-	-	-	8.528	1.063	2.479	0.632 E	-	-	-
31	-	-	-	-	-	-	1.006	2.425	-	-	-	-
MIN	-	-	-	-	-	0.278	1.006	0.773	0.632	-	-	-
MEAN	-	-	-	-	-	4.020	2.501	1.741	1.412	-	-	-
MAX	-	-	-	-	-	8.720	7.539	2.922	2.322	-	-	-

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 100.482 m (ASSUMED)

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	98.360	97.972	98.115	-	-	-
2	-	-	-	-	-	-	98.320	97.968	98.107	-	-	-
3	-	-	-	-	-	-	98.288	97.963	98.100	-	-	-
4	-	-	-	-	-	-	98.258	97.958	98.093	-	-	-
5	-	-	-	-	-	-	98.235	97.952	98.088	-	-	-
6	-	-	-	-	-	-	98.217	97.950	98.083	-	-	-
7	-	-	-	-	-	-	98.200	97.946	98.078	-	-	-
8	-	-	-	-	-	-	98.171	97.944	98.073	-	-	-
9	-	-	-	-	-	-	98.158	97.979	98.066	-	-	-
10	-	-	-	-	-	-	98.142	97.994	98.058	-	-	-
11	-	-	-	-	-	-	98.128	97.995	98.055	-	-	-
12	-	-	-	-	-	-	98.116	98.004	98.051	-	-	-
13	-	-	-	-	-	97.843 P	98.102	98.019	98.043	-	-	-
14	-	-	-	-	-	97.992	98.090	98.024	98.037 P	-	-	-
15	-	-	-	-	-	97.967	98.081	98.027	-	-	-	-
16	-	-	-	-	-	97.939	98.071	98.030	-	-	-	-
17	-	-	-	-	-	97.906	98.061	98.034	-	-	-	-
18	-	-	-	-	-	97.891	98.054	98.041	-	-	-	-
19	-	-	-	-	-	97.883	98.048	98.090	-	-	-	-
20	-	-	-	-	-	98.058	98.045	98.137	-	-	-	-
21	-	-	-	-	-	98.145	98.041	98.142	-	-	-	-
22	-	-	-	-	-	98.220	98.030	98.151	-	-	-	-
23	-	-	-	-	-	98.253	98.026	98.157	-	-	-	-
24	-	-	-	-	-	98.297	98.023	98.158	-	-	-	-
25	-	-	-	-	-	98.342	98.018	98.155	-	-	-	-
26	-	-	-	-	-	98.364	98.011	98.150	-	-	-	-
27	-	-	-	-	-	98.383	98.005	98.143	-	-	-	-
28	-	-	-	-	-	98.395	97.998	98.137	-	-	-	-
29	-	-	-	-	-	98.395	97.992	98.133	-	-	-	-
30	-	-	-	-	-	98.390	97.989	98.127	-	-	-	-
31	-	-	-	-	-	-	97.981	98.123	-	-	-	-
MIN	-	-	-	-	-	97.843	97.981	97.944	98.037	**0.053**	-	-
MEAN	-	-	-	-	-	98.148	98.105	98.052	98.075	0.317	-	-
MAX	-	-	-	-	-	98.395	98.360	98.158	98.115	**0.581**	-	-

NOTES: P - PARTIAL DAILY AVERAGE E - ESTIMATED

PROJECT NAME: Miramar/Doris North/Little Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Little Roberts Lake Outflow
LOCATION: Outflow of Little Roberts Lake
COORDINATES: 434320 m E, 7562920 m N (NAD 27)

MEASUREMENT DATE: 20 June 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE/
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1230 h
MEASUREMENT END TIME: 1250 h

STATION	DISTANCE FROM Right D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Right Bank	0.00		0.06			0.00	1.00	0.000
1	2.00		0.63			0.40	2.00	0.504
2	4.00		0.78			0.42	2.00	0.655
3	6.00		0.56			0.30	2.00	0.336
4	8.00		0.42			0.23	2.00	0.193
5	10.00		0.20			0.12	2.00	0.048
6	12.00		0.10			0.02	2.00	0.004
7	14.00		0.00			0.00	2.00	0.000
8	16.00		0.04			0.00	2.00	0.000
Right Bank	18.00		0.01			0.00	1.00	0.000
								1.74

PROJECT NAME: Miramar/Doris North/Little Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Little Roberts Lake Outflow
LOCATION: Outflow of Little Roberts Lake
COORDINATES: 434320 m E, 7562920 m N (NAD 27)

MEASUREMENT DATE: 13 July 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 0915 h
MEASUREMENT END TIME: 0933 h

STATION	DISTANCE FROM LEFT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	16.95		0.00			0.00	0.13	0.000
1	16.70		0.14			0.01	0.23	0.000
2	16.50		0.16			0.05	0.20	0.002
3	16.30		0.46			0.34	0.35	0.055
4	15.80		0.43			0.46	0.40	0.079
5	15.50		0.37			0.54	0.25	0.050
6	15.30		0.45			0.50	0.35	0.079
7	14.80		0.41			0.53	0.60	0.130
8	14.10		0.30			0.51	0.45	0.069
9	13.90		0.42			0.41	0.35	0.060
10	13.40		0.45			0.30	0.60	0.081
11	12.70		0.36			0.51	0.50	0.092
12	12.40		0.47			0.40	0.35	0.066
13	12.00		0.50			0.15	0.35	0.026
14	11.70		0.50			0.28	0.30	0.042
15	11.40		0.51			0.21	0.25	0.027
16	11.20		0.33			0.32	0.25	0.026
17	10.90		0.51			0.25	0.40	0.051
18	10.40		0.36			0.32	0.40	0.046
19	10.10		0.47			0.38	0.25	0.045
20	9.90		0.31			0.46	0.30	0.043
21	9.50		0.33			0.47	0.30	0.047
22	9.30		0.53			0.33	0.40	0.070
23	8.70		0.50			0.41	0.55	0.113
24	8.20		0.46			0.51	0.50	0.117
25	7.70		0.50			0.49	0.50	0.123
26	7.20		0.53			0.49	0.40	0.104
27	6.90		0.53			0.38	0.20	0.040
28	6.80		0.32			0.55	0.30	0.053
29	6.30		0.34			0.60	0.35	0.071
30	6.10		0.49			0.24	0.35	0.041
31	5.60		0.45			0.48	0.50	0.108
32	5.10		0.21			0.36	0.50	0.038
33	4.60		0.11			0.29	0.50	0.016
34	4.10		0.13			0.02	0.65	0.002
Right Bank	3.30		0.00			0.00	0.40	0.000
								2.011

PROJECT NAME: Miramar/Doris North/Little Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Little Roberts Lake Outflow
LOCATION: Outflow of Little Roberts Lake
COORDINATES: 434320 m E, 7562920 m N (NAD 27)

MEASUREMENT DATE: 17 August 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1305 h
MEASUREMENT END TIME: 1357 h

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Right Bank	1.80		0.10			0.00	0.15	0.000
1	2.10		0.18			0.03	0.40	0.002
2	2.60		0.54			0.02	0.50	0.005
3	3.10		0.60			0.12	0.50	0.036
4	3.60		0.58			0.38	0.50	0.110
5	4.10		0.56			0.40	0.50	0.112
6	4.60		0.38			0.52	0.50	0.099
7	5.10		0.62			0.28	0.50	0.087
8	5.60		0.54			0.42	0.50	0.113
9	6.10		0.52			0.38	0.50	0.099
10	6.60		0.10			0.35	0.50	0.018
11	7.10		0.37			0.30	0.50	0.056
12	7.60		0.22			0.25	0.50	0.028
13	8.10		0.50			0.27	0.50	0.068
14	8.60		0.44			0.35	0.50	0.077
15	9.10		0.45			0.32	0.50	0.072
16	9.60		0.30			0.36	0.50	0.054
17	10.10		0.30			0.36	0.50	0.054
Left Bank	10.60		0.50			0.10	0.25	0.013
								1.101

PROJECT NAME: Miramar/Doris North/Little Roberts Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Little Roberts Lake Outflow
LOCATION: Outflow of Little Roberts Lake
COORDINATES: 434320 m E, 7562920 m N (NAD 27)

MEASUREMENT DATE: 14 September 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: DC

MEASUREMENT START TIME: 1540 h
MEASUREMENT END TIME: 1600 h

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.00		0.01			0.00	0.25	0.000
1	0.50		0.06			0.00	0.50	0.000
2	1.00		0.14			0.00	0.50	0.000
3	1.50		0.20			0.16	0.50	0.016
4	2.00		0.26			0.17	0.50	0.022
5	2.50		0.38			0.19	0.50	0.036
6	3.00		0.44			0.20	0.50	0.044
7	3.50		0.47			0.18	0.50	0.042
8	4.00		0.47			0.18	0.50	0.042
9	4.50		0.53			0.21	0.50	0.056
10	5.00		0.58			0.18	0.50	0.052
11	5.50		0.62			0.19	0.50	0.059
12	6.00		0.70			0.25	0.50	0.088
13	6.50		0.66			0.34	0.50	0.112
14	7.00		0.65			0.30	0.50	0.098
15	7.50		0.60			0.30	0.50	0.090
16	8.00		0.59			0.30	0.50	0.089
17	8.50		0.53			0.30	0.50	0.080
18	9.00		0.42			0.17	0.50	0.036
19	9.50		0.35			0.16	0.50	0.028
20	10.00		0.23			0.00	0.50	0.000
Right Bank	10.50		0.01			0.00	0.25	0.000
								0.988

DORIS LAKE HYDROMETRIC STATION

H74

FACTSHEET

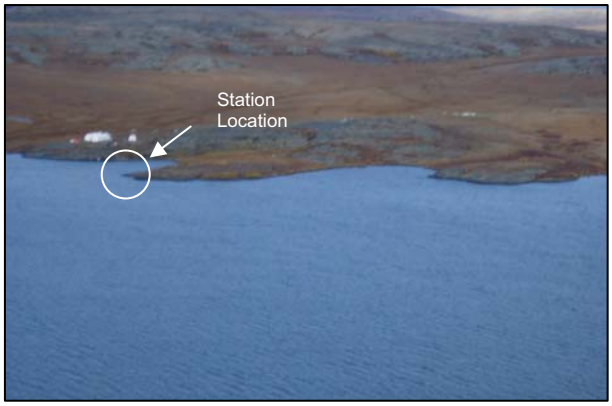
LOCATION AND DETAILS

Located on bedrock outcrop on west shore of Doris Lake.

Operational:	2003	2004	2005	2006	2007	2008	2009
	n/a	7/5-10/9	22/7-31/12	1/1-31/12	1/1-31/12		

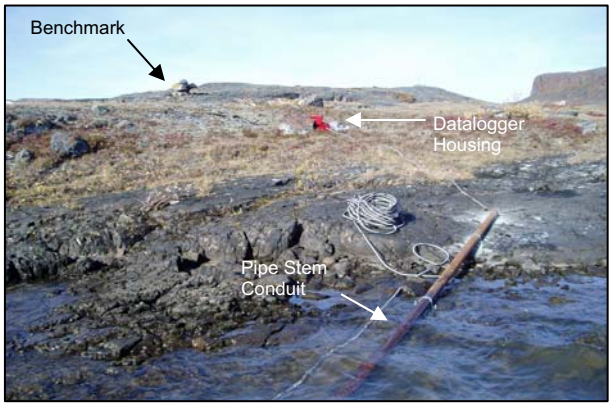
Benchmark: Rock bolt ; 23.546 m (geodetic)
Coordinates: UTM: 433513 m E, 7558450 m N (NAD83)
Datalogger: Optimum Instruments #0939
Thermistor: 5 kΩ

Drainage Area: 93.1 km^2
Lat/Long: 68°07'56" N, 106°34'34" W
Transducer: KPSI #0405797 (10 psi, 60 m)



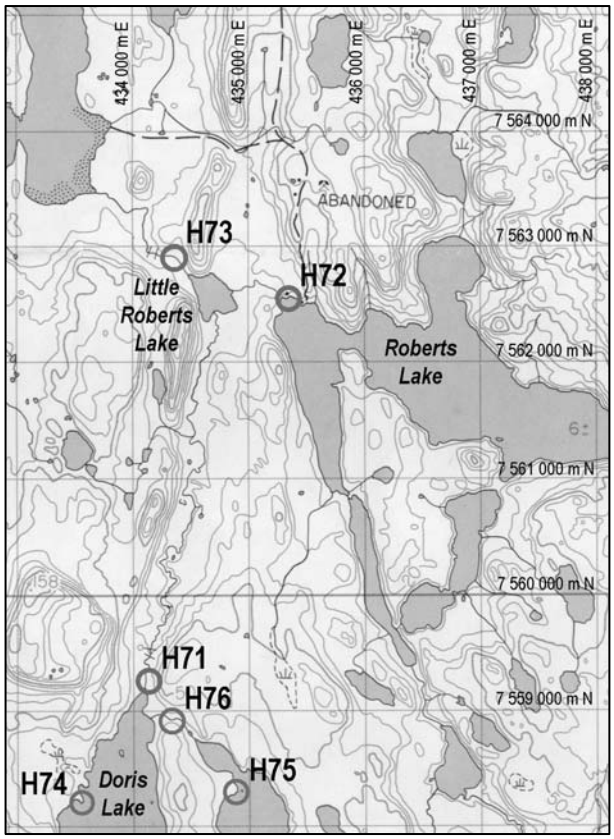
Aerial view of Doris Lake Station H74 looking west.

Station H74 looking southwest.



Station H74 from lake looking northwest.

Station H74 benchmark.



NTS Mapping of Area.

FACT-H74-2007.DOC

Doris Lake Station H74 – Survey Data (2004-2007)

Date & Time	Transducer Reading (m)	Transducer Elevation (m)	Average Transducer Elevation (m)	Staff Gauge Reading (m)	**Stage Datum** Water Surface Elevation (m)	geodetic Stage (m)
5/7/2004 17:00	-0.0191					
6/5/2004 0:00	-					
6/6/2004 0:00	0.7910	20.642			21.433 *	21.433 *
6/7/2004 0:00	0.7893	20.689			21.478 *	21.478 *
6/8/2004 0:00	0.7989					
6/9/2004 13:21	0.8386	20.654	20.662		21.493 *	21.493 *
6/13/2004 10:47	Transducer Shift					
6/15/2004 0:00	Transducer Shift					
6/23/2004 13:01	1.2285	20.557			21.786	21.786
7/18/2004 12:03	1.1131	20.539			21.652	21.652
7/20/2004 13:31	1.0971	20.545			21.642	21.642
9/10/2004 10:18	0.8482	20.546	20.547		21.394	21.394
6/27/2005 12:06	5.9320	15.869			21.801	21.808
6/28/2005 15:40	5.9253				-	21.801
7/22/2005 19:40	5.7633	15.883			21.646	21.639
9/15/2005 12:15	n/a				21.485	n/a
9/16/2005 10:00	5.6053				-	21.481
9/17/2005 12:10	5.5909		15.876		-	21.467
31/05/2006 8:50	5.8330	15.885			21.718	21.718
25/06/2006 14:39	5.8644	15.917			21.781	21.781
11/08/2006 12:30	5.5599	15.889			21.449	21.449
09/09/2006 10:19	5.4599	-	15.888		21.348	21.348
28/Jun/2007 15:20	5.9975	15.518			21.516	21.516
15/Aug/2007 15:20	5.6726	15.879			21.552	21.552
16/Sep/2007 12:00	5.6891	15.927	15.775		21.616	21.616

* Elevations likely local; water surface elevation near shore not equal to that in the lake

H74 – DORIS LAKE - 2006

MEAN DAILY WATER LEVELS (m) BASED ON BENCHMARK EL. 23.546 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	-	-	-	21.340	21.346	21.359
2	-	-	-	-	-	-	-	-	-	21.342	21.347	21.359
3	-	-	-	-	-	-	-	-	-	21.342	21.348	21.359
4	-	-	-	-	-	-	-	-	-	21.340	21.348	21.354
5	-	-	-	-	-	-	-	-	-	21.335	21.349	21.357
6	-	-	-	-	-	-	-	-	-	21.337	21.349	21.358
7	-	-	-	-	-	-	-	-	-	21.337	21.351	21.357
8	-	-	-	-	-	-	-	-	-	21.339	21.350	21.357
9	-	-	-	-	-	-	-	-	21.351 P	21.337	21.350	21.357
10	-	-	-	-	-	-	-	-	21.351	21.334	21.350	21.357
11	-	-	-	-	-	-	-	-	21.350	21.335	21.351	21.359
12	-	-	-	-	-	-	-	-	21.350	21.333	21.350	21.354
13	-	-	-	-	-	-	-	-	21.353	21.334	21.350	21.352
14	-	-	-	-	-	-	-	-	21.351	21.340	21.351	21.353
15	-	-	-	-	-	-	-	-	21.351	21.340	21.351	21.354
16	-	-	-	-	-	-	-	-	21.351	21.340	21.351	21.357
17	-	-	-	-	-	-	-	-	21.355	21.340	21.352	21.361
18	-	-	-	-	-	-	-	-	21.355	21.341	21.352	21.360
19	-	-	-	-	-	-	-	-	21.355	21.340	21.353	21.354
20	-	-	-	-	-	-	-	-	21.355	21.340	21.353	21.354
21	-	-	-	-	-	-	-	-	21.355	21.340	21.353	21.352
22	-	-	-	-	-	-	-	-	21.355	21.339	21.354	21.352
23	-	-	-	-	-	-	-	-	21.351	21.338	21.355	21.353
24	-	-	-	-	-	-	-	-	21.345	21.338	21.354	21.353
25	-	-	-	-	-	-	-	-	21.344	21.338	21.355	21.353
26	-	-	-	-	-	-	-	-	21.347	21.335	21.356	21.352
27	-	-	-	-	-	-	-	-	21.346	21.333	21.358	21.352
28	-	-	-	-	-	-	-	-	21.346	21.334	21.359	21.353
29	-	-	-	-	-	-	-	-	21.344	21.340	21.359	21.355
30	-	-	-	-	-	-	-	-	21.341	21.345	21.359	21.357
31	-	-	-	-	-	-	-	-	-	21.345	0.000	21.360
MIN	-	-	-	-	-	-	-	-	21.341	21.333	21.346	21.352
MEAN	-	-	-	-	-	-	-	-	21.350	21.338	21.352	21.356
MAX	-	-	-	-	-	-	-	-	21.355	21.345	21.359	21.361

MEAN DAILY WATER TEMPERATURE (°C) AT TRANSDUCER

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	-	-	-	4.92	1.27	1.25
2	-	-	-	-	-	-	-	-	-	4.70	1.26	1.25
3	-	-	-	-	-	-	-	-	-	4.54	1.25	1.26
4	-	-	-	-	-	-	-	-	-	4.58	1.24	1.22
5	-	-	-	-	-	-	-	-	-	4.05	1.23	1.25
6	-	-	-	-	-	-	-	-	-	3.80	1.23	1.24
7	-	-	-	-	-	-	-	-	-	3.37	1.24	1.24
8	-	-	-	-	-	-	-	-	-	2.99	1.23	1.22
9	-	-	-	-	-	-	-	-	9.45	2.37	1.23	1.22
10	-	-	-	-	-	-	-	-	9.42	1.46	1.22	1.25
11	-	-	-	-	-	-	-	-	9.38	1.32	1.22	1.24
12	-	-	-	-	-	-	-	-	9.23	1.09	1.23	1.22
13	-	-	-	-	-	-	-	-	8.77	1.14	1.23	1.24
14	-	-	-	-	-	-	-	-	8.36	1.22	1.23	1.25
15	-	-	-	-	-	-	-	-	8.06	1.26	1.23	1.26
16	-	-	-	-	-	-	-	-	7.77	1.28	1.24	1.26
17	-	-	-	-	-	-	-	-	7.63	1.23	1.23	1.28
18	-	-	-	-	-	-	-	-	7.56	1.21	1.23	1.29
19	-	-	-	-	-	-	-	-	7.48	1.17	1.23	1.30
20	-	-	-	-	-	-	-	-	7.44	1.17	1.23	1.30
21	-	-	-	-	-	-	-	-	7.22	1.22	1.24	1.29
22	-	-	-	-	-	-	-	-	6.85	1.24	1.24	1.27
23	-	-	-	-	-	-	-	-	6.65	1.23	1.24	1.26
24	-	-	-	-	-	-	-	-	6.62	1.24	1.23	1.28
25	-	-	-	-	-	-	-	-	6.48	1.24	1.24	1.27
26	-	-	-	-	-	-	-	-	6.18	1.25	1.25	1.28
27	-	-	-	-	-	-	-	-	6.00	1.25	1.25	1.29
28	-	-	-	-	-	-	-	-	5.71	1.26	1.25	1.30
29	-	-	-	-	-	-	-	-	5.08	1.26	1.26	1.30
30	-	-	-	-	-	-	-	-	4.93	1.26	-	1.29
31	-	-	-	-	-	-	-	-	-	-	-	-
MIN	-	-	-	-	-	-	-	-	4.93	1.09	1.22	1.22
MEAN	-	-	-	-	-	-	-	-	7.38	2.05	1.24	1.26
MAX	-	-	-	-	-	-	-	-	9.45	4.92	1.27	1.30

NOTES: D – DERIVED BASED ON DOWNSTREAM DISCHARGES E - ESTIMATED P – PARTIAL DAILY AVERAGE

H74 – DORIS LAKE - 2007

MEAN DAILY WATER LEVELS (m) BASED ON BENCHMARK EL. 23.546 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	21.359	21.378	21.384	21.385	21.409	21.416	2.893	21.565	21.646	-	-	-
2	21.360	21.378	21.386	21.385	21.410	21.416	2.905	21.556	21.642	-	-	-
3	21.362	21.379	21.387	21.385	21.411	21.420	2.931	21.547	21.638	-	-	-
4	21.362	21.381	21.387	21.385	21.417	21.421	2.938	21.540	21.633	-	-	-
5	21.364	21.381	21.385	21.385	21.419	21.420	3.023	21.532	21.630	-	-	-
6	21.366	21.382	21.384	21.385	21.416	21.416	3.026	21.527	21.626	-	-	-
7	21.366	21.382	21.384	21.384	21.420	21.414	3.045	21.521	21.623	-	-	-
8	21.366	21.381	21.386	21.387	21.420	21.415	3.097	21.520	21.620	-	-	-
9	21.369	21.381	21.387	21.390	21.420	21.415	3.096	21.542	21.614	-	-	-
10	21.375	21.382	21.386	21.389	21.420	21.416	3.155	21.546	21.607	-	-	-
11	21.374	21.382	21.386	21.389	21.422	21.416	3.321	21.547	21.603	-	-	-
12	21.374	21.385	21.386	21.388	21.421	21.422	3.393	21.552	21.598	-	-	-
13	21.374	21.383	21.386	21.389	21.420	21.438	3.859	21.558	21.593	-	-	-
14	21.372	21.382	21.386	21.390	21.424	21.456	4.561	21.560	21.587	-	-	-
15	21.374	21.381	21.385	21.390	21.425	21.479	4.575	21.561	21.582	-	-	-
16	21.375	21.381	21.384	21.390	21.423	21.504	5.235	21.562	P 21.579	-	-	-
17	21.377	21.381	21.385	21.390	21.425	21.526	4.784	21.563	-	-	-	-
18	21.376	21.380	21.385	21.392	21.426	21.551	6.248	21.567	-	-	-	-
19	21.376	21.379	21.385	21.395	21.424	21.600	5.954	21.592	-	-	-	-
20	21.377	21.377	21.385	21.394	21.422	21.658	8.758	21.619	-	-	-	-
21	21.379	21.379	21.382	21.394	21.421	21.715	9.309	21.630	-	-	-	-
22	21.378	21.382	21.379	21.394	21.424	21.750	6.865	21.637	-	-	-	-
23	21.375	21.382	21.379	21.395	21.424	21.780	8.562	21.642	-	-	-	-
24	21.376	21.381	21.378	21.393	21.422	21.811	8.081	21.647	-	-	-	-
25	21.378	21.382	21.378	21.394	21.419	21.841	8.720	21.649	-	-	-	-
26	21.379	21.382	21.378	21.407	21.418	21.859	8.605	21.650	-	-	-	-
27	21.379	21.382	21.378	21.408	21.419	21.874	9.050	21.649	-	-	-	-
28	21.379	21.383	21.379	21.409	21.418	21.885	9.344	21.649	-	-	-	-
29	21.380	-	21.378	21.409	21.418	21.889	9.503	21.650	-	-	-	-
30	21.380	-	21.378	21.409	21.417	21.888	10.355	21.649	-	-	-	-
31	21.379	-	21.383	-	21.416	-	10.240	21.648	-	-	-	-
MIN	21.359	21.377	21.378	21.384	21.409	21.414	2.893	21.520	21.579	-	-	-
MEAN	21.373	21.381	21.383	21.393	21.420	21.584	5.788	21.586	21.614	-	-	-
MAX	21.380	21.385	21.387	21.409	21.426	21.889	10.355	21.650	21.646	-	-	-

MEAN DAILY WATER TEMPERATURE (°C) AT TRANSDUCER

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	1.28	1.32	1.37	1.40	1.48	1.54	2.89	9.99	8.29	-	-	-
2	1.27	1.33	1.35	1.40	1.49	1.54	2.90	10.12	8.13	-	-	-
3	1.27	1.34	1.37	1.41	1.49	1.54	2.93	10.25	7.90	-	-	-
4	1.26	1.35	1.38	1.41	1.49	1.54	2.94	10.57	7.79	-	-	-
5	1.27	1.33	1.37	1.41	1.49	1.55	3.02	10.61	7.64	-	-	-
6	1.29	1.34	1.38	1.42	1.49	1.56	3.03	10.57	7.55	-	-	-
7	1.29	1.35	1.38	1.43	1.49	1.56	3.04	10.54	7.51	-	-	-
8	1.31	1.36	1.38	1.44	1.50	1.56	3.10	10.40	7.18	-	-	-
9	1.32	1.35	1.38	1.44	1.50	1.57	3.10	10.21	6.90	-	-	-
10	1.32	1.36	1.37	1.45	1.50	1.57	3.16	10.03	6.62	-	-	-
11	1.34	1.35	1.35	1.46	1.51	1.59	3.32	10.04	6.15	-	-	-
12	1.34	1.35	1.35	1.46	1.51	1.65	3.39	9.92	6.05	-	-	-
13	1.33	1.34	1.35	1.46	1.51	1.67	3.86	9.98	5.85	-	-	-
14	1.32	1.36	1.37	1.47	1.51	1.71	4.56	9.96	5.54	-	-	-
15	1.34	1.35	1.37	1.47	1.52	1.78	4.57	9.83	5.11	-	-	-
16	1.34	1.35	1.35	1.47	1.52	1.84	5.23	9.81	4.92	-	-	-
17	1.33	1.36	1.33	1.45	1.52	1.88	4.78	9.83	-	-	-	-
18	1.34	1.35	1.35	1.46	1.52	1.91	6.25	10.01	-	-	-	-
19	1.33	1.36	1.35	1.46	1.52	1.97	5.95	9.77	-	-	-	-
20	1.32	1.37	1.36	1.47	1.52	1.99	8.76	9.69	-	-	-	-
21	1.32	1.37	1.36	1.47	1.52	2.01	9.31	9.64	-	-	-	-
22	1.31	1.36	1.35	1.47	1.52	2.09	6.87	9.53	-	-	-	-
23	1.30	1.35	1.35	1.47	1.51	2.14	8.56	9.45	-	-	-	-
24	1.30	1.35	1.36	1.47	1.52	2.26	8.08	9.23	-	-	-	-
25	1.31	1.34	1.37	1.47	1.52	2.31	8.72	9.03	-	-	-	-
26	1.31	1.35	1.38	1.47	1.53	2.36	8.61	8.91	-	-	-	-
27	1.29	1.36	1.37	1.47	1.53	2.46	9.05	8.77	-	-	-	-
28	1.29	1.38	1.38	1.47	1.53	2.61	9.34	8.57	-	-	-	-
29	1.30	-	1.38	1.48	1.53	2.77	9.50	8.43	-	-	-	-
30	1.30	-	1.39	1.48	1.54	2.85	10.35	8.26	-	-	-	-
31	1.31	-	1.40	-	1.54	-	10.24	8.30	-	-	-	-
MIN	1.26	1.32	1.33	1.40	1.48	1.54	2.89	8.26	4.92	-	-	-
MEAN	1.31	1.35	1.37	1.45	1.51	1.91	5.79	9.69	6.82	-	-	-
MAX	1.34	1.38	1.40	1.48	1.54	2.85	10.35	10.61	8.29	-	-	-

NOTES: D – DERIVED BASED ON DOWNSTREAM DISCHARGES E - ESTIMATED P – PARTIAL DAILY AVERAGE

TAIL LAKE
HYDROMETRIC STATION

H75

FACTSHEET

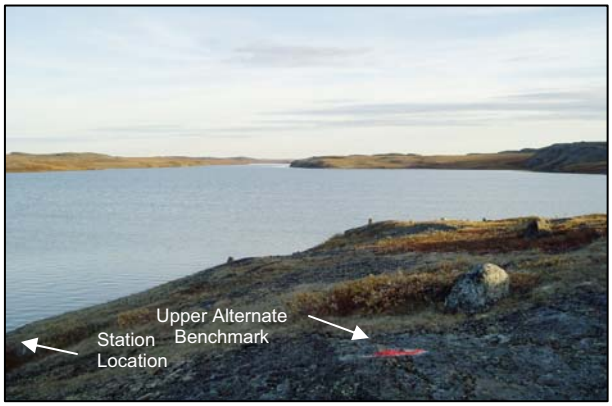
LOCATION AND PURPOSE

Located on bedrock outcrop on northwest shore of Tail Lake.

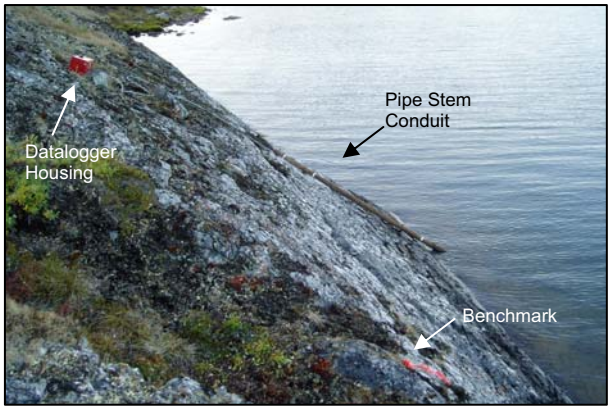
Operational:	2003	2004	2005	2006	2007	2008	2009
	n/a	8/5-31/12	1/1-31/12	1/1-31/12	1/1-31/12		

Benchmark: Rock bolt ; 29.339 m (geodetic)
Coordinates: UTM: 434860 m E, 7558526 m N (NAD83)
Datalogger: Optimum Instruments #1398
Thermistor: 5 kΩ

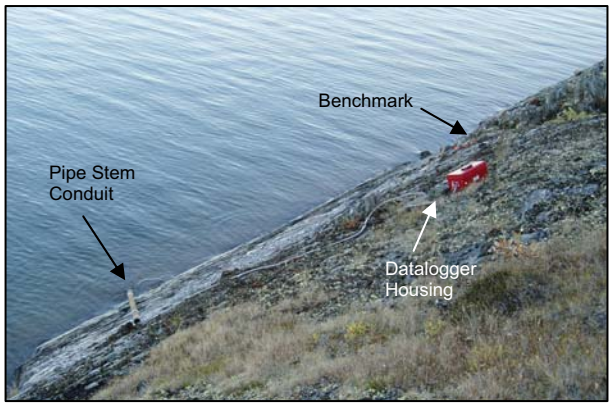
Drainage Area: 4.4 km^2
Lat/Long: 68°07'58" N, 106°33'59" W
Transducer: KPSI #0405798 (10 psi, 60 m)



Station H75 area looking south along Tail Lake.

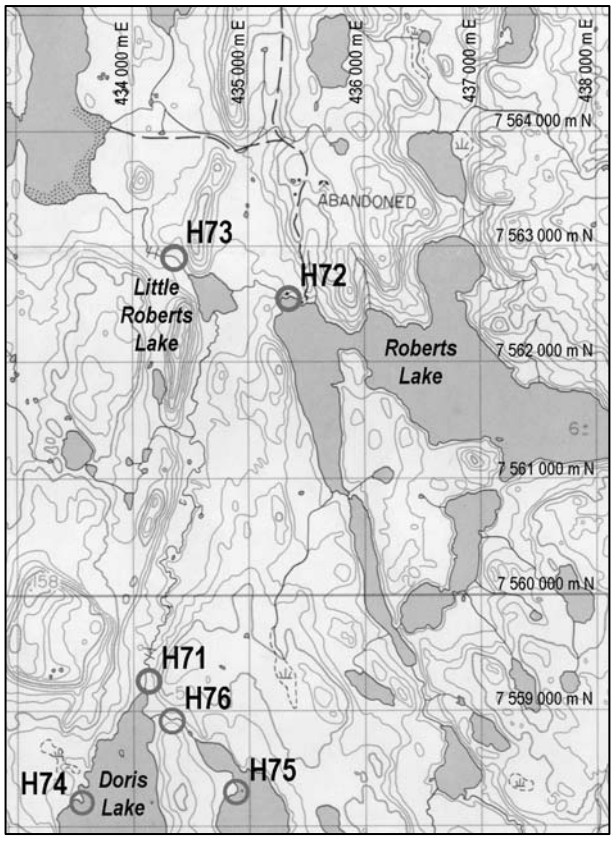


Tail Lake Station H75 looking north.



Tail Lake Station H75 looking east towards water.

Tail Lake Station H75 looking southeast towards water.



NTS Mapping of Area.

FACT-H75-2007.DOC

Tail Lake Station H75 – Survey Data (2004-2007)

Date & Time	Transducer Reading (m)	Transducer Elevation (m)	Average Transducer Elevation (m)	Staff Gauge Reading (m)	**Stage Datum** Water Surface Elevation (m)	geodetic Stage (m)
5/8/2004 15:13	-					
6/5/2004 0:00	-	-			n/a	n/a
6/6/2004 0:00	0.5200	-			n/a	n/a
6/7/2004 0:00	-	-			n/a	n/a
6/8/2004 0:00	0.4580	-			n/a	n/a
6/9/2004 14:57	0.6500	-			n/a	n/a
6/19/2004 14:12	0.8896	27.390	27.390 *		28.279	n/a
6/22/2004 21:53	transducer shifted					
7/18/2004 11:09	0.9533				28.253	28.253
7/19/2004 16:24	0.9518				28.252	28.252
9/10/2004 17:08	0.8412	27.300			28.141	28.141
9/11/2004 9:00	-	n/a	27.300		28.141	28.141
6/26/2005 12:49	5.0191	23.274		28.293	28.300	28.300
7/18/2005 10:15	4.9718	23.267		28.239	28.253	28.253
9/16/2005 14:45	4.9232	23.302		28.225	28.204	28.204
9/17/2005 10:15	4.9216	-	23.281	-	28.203	28.203
28/05/2006 12:00	5.0245	23.295		28.320	28.302	28.302
03/07/2006 13:55	4.9921	-		-	28.269	28.269
12/08/2006 10:00	4.8788	23.259		28.138	28.156	28.156
09/09/2006 11:47	4.8272	-	23.277	-	28.105	28.105
08/15/2007 12:30	4.9328	22.683		27.616	27.995	27.995
09/16/2007 11:00	4.9474	23.441	23.062	28.388	28.009	28.009

* Based on observed transducer shift on 22 Jun 04

H75 – TAIL LAKE - 2006

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 29.339 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	-	-	-	4.837	4.853	4.858
2	-	-	-	-	-	-	-	-	-	4.839	4.853	4.858
3	-	-	-	-	-	-	-	-	-	4.839	4.852	4.858
4	-	-	-	-	-	-	-	-	-	4.838	4.852	4.859
5	-	-	-	-	-	-	-	-	-	4.836	4.852	4.861
6	-	-	-	-	-	-	-	-	-	4.835	4.852	4.861
7	-	-	-	-	-	-	-	-	-	4.836	4.854	4.858
8	-	-	-	-	-	-	-	-	-	4.836	4.855	4.854
9	-	-	-	-	-	-	-	-	4.831	4.836	4.855	4.854
10	-	-	-	-	-	-	-	-	4.831	4.836	4.854	4.855
11	-	-	-	-	-	-	-	-	4.831	4.835	4.854	4.855
12	-	-	-	-	-	-	-	-	4.832	4.835	4.854	4.856
13	-	-	-	-	-	-	-	-	4.837	4.836	4.854	4.856
14	-	-	-	-	-	-	-	-	4.835	4.842	4.854	4.856
15	-	-	-	-	-	-	-	-	4.835	4.842	4.854	4.856
16	-	-	-	-	-	-	-	-	4.838	4.842	4.854	4.856
17	-	-	-	-	-	-	-	-	4.847	4.842	4.855	4.856
18	-	-	-	-	-	-	-	-	4.849	4.842	4.855	4.856
19	-	-	-	-	-	-	-	-	4.849	4.842	4.854	4.856
20	-	-	-	-	-	-	-	-	4.848	4.842	4.855	4.855
21	-	-	-	-	-	-	-	-	4.848	4.842	4.856	4.855
22	-	-	-	-	-	-	-	-	4.846	4.842	4.856	4.856
23	-	-	-	-	-	-	-	-	4.842	4.842	4.855	4.856
24	-	-	-	-	-	-	-	-	4.837	4.841	4.855	4.855
25	-	-	-	-	-	-	-	-	4.836	4.840	4.856	4.855
26	-	-	-	-	-	-	-	-	4.839	4.841	4.857	4.855
27	-	-	-	-	-	-	-	-	4.841	4.841	4.857	4.854
28	-	-	-	-	-	-	-	-	4.839	4.842	4.858	4.855
29	-	-	-	-	-	-	-	-	4.840	4.845	4.858	4.855
30	-	-	-	-	-	-	-	-	4.838	4.850	4.858	4.856
31	-	-	-	-	-	-	-	-	-	4.851		4.858
MIN	-	-	-	-	-	-	-	-	**4.831**	**4.835**	**4.852**	**4.854**
MEAN	-	-	-	-	-	-	-	-	**4.839**	**4.840**	**4.855**	**4.856**
MAX	-	-	-	-	-	-	-	-	**4.849**	**4.851**	**4.858**	**4.861**

MEAN DAILY WATER TEMPERATURE (°C) AT TRANSDUCER

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-
MIN	-	-	-	-	-	-	-	-	-	-	-	-
MEAN	-	-	-	-	-	-	-	-	-	-	-	-
MAX	-	-	-	-	-	-	-	-	-	-	-	-

NOTES: P – PARTIAL DAILY AVERAGE E - ESTIMATED

H75 – TAIL LAKE - 2007

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 29.339 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	28.137	28.149	28.149	28.145	28.174	28.177	28.347	28.179	28.241	-	-	-
2	28.136	28.149	28.150	28.145	28.174	28.178	28.338	28.175	28.238	-	-	-
3	28.136	28.150	28.152	28.144	28.177	28.178	28.332	28.170	28.235	-	-	-
4	28.137	28.151	28.152	28.143	28.179	28.177	28.327	28.166	28.233	-	-	-
5	28.138	28.151	28.149	28.142	28.179	28.177	28.321	28.162	28.231	-	-	-
6	28.140	28.151	28.148	28.141	28.177	28.176	28.314	28.161	28.230	-	-	-
7	28.142	28.150	28.148	28.140	28.182	28.175	28.308	28.159	28.229	-	-	-
8	28.144	28.149	28.149	28.143	28.182	28.175	28.302	28.162	28.229	-	-	-
9	28.148	28.149	28.150	28.147	28.183	28.175	28.296	28.186	28.227	-	-	-
10	28.152	28.150	28.150	28.147	28.182	28.175	28.291	28.194	28.227	-	-	-
11	28.152	28.150	28.149	28.149	28.181	28.176	28.284	28.197	28.229	-	-	-
12	28.152	28.148	28.148	28.152	28.181	28.184	28.274	28.203	28.228	-	-	-
13	28.152	28.148	28.148	28.153	28.181	28.211	28.269	28.210	28.226	-	-	-
14	28.150	28.148	28.149	28.154	28.182	28.239	28.263	28.214	28.228	-	-	-
15	28.150	28.149	28.148	28.155	28.183	28.267	28.258	28.215	28.228	-	-	-
16	28.150	28.150	28.147	28.155	28.183	28.291	28.253	28.216	P 28.228	-	-	-
17	28.150	28.150	28.147	28.155	28.183	28.305	28.246	28.216	-	-	-	-
18	28.150	28.149	28.147	28.155	28.183	28.311	28.241	28.219	-	-	-	-
19	28.151	28.149	28.146	28.154	28.181	28.316	28.237	28.242	-	-	-	-
20	28.151	28.149	28.146	28.154	28.181	28.322	28.232	28.268	-	-	-	-
21	28.151	28.149	28.146	28.154	28.180	28.328	28.226	28.272	-	-	-	-
22	28.151	28.149	28.145	28.154	28.180	28.333	28.219	28.271	-	-	-	-
23	28.150	28.149	28.145	28.154	28.179	28.333	28.214	28.268	-	-	-	-
24	28.150	28.148	28.143	28.154	28.179	28.342	28.212	28.265	-	-	-	-
25	28.150	28.149	28.143	28.158	28.178	28.356	28.210	28.261	-	-	-	-
26	28.150	28.149	28.144	28.171	28.178	28.360	28.206	28.256	-	-	-	-
27	28.150	28.148	28.143	28.173	28.179	28.361	28.201	28.251	-	-	-	-
28	28.150	28.148	28.144	28.174	28.180	28.362	28.196	28.249	-	-	-	-
29	28.150	-	28.144	28.174	28.179	28.359	28.192	28.248	-	-	-	-
30	28.150	-	28.144	28.173	28.178	28.355	28.189	28.246	-	-	-	-
31	28.150	-	28.144	-	28.178	-	28.184	28.244	-	-		-
MIN	28.136	28.148	28.143	28.140	28.174	28.175	28.184	28.159	28.226	-	-	-
MEAN	28.147	28.149	28.147	28.154	28.180	28.262	28.258	28.218	28.230	-	-	-
MAX	28.152	28.151	28.152	28.174	28.183	28.362	28.347	28.272	28.241	-	-	-

MEAN DAILY WATER TEMPERATURE (°C) AT TRANSDUCER

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	3.381	12.360	7.385	-	-	-
2	-	-	-	-	-	-	3.436	12.081	7.260	-	-	-
3	-	-	-	-	-	-	3.497	11.987	6.999	-	-	-
4	-	-	-	-	-	-	3.598	11.980	6.710	-	-	-
5	-	-	-	-	-	-	3.751	11.722	6.525	-	-	-
6	-	-	-	-	-	P 2.050	3.934	11.401	6.367	-	-	-
7	-	-	-	-	-	2.061	4.015	11.168	6.375	-	-	-
8	-	-	-	-	-	2.074	4.135	10.845	6.077	-	-	-
9	-	-	-	-	-	2.089	4.304	10.125	5.685	-	-	-
10	-	-	-	-	-	2.104	4.488	9.689	5.209	-	-	-
11	-	-	-	-	-	2.126	5.356	9.513	4.815	-	-	-
12	-	-	-	-	-	2.161	5.559	9.504	4.661	-	-	-
13	-	-	-	-	-	2.229	5.520	9.403	4.483	-	-	-
14	-	-	-	-	-	2.293	6.178	9.510	4.057	-	-	-
15	-	-	-	-	-	2.354	6.339	9.500	3.589	-	-	-
16	-	-	-	-	-	2.404	6.302	9.296	P 3.412	-	-	-
17	-	-	-	-	-	2.450	6.428	9.222	-	-	-	-
18	-	-	-	-	-	2.491	7.514	9.218	-	-	-	-
19	-	-	-	-	-	2.532	7.602	9.160	-	-	-	-
20	-	-	-	-	-	2.587	8.644	9.053	-	-	-	-
21	-	-	-	-	-	2.643	11.006	8.998	-	-	-	-
22	-	-	-	-	-	2.731	11.861	8.826	-	-	-	-
23	-	-	-	-	-	2.828	12.670	8.607	-	-	-	-
24	-	-	-	-	-	2.908	12.312	8.423	-	-	-	-
25	-	-	-	-	-	2.978	12.146	8.155	-	-	-	-
26	-	-	-	-	-	3.069	12.075	7.932	-	-	-	-
27	-	-	-	-	-	3.130	12.044	7.778	-	-	-	-
28	-	-	-	-	-	3.190	11.962	7.504	-	-	-	-
29	-	-	-	-	-	3.247	11.967	7.329	-	-	-	-
30	-	-	-	-	-	3.319	12.104	7.148	-	-	-	-
31	-	-	-	-	-	3.381	12.244	7.176	-	-		-
MIN	-	-	-	-	-	2.050	3.381	7.148	3.412	-	-	-
MEAN	-	-	-	-	-	2.593	7.625	9.504	5.601	-	-	-
MAX	-	-	-	-	-	3.381	12.670	12.360	7.385	-	-	-

NOTES: P – PARTIAL DAILY AVERAGE E - ESTIMATED

TAIL LAKE OUTFLOW HYDROMETRIC STATION

H76

FACTSHEET

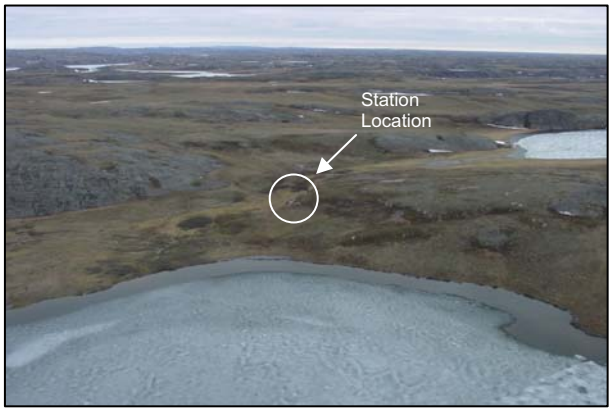
LOCATION AND PURPOSE

Located on the left downstream bank of Tail Lake outflow, approximately 200 m upstream of Doris Lake.

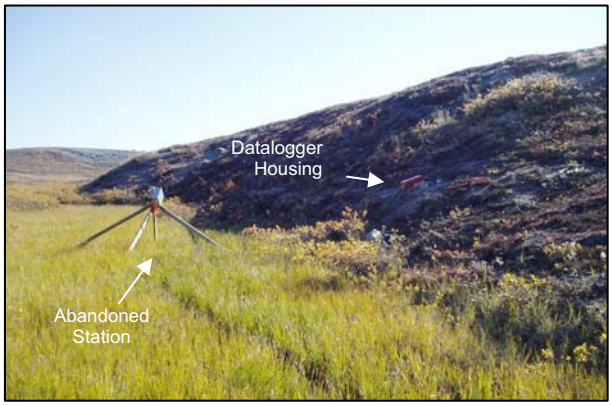
Operational:	2003	2004	2005	2006	2007	2008	2009
	n/a	20/6-11/9	26/6-17/9	26/6-8/9	23/6-14/9		

Benchmark: Top of embedded boulder; 26.301 m (geodetic)
Coordinates: UTM: 434234 m E, 7559195 m N (NAD83)
Datalogger: Optimum Instruments #1399

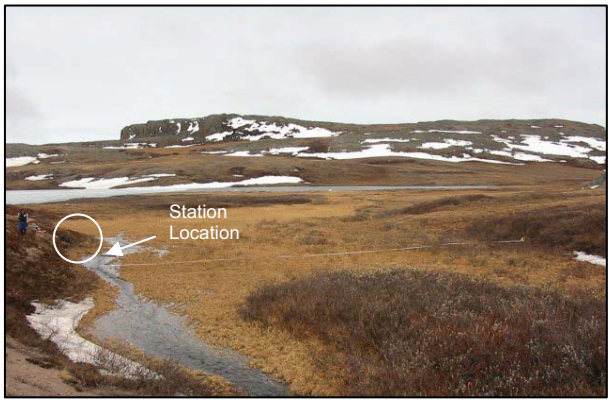
Drainage Area: 4.4 km^2
Lat/Long: 68°08'19" N, 106°34'55" W
Transducer: KPSI #0402787 (5 psi, 15 m)



Aerial view of Tail Creek looking upstream from Doris to Tail Lake.

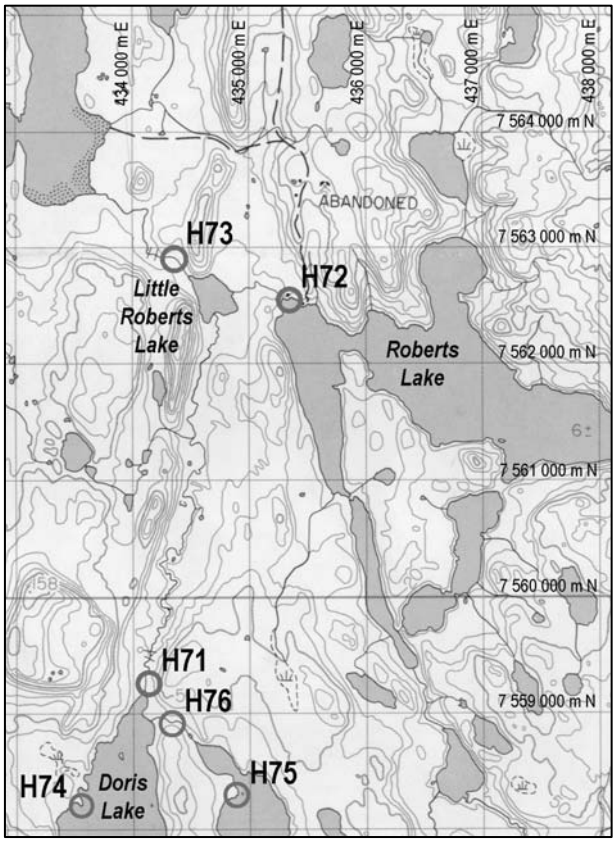


Tail Creek looking east at Station H76.



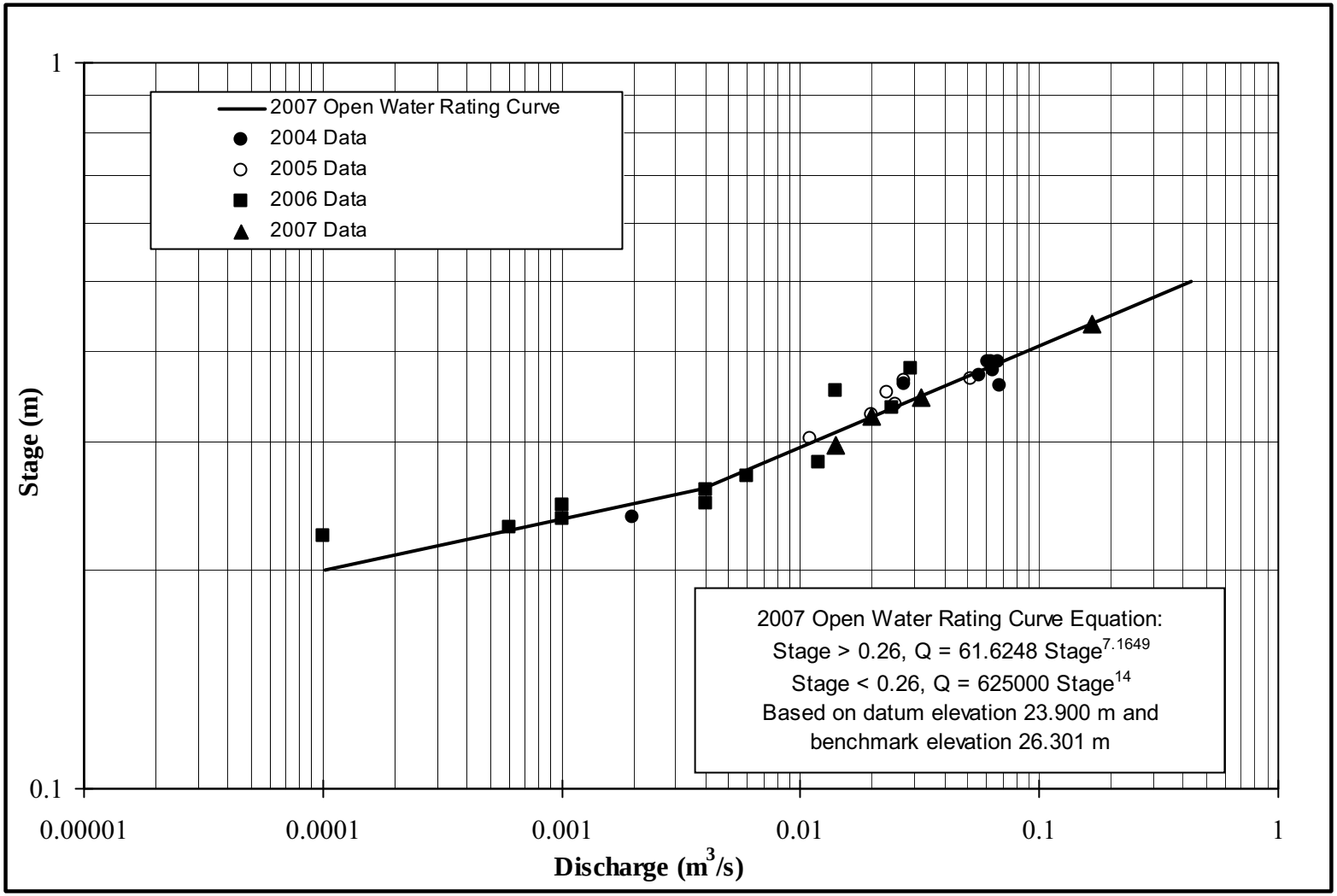
Station H76 looking west (downstream) during high water.

Station H76 looking east (upstream) during high water.



NTS Mapping of Area.

FACT-H76-2007.DOC



Tail Outflow Station H76 – Stage-Discharge Rating Curve (2007)

Tail Outflow Station H76 – Stage-Discharge Data (2004-2007)

Stage Datum 23.900 (geodetic)

Date & Time	Transducer Reading	Transducer Elevation	Average Transducer Elevation	Measured Water Elevation	Stage	Measured Discharge
06/09/2004 10:00						0.025
06/19/2004 10:30	0.1608	24.119		24.280	0.380	0.057
07/02/2004 11:05	0.1729	24.099		24.272	0.372	0.056
07/03/2004 12:48	0.1796	24.107		24.287	0.387	0.063
07/04/2004 12:30	0.1784	24.109		24.287	0.387	0.067
07/05/2004 08:38	0.1725	24.105		24.278	0.378	0.064
07/06/2004 08:40	0.1717	24.088		24.260	0.360	0.068
07/07/2004 12:48	0.1796	24.107	24.103	24.287	0.387	0.061
		Transducer lowered				
07/16/2004 11:15	0.1394	24.122		24.262	0.361	0.027
07/20/2004 11:54	0.1151	24.120		24.235	0.335	
09/11/2004 10:58	0.0328	24.104	24.104	24.137	0.237	0.002
06/26/2005 16:05	0.2824	23.962		24.244	0.344	0.052
07/18/2005 11:05	0.2405	23.840		24.080	0.180	0.020
08/05/2005 20:45	0.2697			*24.170*	0.270	0.027
08/21/2005 16:30	0.2500			*24.151*	0.251	0.025
09/01/2005 12:30	0.2458			*24.146*	0.246	0.023
09/15/2005 15:20	0.1925			*24.093*	0.193	0.011
09/17/2005 10:20	0.1889		23.901	24.089	0.189	
06/25/2006 13:10	0.2771	-		*24.204*	0.304	0.029
06/30/2006 09:24	0.2642	-		*24.159*	0.259	0.024
07/07/2006 08:45	0.2367	-		*24.179*	0.279	0.014
07/12/2007 02:18	0.3495	-	23.895	*24.245*	0.345	-
transducer shifted by unknown cause 13 July 2006						
07/12/2007 02:33	0.3488	-		*24.339*	0.439	-
07/21/2006 15:34	0.1160	-		*24.106*	0.206	0.012
07/28/2006 12:00	0.1037	-		*24.094*	0.194	0.006
08/07/2006 14:00	0.0935	-		*24.084*	0.184	0.004
08/11/2006 09:50	0.0898	23.982		24.072	0.172	0.004
08/18/2006 15:00	0.0805	-		*24.071*	0.171	0.001
08/25/2006 18:15	0.0703	-		*24.061*	0.161	0.001
09/01/2006 12:00	0.0580	-		*24.048*	0.148	0.0001
09/08/2006 11:52	0.0557	23.998	23.990	24.054	0.154	0.0006
06/28/2007 17:00	0.41042	23.852		24.262	0.437	0.166
07/13/2007 03:00	0.32737	23.844		24.171	0.346	0.032
08/15/2007 13:24	0.31116	23.839		24.150	0.325	0.020
09/14/2007 11:15	0.28976	23.832	23.838	24.122	0.297	0.014

H76 – TAIL OUTFLOW - 2007

MEAN DAILY DISCHARGE (m^3/s)

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	0.001 E	0.125	0.004	0.036	0.002 E	-	-
2	-	-	-	-	-	0.001 E	0.109	0.003	0.031	0.001 E	-	-
3	-	-	-	-	-	0.001 E	0.097	0.003	0.028	-	-	-
4	-	-	-	-	-	0.001 E	0.085	0.002	0.025	-	-	-
5	-	-	-	-	-	0.002 E	0.077	0.002	0.025	-	-	-
6	-	-	-	-	-	0.002 E	0.069	0.002	0.023	-	-	-
7	-	-	-	-	-	0.002 E	0.062	0.002	0.023	-	-	-
8	-	-	-	-	-	0.003 E	0.059	0.003	0.021	-	-	-
9	-	-	-	-	-	0.003 E	0.054	0.008	0.019	-	-	-
10	-	-	-	-	-	0.003 E	0.049	0.010	0.016	-	-	-
11	-	-	-	-	-	0.003 E	0.046	0.010	0.016	-	-	-
12	-	-	-	-	-	0.004 E	0.041	0.014	0.016	-	-	-
13	-	-	-	-	-	0.006 E	0.037	0.018	0.014	-	-	-
14	-	-	-	-	-	0.012 E	0.033	0.020	0.013 P	-	-	-
15	-	-	-	-	-	0.020 E	0.030	0.020	0.012 E	-	-	-
16	-	-	-	-	-	0.030 E	0.027	0.020	0.012 E	-	-	-
17	-	-	-	-	-	0.039 E	0.023	0.020	0.011 E	-	-	-
18	-	-	-	-	-	0.042 E	0.021	0.022	0.010 E	-	-	-
19	-	-	-	-	-	0.046 E	0.020	0.055	0.010 E	-	-	-
20	-	-	-	-	-	0.051 E	0.020	0.090	0.009 E	-	-	-
21	-	-	-	-	-	0.056 E	0.020	0.094	0.008 E	-	-	-
22	-	-	-	-	-	0.060 E	0.014	0.098	0.008 E	-	-	-
23	-	-	-	-	-	0.119 P	0.013	0.087	0.007 E	-	-	-
24	-	-	-	-	-	0.128	0.012	0.078	0.006 E	-	-	-
25	-	-	-	-	-	0.142	0.011	0.068	0.006 E	-	-	-
26	-	-	-	-	-	0.143	0.010	0.060	0.005 E	-	-	-
27	-	-	-	-	-	0.143	0.008	0.051	0.004 E	-	-	-
28	-	-	-	-	-	0.146	0.007	0.047	0.003 E	-	-	-
29	-	-	-	-	-	0.148	0.006	0.045	0.003 E	-	-	-
30	-	-	-	-	-	0.139	0.006	0.042	0.002 E	-	-	-
31	-	-	-	-	-	-	0.005	0.040	-	-	-	-
MIN	-	-	-	-	-	0.001	0.005	0.002	0.002	0.001	-	-
MEAN	-	-	-	-	-	0.050	0.039	0.033	0.014	0.001	-	-
MAX	-	-	-	-	-	0.148	0.125	0.098	0.036	0.002	-	-

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 26.301 m

DATE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	-	-	-	-	-	-	24.246	24.084	24.178	-	-	-
2	-	-	-	-	-	-	24.238	24.078	24.171	-	-	-
3	-	-	-	-	-	-	24.231	24.073	24.166	-	-	-
4	-	-	-	-	-	-	24.224	24.067	24.162	-	-	-
5	-	-	-	-	-	-	24.218	24.061	24.161	-	-	-
6	-	-	-	-	-	-	24.212	24.060	24.158	-	-	-
7	-	-	-	-	-	-	24.207	24.055	24.156	-	-	-
8	-	-	-	-	-	-	24.204	24.071	24.154	-	-	-
9	-	-	-	-	-	-	24.199	24.109	24.149	-	-	-
10	-	-	-	-	-	-	24.195	24.120	24.142	-	-	-
11	-	-	-	-	-	-	24.191	24.122	24.141	-	-	-
12	-	-	-	-	-	-	24.185	24.134	24.140	-	-	-
13	-	-	-	-	-	-	24.180	24.146	24.134	-	-	-
14	-	-	-	-	-	-	24.174	24.150	24.130 P	-	-	-
15	-	-	-	-	-	-	24.170	24.150	-	-	-	-
16	-	-	-	-	-	-	24.164	24.151	-	-	-	-
17	-	-	-	-	-	-	24.156	24.150	-	-	-	-
18	-	-	-	-	-	-	24.152	24.155	-	-	-	-
19	-	-	-	-	-	-	24.151	24.197	-	-	-	-
20	-	-	-	-	-	-	24.151	24.227	-	-	-	-
21	-	-	-	-	-	-	24.151	24.229	-	-	-	-
22	-	-	-	-	-	-	24.135	24.232	-	-	-	-
23	-	-	-	-	-	24.243 P	24.130	24.225	-	-	-	-
24	-	-	-	-	-	24.247	24.127	24.219	-	-	-	-
25	-	-	-	-	-	24.253	24.125	24.212	-	-	-	-
26	-	-	-	-	-	24.254	24.120	24.205	-	-	-	-
27	-	-	-	-	-	24.254	24.113	24.196	-	-	-	-
28	-	-	-	-	-	24.255	24.107	24.192	-	-	-	-
29	-	-	-	-	-	24.256	24.101	24.190	-	-	-	-
30	-	-	-	-	-	24.252	24.099	24.186	-	-	-	-
31	-	-	-	-	-	-	24.094	24.184	-	-	-	-
MIN	-	-	-	-	-	24.243	24.094	24.055	24.130	-	-	-
MEAN	-	-	-	-	-	24.252	24.166	24.149	24.153	-	-	-
MAX	-	-	-	-	-	24.256	24.246	24.232	24.178	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE E - ESTIMATED

PROJECT NAME: Miramar/M2 Program/Tail Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Tail Lake Outflow
LOCATION: Ouflow of Tail Lake
COORDINATES: 434270 m E, 7558965 m N (NAD 27)

MEASUREMENT DATE: 28 June 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE/
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1700 h
MEASUREMENT END TIME: 1720 h

MAIN CHANNEL

STATION	DISTANCE FROM RIGHT D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Right Bank	0.00		0.11			0.00	0.325	0.000
1	0.65		0.12			0.00	0.650	0.000
2	1.30		0.08			0.01	0.650	0.001
3	1.95		0.11			0.03	0.650	0.002
4	2.60		0.10			0.02	0.650	0.001
5	3.25		0.07			0.01	0.650	0.000
6	3.90		0.12			0.06	0.650	0.005
7	4.55		0.34			0.60	0.650	0.133
8	5.20		0.18			0.19	0.650	0.022
9	5.85		0.12			0.03	0.650	0.002
Left Bank	6.50		0.00			0.00	0.325	0.000
								0.166

PROJECT NAME: Miramar/M2 Program/Tail Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Tail Lake Outflow
LOCATION: Ouflow of Tail Lake
COORDINATES: 434270 m E, 7558965 m N (NAD 27)

MEASUREMENT DATE: 13 July 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: PE/
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1504 h
MEASUREMENT END TIME: 1510 h

STATION	DISTANCE FROM Left D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.40		0.00			0.00	0.050	0.000
1	0.50		0.06			0.00	0.150	0.000
2	0.70		0.08			0.04	0.150	0.000
3	0.80		0.10			0.10	0.075	0.001
4	0.85		0.14			0.17	0.050	0.001
5	0.90		0.16			0.23	0.050	0.002
6	0.95		0.19			0.68	0.040	0.005
7	0.98		0.21			0.65	0.025	0.003
8	1.00		0.22			0.67	0.025	0.004
9	1.03		0.22			0.58	0.025	0.003
10	1.05		0.21			0.47	0.035	0.003
11	1.10		0.20			0.35	0.050	0.003
12	1.15		0.18			0.15	0.050	0.001
13	1.20		0.14			0.36	0.050	0.003
14	1.25		0.13			0.19	0.050	0.001
15	1.30		0.08			0.01	0.050	0.000
Right Bank	1.35		0.00			0.00	0.025	0.000
								0.032

PROJECT NAME: Miramar/M2 Program/Tail Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Tail Lake Outflow
LOCATION: Ouflow of Tail Lake
COORDINATES: 434270 m E, 7558965 m N (NAD 27)

MEASUREMENT DATE: 15 August 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY/
COMPUTATIONS BY: TJ/DC

MEASUREMENT START TIME: 1140 h
MEASUREMENT END TIME: 1200 h

STATION	DISTANCE FROM Left D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.60		0.00			0.00	0.050	0.000
1	0.70		0.01			0.00	0.150	0.000
2	0.90		0.03			-0.01	0.150	0.000
3	1.00		0.03			-0.01	0.100	0.000
4	1.10		0.04			-0.02	0.100	0.000
5	1.20		0.05			0.00	0.100	0.000
6	1.30		0.09			0.02	0.100	0.000
7	1.40		0.17			0.29	0.100	0.005
8	1.50		0.20			0.38	0.100	0.008
9	1.60		0.19			0.29	0.100	0.006
10	1.70		0.22			0.07	0.100	0.002
Right Bank	1.80		0.02			0.00	0.050	0.000
								0.020

PROJECT NAME: Miramar/M2 Program/Tail Lake Outflow
PROJECT NUMBER: 07-1373-0018.4000
DISCHARGE DATA

STREAM NAME: Tail Lake Outflow
LOCATION: Ouflow of Tail Lake
COORDINATES: 434270 m E, 7558965 m N (NAD 27)

MEASUREMENT DATE: 14 September 2007
METER NUMBER: Marsh McBirney

MEASUREMENT BY: TY
COMPUTATIONS BY: DC

MEASUREMENT START TIME: 1124 h
MEASUREMENT END TIME: 1146 h

STATION	DISTANCE FROM Left D/S BANK (m)	ICE THICKNESS (m)	DEPTH (m)	VELOCITY 0.2 Depth (m/s)	VELOCITY 0.8 Depth (m/s)	VELOCITY 0.6 Depth (m/s)	WIDTH (m)	DISCHARGE (m^3/s)
Left Bank	0.00		0.01			0.00	0.100	0.000
1	0.20		0.03			0.00	0.200	0.000
2	0.40		0.08			0.07	0.200	0.001
3	0.60		0.27			0.22	0.200	0.012
4	0.80		0.12			0.04	0.200	0.001
	1.00		0.08			0.00	0.200	0.000
5	1.20		0.06			0.00	0.200	0.000
10	1.40		0.03			0.00	0.150	0.000
Right Bank	1.50		0.00			0.00	0.050	0.000
								0.014

Snow Course Survey Raw Data – Open Lake Plots

Location	OL-07-01		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
23	2.21	1.9	0.243
15	2.12	1.9	0.265
13	2	1.9	0.139
Average:			0.216

Depth	**SWE**	
[cm]	[mm]	
27	58.2	
28	60.4	
12	25.9	
14	30.2	
13	28.0	
14	30.2	
14	30.2	
14	30.2	
15	32.3	
28	60.4	
26	56.0	
27	58.2	
24	51.7	
25	53.9	
36	77.6	
27	58.2	
25	53.9	
17	36.6	
20	43.1	
13	28.0	
13	28.0	
14	30.2	
15	32.3	
13	28.0	
42	90.5	
27	58.2	
25	53.9	
32	69.0	
25	53.9	
34	73.3	
22.0	**47.4**	**Average**

Location	OL-07-02		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
34	3.19	2.51	0.361
34	3.18	2.51	0.356
64	3.91	2.51	0.395
Average:			0.370

Depth	**SWE**	
[cm]	[mm]	
35	129.6	
35	129.6	
25	92.6	
25	92.6	
24	88.9	
20	74.1	
20	74.1	
35	129.6	
25	92.6	
45	166.7	
35	129.6	
27	100.0	
35	129.6	
36	133.3	
21	77.8	
15	55.6	
28	103.7	
38	140.8	
19	70.4	
30	111.1	
25	92.6	
15	55.6	
18	66.7	
28	103.7	
25	92.6	
21	77.8	
29	107.4	
24	88.9	
24	88.9	
19	70.4	
26.7	**98.9**	**Average**

Location	OL-07-03		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
16	2.61	2.5	0.124
20	2.61	2.5	0.099
21	2.63	2.5	0.112
Average:			0.112

Depth	**SWE**	
[cm]	[mm]	
17	19.0	
16	17.9	
18	20.1	
17	19.0	
24	26.8	
26	29.0	
20	22.3	
20	22.3	
14	15.6	
22	24.6	
15	16.8	
11	12.3	
16	17.9	
20	22.3	
15	16.8	
21	23.5	
21	23.5	
17	19.0	
25	27.9	
20	22.3	
17	19.0	
14	15.6	
11	12.3	
10	11.2	
13	14.5	
17	19.0	
18	20.1	
20	22.3	
18	20.1	
23	25.7	
17.9	**20.0**	**Average**

Snow Course Survey Raw Data – Exposed Lowland Plots

Location	EL-07-01		
Date:		04-May-07	(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
32	2.12	1.88	0.135
39	2.21	1.88	0.153
46	2.45	1.88	0.224
Average:			0.171

Depth	**SWE**	
[cm]	[mm]	
34	58.0	
39	66.5	
36	61.4	
39	66.5	
46	78.4	
26	44.3	
32	54.6	
40	68.2	
46	78.4	
53	90.4	
40	68.2	
40	68.2	
36	61.4	
35	59.7	
36	61.4	
59	100.6	
31	52.9	
38	64.8	
41	69.9	
40	68.2	
26	44.3	
35	59.7	
45	76.7	
50	85.3	
51	87.0	
50	85.3	
34	58.0	
35	59.7	
45	76.7	
45	76.7	
40.1	**68.4**	**Average**

Location	EL-07-02		
Date:		28-Apr-07	(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
22	2.58	2.5	0.066
28	2.67	2.5	0.110
30	2.66	2.5	0.096
Average:			0.090

Depth	**SWE**	
[cm]	[mm]	
21	19.0	
51	46.1	
23	20.8	
29	26.2	
51	46.1	
23	20.8	
36	32.6	
36	32.6	
39	35.3	
37	33.5	
41	37.1	
37	33.5	
34	30.8	
36	32.6	
48	43.4	
25	22.6	
38	34.4	
21	19.0	
50	45.2	
35	31.7	
37	33.5	
28	25.3	
39	35.3	
41	37.1	
43	38.9	
44	39.8	
41	37.1	
42	38.0	
48	43.4	
29	26.2	
36.8	**33.3**	**Average**

Location	EL-07-03		
Date:		28-Apr-07	(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
23	2.66	2.63	0.024
45	2.74	2.63	0.044
44	2.89	2.63	0.107
Average:			0.058

Depth	**SWE**	
[cm]	[mm]	
17	9.9	
33	19.2	
32	18.6	
10	5.8	
12	7.0	
22	12.8	
1	0.6	
21	12.2	
17	9.9	
56	32.5	
15	8.7	
11	6.4	
15	8.7	
26	15.1	
36	20.9	
30	17.4	
32	18.6	
28	16.3	
5	2.9	
20	11.6	
7	4.1	
21	12.2	
18	10.5	
18	10.5	
21	12.2	
28	16.3	
25	14.5	
11	6.4	
44	25.6	
14	8.1	
21.5	**12.5**	**Average**

Snow Course Survey Raw Data – Sheltered Lowland Plots

Location	SL-07-01		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
22	1.97	1.87	0.082
56	2.37	1.87	0.161
66	2.66	1.87	0.216
Average:			0.153

Depth	**SWE**	
[cm]	[mm]	
41	62.7	
30	45.9	
20	30.6	
61	93.4	
26	39.8	
26	39.8	
40	61.2	
35	53.6	
31	47.4	
31	47.4	
34	52.0	
47	71.9	
40	61.2	
32	49.0	
36	55.1	
74	113.3	
111	169.9	
48	73.5	
51	78.1	
46	70.4	
35	53.6	
45	68.9	
26	39.8	
27	41.3	
22	33.7	
24	36.7	
48	73.5	
92	140.8	
81	124.0	
64	97.9	
44.1	**67.5**	**Average**

Location	SL-07-02		
Date:	05-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
24	2.007	1.83	0.133
42	1.96	1.83	0.056
27.5	2.12	1.83	0.190
Average:			0.126

Depth	**SWE**	
[cm]	[mm]	
53	67.0	
54	68.3	
36	45.5	
49	61.9	
60	75.8	
33	41.7	
51	64.5	
53	67.0	
42	53.1	
34	43.0	
48	60.7	
29	36.7	
44	55.6	
29	36.7	
33	41.7	
43	54.4	
35	44.2	
45	56.9	
48	60.7	
37	46.8	
50	63.2	
60	75.8	
38	48.0	
50	63.2	
45	56.9	
35	44.2	
20	25.3	
38	48.0	
19	24.0	
25	31.6	
41.2	**52.1**	**Average**

Location	SL-07-03		
Date:	02-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
45	2.27	1.94	0.132
21	2.008	1.94	0.058
27	2.007	1.94	0.045
Average:			0.079

Depth	**SWE**	
[cm]	[mm]	
34	26.7	
34	26.7	
25	19.6	
34	26.7	
36	28.3	
39	30.6	
33	25.9	
33	25.9	
35	27.5	
40	31.4	
39	30.6	
22	17.3	
25	19.6	
42	33.0	
26	20.4	
31	24.3	
23	18.1	
13	10.2	
20	15.7	
24	18.8	
25	19.6	
28	22.0	
30	23.6	
22	17.3	
54	42.4	
25	19.6	
24	18.8	
36	28.3	
36	28.3	
28	22.0	
30.5	**24.0**	**Average**

Snow Course Survey Raw Data – North Aspect Plots

Location	NA-07-01		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]	(kg)	(kg)	[g/cm3]
25	1.97	1.73	0.173
27	1.94	1.73	0.140
16	1.96	1.73	0.259
Average:			0.191

Depth	**SWE**	
[cm]	[mm]	
20	38.2	
14	26.7	
31	59.2	
22	42.0	
23	43.9	
26	49.7	
48	91.7	
19	36.3	
23	43.9	
23	43.9	
22	42.0	
7	13.4	
23	43.9	
27	51.6	
39	74.5	
32	61.1	
10	19.1	
16	30.6	
19	36.3	
12	22.9	
42	80.2	
36	68.8	
39	74.5	
35	66.8	
42	80.2	
31	59.2	
18	34.4	
20	38.2	
21	40.1	
23	43.9	
25.4	**48.6**	**Average**

Location	NA-07-02		
Date:	02-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
25.5	2.04	1.79	0.177
14	1.93	1.79	0.180
20	1.9	1.79	0.099
Average:			0.152

Depth	**SWE**	
[cm]	[mm]	
56	85.2	
3	4.6	
24	36.5	
25	38.1	
48	73.1	
25	38.1	
15	22.8	
15	22.8	
2	3.0	
70	106.5	
51	77.6	
40	60.9	
30	45.7	
31	47.2	
24	36.5	
37	56.3	
21	32.0	
23	35.0	
12	18.3	
33	50.2	
44	67.0	
19	28.9	
25	38.1	
12	18.3	
27	41.1	
31	47.2	
29	44.1	
36	54.8	
14	21.3	
57	86.8	
29.3	**44.6**	**Average**

Location	NA-07-03		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]	(kg)	(kg)	[g/cm^3]
49	3.32	2.49	0.306
56	3.34	2.49	0.274
79	3.46	2.49	0.222
Average:			0.267

Depth	**SWE**	
[cm]	[mm]	
54	144.2	
52	138.9	
35	93.5	
36	96.1	
37	98.8	
45	120.2	
51	136.2	
25	66.8	
67	178.9	
26	69.4	
52	138.9	
16	42.7	
42	112.2	
42	112.2	
44	117.5	
42	112.2	
43	114.8	
45	120.2	
37	98.8	
36	96.1	
49	130.8	
31	82.8	
44	117.5	
57	152.2	
35	93.5	
38	101.5	
19	50.7	
30	80.1	
40	106.8	
42	112.2	
40.4	**107.9**	**Average**

Snow Course Survey Raw Data – East Aspect Plots

Location	EA-07-01		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
26	2.02	1.85	0.118
29.5	1.99	1.85	0.086
18	1.93	1.85	0.080
Average:			0.095

Depth	**SWE**	
[cm]	[mm]	
41	38.8	
22	20.8	
18	17.0	
19	18.0	
30	28.4	
27	25.5	
14	13.2	
26	24.6	
11	10.4	
30	28.4	
29	27.4	
33	31.2	
35	33.1	
25	23.7	
17	16.1	
28	26.5	
20	18.9	
25	23.7	
21	19.9	
26	24.6	
26	24.6	
34	32.2	
20	18.9	
31	29.3	
40	37.8	
36	34.1	
37	35.0	
24	22.7	
19	18.0	
25	23.7	
26.3	**24.9**	**Average**

Location	EA-07-02		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
45	2.98	2.56	0.168
47	2.88	2.56	0.123
54	3.003	2.56	0.148
Average:			0.146

Depth	**SWE**	
[cm]	[mm]	
35	51.3	
27	39.5	
38	55.6	
57	83.5	
63	92.3	
54	79.1	
56	82.0	
44	64.4	
25	36.6	
60	87.9	
54	79.1	
76	111.3	
73	106.9	
52	76.1	
45	65.9	
47	68.8	
56	82.0	
35	51.3	
40	58.6	
54	79.1	
56	82.0	
60	87.9	
72	105.4	
54	79.1	
93	136.2	
28	41.0	
88	128.9	
80	117.1	
109	159.6	
79	115.7	
57.0	**83.5**	**Average**

Location	EA-07-03		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
22	1.98	1.87	0.090
42	2.22	1.87	0.150
45	2.26	1.87	0.156
Average:			0.132

Depth	**SWE**	
[cm]	[mm]	
35	46.3	
40	52.9	
37	49.0	
40	52.9	
45	59.5	
15	19.8	
12	15.9	
33	43.7	
39	51.6	
10	13.2	
15	19.8	
45	59.5	
48	63.5	
35	46.3	
35	46.3	
36	47.6	
19	25.1	
34	45.0	
21	27.8	
33	43.7	
35	46.3	
15	19.8	
20	26.5	
24	31.8	
34	45.0	
40	52.9	
31	41.0	
44	58.2	
25	33.1	
56	74.1	
31.7	**41.9**	**Average**

Snow Course Survey Raw Data – South Aspect Plots

Location	SA-07-01		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
35	2.34	1.9	0.227
30	2.01	1.9	0.066
25	1.99	1.9	0.065
Average:			0.119

Depth	**SWE**	
[cm]	[mm]	
41	48.9	
38	45.3	
48	57.3	
38	45.3	
30	35.8	
34	40.6	
40	47.7	
32	38.2	
21	25.1	
22	26.3	
29	34.6	
43	51.3	
41	48.9	
36	43.0	
43	51.3	
43	51.3	
39	46.5	
32	38.2	
32	38.2	
32	38.2	
45	53.7	
31	37.0	
13	15.5	
23	27.4	
16	19.1	
31	37.0	
46	54.9	
48	57.3	
37	44.2	
45	53.7	
35.0	**41.7**	**Average**

Location	SA-07-02		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
30	2.76	2.48	0.168
29	2.66	2.48	0.112
48	2.76	2.48	0.105
Average:			0.129

Depth	**SWE**	
[cm]	[mm]	
7	9.0	
27	34.7	
74	95.1	
26	33.4	
23	29.6	
39	50.1	
21	27.0	
13	16.7	
1	1.3	
3	3.9	
18	23.1	
18	23.1	
13	16.7	
27	34.7	
38	48.9	
28	36.0	
4	5.1	
14	18.0	
18	23.1	
48	61.7	
38	48.9	
29	37.3	
33	42.4	
24	30.9	
14	18.0	
51	65.6	
25	32.1	
18	23.1	
12	15.4	
19	24.4	
24.1	**31.0**	**Average**

Location	SA-07-03		
Date:	04-May-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
25	1.9	1.82	0.058
36	2.33	1.82	0.256
30	2.21	1.82	0.235
Average:			0.183

Depth	**SWE**	
[cm]	[mm]	
24	43.8	
13	23.7	
4	7.3	
48	87.7	
48	87.7	
43	78.5	
11	20.1	
9	16.4	
20	36.5	
11	20.1	
4	7.3	
2	3.7	
17	31.1	
44	80.4	
31	56.6	
105	191.8	
2	3.7	
22	40.2	
57	104.1	
70	127.9	
30	54.8	
30	54.8	
9	16.4	
15	27.4	
16	29.2	
77	140.6	
44	80.4	
9	16.4	
19	34.7	
13	23.7	
28.2	**51.6**	**Average**

Snow Course Survey Raw Data – West Aspect Plots

Location	WA-07-01		
Date:	29-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
14	1.91	1.82	0.116
25	2.03	1.82	0.152
18	1.96	1.82	0.140
Average:			0.136

Depth	**SWE**	
[cm]	[mm]	
24	32.6	
17	23.1	
21	28.6	
30	40.8	
34	46.2	
29	39.4	
14	19.0	
36	49.0	
18	24.5	
20	27.2	
35	47.6	
43	58.5	
36	49.0	
33	44.9	
14	19.0	
12	16.3	
22	29.9	
16	21.8	
20	27.2	
45	61.2	
34	46.2	
44	59.8	
31	42.2	
57	77.5	
48	65.3	
20	27.2	
36	49.0	
29	39.4	
32	43.5	
42	57.1	
29.7	**40.4**	**Average**

Location	WA-07-02		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm3]
29	2.69	2.47	0.137
40	2.98	2.47	0.230
35	2.77	2.47	0.155
Average:			0.174

Depth	**SWE**	
[cm]	[mm]	
34	59.1	
46	80.0	
62	107.8	
83	144.3	
31	53.9	
16	27.8	
49	85.2	
34	59.1	
66	114.8	
42	73.0	
16	27.8	
16	27.8	
48	83.5	
24	41.7	
16	27.8	
20	34.8	
8	13.9	
24	41.7	
82	142.6	
66	114.8	
16	27.8	
69	120.0	
37	64.3	
20	34.8	
44	76.5	
73	126.9	
58	100.8	
71	123.5	
75	130.4	
105	182.6	
45.0	**78.3**	**Average**

Location	WA-07-03		
Date:	28-Apr-07		(m)
Depth	**Wgt**	**Tare**	**Density**
[cm]			[g/cm^3]
80	3.006	2.49	0.116
79	3.48	2.49	0.226
72	3.35	2.49	0.216
Average:			0.186

Depth	**SWE**	
[cm]	[mm]	
111	206.5	
112	208.3	
114	212.1	
100	186.0	
57	106.0	
54	100.4	
56	104.2	
65	120.9	
77	143.2	
114	212.1	
112	208.3	
121	225.1	
102	189.7	
87	161.8	
59	109.8	
120	223.2	
120	223.2	
121	225.1	
50	93.0	
38	70.7	
40	74.4	
47	87.4	
36	67.0	
44	81.8	
39	72.5	
64	119.1	
53	98.6	
67	124.6	
110	204.6	
130	241.8	
80.7	**150.1**	**Average**

DORIS AND TAIL LAKE EVAPORATION CALCULATIONS

The following pages contain the results of evaporation calculations for the Doris Lake watershed. The WREVAP model (Morton et al. 1985) was used for these calculations.

The WREVAP model requires at least two years of data to run and was run on a full year basis. The meteorological station at Doris Lake was installed in July 2003 and data were available through to September 9, 2006. A data gap exists in the winter (November to February) of 2003-2004, however, continuous data are available for the period February 24, 2004 to September 9, 2006. Therefore, it was necessary to estimate input parameters for the missing winter period. The results are insensitive to changes in relevant input parameters (relative humidity, air temperature and solar radiation) for the winter months, relative to the summer months, because evaporation in the region is essentially zero for this period. A summary of input data is provided in the following table.

Doris Lake Watershed Input Data to the WREVAP Program

Month	Mean Monthly Parameter Values		
	Relative Humidity (%)	Air Temperature (°C)	Total Solar Radiation (MJ/m^2)
Oct-03	89.4	-5.2	1.9
Nov-03	78.7	-21.5	0
Dec-03	72.3	-27.6	0
Jan-04	70.0	-31.6	0.00
Feb-04	72.7	-29.7	2.98
Mar-04	69.2	-30.3	6.89
Apr-04	77.7	-20.4	14.80
May-04	82.6	-10.8	20.43
Jun-04	78.7	3.8	18.69
Jul-04	72.8	8.8	17.62
Aug-04	76.7	7.1	9.29
Sep-04	82.6	1.6	4.72
Oct-04	86.9	-10.7	2.21
Nov-04	80.5	-21.9	0.42
Dec-04	73.9	-29.8	0.02
Jan-05	74.3	-28.3	0.22
Feb-05	70.3	-32.5	1.87
Mar-05	73.2	-27.9	6.78
Apr-05	81.2	-14.4	13.37
May-05	80.0	-8.0	21.47
Jun-05	75.7	4.1	20.25
Jul-05	80.1	8.0	13.94
Aug-05	78.3	9.1	11.51
Sep-05	81.5	0.8	5.82
Oct-05	87.8	-8.2	2.50
Nov-05	82.6	-20.1	0.42
Dec-05	77.7	-25.7	0.03
Jan-06	76.3	-26.6	0.20
Feb-06	77.2	-23.9	2.04
Mar-06	77.4	-21.7	7.22
Apr-06	79.5	-16.4	16.04
May-06	84.0	-1.6	20.57
Jun-06	70.6	7.8	22.79
Jul-06	71.3	10.5	19.16
Aug-06	70.5	11.8	15.95
Sep-06	82.0	1.2 estimated	5.27 estimated
Latitude		68.13°	
Elevation		40 m	
Mean Annual Precipitation		213 mm	
Mean Lake Depth		3.0 m (Tail Lake)	7.4 m (Doris Lake)
Lake Salinity		66 ppm (Tail Lake)	112.5 ppm (Doris Lake)

Doris Lake Evaporation Calculation Results from Program WREVAP-CRLE

Doris North - 03/10	PHID= 68.13	ALTI= 40.0	DA= 7.4	SALT= 112.50			NET	EVAPORATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	GIJ	HADD	RAD	POTENT	LAKE	Estimated
2003	OCT	1	31	0.9	-5.2	1.9	0.00	56	36	36	
2003	NOV	1	30	0.8	-21.5	0	0.00	15	16	16	
2003	DEC	1	31	0.7	-27.6	0	0.00	-13	1	1	
2004	JAN	1	31	0.7	-31.6	0	0.00	-23	0	0	
2004	FEB	1	29	0.7	-29.7	3	0.00	-47	-1	-1	
2004	MAR	1	31	0.7	-30.3	6.9	0.00	-45	0	0	
2004	APR	1	30	0.8	-20.4	14.8	0.00	-46	-1	-1	
2004	MAY	1	31	0.8	-10.8	20.4	0.00	-35	-2	-2	
2004	JUNE	1	30	0.8	3.8	18.7	0.00	-5	13	13	**7**
2004	JULY	1	31	0.7	8.8	17.6	0.00	58	72	51	**51**
2004	AUG	1	31	0.8	7.1	9.3	0.00	126	93	85	**85**
2004	SEPT	1	30	0.8	1.6	4.7	0.00	111	66	66	**66**
Total October 2003 to September 2004									293	264	**209**
2004	OCT	1	31	0.9	-10.7	2.2	0.00	56	31	31	
2004	NOV	1	30	0.8	-21.9	0.4	0.00	-12	1	1	
2004	DEC	1	31	0.7	-29.8	0	0.00	-12	1	1	
2005	JAN	1	31	0.7	-28.3	0.2	0.00	-24	0	0	
2005	FEB	1	28	0.7	-32.5	1.9	0.00	-42	0	0	
2005	MAR	1	31	0.7	-27.9	6.8	0.00	-46	-1	-1	
2005	APR	1	30	0.8	-14.4	13.4	0.00	-48	-3	-3	
2005	MAY	1	31	0.8	-8	21.5	0.00	-38	-2	-2	
2005	JUNE	1	30	0.8	4.1	20.3	0.00	6	21	19	**10**
2005	JULY	1	31	0.8	8	13.9	0.00	94	75	68	**68**
2005	AUG	1	31	0.8	9.1	11.5	0.00	113	90	81	**81**
2005	SEPT	1	30	0.8	0.8	5.8	0.00	95	57	57	**57**
Total October 2004 to September 2005									270	252	**216**
2005	OCT	1	31	0.9	-8.2	2.5	0.00	56	33	33	
2005	NOV	1	30	0.8	-20.1	0.4	0.00	-7	1	1	
2005	DEC	1	31	0.8	-25.7	0	0.00	-11	1	1	
2006	JAN	1	31	0.8	-26.6	0.2	0.00	-24	0	0	
2006	FEB	1	28	0.8	-23.9	2	0.00	-49	-1	-1	
2006	MAR	1	31	0.8	-21.7	7.2	0.00	-53	-2	-2	
2006	APR	1	30	0.8	-16.4	16	0.00	-50	-3	-3	
2006	MAY	1	31	0.8	-1.6	20.6	0.00	-38	-4	-4	
2006	JUNE	1	30	0.7	7.8	22.8	0.00	19	41	28	**28**
2006	JULY	1	31	0.7	10.5	19.2	0.00	109	104	83	**83**
2006	AUG	1	31	0.7	11.8	16	0.00	139	126	104	**104**
2006	SEPT	1	30	0.8	1.2	5.3	0.00	151	85	85	**85**
Total October 2005 to September 2006									381	325	**286**

Tail Lake Evaporation Calculation Results from Program WREVAP-CRLE

Tail Lake - 03/10 PHID= 68.13 ALTI= 40.0 DA= 3.0 SALT= 66.00								NET	EVAPORATION		
YEAR	MONTH	STARTDAY	LENGTH	RELH	T	GIJ	HADD	RAD	POTENT	LAKE	Estimated
2003	OCT	1	31	0.9	-5.2	1.9	0.00	-3	3	3	
2003	NOV	1	30	0.8	-21.5	.0	0.00	-22	0	0	
2003	DEC	1	31	0.7	-27.6	.0	0.00	-30	0	0	
2004	JAN	1	31	0.7	-31.6	.0	0.00	-28	0	0	
2004	FEB	1	29	0.7	-29.7	3.0	0.00	-48	-1	-1	
2004	MAR	1	31	0.7	-30.3	6.9	0.00	-39	0	0	
2004	APR	1	30	0.8	-20.4	14.8	0.00	-28	0	0	
2004	MAY	1	31	0.8	-10.8	20.4	0.00	-1	4	4	
2004	JUNE	1	30	0.8	3.8	18.7	0.00	63	52	45	**23**
2004	JULY	1	31	0.7	8.8	17.6	0.00	121	102	86	**86**
2004	AUG	1	31	0.8	7.1	9.3	0.00	116	88	79	**79**
2004	SEPT	1	30	0.8	1.6	4.7	0.00	53	39	38	**38**
Total October 2003 to September 2004									287	254	**226**
2004	OCT	1	31	0.9	-10.7	2.2	0.00	-4	3	3	
2004	NOV	1	30	0.8	-21.9	.4	0.00	-48	-2	-2	
2004	DEC	1	31	0.7	-29.8	.0	0.00	-28	0	0	
2005	JAN	1	31	0.7	-28.3	.2	0.00	-29	0	0	
2005	FEB	1	28	0.7	-32.5	1.9	0.00	-42	0	0	
2005	MAR	1	31	0.7	-27.9	6.8	0.00	-41	0	0	
2005	APR	1	30	0.8	-14.4	13.4	0.00	-30	-1	-1	
2005	MAY	1	31	0.8	-8.0	21.5	0.00	7	10	10	
2005	JUNE	1	30	0.8	4.1	20.3	0.00	84	65	57	**29**
2005	JULY	1	31	0.8	8.0	13.9	0.00	135	95	92	**92**
2005	AUG	1	31	0.8	9.1	11.5	0.00	92	80	69	**69**
2005	SEPT	1	30	0.8	.8	5.8	0.00	52	39	37	**37**
Total October 2004 to September 2005									289	265	**227**
2005	OCT	1	31	0.9	-8.2	2.5	0.00	-3	3	3	
2005	NOV	1	30	0.8	-20.1	.4	0.00	-47	-2	-2	
2005	DEC	1	31	0.8	-25.7	5.4	0.00	-30	0	0	
2006	JAN	1	31	0.8	-26.6	2.1	0.00	-30	0	0	
2006	FEB	1	28	0.8	-23.9	0.4	0.00	-50	-1	-1	
2006	MAR	1	31	0.8	-21.7	0.0	0.00	-47	-1	-1	
2006	APR	1	30	0.8	-16.4	0.2	0.00	-30	0	0	
2006	MAY	1	31	0.8	-1.6	1.9	0.00	21	22	22	
2006	JUNE	1	30	0.7	7.8	6.8	0.00	112	96	79	**40**
2006	JULY	1	31	0.7	10.5	14.1	0.00	160	130	114	**114**
2006	AUG	1	31	0.7	11.8	21.0	0.00	130	121	98	**98**
2006	SEPT	1	30	0.8	1.2	19.5	0.00	92	56	56	**56**
Total October 2005 to September 2006									424	368	**308**

APPENDIX B

PHYSICAL LIMNOLOGY AND WATER QUALITY DATA

Appendix B1. Field Data Collected for Doris North Project Water Quality Sites: Dissolved Oxygen, pH, Water Temperature and Secchi Depth, 2007.

Waterbody	Date	Dissolved Oxygen (mg/L)	pH	Water Temperature (°C)	Secchi Depth (m)	Water Depth (m)
Doris Lake	22-May-07	11.64	7.8	1.13	nd	14.6
Doris Lake	16-Jul-07	11.74	6.7	5.39	1.7	13.5
Doris Lake	16-Aug-07	13.26	6.9	9.82	1.2	14.0
Doris Lake	13-Sep-07	12.26	6.5	5.60	1.2	13.9
Tail Lake	22-May-07	10.0	7.3	0.55	nd	4.2
Tail Lake	16-Jul-07	13.27	7.1	15.78	3.5	5.4
Tail Lake	16-Aug-07	13.29	6.8	9.55	3.2	5.0
Tail Lake	13-Sep-07	12.35	nd	3.67	4.4	5.7
Roberts Lake	24-May-07	13.81	7.3	0.11	nd	4.5
Roberts Lake	15-Jul-07	12.21	***6.1***	15.85	1.8	5.0
Roberts Lake	18-Aug-07	11.54	6.9	9.17	1.5	5.2
Roberts Lake	14-Sep-07	11.56	nd	3.79	2.0	4.9
Little Roberts Lake	24-May-07	0.68	6.7	0.08	nd	1.9
Little Roberts Lake	15-Jul-07	13.81	6.8	11.72	1.5	2.4
Little Roberts Lake	18-Aug-07	11.59	6.9	9.39	1.3	2.2
Little Roberts Lake	14-Sep-07	11.16	nd	2.97	1.4	2.5
Doris Outflow	20-Jun-07	11.83	7.1	0.33		
Doris Outflow	7-Jul-07	11.77	***6.1***	5.85		
Doris Outflow	14-Jul-07	11.73	6.8	6.52		
Doris Outflow	21-Jul-07	10.64	7.0	16.68		
Doris Outflow	27-Jul-07	11.50	***5.7***	8.93		
Doris Outflow	4-Aug-07	10.20	6.7	11.10		
Doris Outflow	12-Aug-07	nd	***6.2***	9.51		
Doris Outflow	18-Aug-07	12.33	7.0	9.59		
Doris Outflow	25-Aug-07	11.52	6.7	8.25		
Doris Outflow	31-Aug-07	nd	nd	nd		
Doris Outflow	7-Sep-07	12.05	***6.5***	7.15		
Doris Outflow	16-Sep-07	11.32	7.0	4.03		
Tail Outflow	20-Jun-07	11.00	6.9	4.9		
Tail Outflow	7-Jul-07	10.05	***5.8***	12.07		
Tail Outflow	14-Jul-07	***8.10***	7.0	14.54		
Tail Outflow	21-Jul-07	***7.78***	6.5	17.29		
Tail Outflow	27-Jul-07	***8.66***	***6.2***	10.09		
Tail Outflow	4-Aug-07	***8.51***	6.5	10.45		
Tail Outflow	12-Aug-07	nd	***6.2***	8.42		
Tail Outflow	18-Aug-07	10.95	***6.4***	8.65		
Tail Outflow	25-Aug-07	9.99	***6.3***	6.31		
Tail Outflow	31-Aug-07	nd	nd	nd		
Tail Outflow	7-Sep-07	10.51	***6.1***	5.18		
Tail Outflow	16-Sep-07	10.96	6.6	1.30		
Roberts Outflow	20-Jun-07	13.45	7.0	2.30		
Roberts Outflow	14-Jul-07	12.06	7.1	5.04		
Roberts Outflow	12-Aug-07	nd	6.7	9.04		
Roberts Outflow	16-Sep-07	11.22	7.0	3.26		
Little Roberts Outflow	20-Jun-07	11.76	6.8	0.60		
Little Roberts Outflow	14-Jul-07	12.67	6.8	11.2		
Little Roberts Outflow	12-Aug-07	nd	6.9	9.31		
Little Roberts Outflow	16-Sep-07	11.54	7.0	2.41		
Roberts Bay	27-May-07	nd	7.6	-2.00	1.0	3.2
Roberts Bay	23-Jul-07	10.42	7.8	10.80	1.0	4.0
Roberts Bay	17-Aug-07	14.98	7.9	10.32	2.3	3.5
Roberts Bay	14-Sep-07	11.49	nd	1.04	1.0	5.0

nd - not determined/probe not functioning.
Values in bold and italicized font are exceedances.

Appendix B2. Dissolved Oxygen (DO) and Water Temperature Profiles Collected for the Doris North Project Water Quality Sites, 2007.

DORIS LAKE (13W 0433799E 7558286N NAD27)											
22 May 2007			16 July 2007			16 August 2007			13 September 2007		
Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)
0.0	11.64	0.04	0.0	11.74	5.39	0.0	13.26	9.82	0.0	12.26	5.60
0.5	11.45	0.04	1.0	11.67	5.25	1.0	13.17	9.82	1.0	12.23	5.61
1.0	11.36	0.08	2.0	11.42	4.85	2.0	13.28	9.82	2.0	12.18	5.61
1.5	11.15	0.14	3.0	11.19	4.49	3.0	13.02	9.82	3.0	12.12	5.61
2.0	10.93	0.52	4.0	10.80	4.28	4.0	13.30	9.82	4.0	12.08	5.61
2.5	10.51	0.99	5.0	10.58	4.18	5.0	13.23	9.82	5.0	12.01	5.61
3.0	10.26	1.11	6.0	10.34	4.06	6.0	12.95	9.81	6.0	11.96	5.60
3.5	9.97	1.15	7.0	10.05	4.01	7.0	13.06	9.80	7.0	11.87	5.60
4.0	9.72	1.15	8.0	9.27	3.86	8.0	13.03	9.80	8.0	11.82	5.61
5.0	9.61	1.17	9.0	8.53	3.81	9.0	13.05	9.80	9.0	11.73	5.61
6.0	9.60	1.20	10.0	6.92	3.35	10.0	13.02	9.80	10.0	11.64	5.61
7.0	9.44	1.25	11.0	6.57	3.35	11.0	13.03	9.78	11.0	11.55	5.59
8.0	9.22	1.33	12.0	5.15	3.31	12.0	13.01	9.75	12.0	11.39	5.60
9.0	8.57	1.38	13.0	4.67	3.22	13.0	13.20	9.71	13.0	11.21	5.58
10.0	7.51	1.55									
11.0	6.73	1.63									
12.0	6.15	1.73									
13.0	5.12	1.96									
13.5	3.54	1.96									

TAIL LAKE (13W 0434987E 7557952N NAD27)											
22 May 2007			16 July 2007			16 August 2007			13 September 2007		
Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)
0.0	10.00	0.09	0.0	13.27	15.78	0.0	13.29	9.55	0.0	12.35	3.67
0.5	9.50	0.07	0.5	13.36	15.64	0.5	13.20	9.55	0.5	12.32	3.66
1.0	9.35	0.12	1.0	13.59	14.84	1.0	13.19	9.56	1.0	12.28	3.67
1.5	9.21	0.16	1.5	13.66	14.42	1.5	13.20	9.56	1.5	12.23	3.67
2.0	9.20	0.55	2.0	13.65	14.02	2.0	13.11	9.55	2.0	12.12	3.67
2.5	9.06	1.23	2.5	14.30	12.63	2.5	13.13	9.53	2.5	12.11	3.65
3.0	9.05	1.84	3.0	14.79	11.49	3.0	13.27	9.51	3.0	11.96	3.66
3.5	8.56	2.34	3.5	15.33	9.89	3.5	13.25	9.48	3.5	11.90	3.66
4.2	6.00	2.58	4.0	15.56	8.97	4.0	13.09	9.47	4.0	11.73	3.66
			4.5	14.32	7.83	4.5	13.20	9.50	4.5	11.65	3.65
						5.0	13.21	9.44	5.0	11.52	3.66

Appendix B2. Dissolved Oxygen (DO) and Water Temperature Profiles Collected for the Doris North Project Water Quality Sites, 2007.

ROBERTS LAKE (13W 0435587E 7562161N NAD 27)											
24 May 2007			15 July 2007			18 August 2007			14 September 2007		
Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)
0.0	13.81	0.09	0.0	12.21	15.85	0.0	11.54	9.17	0.0	11.56	3.79
0.5	13.92	0.08	0.5	12.39	15.37	0.5	11.62	9.15	0.5	11.52	3.79
1.0	13.92	0.06	1.0	13.85	11.34	1.0	11.61	9.16	1.0	11.53	3.79
1.5	13.93	0.10	1.5	14.75	8.46	1.5	11.67	9.16	1.5	11.51	3.78
2.0	14.00	0.16	2.0	14.58	6.62	2.0	11.61	9.17	2.0	11.51	3.80
2.5	13.79	0.56	2.5	14.43	5.92	2.5	11.55	9.15	2.5	11.48	3.80
3.0	13.77	0.96	3.0	14.17	5.62	3.0	11.58	9.15	3.0	11.48	3.80
3.5	13.11	1.56	3.5	13.88	5.42	3.5	11.54	9.16	3.5	11.41	3.83
4.0	11.65	1.98	4.0	13.81	5.15	4.0	11.57	9.15	4.0	11.40	3.81
4.5	9.28	2.15	4.8	12.00	3.23	4.5	11.52	9.14			
						5.0	11.54	9.16			

LITTLE ROBERTS LAKE (13W 434723E 7562724N NAD27)											
24 May 2007			15 July 2007			18 August 2007			14 September 2007		
Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)
0.0	0.68	0.09	0.0	13.81	11.72	0.0	11.59	9.39	0.0	11.16	2.97
0.5	0.48	0.06	0.5	13.80	11.54	0.5	11.57	9.39	0.5	11.12	2.96
1.0	0.38	0.04	1.0	13.90	10.89	1.0	11.63	9.39	1.0	11.03	2.97
1.5	0.01	0.02	1.5	13.94	10.19	1.5	11.60	9.39	1.5	11.00	2.97
1.9	0.00	0.02	2.0	14.24	9.62	2.0	11.55	9.40	2.0	10.96	3.04
									2.5	10.77	2.96

ROBERTS BAY (13W 433290E 7564019N NAD27)											
27 May 2007			23 July 2007			17 August 2007			14 September 2007		
Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)	Depth (m)	DO (mg/L)	Temp (°C)
not collected due to equipment malfunction			0.0	10.42	10.80	0.0	14.98	10.32	0.0	11.49	1.04
			0.5	9.85	11.47	0.5	13.30	8.81	0.5	11.48	1.09
			1.0	9.73	11.59	1.0	13.13	8.14	1.0	9.43	2.84
			1.5	9.70	11.60	1.5	13.37	7.60	1.5	9.98	3.69
			2.0	9.62	11.57	2.0	13.69	7.08	2.0	8.92	3.84
			2.5	9.48	11.53	2.5	13.74	6.90	2.5	8.77	4.02
			3.0	9.38	11.54	3.0	13.80	6.88	3.0	8.64	4.29
						3.5	13.81	6.89	3.5	8.58	4.07
									4.0	8.26	4.35

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Doris Lake							
			22-May-07		15-Jul-07		16-Aug-07		13-Sep-07	
			Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
Physical										
Conductivity	µS/cm		317	324	286	320	273	273	263	267
pH	units	*6.5-9*	7.8		6.7		6.9		6.5	
TDS (calculated)	mg/L		161	169	143	152	134	135	135	132
Total Suspended Solids	mg/L		4	<1	2	2	3	6	2	4
Dissolved Anions										
Hardness, Total ($CaCO_3$)	mg/L		53.1	53.3	44.3	49.6	42.9	43.3	44.6	44.6
Alkalinity, Total ($CaCO_3$)	mg/L		32.0	33.6	28.8	32.4	28.0	28.0	27.9	28.1
Chloride (Cl)	mg/L		77.6	79.0	72.2	73.3	64.5	65.1	64.4	65.0
Fluoride (F)	mg/L		0.06	0.06	0.18	0.14	0.06	0.05	0.05	0.05
Sulphate (SO_4)	mg/L		<3	6	<3	<3	<3	<3	4	<3
Sulphide	mg/L		0.000	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nutrients										
Phosphorous, Total	mg/L		***0.047***	0.013	0.022	0.022	0.027	0.028	0.028	0.027
Ammonia-N	mg/L	*0.572**	0.030	0.018	0.013	0.020	0.009	0.009	0.010	0.009
Nitrite-N	mg/L	*0.06*	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.046	0.187	<0.005	0.009	<0.005	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.75	0.33	0.51	0.55	0.50	0.49	0.53	0.52
Total Metals										
Aluminum (Al)	µg/L	*5-100*	7.2	14.1	30.1	27.1	71.0	79.8	64.1	89.6
Antimony (Sb)	µg/L		0.0224	0.0235	0.0161	0.0173	0.0141	0.0140	0.0225	0.0143
Arsenic (As)	µg/L	*5*	0.528	0.585	0.453	0.585	0.374	0.389	0.400	0.376
Barium (Ba)	µg/L		3.42	2.91	2.84	3.43	3.17	3.27	3.23	3.28
Beryllium (Be)	µg/L		0.004	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	0.005
Bismuth (Bi)	µg/L		0.001	0.001	0.007	<0.001	0.002	<0.001	<0.001	<0.001
Boron (B)	µg/L		27.1	27.7	23.5	25.0	20.2	23.8	23.7	24.3
Cadmium (Cd)	µg/L	*0.017*	<0.002	0.004	0.005	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium (Ca)	µg/L		8.93	8.92	7.3	8.11	6.99	7.01	7.22	7.28
Chromium (Cr)	µg/L		0.855	0.782	0.237	0.193	0.187	0.227	0.280	0.450
Cobalt (Co)	µg/L		0.0286	0.0176	0.0288	0.0510	0.0263	0.0272	0.0363	0.0421
Copper (Cu)	µg/L	*2*	1.58	***2.24***	1.26	1.51	***2.10***	1.28	1.70	1.63
Iron (Fe)	µg/L	*300*	<2	20.2	60.5	292	89	98.3	66.1	86.5
Lead (Pb)	µg/L	*1*	0.0383	0.0393	0.0353	0.0217	0.0313	0.0248	0.0772	0.0604
Magnesium (Mg)	mg/L		7.86	8.03	6.67	7.37	6.02	6.27	7.04	6.92
Manganese (Mn)	µg/L		2.42	28.1	25.3	90.9	13.7	14.6	12.3	13
Molybdenum (Mo)	µg/L	*73*	0.163	0.144	0.137	0.157	0.132	0.128	0.164	0.133
Mercury (Hg)	ng/L	*26*	6.8	<0.6	1.3	<0.6	1.3	1.5	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.373	0.285	0.335	0.312	0.376	0.387	0.476	0.419
Potassium (K)	µg/L		2950	2900	2410	2700	2220	2230	2400	2350
Selenium (Se)	µg/L	*1*	***1.13***	***1.43***	0.91	***1.20***	0.68	0.84	0.49	0.71
Silver (Ag)	µg/L	*0.1*	0.0023	0.0018	0.0018	<0.0005	<0.0005	<0.0005	<0.0005	0.0009
Sodium (Na)	µg/L		40800	41600	33700	38100	29900	38.2	32100	31900
Strontium (Sr)	µg/L		47.2	48.1	40.3	44.5	0.0	38.5	39.5	39.1
Thallium (Tl)	µg/L		<0.0003	<0.0003	0.0056	0.0047	0.0029	0.0021	0.0022	<0.0003
Tin (Sn)	µg/L		0.70	2.95	0.08	1.11	1.00	0.41	0.60	0.76
Uranium (U)	µg/L		0.0273	0.0251	0.0294	0.0308	0.0214	0.0210	0.0328	0.0319
Vanadium (V)	µg/L		0.201	0.149	0.028	0.019	0.138	0.123	0.138	0.252
Zinc (Zn)	µg/L	*30*	2.05	4.17	1.04	1.64	1.50	0.77	1.31	1.46
Dissolved Metals										
Aluminum	µg/L	*5-100*	0.5	1.2	2.5	1.8	0.3	0.3	3.0	2.4
Antimony	µg/L		0.0222	0.0233	0.0159	0.0171	0.0140	0.0139	0.0223	0.0142
Arsenic	µg/L	*5*	0.490	0.494	0.389	0.526	0.299	0.347	0.357	0.342
Barium	µg/L		3.24	2.64	2.39	2.75	2.24	2.09	2.2	2.21
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron	µg/L		25.4	25.6	22.5	24.7	19.0	20.2	20.9	21.3
Cadmium	µg/L	*0.017*	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		8.48	8.54	7.21	7.96	6.90	6.75	6.76	7.03
Chromium	µg/L		0.846	0.774	0.235	0.191	0.185	0.215	0.158	0.350
Cobalt	µg/L		0.019	0.014	0.012	0.014	<0.001	<0.001	0.008	0.011
Copper	µg/L	*2.0*	1.6	2.0	1.2	1.3	1.5	1.1	1.4	1.3
Iron	µg/L	*300*	<2	<2	8.0	62.2	2.4	<2	<2	<2
Lead	µg/L	*1*	0.011	0.012	0.035	0.009	<0.001	<0.001	0.076	0.060
Magnesium	mg/L		7.49	7.64	6.55	7.37	5.99	6.00	6.58	6.71
Manganese	µg/L		0.914	2.810	8.040	11.100	<0.003	<0.003	0.084	0.037
Molybdenum	µg/L	*73*	0.158	0.142	0.127	0.137	0.124	0.118	0.126	0.115
Nickel	µg/L	*25*	0.098	0.282	0.167	0.175	0.163	0.147	0.135	0.124
Potassium	µg/L		2810	2780	2350	2690	2150	2110	2210	2230
Selenium	µg/L	*1*	0.992	***1.130***	0.787	***1.190***	0.579	0.570	0.408	0.635
Silver	µg/L	*0.1*	0.0014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Sodium	µg/L		38600	39900	33100	37000	29700	30300	30400	31100
Strontium	µg/L		46.1	47.6	39.9	43.7	38.2	37.3	37.4	37.8
Uranium	µg/L		0.021	0.017	0.022	0.023	0.012	0.013	0.023	0.023
Vanadium	µg/L		0.20	0.15	<0.01	0.02	0.10	0.07	0.04	0.11
Zinc	µg/L	*30*	2.03	4.13	0.83	1.62	1.13	0.76	1.03	1.45
Ion Balance										
Ion Balance			1.05	1.00	0.93	1.01	1.01	1.01	0.98	0.97
Anions	meq/L		2.88	3.04	2.66	2.76	2.42	2.44	2.47	2.44
Cations	meq/L		3.02	3.05	2.49	2.78	2.46	2.46	2.42	2.36
Other										
Color, True	TCU		8	8	13	13	12	12	13	9
Cyanide, Total	mg/L		0.002	<0.001	<0.001	0.002	<0.001	0.002	<0.001	<0.001
Dissolved Organic Carbon	mg/L		6.4	4.8	4.9	5.0	5.6	5.5	5.4	5.4
Carbon Part	mg/L		1.29	0.19	0.50	0.52	1.13	1.12	1.96	1.96

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Tail Lake							
			22-May-07		15-Jul-07		16-Aug-07		13-Sep-07	
			Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
Physical										
Conductivity	µS/cm		257	256	154	158	159	159	150	151
pH	units	*6.5-9*	7.3		7.1		6.8		nd	
TDS (calculated)	mg/L		135	135	74	77	79	80	75	75
Total Suspended Solids	mg/L		<1	<1	1	1	<1	<1	<1	<1
Dissolved Anions										
Hardness, Total ($CaCO_3$)	mg/L		58.1	58.3	31.6	33.0	32.5	33.1	33.6	33.6
Alkalinity, Total ($CaCO_3$)	mg/L		46.5	46.3	26.3	26.7	27.2	27.2	27.1	27.2
Chloride (Cl)	mg/L		52.8	52.6	28.4	30.0	31.1	30.9	30.1	30.5
Fluoride (F)	mg/L		0.08	0.08	0.10	0.18	0.05	0.05	0.06	0.06
Sulphate (SO_4)	mg/L		4	3	<3	<3	<3	3	<3	<3
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nutrients										
Phosphorous, Total	mg/L		0.009	0.008	0.007	0.018	0.011	0.011	0.008	0.007
Ammonia-N	mg/L	*0.572**	0.018	0.023	0.010	0.010	0.008	0.009	0.010	0.009
Nitrite-N	mg/L	*0.06*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.024	0.018	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.39	0.39	0.30	0.38	0.32	0.28	0.30	0.37
Total Metals										
Aluminum (Al)	µg/L	*5-100*	41.0	16.6	30.6	40.8	67.9	70.9	49.5	55.2
Antimony (Sb)	µg/L		0.0262	0.0183	0.0106	0.0112	0.0096	0.0096	0.0108	0.0123
Arsenic (As)	µg/L	*5*	0.418	0.438	0.263	0.285	0.222	0.237	0.243	0.229
Barium (Ba)	µg/L		3.07	2.53	1.82	1.88	1.93	2.01	1.79	1.83
Beryllium (Be)	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	<0.003
Bismuth (Bi)	µg/L		0.007	0.008	<0.001	<0.001	<0.001	<0.001	0.003	0.004
Boron (B)	µg/L		23.1	24.4	14.4	14.9	14.4	14.5	19.6	14.7
Cadmium (Cd)	µg/L	*0.017*	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
Calcium (Ca)	µg/L		10.1	10.1	5.56	5.72	5.65	5.62	5.57	5.54
Chromium (Cr)	µg/L		0.226	0.145	0.279	0.201	0.192	0.224	0.185	0.195
Cobalt (Co)	µg/L		0.0245	0.0121	0.0229	0.0288	0.0172	0.0157	0.0155	0.0208
Copper (Cu)	µg/L	*2*	1.75	1.51	1.10	0.96	0.94	1.66	1.27	1.31
Iron (Fe)	µg/L	*300*	86.2	87.5	80.8	126	76.5	74.7	55.2	56.2
Lead (Pb)	µg/L	*1*	0.0981	0.0193	0.0253	0.0425	0.0215	0.0212	0.0308	0.0299
Magnesium (Mg)	mg/L		8.31	8.41	4.85	4.84	4.95	5.00	5.26	5.18
Manganese (Mn)	µg/L		6.25	10.1	12.3	27.8	4.22	4.03	2.94	2.85
Molybdenum (Mo)	µg/L	*73*	0.161	0.147	0.085	0.100	0.110	0.108	0.105	0.136
Mercury (Hg)	ng/L	*26*	0.7	<0.6	4.9	<0.6	<0.6	<0.6	1.0	1.5
Nickel (Ni)	µg/L	*25*	0.794	0.639	0.515	0.496	0.458	0.445	0.499	0.492
Potassium (K)	µg/L		2530	2510	1470	1570	1500	1500	1480	1470
Selenium (Se)	µg/L	*1*	0.83	0.91	0.55	0.54	0.45	0.25	0.21	0.12
Silver (Ag)	µg/L	*0.1*	0.0047	0.0026	<0.0005	<0.0005	<0.0005	<0.0005	0.0062	0.0047
Sodium (Na)	µg/L		28100	28600	15500	16000	15900	16400	15400	15300
Strontium (Sr)	µg/L		40.6	40.6	23.6	23.9	23.4	23.6	23.0	22.9
Thallium (Tl)	µg/L		<0.0003	<0.0003	0.0076	0.0069	0.0008	0.0006	0.0017	0.0019
Tin (Sn)	µg/L		2.72	0.38	2.98	1.13	0.56	1.77	0.60	0.90
Uranium (U)	µg/L		0.0275	0.0267	0.0209	0.0211	0.0158	0.0160	0.0259	0.0249
Vanadium (V)	µg/L		0.044	0.030	0.053	0.066	0.140	0.131	0.097	0.181
Zinc (Zn)	µg/L	*30*	2.58	1.10	4.04	1.50	1.03	1.01	1.86	1.06
Dissolved Metals										
Aluminum	µg/L	*5-100*	2.6	3.0	7.0	5.8	8.6	9.3	14.4	14.8
Antimony	µg/L		0.0259	0.0181	0.0105	0.0111	0.0095	0.0095	0.0107	0.0122
Arsenic	µg/L	*5*	0.379	0.401	0.238	0.238	0.191	0.189	0.225	0.198
Barium	µg/L		2.46	2.31	1.41	1.42	1.24	1.25	1.36	1.31
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.0032	<0.003
Boron	µg/L		22.1	22.3	13.0	14.0	13.4	13.6	12.8	12.7
Cadmium	µg/L	*0.017*	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
Calcium	mg/L		9.84	9.69	5.37	5.55	5.45	5.42	5.36	5.37
Chromium	µg/L		0.222	0.111	0.276	0.199	0.190	0.129	0.183	0.193
Cobalt	µg/L		0.012	0.012	0.009	0.012	<0.001	<0.001	0.012	0.010
Copper	µg/L	*2.0*	1.7	1.4	1.0	0.9	0.9	1.4	1.1	1.2
Iron	µg/L	*300*	14.5	19.5	21.6	21.4	13.1	13.5	14.9	15.8
Lead	µg/L	*1*	0.097	0.007	0.010	0.008	<0.001	<0.001	0.012	0.015
Magnesium	mg/L		8.07	8.11	4.52	4.72	4.84	4.81	5.05	5.02
Manganese	µg/L		0.612	0.829	0.932	0.843	0.204	0.376	0.829	0.883
Molybdenum	µg/L	*73*	0.146	0.138	0.080	0.081	0.110	0.103	0.099	0.118
Nickel	µg/L	*25*	0.704	0.597	0.457	0.449	0.393	0.408	0.428	0.471
Potassium	µg/L		2450	2410	1430	1490	1440	1430	1420	1420
Selenium	µg/L	*1*	0.676	0.696	0.443	0.431	0.207	0.249	0.133	0.115
Silver	µg/L	*0.1*	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0046	0.0046
Sodium	µg/L		27500	27800	14700	15400	15700	15800	15000	14900
Strontium	µg/L		40.2	39.8	21.7	23.7	23.2	23.6	22.8	22.7
Uranium	µg/L		0.022	0.020	0.016	0.016	0.011	0.012	0.020	0.021
Vanadium	µg/L		0.02	<0.01	0.05	0.07	0.08	0.05	0.05	0.04
Zinc	µg/L	*30*	2.55	1.09	1.20	1.39	1.02	1.00	1.19	1.05
Ion Balance										
Ion Balance			1.02	1.03	1.02	1.02	1.01	1.00	0.95	0.93
Anions	meq/L		2.50	2.49	1.37	1.43	1.46	1.48	1.43	1.45
Cations	meq/L		2.54	2.57	1.40	1.46	1.47	1.49	1.36	1.34
Other										
Color, True	TCU		8	8	13	13	10	10	13	13
Cyanide, Total	mg/L		0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		7.1	6.6	4.5	5.1	5.0	5.0	5.6	5.3
Carbon Part	mg/L		0.18	0.14	0.26	0.44	0.24	0.19	0.15	0.19

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Roberts Lake							
			24-May-07		15-Jul-07		18-Aug-07		14-Sep-07	
			Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
Physical										
Conductivity	µS/cm		318	339	199	310	253	252	250	250
pH	units	*6.5-9*	7.3		***6.1***		6.9		nd	
TDS (calculated)	mg/L		164	177	98	147	122	127	129	128
Total Suspended Solids	mg/L		1	<1	1	1	2	2	2	2
Dissolved Anions										
Hardness, Total ($CaCO_3$)	mg/L		48.3	51.4	28.5	40.6	37.2	37.0	39.5	39.6
Alkalinity, Total ($CaCO_3$)	mg/L		28.8	29.9	16.7	23.7	14.2	21.8	22.0	22.0
Chloride (Cl)	mg/L		77.4	84.4	47.0	74.4	60.9	61.1	64.3	63.0
Fluoride (F)	mg/L		0.05	0.05	0.11	0.11	0.04	0.04	0.04	0.04
Sulphate (SO_4)	mg/L		7	8	5	4	5	6	6	6
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Nutrients										
Phosphorous, Total	mg/L		0.023	0.020	0.015	0.016	0.017	0.018	0.015	0.016
Ammonia-N	mg/L	*0.572**	0.016	0.031	0.008	0.009	0.008	0.009	0.006	0.008
Nitrite-N	mg/L	*0.06*	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.032	0.054	<0.005	0.007	<0.005	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.34	0.30	0.31	0.37	0.28	0.34	0.30	0.32
Total Metals										
Aluminum (Al)	µg/L	*5-100*	***153***	***153***	***128***	60.2	***139***	***125***	73.8	72.8
Antimony (Sb)	µg/L		0.0205	0.0200	0.0126	0.0150	0.0162	0.0139	0.0174	0.0156
Arsenic (As)	µg/L	*5*	0.593	0.705	0.398	0.513	0.416	0.386	0.358	0.391
Barium (Ba)	µg/L		5.37	5.85	3.35	3.63	3.84	3.61	3.11	3.14
Beryllium (Be)	µg/L		0.005	0.004	0.004	<0.003	0.005	0.009	<0.003	0.004
Bismuth (Bi)	µg/L		0.002	0.002	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Boron (B)	µg/L		34.7	35.6	18.6	25.5	25.8	23.6	23.9	26.2
Cadmium (Cd)	µg/L	*0.017*	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium (Ca)	µg/L		7.51	7.76	3.89	5.64	5.49	5.32	5.46	5.55
Chromium (Cr)	µg/L		0.261	0.308	0.383	0.285	0.305	0.285	0.253	0.270
Cobalt (Co)	µg/L		0.0447	0.0553	0.0487	0.0557	0.0384	0.0340	0.0259	0.0273
Copper (Cu)	µg/L	*2*	1.87	1.87	1.18	1.49	1.82	***2.12***	1.34	1.48
Iron (Fe)	µg/L	*300*	119	150	161	135	119	112	59.5	61.2
Lead (Pb)	µg/L	*1*	0.0489	0.0459	0.0557	0.0402	0.0449	0.0415	0.0642	0.0393
Magnesium (Mg)	mg/L		8.05	8.41	4.73	6.49	6.28	6.13	6.72	6.91
Manganese (Mn)	µg/L		7.35	15.5	10.3	31.5	5.2	4.83	2.93	2.97
Molybdenum (Mo)	µg/L	*73*	0.206	0.187	0.141	0.148	0.185	0.180	0.194	0.189
Mercury (Hg)	ng/L	*26*	1.6	2.2	2.1	<0.6	<0.6	<0.6	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.479	0.528	0.491	0.463	0.456	0.454	0.449	0.481
Potassium (K)	µg/L		2880	3010	1550	2190	2060	1960	2050	2090
Selenium (Se)	µg/L	*1*	***1.20***	***1.58***	0.83	***1.03***	0.71	0.59	0.60	0.47
Silver (Ag)	µg/L	*0.1*	0.0021	0.0035	<0.0005	<0.0005	<0.0005	<0.0005	0.0025	<0.0005
Sodium (Na)	µg/L		44200	46900	23500	34500	31900	30300	31700	32400
Strontium (Sr)	µg/L		49.0	50.9	28.7	40.9	38.2	37.7	38.1	38.7
Thallium (Tl)	µg/L		<0.0003	<0.0003	0.0072	0.0062	0.0026	0.0023	0.0024	0.0021
Tin (Sn)	µg/L		0.39	0.17	1.34	2.01	2.40	1.34	0.13	0.30
Uranium (U)	µg/L		0.0446	0.0433	0.0412	0.0410	0.0514	0.0466	0.0432	0.0445
Vanadium (V)	µg/L		0.169	0.157	0.203	0.046	0.245	0.208	0.118	0.126
Zinc (Zn)	µg/L	*30*	0.85	3.34	1.76	1.81	0.92	1.78	5.56	1.84
Dissolved Metals										
Aluminum	µg/L	*5-100*	7.1	8.4	***14.8***	7.8	9.0	9.2	12.1	12.8
Antimony	µg/L		0.0203	0.0198	0.0125	0.0149	0.0160	0.0138	0.0172	0.0154
Arsenic	µg/L	*5*	0.503	0.556	0.334	0.410	0.325	0.282	0.351	0.360
Barium	µg/L		3.68	4.35	1.96	2.74	2.22	2.11	2.3	2.34
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron	µg/L		32.8	35.4	17.3	23.9	23.8	22.2	23.9	23.4
Cadmium	µg/L	*0.017*	<0.002	<0.002	<0.002	0.006	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		7.14	7.57	3.76	5.52	5.23	5.17	5.32	5.34
Chromium	µg/L		0.097	0.278	0.344	0.282	0.121	0.168	0.193	0.190
Cobalt	µg/L		0.009	0.013	0.013	0.027	<0.001	<0.001	0.007	0.010
Copper	µg/L	*2.0*	1.7	1.6	1.1	1.3	1.5	1.7	1.2	1.3
Iron	µg/L	*300*	<2	<2	42.8	58.2	7.6	8.9	8.8	8.7
Lead	µg/L	*1*	0.016	0.006	0.016	0.013	0.002	<0.001	0.014	0.017
Magnesium	mg/L		7.71	8.25	4.65	6.34	6.15	5.84	6.67	6.66
Manganese	µg/L		4.360	10.100	0.610	24.100	0.003	0.018	0.156	0.170
Molybdenum	µg/L	*73*	0.185	0.178	0.125	0.147	0.184	0.179	0.180	0.188
Nickel	µg/L	*25*	0.374	0.384	0.341	0.372	0.322	0.331	0.330	0.328
Potassium	µg/L		2720	2880	1480	2080	1910	1840	2000	2000
Selenium	µg/L	*1*	***1.200***	***1.260***	0.643	0.911	0.650	0.478	0.590	0.469
Silver	µg/L	*0.1*	0.0014	0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Sodium	µg/L		42400	45900	23000	33700	31000	29100	31700	31500
Strontium	µg/L		46.2	49.7	28.4	39.3	37.8	36.6	37.0	38.1
Uranium	µg/L		0.031	0.029	0.030	0.032	0.028	0.027	0.032	0.034
Vanadium	µg/L		<0.01	0.01	0.08	0.01	0.04	0.05	0.03	0.01
Zinc	µg/L	*30*	0.84	2.90	1.74	1.16	0.91	1.76	5.50	1.71
Ion Balance										
Ion Balance			1.03	1.03	0.99	0.97	1.09	0.99	0.94	0.95
Anions	meq/L		2.91	3.14	1.76	2.66	2.10	2.29	2.38	2.34
Cations	meq/L		2.99	3.23	1.74	2.59	2.28	2.27	2.23	2.22
Other										
Color, True	TCU		8	8	13	18	16	9	11	11
Cyanide, Total	mg/L		<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		4.3	4.3	3.4	4.2	4.5	4.2	4.6	4.8
Carbon Part	mg/L		0.16	0.20	0.38	0.40	0.49	0.43	0.77	0.77

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Little Roberts Lake			
			24-May-07	15-Jul-07	18-Aug-07	14-Sep-07
Physical						
Conductivity	µS/cm		1160	256	273	260
pH	units	*6.5-9*	6.7	6.8	6.9	nd
TDS (calculated)	mg/L		613	122	134	134
Total Suspended Solids	mg/L		11	1	3	3
Dissolved Anions						
Hardness, Total ($CaCO_3$)	mg/L		192.0	38.6	44.0	42.5
Alkalinity, Total ($CaCO_3$)	mg/L		105.0	23.6	25.8	25.1
Chloride (Cl)	mg/L		306.0	58.9	64.1	65.4
Fluoride (F)	mg/L		0.13	0.15	0.04	0.05
Sulphate (SO_4)	mg/L		14	4	5	6
Sulphide	mg/L		0.005	<0.001	<0.001	<0.001
Nutrients						
Phosphorous, Total	mg/L		***0.045***	0.018	0.020	0.019
Ammonia-N	mg/L	*0.572**	0.240	0.011	0.008	0.006
Nitrite-N	mg/L	*0.06*	0.008	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.028	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		1.02	0.41	0.41	0.38
Total Metals						
Aluminum (Al)	µg/L	*5-100*	***112***	73.3	***117***	41.5
Antimony (Sb)	µg/L		0.0459	0.0130	0.0159	0.0297
Arsenic (As)	µg/L	*5*	2.310	0.440	0.414	0.393
Barium (Ba)	µg/L		17.60	3.17	4.14	2.96
Beryllium (Be)	µg/L		0.005	0.005	0.003	<0.003
Bismuth (Bi)	µg/L		0.004	0.004	0.005	<0.001
Boron (B)	µg/L		76.9	20.8	23.7	24.5
Cadmium (Cd)	µg/L	*0.017*	<0.002	<0.002	<0.002	0.002
Calcium (Ca)	µg/L		28.8	6.14	7.25	6.58
Chromium (Cr)	µg/L		0.465	0.279	0.270	0.253
Cobalt (Co)	µg/L		0.6200	0.0474	0.0398	0.0354
Copper (Cu)	µg/L	*2*	***2.43***	1.35	***2.50***	1.37
Iron (Fe)	µg/L	*300*	***1700***	111	120	60
Lead (Pb)	µg/L	*1*	0.0819	0.0413	0.0439	0.0414
Magnesium (Mg)	mg/L		28.50	6.19	6.58	7.09
Manganese (Mn)	µg/L		639	10.7	7.94	5.32
Molybdenum (Mo)	µg/L	*73*	0.233	0.134	0.190	0.237
Mercury (Hg)	ng/L	*26*	4.3	2.9	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.922	0.392	0.485	0.442
Potassium (K)	µg/L		8420	2140	2130	2240
Selenium (Se)	µg/L	*1*	***6.57***	0.99	0.85	0.53
Silver (Ag)	µg/L	*0.1*	0.0037	0.0014	<0.0005	0.0026
Sodium (Na)	µg/L		158000	31400	31800	32500
Strontium (Sr)	µg/L		200.0	37.1	45.0	40.5
Thallium (Tl)	µg/L		0.0006	0.0063	0.0030	0.0016
Tin (Sn)	µg/L		1.66	0.31	1.44	0.45
Uranium (U)	µg/L		0.0696	0.0347	0.0383	0.0360
Vanadium (V)	µg/L		0.093	0.123	0.198	0.093
Zinc (Zn)	µg/L	*30*	2.46	0.91	1.07	0.95
Dissolved Metals						
Aluminum	µg/L	*5-100*	1.4	7.8	10.8	7.4
Antimony	µg/L		0.0454	0.0129	0.0157	0.0294
Arsenic	µg/L	*5*	1.520	0.397	0.326	0.342
Barium	µg/L		14.9	2.16	2.64	2.34
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003
Boron	µg/L		74.8	19.8	22.0	21.9
Cadmium	µg/L	*0.017*	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		27.50	5.82	7.04	6.27
Chromium	µg/L		0.399	0.277	0.212	0.215
Cobalt	µg/L		0.088	0.013	<0.001	0.010
Copper	µg/L	*2.0*	***2.2***	1.2	1.9	1.3
Iron	µg/L	*300*	255.0	26.7	17.2	5.5
Lead	µg/L	*1*	0.019	0.041	0.001	0.018
Magnesium	mg/L		27.10	6.00	6.39	6.74
Manganese	µg/L		400.000	1.260	0.103	0.164
Molybdenum	µg/L	*73*	0.176	0.133	0.163	0.151
Nickel	µg/L	*25*	0.809	0.298	0.354	0.271
Potassium	µg/L		8050	2000	2020	2110
Selenium	µg/L	*1*	***3.970***	0.948	0.646	0.345
Silver	µg/L	*0.1*	0.0018	<0.0005	<0.0005	<0.0005
Sodium	µg/L		151000	29600	30600	31200
Strontium	µg/L		197.0	36.0	42.8	39.4
Uranium	µg/L		0.049	0.028	0.019	0.027
Vanadium	µg/L		<0.01	0.05	0.05	<0.01
Zinc	µg/L	*30*	2.44	0.90	1.06	0.94
Ion Balance						
Ion Balance			1.01	1.00	1.00	0.95
Anions	meq/L		11.00	2.21	2.42	2.46
Cations	meq/L		11.20	2.22	2.42	2.35
Other						
Color, True	TCU		24	13	12	13
Cyanide, Total	mg/L		0.002	<0.001	0.001	<0.001
Dissolved Organic Carbon	mg/L		9.6	4.2	5.2	5.1
Carbon Part	mg/L		1.04	0.53	0.73	1.15

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Doris Outflow					
			20-Jun-07	07-Jul-07	14-Jul-07	21-Jul-07	27-Jul-07	04-Aug-07
Physical								
Conductivity	µS/cm		199	209	324	220	279	268
pH	units	*6.5-9*	7.1	***6.1***	6.8	7.0	***5.7***	6.7
TDS (calculated)	mg/L		95	107	151	113	143	136
Total Suspended Solids	mg/L		<1	3	2	3	2	2
Dissolved Anions								
Hardness, Total ($CaCO_3$)	mg/L		55.1	34.5	50.0	36.2	45.6	43.5
Alkalinity, Total ($CaCO_3$)	mg/L		19.3	21.3	32.8	23.2	28.8	28.6
Chloride (Cl)	mg/L		43.9	48.8	73.3	56.3	72.6	64.7
Fluoride (F)	mg/L		0.04	0.10	0.13	0.05	0.06	0.05
Sulphate (SO_4)	mg/L		7	7	<3	<3	<3	3
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nutrients								
Phosphorous, Total	mg/L		0.000	0.018	0.027	0.020	0.025	0.029
Ammonia-N	mg/L	*0.572**	0.036	0.011	0.011	0.019	0.020	0.017
Nitrite-N	mg/L	*0.06*	0.003	<0.001	<0.001	<0.001	0.002	<0.001
Nitrate-N	mg/L	*13*	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.52	0.42	0.58	0.40	0.49	0.52
Total Metals								
Aluminum (Al)	µg/L	*5-100*	66.4	***78.5***	37.5	90.8	***50.3***	43.9
Antimony (Sb)	µg/L		0.0086	0.0106	0.0159	0.0090	0.0127	0.0139
Arsenic (As)	µg/L	*5*	0.208	0.325	0.535	0.397	0.469	0.426
Barium (Ba)	µg/L		5.90	2.71	3.28	3.03	3.03	2.97
Beryllium (Be)	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	0.003
Bismuth (Bi)	µg/L		0.001	<0.001	0.001	0.002	0.001	<0.001
Boron (B)	µg/L		19.7	16.5	25.2	17.4	21.6	23.9
Cadmium (Cd)	µg/L	*0.017*	0.012	0.014	0.003	<0.002	<0.002	<0.002
Calcium (Ca)	µg/L		14.4	5.28	8.19	5.76	7.09	7.37
Chromium (Cr)	µg/L		0.239	0.293	0.238	0.362	0.272	0.331
Cobalt (Co)	µg/L		0.0785	0.0422	0.0388	0.0685	0.0432	0.0278
Copper (Cu)	µg/L	*2*	***3.31***	1.24	1.40	1.08	1.50	1.27
Iron (Fe)	µg/L	*300*	73.8	104	92.7	148	141	95.6
Lead (Pb)	µg/L	*1*	0.0198	0.0499	0.0248	0.0273	0.0231	0.0198
Magnesium (Mg)	mg/L		5.62	4.99	7.68	5.07	6.46	6.89
Manganese (Mn)	µg/L		23.4	15.8	32	21.8	24.3	19.6
Molybdenum (Mo)	µg/L	*73*	0.172	0.105	0.135	0.102	0.124	0.152
Mercury (Hg)	ng/L	*26*	2.8	1.4	<0.6	1.0	<0.6	1.2
Nickel (Ni)	µg/L	*25*	0.983	0.536	0.353	0.372	0.358	0.399
Potassium (K)	µg/L		1960	1800	2710	1840	2330	2420
Selenium (Se)	µg/L	*1*	0.45	0.62	***1.21***	0.88	***1.25***	0.78
Silver (Ag)	µg/L	*0.1*	0.0069	<0.0005	0.0010	0.0025	0.0013	<0.0005
Sodium (Na)	µg/L		10400	23500	38700	25300	33200	35100
Strontium (Sr)	µg/L		99.3	29.8	44.5	31.8	40.0	41.8
Thallium (Tl)	µg/L		0.0048	0.0068	0.0045	0.0044	0.0034	<0.0003
Tin (Sn)	µg/L		<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Uranium (U)	µg/L		0.0229	0.0259	0.0288	0.0247	0.0244	0.0227
Vanadium (V)	µg/L		0.160	0.124	0.073	0.195	0.107	0.122
Zinc (Zn)	µg/L	*30*	4.46	1.51	1.88	1.03	1.47	3.71
Dissolved Metals								
Aluminum	µg/L	*5-100*	22.4	***9.1***	1.5	2.7	2.0	<0.2
Antimony	µg/L		0.0085	0.0105	0.0157	0.0089	0.0126	0.0138
Arsenic	µg/L	*5*	0.133	0.288	0.470	0.305	0.361	0.397
Barium	µg/L		5.05	1.78	2.72	1.87	2.24	2.34
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron	µg/L		18.1	15.8	24.1	16.4	19.7	20.7
Cadmium	µg/L	*0.017*	0.007	0.014	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		13.90	5.24	8.14	5.51	6.79	7.05
Chromium	µg/L		0.237	0.279	0.236	0.231	0.269	0.213
Cobalt	µg/L		0.039	0.017	0.017	0.013	0.017	0.001
Copper	µg/L	*2.0*	3.1	1.2	1.3	1.1	1.1	1.2
Iron	µg/L	*300*	44.7	25.4	6.6	9.4	17.3	5.7
Lead	µg/L	*1*	0.012	0.041	0.012	0.005	<0.001	<0.001
Magnesium	mg/L		5.39	4.89	7.47	4.96	6.09	6.49
Manganese	µg/L		3.820	2.810	10.900	0.261	0.311	0.058
Molybdenum	µg/L	*73*	0.160	0.104	0.135	0.089	0.119	0.128
Nickel	µg/L	*25*	0.901	0.366	0.171	0.201	0.231	0.222
Potassium	µg/L		1880	1750	2640	1750	2160	2270
Selenium	µg/L	*1*	0.235	0.569	***1.130***	0.725	0.848	0.770
Silver	µg/L	*0.1*	0.0036	<0.0005	<0.0005	0.0025	0.0013	<0.0005
Sodium	µg/L		10000	23300	38300	24900	30900	33000
Strontium	µg/L		96.5	29.7	43.8	31.5	39.7	41.4
Uranium	µg/L		0.020	0.019	0.022	0.015	0.017	0.013
Vanadium	µg/L		0.11	0.05	0.03	0.02	0.02	0.03
Zinc	µg/L	*30*	3.27	1.49	1.86	0.54	1.35	2.88
Ion Balance								
Ion Balance			0.95	0.97	0.98	0.94	0.93	1.00
Anions	meq/L		1.76	1.94	2.77	2.10	2.67	2.46
Cations	meq/L		1.67	1.88	2.72	1.97	2.48	2.46
Other								
Color, True	TCU		69	15	12	11	11	14
Cyanide, Total	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		9.9	5.1	5.1	4.2	4.7	4.5
Carbon Part	mg/L		0.17	0.40	0.40	0.43	0.82	0.96

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Doris Outflow					
			12-Aug-07	18-Aug-07	25-Aug-07	31-Aug-07	09-Sep-07	16-Sep-07
Physical								
Conductivity	µS/cm		259	273	269	273	266	259
pH	units	*6.5-9*	***6.2***	7.0	6.7	nd	6.5	7.0
TDS (calculated)	mg/L		135	134	127	128	133	130
Total Suspended Solids	mg/L		3	3	4	8	3	5
Dissolved Anions								
Hardness, Total ($CaCO_3$)	mg/L		45.1	44.2	41.2	42.2	42.3	45.1
Alkalinity, Total ($CaCO_3$)	mg/L		28.9	27.6	28.3	28.6	28.3	28.1
Chloride (Cl)	mg/L		65.0	64.8	64.6	65.0	65.4	63.8
Fluoride (F)	mg/L		0.05	0.05	0.05	0.05	0.05	0.05
Sulphate (SO_4)	mg/L		<3	<3	<3	<3	<3	3
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nutrients								
Phosphorous, Total	mg/L		***0.037***	***0.040***	0.027	0.030	0.027	0.028
Ammonia-N	mg/L	*0.572**	0.009	0.008	0.009	0.006	0.008	0.007
Nitrite-N	mg/L	*0.06*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.55	0.50	0.53	0.54	0.53	0.52
Total Metals								
Aluminum (Al)	µg/L	*5-100*	***67.0***	66.3	46.4	***159***	41.3	50.9
Antimony (Sb)	µg/L		0.0142	0.0138	0.0137	0.0128	0.0130	0.0150
Arsenic (As)	µg/L	*5*	0.445	0.356	0.419	0.441	0.477	0.396
Barium (Ba)	µg/L		3.39	3.21	3.00	4.20	3.10	3.00
Beryllium (Be)	µg/L		0.007	<0.003	0.003	0.010	<0.003	<0.003
Bismuth (Bi)	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	µg/L		28.5	22.5	20.7	20.9	24.8	25.2
Cadmium (Cd)	µg/L	*0.017*	0.003	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium (Ca)	µg/L		7.79	7.4	7.17	7.33	6.95	7.26
Chromium (Cr)	µg/L		0.169	0.202	2.280	0.510	0.390	0.238
Cobalt (Co)	µg/L		0.0366	0.0351	0.0313	0.0800	0.0428	0.0384
Copper (Cu)	µg/L	*2*	1.33	1.25	1.28	1.31	1.33	1.27
Iron (Fe)	µg/L	*300*	105	91.1	62	175	60.4	58.1
Lead (Pb)	µg/L	*1*	0.0180	0.0283	0.0212	0.0491	0.0367	0.1240
Magnesium (Mg)	mg/L		7.07	6.62	6.20	6.34	6.91	7.06
Manganese (Mn)	µg/L		18.4	13.7	11	20.2	11.1	11.6
Molybdenum (Mo)	µg/L	*73*	0.125	0.135	0.116	0.126	0.108	0.163
Mercury (Hg)	ng/L	*26*	<0.6	1.1	<0.6	1.1	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.419	0.424	0.288	0.491	0.482	0.414
Potassium (K)	µg/L		2400	2280	2220	2340	2340	2340
Selenium (Se)	µg/L	*1*	1.00	0.81	0.70	0.77	0.93	0.64
Silver (Ag)	µg/L	*0.1*	<0.0005	<0.0005	0.0008	<0.0005	0.0009	0.0042
Sodium (Na)	µg/L		35200	31600	30700	31900	34500	31900
Strontium (Sr)	µg/L		45.0	41.7	39.3	40.1	39.2	39.8
Thallium (Tl)	µg/L		<0.0003	0.0017	0.0007	0.0013	<0.0003	0.0020
Tin (Sn)	µg/L		0.32	0.09	0.09	<0.03	<0.03	<0.03
Uranium (U)	µg/L		0.0193	0.0304	0.0275	0.0322	0.0304	0.0313
Vanadium (V)	µg/L		0.115	0.158	0.488	0.327	0.135	0.111
Zinc (Zn)	µg/L	*30*	1.53	0.39	2.23	1.39	1.09	0.61
Dissolved Metals								
Aluminum	µg/L	*5-100*	0.6	0.7	0.4	1.6	2.1	2.8
Antimony	µg/L		0.0141	0.0137	0.0136	0.0127	0.0129	0.0149
Arsenic	µg/L	*5*	0.378	0.318	0.363	0.334	0.380	0.353
Barium	µg/L		2.42	2.28	2.18	2.18	2.35	2.16
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron	µg/L		25.4	20.5	19.2	19.9	21.0	23.5
Cadmium	µg/L	*0.017*	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		7.48	7.24	6.91	6.93	6.65	6.84
Chromium	µg/L		0.150	0.167	2.270	0.457	0.386	0.179
Cobalt	µg/L		0.005	<0.001	0.015	0.012	0.011	0.011
Copper	µg/L	*2.0*	1.2	1.1	1.2	1.2	1.3	1.1
Iron	µg/L	*300*	<2	4.0	<2	2.7	14.1	<2
Lead	µg/L	*1*	<0.001	<0.001	<0.001	0.006	0.018	0.015
Magnesium	mg/L		6.75	6.37	5.97	6.05	6.25	6.73
Manganese	µg/L		<0.003	<0.003	0.094	0.132	0.205	0.106
Molybdenum	µg/L	*73*	0.120	0.122	0.115	0.125	0.102	0.140
Nickel	µg/L	*25*	0.165	0.148	0.190	0.195	0.170	0.130
Potassium	µg/L		2220	2150	2100	2130	2160	2190
Selenium	µg/L	*1*	0.653	0.648	0.517	0.564	0.845	0.638
Silver	µg/L	*0.1*	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0025
Sodium	µg/L		34300	30500	29900	30800	31700	30500
Strontium	µg/L		43.3	40.7	37.9	37.7	38.3	37.4
Uranium	µg/L		0.014	0.015	0.020	0.021	0.024	0.024
Vanadium	µg/L		<0.01	0.05	0.32	0.10	0.11	0.05
Zinc	µg/L	*30*	1.25	0.38	2.21	1.38	1.08	0.40
Ion Balance								
Ion Balance			1.01	1.01	0.88	0.88	0.96	0.93
Anions	meq/L		2.45	2.42	2.43	2.45	2.45	2.43
Cations	meq/L		2.47	2.45	2.14	2.16	2.34	2.26
Other								
Color, True	TCU		13	9	6	16	4	12
Cyanide, Total	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		5.5	5.1	44.7	4.9	5.6	4.9
Carbon Part	mg/L		0.81	1.25	1.61	1.90	1.90	1.86

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Tail Outflow					
			20-Jun-07	07-Jul-07	14-Jul-07	21-Jul-07	27-Jul-07	04-Aug-07
Physical								
Conductivity	µS/cm		166	162	158	164	168	171
pH	units	*6.5-9*	6.9	***5.8***	7.0	6.5	***6.2***	6.5
TDS (calculated)	mg/L		81	88	77	84	87	88
Total Suspended Solids	mg/L		<1	<1	<1	<1	<1	<1
Dissolved Anions								
Hardness, Total ($CaCO_3$)	mg/L		33.2	36.0	33.7	37.0	36.7	36.5
Alkalinity, Total ($CaCO_3$)	mg/L		28.6	26.9	27.0	29.4	28.5	29.2
Chloride (Cl)	mg/L		31.8	31.8	29.6	33.6	36.1	35.8
Fluoride (F)	mg/L		0.11	0.18	0.14	0.54	0.06	0.05
Sulphate (SO_4)	mg/L		<3	8	<3	<3	<3	<3
Sulphide	mg/L		<0.001	<0.001	<0.001	0.003	0.007	0.003
Nutrients								
Phosphorous, Total	mg/L		0.013	0.005	0.007	0.008	0.008	0.006
Ammonia-N	mg/L	*0.572**	0.009	0.010	0.008	0.010	0.012	0.010
Nitrite-N	mg/L	*0.06*	0.001	<0.001	0.001	<0.001	0.002	0.001
Nitrate-N	mg/L	*13*	0.005	<0.005	<0.005	<0.005	0.006	0.010
Total Kjeldahl Nitrogen	mg/L		0.43	0.29	0.31	0.32	0.27	0.27
Total Metals								
Aluminum (Al)	µg/L	*5-100*	34.2	***30.2***	13.8	13.0	***15.1***	17.7
Antimony (Sb)	µg/L		0.0138	0.0100	0.0095	0.0079	0.0060	0.0086
Arsenic (As)	µg/L	*5*	0.326	0.251	0.260	0.296	0.281	0.240
Barium (Ba)	µg/L		2.33	2.05	2.10	2.42	2.09	2.52
Beryllium (Be)	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	0.004
Bismuth (Bi)	µg/L		<0.001	<0.001	0.002	0.002	<0.001	<0.001
Boron (B)	µg/L		15.7	14.6	13.6	13.5	13.1	15.6
Cadmium (Cd)	µg/L	*0.017*	<0.002	0.016	0.004	<0.002	<0.002	0.005
Calcium (Ca)	µg/L		6.46	5.97	5.84	6.32	6.16	6.81
Chromium (Cr)	µg/L		0.257	0.267	0.129	0.231	0.246	0.154
Cobalt (Co)	µg/L		0.0721	0.0185	0.0278	0.0473	0.0505	0.0609
Copper (Cu)	µg/L	*2*	1.28	1.15	0.73	0.62	0.50	0.52
Iron (Fe)	µg/L	*300*	107	60.1	129	213	234	281
Lead (Pb)	µg/L	*1*	0.0144	0.0299	0.0126	0.0022	<0.001	0.0047
Magnesium (Mg)	mg/L		4.98	5.17	4.89	4.92	4.94	5.74
Manganese (Mn)	µg/L		15.5	1.16	2.12	3.9	4.55	7.38
Molybdenum (Mo)	µg/L	*73*	0.136	0.109	0.085	0.071	0.054	0.063
Mercury (Hg)	ng/L	*26*	1.2	1.2	<0.6	<0.6	1.2	0.9
Nickel (Ni)	µg/L	*25*	0.801	0.518	0.454	0.524	0.427	0.543
Potassium (K)	µg/L		1910	1520	1320	1350	1290	1310
Selenium (Se)	µg/L	*1*	0.76	0.47	0.45	0.63	0.53	0.46
Silver (Ag)	µg/L	*0.1*	0.0022	<0.0005	0.0012	0.0023	0.0085	<0.0005
Sodium (Na)	µg/L		15600	17100	16100	15800	16700	19800
Strontium (Sr)	µg/L		26.2	25.4	25.0	27.9	26.8	30.7
Thallium (Tl)	µg/L		0.0031	0.0076	0.0069	0.0044	0.0043	<0.0003
Tin (Sn)	µg/L		0.20	<0.03	<0.03	<0.03	<0.03	<0.03
Uranium (U)	µg/L		0.0182	0.0108	0.0098	0.0090	0.0077	0.0027
Vanadium (V)	µg/L		0.086	0.085	0.045	0.059	0.067	0.068
Zinc (Zn)	µg/L	*30*	2.34	1.22	2.58	1.46	0.47	1.62
Dissolved Metals								
Aluminum	µg/L	*5-100*	9.7	***5.2***	4.6	5.0	4.8	2.9
Antimony	µg/L		0.0137	0.0099	0.0094	0.0079	0.0059	0.0082
Arsenic	µg/L	*5*	0.239	0.241	0.228	0.285	0.254	0.209
Barium	µg/L		1.96	1.87	1.82	2.13	1.92	2.32
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron	µg/L		15.2	13.3	12.5	12.9	11.7	14.6
Cadmium	µg/L	*0.017*	<0.002	0.016	<0.002	<0.002	<0.002	<0.002
Calcium	mg/L		6.27	5.78	5.61	5.96	5.84	6.96
Chromium	µg/L		0.254	0.264	0.093	0.224	0.223	0.136
Cobalt	µg/L		0.021	0.018	0.015	0.015	0.023	0.006
Copper	µg/L	*2.0*	1.2	1.0	0.7	0.5	0.5	0.6
Iron	µg/L	*300*	56.7	27.5	28.3	47.9	47.1	35.2
Lead	µg/L	*1*	0.007	0.030	0.009	<0.001	<0.001	<0.001
Magnesium	mg/L		4.82	4.79	4.60	4.73	4.80	5.81
Manganese	µg/L		0.697	0.692	0.786	0.334	1.630	1.300
Molybdenum	µg/L	*73*	0.110	0.109	0.084	0.070	0.054	0.060
Nickel	µg/L	*25*	0.712	0.517	0.405	0.466	0.406	0.403
Potassium	µg/L		1850	1460	1230	1310	1230	1480
Selenium	µg/L	*1*	0.412	0.395	0.446	0.590	0.478	0.384
Silver	µg/L	*0.1*	0.0011	<0.0005	0.0009	0.0023	0.0084	<0.0005
Sodium	µg/L		15500	16000	15100	15400	16600	20300
Strontium	µg/L		25.9	24.9	23.7	27.0	26.5	32.6
Uranium	µg/L		0.016	0.010	0.008	0.008	0.005	<0.0001
Vanadium	µg/L		0.09	0.06	0.01	0.04	0.03	0.03
Zinc	µg/L	*30*	1.23	1.21	2.55	1.15	0.46	0.91
Ion Balance								
Ion Balance			0.97	1.00	1.03	0.96	0.96	1.00
Anions	meq/L		1.52	1.60	1.42	1.61	1.63	1.64
Cations	meq/L		1.47	1.61	1.47	1.55	1.57	1.64
Other								
Color, True	TCU		38	15	20	21	14	14
Cyanide, Total	mg/L		.	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		8.6	5.5	4.9	5.3	4.7	4.3
Carbon Part	mg/L		0.19	0.17	0.15	0.23	0.28	0.21

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Tail Outflow					
			12-Aug-07	18-Aug-07	25-Aug-07	31-Aug-07	09-Sep-07	16-Sep-07
Physical								
Conductivity	µS/cm		179	182	169	169	167	161
pH	units	*6.5-9*	***6.2***	***6.4***	***6.3***	nd	***6.1***	6.6
TDS (calculated)	mg/L		93	87	82	81	85	82
Total Suspended Solids	mg/L		<1	<1	<1	4	1	14
Dissolved Anions								
Hardness, Total ($CaCO_3$)	mg/L		38.9	37.8	34.2	33.9	36.1	37.0
Alkalinity, Total ($CaCO_3$)	mg/L		27.0	22.3	27.9	27.4	26.4	25.8
Chloride (Cl)	mg/L		39.8	37.7	35.3	34.6	37.3	34.7
Fluoride (F)	mg/L		0.05	0.05	0.05	0.06	0.05	0.05
Sulphate (SO_4)	mg/L		<3	<3	<3	<3	<3	<3
Sulphide	mg/L		0.001	<0.001	<0.001	<0.001	0.001	0.001
Nutrients								
Phosphorous, Total	mg/L		0.009	0.027	0.007	0.006	0.008	0.006
Ammonia-N	mg/L	*0.572**	0.010	0.009	0.008	0.008	0.008	0.018
Nitrite-N	mg/L	*0.06*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	<0.005	<0.005	0.007	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.29	0.32	0.32	0.28	0.27	0.27
Total Metals								
Aluminum (Al)	µg/L	*5-100*	***10.2***	***23.4***	***15.8***	17.4	***21.9***	21.7
Antimony (Sb)	µg/L		0.0083	0.0091	0.0071	0.0090	0.0077	0.0099
Arsenic (As)	µg/L	*5*	0.211	0.208	0.208	0.231	0.276	0.219
Barium (Ba)	µg/L		2.53	2.36	1.90	2.00	2.19	1.85
Beryllium (Be)	µg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Bismuth (Bi)	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (B)	µg/L		15.5	16.0	11.1	13.3	15.6	16.2
Cadmium (Cd)	µg/L	*0.017*	<0.002	<0.002	<0.002	0.010	0.002	<0.002
Calcium (Ca)	µg/L		7.18	6.76	6.2	6.13	5.72	5.75
Chromium (Cr)	µg/L		0.137	0.131	0.618	0.569	0.458	0.141
Cobalt (Co)	µg/L		0.0244	0.0269	0.0286	0.0283	0.0337	0.0340
Copper (Cu)	µg/L	*2*	0.57	0.64	0.82	1.42	0.77	0.69
Iron (Fe)	µg/L	*300*	123	195	111	118	140	277
Lead (Pb)	µg/L	*1*	0.0060	0.0102	0.0065	0.0258	0.0213	0.0202
Magnesium (Mg)	mg/L		5.98	5.82	4.94	5.07	5.38	5.49
Manganese (Mn)	µg/L		3.08	3.38	2.38	2.31	2.84	3.9
Molybdenum (Mo)	µg/L	*73*	0.061	0.080	0.075	0.073	0.051	0.085
Mercury (Hg)	ng/L	*26*	<0.6	<0.6	<0.6	0.8	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.431	0.414	0.440	0.475	0.594	0.446
Potassium (K)	µg/L		1520	1610	1420	1490	1680	1450
Selenium (Se)	µg/L	*1*	0.39	0.43	0.27	0.27	0.50	0.28
Silver (Ag)	µg/L	*0.1*	<0.0005	<0.0005	0.0012	0.0009	<0.0005	0.0087
Sodium (Na)	µg/L		20700	18600	16000	17000	18600	16700
Strontium (Sr)	µg/L		33.0	30.0	25.5	26.2	25.3	24.1
Thallium (Tl)	µg/L		<0.0003	0.0008	<0.0003	<0.0003	<0.0003	0.0014
Tin (Sn)	µg/L		<0.03	0.10	0.15	0.03	<0.03	0.03
Uranium (U)	µg/L		0.0013	0.0096	0.0112	0.0100	0.0110	0.0109
Vanadium (V)	µg/L		0.031	0.059	0.172	0.160	0.105	0.063
Zinc (Zn)	µg/L	*30*	1.38	0.81	0.80	3.89	1.03	0.65
Dissolved Metals								
Aluminum	µg/L	*5-100*	3.0	3.7	4.8	7.7	***6.8***	6.6
Antimony	µg/L		0.0090	0.0070	0.0089	0.0085	0.0076	0.0098
Arsenic	µg/L	*5*	0.196	0.190	0.209	0.234	0.257	0.217
Barium	µg/L		1.99	1.59	1.76	2.26	1.91	1.61
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003	<0.003	0.0048
Boron	µg/L		14.4	9.7	11.0	13.4	13.1	15.2
Cadmium	µg/L	*0.017*	<0.002	<0.002	0.003	<0.002	0.002	<0.002
Calcium	mg/L		6.41	5.91	5.85	6.43	5.23	5.71
Chromium	µg/L		0.130	0.576	0.566	0.152	0.453	0.140
Cobalt	µg/L		0.011	0.011	0.015	0.008	0.025	0.018
Copper	µg/L	*2.0*	0.6	0.8	0.7	0.5	0.8	0.7
Iron	µg/L	*300*	33.1	20.3	25.3	51.8	36.8	29.2
Lead	µg/L	*1*	<0.001	<0.001	0.001	<0.001	0.016	0.009
Magnesium	mg/L		5.44	4.74	4.76	5.37	4.90	5.44
Manganese	µg/L		1.510	0.450	1.030	1.120	1.420	1.580
Molybdenum	µg/L	*73*	0.069	0.074	0.072	0.050	0.049	0.084
Nickel	µg/L	*25*	0.388	0.436	0.453	0.442	0.588	0.409
Potassium	µg/L		1540	1370	1400	1260	1560	1430
Selenium	µg/L	*1*	0.421	0.221	0.268	0.399	0.459	0.279
Silver	µg/L	*0.1*	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	0.0082
Sodium	µg/L		17500	15400	16100	18700	17600	16700
Strontium	µg/L		28.9	24.5	25.1	30.1	25.3	23.9
Uranium	µg/L		<0.0001	0.009	0.008	0.001	0.008	0.009
Vanadium	µg/L		0.05	0.12	0.16	0.03	0.10	0.02
Zinc	µg/L	*30*	0.80	0.79	2.16	1.49	1.02	0.64
Ion Balance								
Ion Balance			1.02	1.09	0.88	0.90	0.92	0.99
Anions	meq/L		1.71	1.55	1.60	1.57	1.63	1.54
Cations	meq/L		1.74	1.69	1.40	1.41	1.50	1.52
Other								
Color, True	TCU		14	9	16	16	9	15
Cyanide, Total	mg/L		<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		4.4	5.2	51.1	5.2	5.5	4.7
Carbon Part	mg/L		0.20	0.27	0.31	0.28	0.20	0.38

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Roberts Outflow			
			20-Jun-07	14-Jul-07	12-Aug-07	16-Sep-07
Physical						
Conductivity	µS/cm		233	279	238	254
pH	units	*6.5-9*	7.0	7.1	6.7	7.0
TDS (calculated)	mg/L		111	134	124	126
Total Suspended Solids	mg/L		1	1	3	3
Dissolved Anions						
Hardness, Total ($CaCO_3$)	mg/L		33.6	40.3	37.7	41.1
Alkalinity, Total ($CaCO_3$)	mg/L		21.6	22.8	22.3	22.1
Chloride (Cl)	mg/L		55.1	66.8	60.2	63.2
Fluoride (F)	mg/L		0.09	0.12	0.04	0.05
Sulphate (SO_4)	mg/L		<3	4	4	6
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001
Nutrients						
Phosphorous, Total	mg/L		0.018	0.017	0.017	0.016
Ammonia-N	mg/L	*0.572**	0.010	0.009	0.006	0.008
Nitrite-N	mg/L	*0.06*	0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.027	0.018	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.38	0.36	0.28	0.34
Total Metals						
Aluminum (Al)	µg/L	*5-100*	***241***	50.3	***241***	***104***
Antimony (Sb)	µg/L		0.0337	0.0138	0.0153	0.0183
Arsenic (As)	µg/L	*5*	0.559	0.456	0.539	0.385
Barium (Ba)	µg/L		5.90	3.41	5.01	3.38
Beryllium (Be)	µg/L		0.009	<0.003	0.010	<0.003
Bismuth (Bi)	µg/L		0.001	0.009	<0.001	<0.001
Boron (B)	µg/L		22.0	23.6	27.5	31.8
Cadmium (Cd)	µg/L	*0.017*	0.010	0.005	***0.027***	0.003
Calcium (Ca)	µg/L		6	5.77	5.58	5.34
Chromium (Cr)	µg/L		0.528	0.247	0.386	0.310
Cobalt (Co)	µg/L		0.1700	0.0449	0.0693	0.0395
Copper (Cu)	µg/L	*2*	1.81	1.35	***2.43***	1.37
Iron (Fe)	µg/L	*300*	253	103	171	85.4
Lead (Pb)	µg/L	*1*	0.1320	0.0269	0.0956	0.0621
Magnesium (Mg)	mg/L		5.53	6.54	6.36	6.75
Manganese (Mn)	µg/L		49.4	24.3	8.46	3.74
Molybdenum (Mo)	µg/L	*73*	0.192	0.160	0.192	0.174
Mercury (Hg)	ng/L	*26*	1.7	1.0	<0.6	1.0
Nickel (Ni)	µg/L	*25*	0.904	0.419	0.673	0.471
Potassium (K)	µg/L		2180	2200	2120	2030
Selenium (Se)	µg/L	*1*	***1.42***	0.95	0.96	0.62
Silver (Ag)	µg/L	*0.1*	0.0036	0.0011	<0.0005	0.0036
Sodium (Na)	µg/L		27200	34600	32800	31300
Strontium (Sr)	µg/L		36.8	39.2	39.9	37.7
Thallium (Tl)	µg/L		0.0063	0.0066	<0.0003	0.0028
Tin (Sn)	µg/L		<0.03	<0.03	<0.03	<0.03
Uranium (U)	µg/L		0.0486	0.0394	0.0389	0.0440
Vanadium (V)	µg/L		0.371	0.084	0.305	0.173
Zinc (Zn)	µg/L	*30*	6.13	1.68	3.15	1.19
Dissolved Metals						
Aluminum	µg/L	*5-100*	22.8	6.4	18.6	12.9
Antimony	µg/L		0.0334	0.0137	0.0151	0.0181
Arsenic	µg/L	*5*	0.408	0.355	0.390	0.355
Barium	µg/L		2.77	2.53	2.38	2.24
Beryllium	µg/L		0.0042	<0.003	0.0045	<0.003
Boron	µg/L		21.7	22.5	27.2	31.5
Cadmium	µg/L	*0.017*	0.002	0.004	<0.002	0.003
Calcium	mg/L		5.84	5.61	5.47	5.24
Chromium	µg/L		0.206	0.245	0.115	0.202
Cobalt	µg/L		0.018	0.023	<0.001	0.006
Copper	µg/L	*2.0*	1.5	1.3	1.2	1.2
Iron	µg/L	*300*	42.7	43.3	8.1	12.2
Lead	µg/L	*1*	0.018	0.010	0.001	0.018
Magnesium	mg/L		5.35	6.53	6.30	6.62
Manganese	µg/L		0.253	16.400	<0.003	0.232
Molybdenum	µg/L	*73*	0.190	0.158	0.176	0.172
Nickel	µg/L	*25*	0.578	0.376	0.341	0.365
Potassium	µg/L		2030	2150	1990	1950
Selenium	µg/L	*1*	0.890	0.738	0.812	0.610
Silver	µg/L	*0.1*	0.0007	0.0007	<0.0005	0.0036
Sodium	µg/L		26700	34600	32472	31000
Strontium	µg/L		36.6	38.7	38.3	36.6
Uranium	µg/L		0.036	0.031	0.025	0.033
Vanadium	µg/L		0.10	0.04	<0.01	0.06
Zinc	µg/L	*30*	2.39	1.66	1.27	1.18
Ion Balance						
Ion Balance			0.96	1.00	1.01	0.93
Anions	meq/L		2.03	2.42	2.23	2.34
Cations	meq/L		1.96	2.42	2.26	2.17
Other						
Color, True	TCU		24	13	11	15
Cyanide, Total	mg/L		<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		5.7	4.1	4.1	4.3
Carbon Part	mg/L		0.47	0.39	0.39	0.88

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B3. Water Quality Data for Freshwater Stations in the Doris North Project Area, 2007.

Parameters	Units	Fresh CWQG	Little Roberts Outflow			
			20-Jun-07	14-Jul-07	12-Aug-07	16-Sep-07
Physical						
Conductivity	µS/cm		237	240	265	262
pH	units	*6.5-9*	6.8	6.8	6.9	7.0
TDS (calculated)	mg/L		114	113	139	130
Total Suspended Solids	mg/L		2	1	4	4
Dissolved Anions						
Hardness, Total ($CaCO_3$)	mg/L		37.2	35.9	47.2	44.6
Alkalinity, Total ($CaCO_3$)	mg/L		24.8	22.2	26.1	25.7
Chloride (Cl)	mg/L		55.0	54.9	67.0	64.0
Fluoride (F)	mg/L		0.08	0.09	0.05	0.05
Sulphate (SO_4)	mg/L		<3	<3	4	5
Sulphide	mg/L		<0.001	<0.001	<0.001	<0.001
Nutrients						
Phosphorous, Total	mg/L		0.000	0.018	0.023	0.021
Ammonia-N	mg/L	*0.572**	0.017	0.009	0.004	0.006
Nitrite-N	mg/L	*0.06*	0.001	<0.001	<0.001	<0.001
Nitrate-N	mg/L	*13*	0.006	<0.005	<0.005	<0.005
Total Kjeldahl Nitrogen	mg/L		0.46	0.38	0.44	0.44
Total Metals						
Aluminum (Al)	µg/L	*5-100*	***155***	75.2	***179***	49.0
Antimony (Sb)	µg/L		0.0222	0.0114	0.0161	0.0146
Arsenic (As)	µg/L	*5*	0.547	0.412	0.439	0.380
Barium (Ba)	µg/L		5.39	2.98	4.80	2.97
Beryllium (Be)	µg/L		<0.003	<0.003	0.006	<0.003
Bismuth (Bi)	µg/L		<0.001	0.001	0.005	<0.001
Boron (B)	µg/L		21.4	19.1	23.5	28.9
Cadmium (Cd)	µg/L	*0.017*	0.008	***0.034***	<0.002	0.003
Calcium (Ca)	µg/L		7.11	5.38	7.76	6.64
Chromium (Cr)	µg/L		0.394	0.194	0.340	0.225
Cobalt (Co)	µg/L		0.2030	0.0439	0.0765	0.0356
Copper (Cu)	µg/L	*2*	1.95	1.22	1.45	1.34
Iron (Fe)	µg/L	*300*	241	118	210	63.6
Lead (Pb)	µg/L	*1*	0.0643	0.0386	0.0612	0.0323
Magnesium (Mg)	mg/L		5.75	5.45	7.00	7.17
Manganese (Mn)	µg/L		74.4	10.3	11.2	5.4
Molybdenum (Mo)	µg/L	*73*	0.219	0.126	0.165	0.161
Mercury (Hg)	ng/L	*26*	<0.6	<0.6	<0.6	<0.6
Nickel (Ni)	µg/L	*25*	0.909	0.370	0.572	0.439
Potassium (K)	µg/L		2270	1900	2170	2220
Selenium (Se)	µg/L	*1*	***1.21***	0.98	0.86	0.62
Silver (Ag)	µg/L	*0.1*	0.0040	0.0019	<0.0005	0.0094
Sodium (Na)	µg/L		26100	27300	33100	32500
Strontium (Sr)	µg/L		42.3	32.9	46.8	40.2
Thallium (Tl)	µg/L		0.0052	0.0058	0.0033	0.0019
Tin (Sn)	µg/L		0.03	<0.03	<0.03	<0.03
Uranium (U)	µg/L		0.0449	0.0344	0.0296	0.0337
Vanadium (V)	µg/L		0.268	0.127	0.302	0.087
Zinc (Zn)	µg/L	*30*	3.09	0.93	0.83	0.95
Dissolved Metals						
Aluminum	µg/L	*5-100*	26.1	9.3	9.3	7.3
Antimony	µg/L		0.0220	0.0113	0.0159	0.0145
Arsenic	µg/L	*5*	0.431	0.377	0.353	0.336
Barium	µg/L		3.48	2.1	2.73	2.32
Beryllium	µg/L		<0.003	<0.003	<0.003	<0.003
Boron	µg/L		20.4	18.5	21.2	25.5
Cadmium	µg/L	*0.017*	0.007	0.003	<0.002	<0.002
Calcium	mg/L		6.89	5.32	7.54	6.37
Chromium	µg/L		0.390	0.192	0.272	0.161
Cobalt	µg/L		0.054	0.013	0.004	0.010
Copper	µg/L	*2.0*	1.7	1.1	1.3	1.1
Iron	µg/L	*300*	76.7	31.5	22.6	9.5
Lead	µg/L	*1*	0.017	0.014	0.004	0.011
Magnesium	mg/L		5.70	5.40	6.92	6.87
Manganese	µg/L		27.200	1.110	0.132	0.157
Molybdenum	µg/L	*73*	0.197	0.126	0.161	0.151
Nickel	µg/L	*25*	0.788	0.262	0.342	0.246
Potassium	µg/L		2170	1860	2090	2100
Selenium	µg/L	*1*	0.961	0.844	0.723	0.570
Silver	µg/L	*0.1*	<0.0005	<0.0005	<0.0005	0.0045
Sodium	µg/L		25800	27027	32700	31300
Strontium	µg/L		40.6	32.5	46.3	39.8
Uranium	µg/L		0.036	0.026	0.017	0.026
Vanadium	µg/L		0.12	0.04	0.06	0.02
Zinc	µg/L	*30*	3.06	0.92	0.81	0.42
Ion Balance						
Ion Balance			0.97	1.01	1.02	0.94
Anions	meq/L		2.09	2.04	2.49	2.42
Cations	meq/L		2.03	2.06	2.54	2.28
Other						
Color, True	TCU		36	16	5	15
Cyanide, Total	mg/L		<0.001	<0.001	<0.001	<0.001
Dissolved Organic Carbon	mg/L		7.3	4.1	4.4	4.7
Carbon Part	mg/L		0.35	0.42	0.82	1.29

Notes:

Values in bold and italics are Canadian Water Quality Guideline exceedances.

* ammonia CWQG is temperature and pH dependent the value used here is for pH and temperature limits of Doris North waters for which the guideline value would be the lowest.

Appendix B4. Water quality QA/QC for the Doris North Project, 2007.

		Hope Lake (Doris Lake)								**Wolf Lake** (Tail Lake)		
Parameter	**Units**	22-May-07	22-May-07	15-Jul-07	15-Jul-08	16-Aug-07	16-Aug-08	13-Sep-07	13-Sep-08	18-Jul-07	16-Aug-07	13-Sep-07
		Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Rep 1	Rep 2	Field blanks		
Physical Parameters												
Conductivity	µS/cm	321	317	283	286	273	273	260	263	1.5	1	1
TDS (calculated)	mg/L	169	161	136	143	136	134	133	135	6.7	5.7	3.9
Total Suspended Solids	mg/L	3	4	3	2	3	3	19	2	< 1	< 1	< 1
Dissolved Anions												
Hardness, Total ($CaCO_3$)	mg/L	54.3	53.1	44.8	44.3	43.3	42.9	45.2	44.6	0.08	0.09	0.02
Alkalinity, Total ($CaCO_3$)	mg/L	34.3	32	28.8	28.8	28.1	28	27.9	27.9	2.1	2.1	1.9
Chloride (Cl)	mg/L	79.4	77.6	65.4	72.2	64.7	64.5	63.9	64.4	0.7	0.4	< 0.3
Fluoride (F)	mg/L	0.06	0.06	0.09	0.18	0.05	0.06	0.05	0.05	0.17	< 0.01	< 0.01
Sulphate (SO_4)	mg/L	4	<3	< 3	<3	4	<3	5	4	< 3	< 3	< 3
Sulphide	mg/L	< 0.001		< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Nutrients												
Phosphorus, Total	mg/L	***0.043***	***0.047***	0.021	0.022	0.027	0.027	0.026	0.028	0.002	0.002	0.004
Ammonia-N	mg/L	0.037	0.03	0.008	0.013	0.009	0.009	0.01	0.01	0.019	0.008	0.009
Nitrate-N	mg/L	0.03	0.046	< 0.005	<0.005	< 0.005	<0.005	< 0.005	<0.005	< 0.005	< 0.005	< 0.005
Nitrite-N	mg/L	< 0.001	0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Total Kjeldahl Nitrogen	mg/L	0.7	0.75	0.49	0.51	0.51	0.5	0.54	0.53	0.03	< 0.01	< 0.01
Total Metals												
Aluminum (Al)	µg/L	15.1	7.19	34.4	30.1	67.9	71	81.6	64.1	< 0.5	< 0.5	< 0.5
Antimony (Sb)	µg/L	0.0284	0.0224	0.0164	0.0161	0.0144	0.0141	0.0154	0.0225	0.0016	0.004	0.0018
Arsenic (As)	µg/L	0.611	0.528	0.482	0.453	0.401	0.374	0.389	0.4	0.025	< 0.002	< 0.002
Barium (Ba)	µg/L	3.9	3.42	2.84	2.84	3.18	3.17	3.41	3.23	0.143	< 0.004	0.056
Beryllium (Be)	µg/L	< 0.003	0.0039	< 0.003	<0.003	< 0.003	<0.003	< 0.003	0.0043	0.0057	< 0.003	< 0.003
Bismuth (Bi)	µg/L	0.0014	0.0013	< 0.001	0.0068	0.0017	0.0016	0.0021	<0.001	< 0.001	< 0.001	< 0.001
Boron (B)	µg/L	29.8	27.1	22.5	23.5	22.6	20.2	25.2	23.7	0.106	0.356	< 0.05
Cadmium (Cd)	µg/L	< 0.002	<0.002	< 0.002	0.005	0.008	<0.002	< 0.002	<0.002	< 0.002	< 0.002	< 0.002
Calcium (Ca)	mg/L	17.72	8.93	7.43	7.3	14.08	6.99	14.43	7.22	< 0.008	< 0.008	< 0.004
Chromium (Cr)	µg/L	0.1	0.855	0.215	0.237	0.253	0.187	0.264	0.28	0.119	< 0.03	< 0.03
Cobalt (Co)	µg/L	0.0321	0.0286	0.0306	0.0288	0.0316	0.0263	0.0416	0.0363	0.0024	< 0.001	< 0.001
Copper (Cu)	µg/L	2.13	1.58	1.47	1.26	1.82	***2.1***	1.39	1.7	< 0.05	< 0.05	< 0.05
Iron (Fe)	µg/L	< 2	<2	59.4	60.5	92.6	89	79.6	66.1	< 2	< 2	< 2
Lead (Pb)	µg/L	0.0863	0.0383	0.0359	0.0353	0.0311	0.0313	0.044	0.0772	0.0025	< 0.001	0.0049
Magnesium (Mg)	mg/L	15.82	7.86	6.73	6.67	12.51	6.02	13.47	7.04	0.0058	0.0007	0.0024
Manganese (Mn)	µg/L	2.5	2.42	24	25.3	13.5	13.7	13.7	12.3	0.0367	< 0.003	< 0.003
Molybdenum (Mo)	µg/L	0.221	0.163	0.133	0.137	0.131	0.132	0.156	0.164	0.0047	0.0058	0.0181
Nickel (Ni)	µg/L	0.386	0.373	0.336	0.335	0.391	0.376	0.408	0.476	< 0.005	< 0.005	0.0143
Potassium (K)	µg/L	2980	2950	2480	2410	2220	2220	2360	2400	< 2	< 2	< 2
Selenium (Se)	µg/L	***1.34***	***1.13***	***1.09***	0.911	0.855	0.678	0.412	0.494	< 0.1	< 0.1	< 0.1
Silver (Ag)	µg/L	0.0025	0.0023	0.0011	0.0018	< 0.0005	<0.0005	0.0049	<0.0005	0.105	< 0.0005	0.0141
Sodium (Na)	µg/L	41800	40800	33900	33700	31100	29900	31700	32100	< 2	< 2	< 2
Strontium (Sr)	µg/L	47	47.2	40.1	40.3	39.3		39.3	39.5	0.0752	0.0291	0.037
Thallium (Tl)	µg/L	< 0.0003	<0.0003	0.0053	0.0056	0.0027	0.0029	0.0019	0.0022	< 0.0003	< 0.0003	< 0.0003
Trace Mercury (Hg)	ng/L	4.7	6.8	< 0.6	1.3	0.6	1.3	< 0.6	<0.6	2.2	< 0.6	< 0.6
Tin (Sn)	µg/L	1.57	0.703	1.39	0.084	0.551	0.997	0.525	0.598	< 0.03	< 0.03	0.0346
Uranium (U)	µg/L	0.0283	0.0273	0.0297	0.0294	0.0205	0.0214	0.0332	0.0328	0.0006	< 0.0001	0.0002
Vanadium (V)	µg/L	< 0.01	0.201	0.027	0.028	0.183	0.138	0.172	0.138	0.157	< 0.01	0.0469
Zinc (Zn)	µg/L	2.65	2.05	1.33	1.04	1.59	1.5	1.28	1.31	0.361	0.252	0.345
Dissolved Metals												
Aluminum (Al)	µg/L	0.588	0.508	2.47	2.48	0.365	0.291	2.5	3	< 0.2	< 0.2	< 0.2
Antimony (Sb)	µg/L	0.0281	0.0222	0.0162	0.0159	0.0143	0.014	0.0152	0.0223	0.00161	0.004	0.00174
Arsenic (As)	µg/L	0.541	0.49	0.427	0.389	0.338	0.299	0.359	0.357	0.0248	< 0.002	< 0.002
Barium (Ba)	µg/L	3.64	3.24	2.28	2.39	2.17	2.24	2.27	2.2	< 0.004	< 0.004	< 0.004
Beryllium (Be)	µg/L	< 0.003	<0.003	< 0.003	<0.003	< 0.003	<0.003	< 0.003	<0.003	< 0.003	< 0.003	< 0.003
Boron (B)	µg/L	28.5	25.4	21.9	22.5	20.6	19	21.2	20.9	0.106	0.354	< 0.03
Cadmium (Cd)	µg/L	< 0.002	<0.002	< 0.002	<0.002	< 0.002	<0.002	< 0.002	<0.002	< 0.002	< 0.002	< 0.002
Calcium (Ca)	mg/L	8.76	8.48	7.14	7.21	6.84	6.9	6.8	6.76	< 0.004	< 0.004	0.0045
Chromium (Cr)	µg/L	0.099	0.846	0.158	0.235	0.25	0.185	0.25	0.158	0.071	< 0.03	< 0.03
Cobalt (Co)	µg/L	0.0153	0.0187	0.0109	0.012	< 0.001	<0.001	0.0124	0.0079	0.0019	< 0.001	< 0.001
Copper (Cu)	µg/L	1.59	1.56	1.21	1.18	1.4	1.53	1.37	1.38	< 0.05	< 0.05	0.0661
Iron (Fe)	µg/L	< 2	<2	7.44	8.04	< 2	2.43	< 2	<2	< 2	< 2	< 2
Lead (Pb)	µg/L	0.0327	0.0107	0.0089	0.0348	< 0.001	<0.001	0.0114	0.0764	< 0.001	< 0.001	0.0049
Magnesium (Mg)	mg/L	8	7.49	6.55	6.55	6.25	5.99	6.72	6.58	0.0014	0.0002	0.0012
Manganese (Mn)	µg/L	0.694	0.914	7.39	8.04	< 0.003	<0.003	0.0976	0.0836	< 0.003	< 0.003	< 0.003
Molybdenum (Mo)	µg/L	0.165	0.158	0.118	0.127	0.117	0.124	0.144	0.126	< 0.001	< 0.001	< 0.001
Nickel (Ni)	µg/L	0.096	0.098	0.167	0.167	0.156	0.163	0.147	0.135	< 0.005	< 0.005	0.0142
Potassium (K)	µg/L	2890	2810	2400	2350	2170	2150	2230	2210	< 2	< 2	< 2
Selenium (Se)	µg/L	1.17	0.992	0.987	0.787	0.685	0.579	0.408	0.408	< 0.1	< 0.1	< 0.1
Silver (Ag)	µg/L	< 0.0005	0.0014	< 0.0005	<0.0005	< 0.0005	<0.0005	0.0046	<0.0005	0.005	< 0.0005	0.0138
Sodium (Na)	µg/L	41400	38600	33200	33100	31100	29700	31000	30400	< 2	< 2	< 2
Strontium (Sr)	µg/L	46.4	46.1	39	39.9	37.8	38.2	38.8	37.4	0.0385	0.0288	0.0366
Uranium (U)	µg/L	0.022	0.0207	0.0205	0.0216	0.0125	0.0123	0.0235	0.023	0.0001	< 0.0001	< 0.0001
Vanadium (V)	µg/L	< 0.01	0.199	< 0.01	<0.01	0.0867	0.103	0.0163	0.043	< 0.01	< 0.01	0.0373
Zinc (Zn)	µg/L	2.62	2.03	1.32	0.829	1.57	1.13	0.905	1.03	0.261	0.147	0.245
Ion Balance												
Ion Balance	%	3.02	1.05	2.47	0.93	2.46	1.01	2.47	0.98	0.11	0.1	0.09
Anions	meq/L	1.03	2.88	1.01	2.66	0.99	2.42	0.92	2.47	1.01	0.92	0.27
Cations	meq/L	3.1	3.02	2.5	2.49	2.45	2.46	2.28	2.42	0.11	0.09	0.02
Other												
Color, True	TCU	11	8	13	13	12	12	13	13	< 1	< 1	< 1
Cyanide, Total	mg/L	< 0.001	0.002	< 0.001	<0.001	< 0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Dissolved Organic Carbon	mg/L	5.9	6.4	4.5	4.9	5.5	5.6	5.6	5.4	< 0.2	0.3	< 0.2
Carbon Part	mg/L	0.8	1.29	0.68	0.5	1.15	1.13	1.85	1.96	< 0.02	0.06	0.06

Rep - Replicate sample

Values exceeding CWQGs are ***italicized and in bold type***.

Appendix B5. Water Quality Data for the Marine Station in the Doris North Project, 2007.

Parameters	Units	Marine CWQG	Roberts Bay							
			27-May-07		23-Jul-07		31-Aug-07		15-Sep-07	
			Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom
Physical										
Conductivity	µS/cm		40300	40400	19100	21000	16000	32600	18000	32100
Salinity	g/L				11.5	12.7	9.4	20.7	11.1	20.9
pH	pH	7.0 - 8.7	7.6	7.7	7.5	7.7	7.6	7.8	7.0	7.6
TDS (calculated)	mg/L		29300	29200	11100	13700	10500	21900	11200	21600
Total suspended solids	mg/L		4	<4	6.9	4.2	5.5	4.8	9.6	4.2
Dissolved Anions										
Hardness, Total ($CaCO_3$)	mg/L				1820	2450	1290	4170	1910	3860
Alkalinity, Total ($CaCO_3$)	mg/L		94.8	98	40.3	41.4	38	47.5	43.7	89.6
Chloride (Cl)	mg/L		16900	17300	6610	6980	5050	12000	6050	11600
Fluoride (F)	mg/L		0.85	0.84	<2.0	0.36	0.46	2.2	<0.20	<2.0
Sulfate (SO_4)	mg/L		2280	2270	900	987	670	1550	826	1550
Sulphide	mg/L		<0.005	0.005	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nutrients										
Phosphorus, Total	mg/L		0.035	0.034	0.0205	0.0272	0.0158	0.0259	0.0217	0.0208
Ammonia-N	mg/L		0.033	0.032	0.214	0.26	0.024	0.027	0.027	<0.20
Nitrite-N	mg/L		<0.005	<0.005	<0.010	<0.010	0.104	0.55	<0.010	<0.10
Nitrate-N	mg/L	0.016	0.04	0.03	<0.50	<0.50	<0.10	<0.50	<0.50	<0.50
Total Kjeldahl Nitrogen	mg/L		0.46	0.07	0.273	0.219	0.258	0.09	0.139	0.215
Total Metals										
Aluminum (Al)	µg/L				188	86	<250	<100	187	<100
Antimony (Sb)	µg/L				<1	<10	<5.0	<10	<5.0	<10
Arsenic (As)	µg/L	12.5	0.1	0.6	0.37	0.27	0.39	0.8	0.33	0.58
Barium (Ba)	µg/L				5.6	5.9	5.8	6.9	5.5	6.4
Beryllium (Be)	µg/L				<5	<50	<25	<50	<25	<50
Bismuth (Bi)	µg/L				<5	<50	<25	<50	<25	<50
Boron (B)	µg/L		3500	3000	1250	1600	1140	2700	1520	2700
Cadmium (Cd)	mg/L	0.12	0.01	0.1	<0.020	0.022	<0.020	0.032	<0.020	0.041
Calcium (Ca)	µg/L				115	151	105	238	139	258
Chromium (Cr)	µg/L		1	<0.5	<5	<50	<25	<50	<25	<50
Cobalt (Co)	µg/L		<0.1	<0.1	0.138	0.086	0.094	<0.050	0.108	0.073
Copper (Cu)	µg/L	2-3	0.8	0.6	1.15	0.981	1.06	0.909	0.917	0.791
Iron (Fe)	µg/L		5	2	242	123	117	18	163	70
Lead (Pb)	µg/L		<0.1	<0.1	0.08	0.051	<0.050	<0.050	0.062	0.094
Lithium	µg/L				<50	<500	<250	<500	<250	<500
Magnesium (Mg)	mg/L				375	493	345	836	412	774
Manganese (Mn)	µg/L		1	1	8.82	4.52	5.59	1.67	4.68	2.59
Mercury (Hg)	ng/L	16	<10	<10	<10	<10	5.7[a]	<0.6[a]	1[a]	1.1[a]
Molybdenum (Mo)	µg/L				3.2	3.7	3.5	6.9	4.1	6.5
Nickel (Ni)	µg/L		0.6	0.6	0.613	0.559	0.659	0.484	0.549	0.541
Potassium (K)	µg/L				120000	156000	109000	258000	130000	251000
Selenium (Se)	µg/L	2			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon	µg/L				510	<500	690	<500	810	<500
Silver (Ag)	µg/L		<0.1	<0.1	<0.10	<1	<0.50	<1	<0.50	<1
Sodium (Na)	µg/L				3110000	4070000	2790000	6260000	3510000	6770000
Strontium (Sr)	µg/L		5700	5800	2090	2740	1970	4510	2570	4360
Thallium (Tl)	µg/L				<1	<10	<5	<10	<5	<10
Tin (Sn)	µg/L				<1	<10	<5	<10	<5	<10
Titanium	µg/L				<50	<100	<100	<100	<100	<100
Trace Mercury	ng/L						5.7	<0.6	1100	1000
Uranium (U)	µg/L				0.809	0.985	0.753	1.56	0.87	1.6
Vanadium (V)	µg/L				<10	<100	<50	<100	<50	<100
Zinc (Zn)	µg/L	10	2	<1	1.45	1.03	0.76	0.65	0.92	1.32
Dissolved Metals										
Aluminum (Al)	µg/L				<10	<100	<250	<100	<50	<100
Antimony (Sb)	µg/L				<1	<10	<5	<10	<5	<10
Arsenic (As)	µg/L	12.5			<0.20	0.29	0.27	0.77	0.36	0.4
Barium (Ba)	µg/L				4.9	5.7	<5	7	4.1	6.3
Beryllium (Be)	µg/L				<5	<50	<25	<50	<25	<50
Bismuth (Bi)	µg/L				<5	<50	<25	<50	<25	<50
Boron (B)	µg/L		3500	3600	1290	1760	<1000	2800	1380	2700
Cadmium (Cd)	µg/L	0.12			<0.020	0.022	<0.020	0.034	0.021	0.027
Calcium (Ca)	mg/L				115	152	84.3	244	129	255
Chromium (Cr)	µg/L				<50	<50	<25	<50	<25	<50
Cobalt (Co)	µg/L				<0.050	<0.050	0.108	0.065	<0.050	<0.050
Copper (Cu)	µg/L	2-3			0.799	0.574	1.63	0.523	0.702	0.34
Iron (Fe)	µg/L				<10	<10	129	22	<10	<10
Lead (Pb)	µg/L				<0.050	<0.050	0.051	<0.050	<0.050	<0.050
Lithium (Li)	µg/L				<50	<500	<250	<500	<250	<500
Magnesium (Mg)	mg/L				373	502	263	865	385	782
Manganese (Mn)	µg/L				1.37	0.815	5.73	1.7	1.47	0.45
Mercury (Hg)	ng/L	16			<10	<10	<10	<10	<10	<10
Molybdenum	µg/L				3.1	4.1	<5	5.8	3.5	8.4
Nickel (Ni)	µg/L				0.413	0.319	0.647	0.508	0.398	0.38
Potassium (K)	µg/L				118000	161000	86000	264000	121000	251000
Selenium (Se)	µg/L	2			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon	µg/L				<250	<500	860	<500	<500	<500
Silver (Ag)	µg/L				<0.10	<1	<0.50	<1	<0.50	<1
Sodium (Na)	µg/L				3050000	4110000	2230000	6440000	3260000	6760000
Strong	µg/L		6000	5900	2120	2980	1520	4350	2380	4410
Thallium (Tl)	µg/L				<1	<10	<5	<10	<5	<10
Tin (Sn)	µg/L				<1	<10	<5	<10	<5	<10
Titanium	µg/L				<50	<100	<100	<100	<100	<100
Uranium (U)	µg/L				0.763	0.998	0.574	1.51	0.784	1.18
Vanadium (V)	µg/L				<10	<100	<50	<100	<50	<100
Zinc (Zn)	µg/L	10			0.66	<0.50	1.41	1.22	<0.50	<0.50
Ion Balance										
Ion Balance	%				-9	3	-11.4	-0.2	-2	2
Anions	meq/L				206	218	157	372	189	361
Cations	meq/L				172	232	125	370	183	377
Other										
Color, True	TCU		<5.0	5	<5.0	<5.0	<5.0	<5.0	5.7	<5.0
Cyanide, Total	mg/L		<0.5	<0.5	<5.0	<5.0	0.0058	<0.0050	<0.0050	<0.0050
Dissolved Organic Carbon	mg/L		1.3	1	2.01	1.53	3.21	1.17	3.83	1.55

Notes: [a]trace mercury analysis from ARC

APPENDIX C

FISH DATA

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1	ARCH	180	65	1.11	U				TF	28-Jun-07	LROTFF-01	Little Roberts Outflow	Otoliths, pelvic fin	M		Mortality
2	ARCH	469	855	0.83	U			985120031545975	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		also tag # 985120031571230 would not read
3	ARCH	735	3145	0.79	U	Green	3802	985120031571230	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
4	ARCH	855	4275	0.68	M	Green	4286	985120031583443	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow		R	2005	
5	ARCH	808	4115	0.78	F	Green	3804	985120031602650	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
6	ARCH	225	85	0.75	U				TF	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		
7	LKTR	589			U	Green	3806	985120031577260	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	PIT tag may have fallen out and been retagged upon recapture on 22-Jul
8	ARCH	218	85	0.82	U				TF	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		
9	LKTR	535	1615	1.05	U	Green	3809	985120031623702	TF	28-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	
10	LKTR	318	295	0.92	U			985120031587303	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
11	ARCH	290	195	0.80	U			985120031586022	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
12	ARCH	755	3425	0.80	M	Green	3810	985120031596021	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
13	ARCH	222	90	0.82	U			985120031629910	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
14	LKWH	349	460	1.08					TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		Mortality
15	ARCH	205	70	0.81	U			985120031581998	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
16	ARCH	757	3505	0.81	M	Green	3815	985120031632160	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	
17	ARCH	680	2770	0.88	F	Green	3818	985120031583409	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	
18	ARCH	643	2045	0.77	F	Green	3819	985120031630268	TF	29-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	
19	ARCH	253	190	1.17				985120031625937	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
20	ARCH	259	130	0.75				985120031625315	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
21	ARCH	216	90	0.89				985120031565801	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
22	ARCH	260	125	0.71				985120031630881	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
23	ARCH	690	2070	0.63		Green	4078	985120031459610	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2004	
24	ARCH	557	1560	0.90	F	Green	4355	985120031573231	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2005	
25	ARCH	779	4825	1.02	M	Green	3820	985120031571562	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
26	ARCH	754	3115	0.73	M	Green	3821	985120031628538	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
27	LKTR	496	1010	0.83		Green	4454	985120031613687	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2005	
28	ARCH	680	2770	0.88	F	Green	3818	985120031583409	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow		R	2007	
29	ARCH	735	4660	1.17	F	Green	4815	985120031633272	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow		R	2006	
30	ARCH	195	65	0.88					TF	30-Jun-07	LROTFF-01	Little Roberts Outflow	Otolith, scales, fin ray	M		Mortality
31	ARCH	217	90	0.88					TF	30-Jun-07	LROTFF-01	Little Roberts Outflow		M		Mortality
32	ARCH	218	95	0.92					TF	30-Jun-07	LROTFF-01	Little Roberts Outflow		M		Mortality
33	ARCH	624	1900	0.78	F	Green	3822	985120031657089	TF	30-Jun-07	LROTFF-01	Little Roberts Outflow		C	2007	Ripe
34	ARCH	238	114.5	0.85				985120031570978	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
35	ARCH	279	170	0.78				985120031582489	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
36	ARCH	203	69	0.82					TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		Too small to tag
37	ARCH	355	370.5	0.83				985120031558457	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
38	ARCH	353	415	0.94				985120031604893	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
39	LKTR	622	2040	0.85	U	Green	3823	985120031600297	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
40	ARCH	724	3750	0.99	F	Green	3824	985120031585074	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
41	ARCH	668	3080	1.03	M	Green	3826	985120031570430	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C	2007	
42	ARCH	259	149	0.86				985120031622245	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
43	ARCH	244	121	0.83				985120031583955	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
44	ARCH	227	101	0.86				985120031576866	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
45	ARCH	389	502	0.85		Green	4237	985120031657335	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	R	2004	
46	ARCH	329	303.5	0.85	U			985120031565195	TF	06-Jul-07	LROTFF-01	Little Roberts Outflow		C		
47	ARCH	224	96.5	0.86					TF	06-Jul-07	LROTFF-01	Little Roberts Outflow	Otoliths, scales	M		Mortality
48	LKTR	378	618	1.14				985120031582448	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
49	ARCH	203	72.5	0.87				985120031620156	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
50	ARCH	243	118	0.82				985120031566173	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
51	ARCH	195	60	0.81					TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
52	ARCH	215	80.5	0.81				985120031581649	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
53	LKTR	724	4040	1.06		Green	4646	985120031632031	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
54	LKTR	724	4470	1.18		Green	4702	985120031627753	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
55	ARCH	685	3390	1.05	F			985120031569430	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
56	ARCH	775	6110	1.31	M	Green	3827	985120031555092	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
57	ARCH	381	410	0.74				985120031587705	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
58	ARCH	456	831.5	0.88				985120031625477	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		*
59	ARCH	363	402.5	0.84				985120031568671	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
60	ARCH	456	864.5	0.91				985120031552967	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
61	LKTR	366	570	1.16				985120031605864	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
62	ARCH	264	161	0.88				985120031598500	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
63	ARCH	242	113.5	0.80				985120031573385	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
64	ARCH	241	107.5	0.77				985120031617845	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
65	ARCH	263	147	0.81				985120031597605	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
66	ARCH	224	95.5	0.85					TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality
67	LKTR	595	2105	1.00		Green	3828	985120031587258	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
68	ARCH	713	3595	0.99	F	Green	3829	985120031629788	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
69	ARCH	695	4550	1.36	F	Green	3830	985120031660308	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
70	ARCH	285	182	0.79				985120031624361	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
71	ARCH	380	506	0.92				985120031446512	TF	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
72	LKTR	813	5375	1.00		Green	4617	985120031578163	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
73	ARCH	244	115.5	0.80				985120031569196	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
74	ARCH	769	5590	1.23	F	Green	3831	985120031567585	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
75	ARCH	690	3085	0.94		Green	3832	985120031575713	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
76	ARCH	804	5235	1.01	U	Green	3833	985120031452028	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
77	ARCH	694	3620	1.08	F	Green	3834	985120031597952	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
78	ARCH	670	3485	1.16		Green	3835	985120031629826	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
79	ARCH	228	107	0.90				985120031626429	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
80	ARCH	668	3080	1.03	M	Green	3826	985120031570430	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	Captured previous day
81	ARCH	237	107	0.80				985120031615909	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
82	ARCH	299	230	0.86				985120031586142	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
83	LKTR	450	920	1.01		Green	4016	985120031599158	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
84	ARCH	193	50	0.70					TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
85	ARCH	198	67.5	0.87				985120031623435	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
86	ARCH	286	194	0.83				985120031608942	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
87	ARCH	715	4090	1.12		Green	3836	985120031607457	TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
88	ARCH	210	81	0.87	M				TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
89	ARCH	249	115	0.74	F				TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
90	ARCH	215	82	0.83	F				TF	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
91	ARCH	840	5895	0.99	M	Green	3837	985120031601288	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
92	ARCH	690	3085	0.94		Green	3832	985120031575713	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
93	ARCH	341	343	0.87	U			985120031571281	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
94	ARCH	241	110	0.79	U			985120031573385	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
95	ARCH	354	360	0.81	U			985120031485563	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
96	ARCH	730	3750	0.96	F	Green	3838	985120031657736	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
97	ARCH	796	6335	1.26	M	Green	3839	985120031565858	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
98	ARCH	838	6015	1.02	M	Green	3840	985120031659859	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
99	ARCH	788	4865	0.99	M	Green	3842	985120031556295	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
100	ARCH	748	4209	1.01	F	Green	3843	985120031582585	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
101	LKTR	802	5240	1.02	U	Green	4506	985120031626888	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
102	ARCH	730	3555	0.91	F	Green	3844	985120031618446	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
103	LKTR	518	1345	0.97	F				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
104	ARCH	801	5700	1.11	M				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
105	ARCH	225	101	0.89	U				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
106	ARCH	389	485	0.82	U			985120031620913	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
107	ARCH	385	475	0.83	U			985120031582740	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
108	ARCH	343	350	0.87	U			985120031561130	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
109	ARCH	276	180	0.86	U			985120031604677	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
110	ARCH	458	830	0.86	U			985120031554967	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
111	ARCH	354	355	0.80	U			985120031458563	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
112	ARCH	361	430	0.91	U			985120031554977	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
113	ARCH	203	65	0.78	U				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
114	ARCH	708	3765	1.06	U	Green	3845/3846	985120031586231	TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	Floy number not recorded; either 3846 or 3845
115	ARCH	219	80	0.76	U				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
116	ARCH	279	175	0.81	M				TF	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
117	LKTR	517	1480	1.07	U	Green	4030	985120031587003	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
118	ARCH	205			U			985120031565429	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
119	ARCH	295	415	1.62	U			985120031603045	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
120	ARCH	283	180	0.79	U			985120031618209	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
121	ARCH	249	128	0.83	U			985120031621904	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
122	ARCH	238	107	0.79	U			985120031620547	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
123	ARCH	225	89	0.78	U			985120031613532	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
124	ARCH	249	128	0.83	U			985120031583608	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
125	ARCH	209	73	0.80	U			985120031618662	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
126	ARCH	236	103	0.78	U			985120031617845	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
127	ARCH	336	352	0.93	U			985120031563666	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
128	ARCH	264	142	0.77	U			985120031564581	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
129	LKTR	797	4740	0.94	U	Green	4330	985120031621279	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
130	LKTR	760	5410	1.23	U	Green	4709	985120031631174	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
131	ARCH	720	4600	1.23	F	Green	3281	985120031629675	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
132	ARCH	685	3010	0.94	F	Green	3847	985120031564136	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
133	ARCH	785	5635	1.16	M	Green	3848	985120031579917	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
134	ARCH	820	5170	0.94	M	Green	3849	985120031610936	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
135	ARCH	645	1985	0.74	F	Green	3950	985120031600704	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
136	ARCH	237	107	0.80	U			985120031615909	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
137	ARCH	271	171	0.86	U			985120031602037	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
138	ARCH	286	266	1.14	U			985120031566677	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
139	ARCH	214	78	0.80	U			985120031603318	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
140	ARCH	190	60	0.87	U				TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
141	ARCH	206	64	0.73	U				TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
142	ARCH	219	82	0.78	U			985120031601944	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
143	ARCH	201	50	0.62	U				TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
144	ARCH	211	81	0.86	U			985120031656727	TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
145	ARCH	188	56	0.84	U				TF	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
146	LKTR	885	7350	1.06	U	Green	4343	985120031573882	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
147	ARCH	680	3630	1.15	F	Green	3953	985120031656281	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
148	ARCH	804	4950	0.95		Green	3954	985120031561969	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
149	ARCH	640	2010	0.77		Green	3950	985120031600704	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
150	LKTR	470	1120	1.08		Green	4274	985120031620239	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
151	ARCH	775	4635	1.00		Green	3955	985120031564788	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
152	ARCH	821	5775	1.04		Green	3956	985120031657382	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
153	ARCH	840	6505	1.10	M	Green	3957	985120031632345	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
154	ARCH	760	4400	1.00	M	Green	3499	985120031567055	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
155	ARCH	823	5490	0.98	M	Green	3958	985120031578113	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
156	ARCH	440	606	0.71	U			985120031614759	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
157	ARCH	275	186	0.89	U			985120031569428	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
158	ARCH	382	486.5	0.87	U			985120031605415	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
159	ARCH	255	149	0.90	U			985120031630467	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
160	ARCH	228	91	0.77	U			985120031445529	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
161	ARCH	260	144	0.82	U			985120031562647	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
162	ARCH	241	104	0.74	U			985120031603675	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
163	ARCH	796	4930	0.98					TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
164	ARCH	300	202	0.75				985120031630110	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
165	LKTR	650	2695	0.98		Green	3960	985120031604311	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
166	ARCH	323	286	0.85				985120031624204	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
167	ARCH	359	385	0.83				985120031567446	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
168	ARCH	315	258	0.83				985120031653966	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
169	ARCH	347	354.5	0.85				985120031562614	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
170	ARCH	280	190	0.87				985120031618209	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
171	ARCH	345	360	0.88				985120031573506	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
172	ARCH	350	342	0.80				985120031621941	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
173	ARCH	345	360	0.88				985120031611172	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
174	ARCH	230	98	0.81				985120031660711	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
175	ARCH	319	262	0.81				985120031617064	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
176	ARCH	288	262	1.10				985120031587703	TF	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
177	LKTR	874	6915	1.04		Green	3961	985120031660110	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
178	ARCH	253	168	1.04				985120031585134	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
179	ARCH	443	757	0.87				985120031622282	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
180	ARCH	210	80.5	0.87				985120031655919	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
181	ARCH	231	93	0.75				985120031633147	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
182	ARCH	835	5770	0.99	M	Green	3962	985120031564007	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
183	ARCH	800	5850	1.14	M	Green	3963	985120031564809	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	

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Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
184	LKTR	794	4850	0.97		Green	4695	985120031554950	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
185	ARCH	804	5240	1.01	F	Green	3964	985120031581259	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
186	LKTR	795	4800	0.96		Green	4685	985120031583871	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
187	ARCH	679	3240	1.03		Green	3965	985120031570589	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
188	ARCH	715	3500	0.96	F	Green	3966	985120031624111	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
189	ARCH	873	6105	0.92	M	Green	3967	985120031568619	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
190	LKTR	785	5080	1.05		Green	4614	985120031562158	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
191	LKTR	330	361	1.00				985120031550763	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
192	ARCH	680	3630	1.15	F	Green	3953	985120031656281	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
193	LKTR	800	5165	1.01					TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
194	ARCH	315	280	0.90					TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
195	ARCH	275	199	0.96					TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
196	ARCH	284	195	0.85				985120031620807	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
197	ARCH	226	94	0.81				985120031580017	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
198	ARCH	293						985120031655529	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
199	ARCH	284	220	0.96				985120031613877	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
200	ARCH	204	73	0.86				985120031606073	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
201	ARCH	255	149	0.90	U			985120031630467	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
202	ARCH	194	54	0.74					TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		Did not tag
203	ARCH	187	57	0.87					TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		Did not tag
204	LKTR	330	361	1.00				985120031550763	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	Recaptured on same day
205	LKTR	517	1452	1.05		Green	4017	985120031559386	TF	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
206	LKTR	719	4472	1.20						12-Jul-07	RBFT-EB	Roberts Bay				
207	LKTR	710	3990	1.11						12-Jul-07	RBFT-EB	Roberts Bay				
208	LKTR	605	2085	0.94						12-Jul-07	RBFT-EB	Roberts Bay				
209	ARFL	179	71	1.24						12-Jul-07	RBFT-EB	Roberts Bay				
210	PCHR	73	2	0.51						12-Jul-07	RBFT-EB	Roberts Bay				
211	PCHR	67	2	0.66						12-Jul-07	RBFT-EB	Roberts Bay				
212	ARFL	120	21	1.22						12-Jul-07	RBFT-WB	Roberts Bay				
213	SFCD	188	35	0.53						12-Jul-07	RBFT-WB	Roberts Bay				
214	SFCD	187	37	0.57						12-Jul-07	RBFT-WB	Roberts Bay				
215	SFCD	197	43	0.56						12-Jul-07	RBFT-WB	Roberts Bay				
216	SFCD	175	27	0.50						12-Jul-07	RBFT-WB	Roberts Bay				
217	SFCD	187	38	0.58						12-Jul-07	RBFT-WB	Roberts Bay				
218	SFCD	205	53	0.62						12-Jul-07	RBFT-WB	Roberts Bay				
219	SFCD	181	29	0.49						12-Jul-07	RBFT-WB	Roberts Bay				
220	SFCD	183	35	0.57						12-Jul-07	RBFT-WB	Roberts Bay				
221	SFCD	200	49	0.61						12-Jul-07	RBFT-WB	Roberts Bay				
222	SFCD	201	50	0.62						12-Jul-07	RBFT-WB	Roberts Bay				
223	SFCD	167	24	0.52						12-Jul-07	RBFT-WB	Roberts Bay				
224	SFCD	241	77	0.55						12-Jul-07	RBFT-WB	Roberts Bay				
225	SFCD	269	105	0.54						12-Jul-07	RBFT-WB	Roberts Bay				
226	SFCD	196	42	0.56						12-Jul-07	RBFT-WB	Roberts Bay				
227	SFCD	180	34	0.58						12-Jul-07	RBFT-WB	Roberts Bay				
228	SFCD	84	3	0.51						12-Jul-07	RBFT-WB	Roberts Bay				
229	SFCD	180	32	0.55						12-Jul-07	RBFT-WB	Roberts Bay				
230	SFCD	77	2	0.44						12-Jul-07	RBFT-WB	Roberts Bay				
231	PCHR	75	2	0.47						12-Jul-07	RBFT-WB	Roberts Bay				
232	ARCH	264	159	0.86	U			985120031556676	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
233	ARCH	205	77.5	0.90	U			985120031567716	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
234	ARCH	265	150	0.81	U			985120031603799	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
235	ARCH	195	70.5	0.95	U			985120031576356	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
236	ARCH	226	83.5	0.72	U			985120031584182	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
237	ARCH	256	138	0.82	U			985120031630467	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
238	ARCH	214	76	0.78	U			985120031449019	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
239	ARCH	203			U			985120031607446	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
240	LKTR	376	552	1.04	U			985120031656284	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
241	ARCH	234	87.5	0.68	U			985120031586441	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
242	ARCH	191	68	0.98	U				TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		Fish small and stressed-no tag
243	ARCH	224	99.5	0.89	U			985120031584205	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
244	ARCH	267	160	0.84	U			985120031633661	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
245	ARCH	870	6890	1.05	M	Green	3968	985120031565228	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
246	ARCH	694	3690	1.10	F	Green	3969	985120031631406	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
247	ARCH	698	3355	0.99	F	Green	3970	985120031661438	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
248	LKTR	835	6480	1.11	U	Green	4667	985120031614241	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	Fish had eaten fish with tag 985120031556676
249	LKTR	614	2360	1.02	U	Green	4222	985120031616738	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
250	ARCH	416	616	0.86	U			985120031603159	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
251	ARCH	380	559	1.02	U			985120031579731	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
252	ARCH	449	800	0.88	U			985120031548669	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
253	ARCH	307	255	0.88	U			985120031622166	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
254	ARCH	281	186	0.84	U			985120031557697	TF	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
255	ARFL	302	360	1.31						13-Jul-07	RBFT-EB	Roberts Bay				
256	ARFL	254	218	1.33						13-Jul-07	RBFT-EB	Roberts Bay				
257	ARFL	197	90	1.18						13-Jul-07	RBFT-EB	Roberts Bay				
258	ARFL	205	120	1.39						13-Jul-07	RBFT-EB	Roberts Bay				
259	ARFL	175	73	1.36						13-Jul-07	RBFT-EB	Roberts Bay				
260	ARFL	135	32	1.30						13-Jul-07	RBFT-EB	Roberts Bay				
261	ARFL	96	11	1.24						13-Jul-07	RBFT-EB	Roberts Bay				
262	FRSC	84	5	0.84						13-Jul-07	RBFT-EB	Roberts Bay				
263	FRSC	70	3	0.87						13-Jul-07	RBFT-EB	Roberts Bay				
264	LKTR	690	4000	1.22						13-Jul-07	RBFT-EB	Roberts Bay				
265	PCHR	86	3	0.47						13-Jul-07	RBFT-EB	Roberts Bay				
266	PCHR	76	2	0.46						13-Jul-07	RBFT-EB	Roberts Bay				
267	PCHR	75	2	0.47						13-Jul-07	RBFT-EB	Roberts Bay				
268	PCHR	76	2	0.46						13-Jul-07	RBFT-EB	Roberts Bay				
269	PCHR	70	2	0.58						13-Jul-07	RBFT-EB	Roberts Bay				
270	PCHR	75	2	0.47						13-Jul-07	RBFT-EB	Roberts Bay				
271	PCHR	71	2	0.56						13-Jul-07	RBFT-EB	Roberts Bay				
272	PCHR	72	2	0.54						13-Jul-07	RBFT-EB	Roberts Bay				
273	PCHR	75	2	0.47						13-Jul-07	RBFT-EB	Roberts Bay				
274	PCHR	75	3	0.71						13-Jul-07	RBFT-EB	Roberts Bay				
275	PCHR	75	3	0.71						13-Jul-07	RBFT-EB	Roberts Bay				
276	PCHR	76	2	0.46						13-Jul-07	RBFT-EB	Roberts Bay				
277	PCHR	75	2	0.47						13-Jul-07	RBFT-EB	Roberts Bay				
278	PCHR	69	1	0.30						13-Jul-07	RBFT-EB	Roberts Bay				
279	PCHR	74	2	0.49						13-Jul-07	RBFT-EB	Roberts Bay				
280	PCHR	73	2	0.51						13-Jul-07	RBFT-EB	Roberts Bay				
281	PCHR	66	1	0.35						13-Jul-07	RBFT-EB	Roberts Bay				
282	PCHR	73	2	0.51						13-Jul-07	RBFT-EB	Roberts Bay				
283	PCHR	68	2	0.64						13-Jul-07	RBFT-EB	Roberts Bay				
284	PCHR	80	2	0.39						13-Jul-07	RBFT-EB	Roberts Bay				
285	ARCH	227	85	0.73						13-Jul-07	RBFT-WB	Roberts Bay				
286	ARFL	200	106	1.33						13-Jul-07	RBFT-WB	Roberts Bay				
287	ARFL	230	150	1.23						13-Jul-07	RBFT-WB	Roberts Bay				
288	ARFL	200	120	1.50						13-Jul-07	RBFT-WB	Roberts Bay				
289	ARFL	310	400	1.34						13-Jul-07	RBFT-WB	Roberts Bay				
290	ARFL	213	110	1.14						13-Jul-07	RBFT-WB	Roberts Bay				
291	ARFL	205	100	1.16						13-Jul-07	RBFT-WB	Roberts Bay				
292	ARFL	154	32	0.88						13-Jul-07	RBFT-WB	Roberts Bay				
293	ARFL	180	70	1.20						13-Jul-07	RBFT-WB	Roberts Bay				
294	ARFL	160	55	1.34						13-Jul-07	RBFT-WB	Roberts Bay				
295	ARFL	131	23	1.02						13-Jul-07	RBFT-WB	Roberts Bay				
296	ARFL	108	12	0.95						13-Jul-07	RBFT-WB	Roberts Bay				
297	ARFL	96	10	1.13						13-Jul-07	RBFT-WB	Roberts Bay				
298	LKTR	700	4275	1.25						13-Jul-07	RBFT-WB	Roberts Bay				
299	LKTR	591	2001	0.97						13-Jul-07	RBFT-WB	Roberts Bay				
300	PCHR	68	2	0.64						13-Jul-07	RBFT-WB	Roberts Bay				
301	PCHR	75	2	0.47						13-Jul-07	RBFT-WB	Roberts Bay				
302	PCHR	82	3	0.54						13-Jul-07	RBFT-WB	Roberts Bay				
303	PCHR	76	3	0.68						13-Jul-07	RBFT-WB	Roberts Bay				
304	PCHR	70	2	0.58						13-Jul-07	RBFT-WB	Roberts Bay				
305	PCHR	79	2	0.41						13-Jul-07	RBFT-WB	Roberts Bay				
306	PCHR	75	2	0.47						13-Jul-07	RBFT-WB	Roberts Bay				
307	PCHR	78	3	0.63						13-Jul-07	RBFT-WB	Roberts Bay				

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
308	PCHR	80	3	0.59						13-Jul-07	RBFT-WB	Roberts Bay				
309	PCHR	70	2	0.58						13-Jul-07	RBFT-WB	Roberts Bay				
310	PCHR	70	2	0.58						13-Jul-07	RBFT-WB	Roberts Bay				
311	PCHR	74	2	0.49						13-Jul-07	RBFT-WB	Roberts Bay				
312	PCHR	74	2	0.49						13-Jul-07	RBFT-WB	Roberts Bay				
313	PCHR	75	2	0.47						13-Jul-07	RBFT-WB	Roberts Bay				
314	PCHR	70	2	0.58						13-Jul-07	RBFT-WB	Roberts Bay				
315	PCHR	78	3	0.63						13-Jul-07	RBFT-WB	Roberts Bay				
316	PCHR	70	1	0.29						13-Jul-07	RBFT-WB	Roberts Bay				
317	PCHR	75	2	0.47						13-Jul-07	RBFT-WB	Roberts Bay				
318	PCHR	75	2	0.47						13-Jul-07	RBFT-WB	Roberts Bay				
319	PCHR	74	2	0.49						13-Jul-07	RBFT-WB	Roberts Bay				
320	PCHR	73	2	0.51						13-Jul-07	RBFT-WB	Roberts Bay				
321	PCHR	74	1	0.25						13-Jul-07	RBFT-WB	Roberts Bay				
322	SFCD	80	4	0.78						13-Jul-07	RBFT-WB	Roberts Bay				
323	SFCD	97	7	0.77						13-Jul-07	RBFT-WB	Roberts Bay				
324	SFCD	73	2	0.51						13-Jul-07	RBFT-WB	Roberts Bay				
325	SFCD	95	5	0.58						13-Jul-07	RBFT-WB	Roberts Bay				
326	SFCD	76	2	0.46						13-Jul-07	RBFT-WB	Roberts Bay				
327	SFCD	74	2	0.49						13-Jul-07	RBFT-WB	Roberts Bay				
328	ARCH	336	339	0.89	U			985120031582437	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
329	ARCH	353	386	0.88				985120031585335	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
330	ARCH	406	625	0.93				985120031575355	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
331	ARCH	210	78	0.84					TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
332	ARCH	295	223	0.87				985120031621171	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
333	ARCH	335	312	0.83				985120031565195	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
334	ARCH	250	122	0.78				985120031551053	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
335	ARCH	268	173	0.90				985120031567943	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
336	ARCH	268	154	0.80				985120031633098	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
337	ARCH	371	426	0.83				985120031443140	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
338	ARCH	278	199	0.93				985120031576259	TF	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
339	ARFL	290	320	1.31						14-Jul-07	RBFT-EB	Roberts Bay				
340	ARFL	195	103	1.39						14-Jul-07	RBFT-EB	Roberts Bay				
341	ARFL	174	58	1.10						14-Jul-07	RBFT-EB	Roberts Bay				
342	ARFL	172	71	1.40						14-Jul-07	RBFT-EB	Roberts Bay				
343	ARFL	125	25	1.28						14-Jul-07	RBFT-EB	Roberts Bay				
344	ARFL	100	12	1.20						14-Jul-07	RBFT-EB	Roberts Bay				
345	ARFL	92	9	1.16						14-Jul-07	RBFT-EB	Roberts Bay				
346	ARCH	225	105	0.92						14-Jul-07	RBFT-WB	Roberts Bay				
347	ARCH	246	121	0.81						14-Jul-07	RBFT-WB	Roberts Bay				
348	ARFL	302	364	1.32						14-Jul-07	RBFT-WB	Roberts Bay				
349	ARFL	368	560	1.12						14-Jul-07	RBFT-WB	Roberts Bay				
350	ARFL	320	410	1.25						14-Jul-07	RBFT-WB	Roberts Bay				
351	ARFL	202	107	1.30						14-Jul-07	RBFT-WB	Roberts Bay				
352	ARFL	150	54	1.60						14-Jul-07	RBFT-WB	Roberts Bay				
353	ARFL	145	42	1.38						14-Jul-07	RBFT-WB	Roberts Bay				
354	ARCH	333	320	0.87	U			985120031549784	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
355	LKTR	685	3035	0.94		Green	4726	985120031445296	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
356	ARCH	681	3145	1.00	F	Green	3972	985120031630764	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
357	LKTR	710	3870	1.08		Green	4178	985120031607609	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
358	ARCH	753	4180	0.98	F	Green	3974	985120031560885	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
359	LKTR	464	1060	1.06		Green	3976	985120031565262	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
360	LKTR	581	2005	1.02		Green	3977	985120031607615	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
361	ARCH	285	200	0.86	U			985120031655529	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
362	ARCH	386	555	0.97	U			985120031630943	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
363	ARCH	292	225	0.90	U			985120031620847	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
364	ARCH	216	85	0.84				985120031613532	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
365	ARCH	270	175	0.89				985120031660199	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
366	ARCH	264	180	0.98				985120031455104	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
367	ARCH	239	120	0.88				985120031631719	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
368	ARCH	244	130	0.89				985120031577891	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
369	ARCH	198	65	0.84					TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag

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Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
370	ARCH	226	100	0.87				985120031633147	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
371	ARCH	235	115	0.89				985120031578354	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
372	ARCH	325	309	0.90				985120031572647	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
373	ARCH	193	60	0.83					TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
374	ARCH	248	125	0.82				985120031626774	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
375	ARCH	204	70	0.82				985120031631921	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
376	ARCH	245	125	0.85				985120031578764	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
377	ARCH	358	390	0.85				985120031612947	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
378	ARCH	260	130	0.74				985120031659507	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
379	ARCH	260	140	0.80				985120031584694	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
380	ARCH	434	635	0.78				985120031567021	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
381	ARCH	233	85	0.67				985120031660711	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
382	ARCH	293	220	0.87				985120031632838	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
383	ARCH	267	140	0.74				985120031633961	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
384	ARCH	275	175	0.84				985120031588078	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
385	ARCH	260	140	0.80				985120031656898	TF	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
386	PCHR	73	2	0.51						15-Jul-07	RBFT-EB	Roberts Bay				
387	PCHR	77	3	0.66						15-Jul-07	RBFT-EB	Roberts Bay				
388	PCHR	72	2	0.54						15-Jul-07	RBFT-EB	Roberts Bay				
389	PCHR	71	2	0.56						15-Jul-07	RBFT-EB	Roberts Bay				
390	PCHR	71	2	0.56						15-Jul-07	RBFT-EB	Roberts Bay				
391	PCHR	73	3	0.77						15-Jul-07	RBFT-EB	Roberts Bay				
392	PCHR	68	1	0.32						15-Jul-07	RBFT-EB	Roberts Bay				
393	PCHR	74	2	0.49						15-Jul-07	RBFT-EB	Roberts Bay				
394	PCHR	75	2	0.47						15-Jul-07	RBFT-EB	Roberts Bay				
395	ARFL	168	50	1.05						15-Jul-07	RBFT-EB	Roberts Bay				
396	ARFL	183	79	1.29						15-Jul-07	RBFT-EB	Roberts Bay				
397	ARFL	121	22	1.24						15-Jul-07	RBFT-EB	Roberts Bay				
398	ARFL	103	14	1.28						15-Jul-07	RBFT-EB	Roberts Bay				
399	ARFL	99	10	1.03						15-Jul-07	RBFT-EB	Roberts Bay				
400	SFCD	96	7	0.79						15-Jul-07	RBFT-EB	Roberts Bay				
401	SFCD	98	8	0.85						15-Jul-07	RBFT-EB	Roberts Bay				
402	SFCD	75	5	1.19						15-Jul-07	RBFT-EB	Roberts Bay				
403	ARFL	212	125	1.31						15-Jul-07	RBFT-WB	Roberts Bay				
404	ARFL	180	78	1.34						15-Jul-07	RBFT-WB	Roberts Bay				
405	ARFL	214	135	1.38						15-Jul-07	RBFT-WB	Roberts Bay				
406	ARFL	118	18	1.10						15-Jul-07	RBFT-WB	Roberts Bay				
407	SFCD	101	8	0.78						15-Jul-07	RBFT-WB	Roberts Bay				
408	FRSC	143	32	1.09						15-Jul-07	RBFT-WB	Roberts Bay				
409	LKTR	613	2050	0.89		Green	3978	985120031573894	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	LKTR in trap eating smolts
410	LKWH	425	1125	1.47				985120031603275	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
411	ARCH	342	374	0.93				985120031443581	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
412	LKTR	251	160.5	1.01				985120031626109	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
413	ARCH	248	134	0.88					TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality due to LKTR
414	ARCH	694	3555	1.06	F	Green	3979	985120031631635	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
415	ARCH	812	5350	1.00	M	Green	3980	985120031629734	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
416	LKTR	545	1545	0.95		Green	3999	985120031599153	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
417	ARCH	202	77.5	0.94					TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		Huge gash on side
418	ARCH	426	699	0.90				985120031573531	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
419	ARCH	276	177	0.84				985120031629637	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
420	ARCH	297	252.5	0.96				985120031660002	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
421	ARCH	285	229	0.99				985120031575248	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
422	ARCH	285	252	1.09				985120031587703	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
423	ARCH	346	384	0.93				985120031609034	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
424	ARCH	225	106	0.93				985120031612308	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
425	ARCH	301	271.5	1.00				985120031579684	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
426	ARCH	242	122	0.86				985120031579487	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
427	ARCH	260	160.5	0.91				985120031455222	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
428	ARCH	266	147	0.78				985120031633098	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
429	ARCH	276	213	1.01				985120031550949	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
430	ARCH	273	171.5	0.84				985120031619425	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
431	ARCH	316	278.5	0.88				985120031561336	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
432	ARCH	283	204.5	0.90				985120031629261	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
433	ARCH	345	350	0.85				985120031573506	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
434	ARCH	381	536	0.97				985120031630943	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
435	ARCH	276	235	1.12				985120031563432	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
436	ARCH	265	192.5	1.03				985120031564891	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
437	ARCH	302	290	1.05				985120031569294	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
438	ARCH	269	188	0.97				985120031602037	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
439	ARCH	255	171.5	1.03				985120031567214	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
440	ARCH	225	110.5	0.97				985120031578188	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
441	ARCH	218	99	0.96				985120031605760	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
442	ARCH	204	75.5	0.89				985120031609300	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
443	ARCH	198	73	0.94				985120031568624	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
444	ARCH	193	57	0.79				985120031630471	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
445	ARCH	204	81	0.95				985120031655919	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
446	ARCH	260	149	0.85				985120031586093	TF	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
447	ARCH	228	92	0.78						16-Jul-07	RBFT-EB	Roberts Bay				
448	SFCD	197	41	0.54						16-Jul-07	RBFT-EB	Roberts Bay				
449	SFCD	180	32	0.55						16-Jul-07	RBFT-EB	Roberts Bay				
450	FRSC	85	5	0.81						16-Jul-07	RBFT-EB	Roberts Bay				
451	FRSC	71	3	0.84						16-Jul-07	RBFT-EB	Roberts Bay				
452	ARFL	326	418	1.21						16-Jul-07	RBFT-EB	Roberts Bay				
453	ARFL	202	110	1.33						16-Jul-07	RBFT-EB	Roberts Bay				
454	ARFL	153	55	1.54						16-Jul-07	RBFT-EB	Roberts Bay				
455	ARFL	143	42	1.44						16-Jul-07	RBFT-EB	Roberts Bay				
456	ARFL	181	71	1.20						16-Jul-07	RBFT-EB	Roberts Bay				
457	ARFL	158	53	1.34						16-Jul-07	RBFT-EB	Roberts Bay				
458	ARFL	132	20	0.87						16-Jul-07	RBFT-EB	Roberts Bay				
459	ARFL	109	13	1.00						16-Jul-07	RBFT-EB	Roberts Bay				
460	FRSC	118	16	0.97						16-Jul-07	RBFT-WB	Roberts Bay				
461	FRSC	105	12	1.04						16-Jul-07	RBFT-WB	Roberts Bay				
462	FRSC	93	10	1.24						16-Jul-07	RBFT-WB	Roberts Bay				
463	FRSC	84	6	1.01						16-Jul-07	RBFT-WB	Roberts Bay				
464	ARFL	153	30	0.84						16-Jul-07	RBFT-WB	Roberts Bay				
465	ARFL	217	145	1.42						16-Jul-07	RBFT-WB	Roberts Bay				
466	ARFL	213	130	1.35						16-Jul-07	RBFT-WB	Roberts Bay				
467	ARFL	201	110	1.35						16-Jul-07	RBFT-WB	Roberts Bay				
468	ARFL	200	115	1.44						16-Jul-07	RBFT-WB	Roberts Bay				
469	ARFL	200	130	1.63						16-Jul-07	RBFT-WB	Roberts Bay				
470	ARFL	187	90	1.38						16-Jul-07	RBFT-WB	Roberts Bay				
471	ARFL	209	125	1.37						16-Jul-07	RBFT-WB	Roberts Bay				
472	ARFL	229	185	1.54						16-Jul-07	RBFT-WB	Roberts Bay				
473	ARFL	220	145	1.36						16-Jul-07	RBFT-WB	Roberts Bay				
474	ARFL	211	140	1.49						16-Jul-07	RBFT-WB	Roberts Bay				
475	ARFL	200	110	1.38						16-Jul-07	RBFT-WB	Roberts Bay				
476	ARFL	193	105	1.46						16-Jul-07	RBFT-WB	Roberts Bay				
477	ARFL	190	100	1.46						16-Jul-07	RBFT-WB	Roberts Bay				
478	ARFL	188	95	1.43						16-Jul-07	RBFT-WB	Roberts Bay				
479	ARFL	185	80	1.26						16-Jul-07	RBFT-WB	Roberts Bay				
480	ARFL	220	145	1.36						16-Jul-07	RBFT-WB	Roberts Bay				
481	ARFL	211	155	1.65						16-Jul-07	RBFT-WB	Roberts Bay				
482	ARFL	211	125	1.33						16-Jul-07	RBFT-WB	Roberts Bay				
483	ARFL	208	125	1.39						16-Jul-07	RBFT-WB	Roberts Bay				
484	ARFL	204	125	1.47						16-Jul-07	RBFT-WB	Roberts Bay				
485	ARFL	202	125	1.52						16-Jul-07	RBFT-WB	Roberts Bay				
486	ARFL	200	110	1.38						16-Jul-07	RBFT-WB	Roberts Bay				
487	ARFL	185	85	1.34						16-Jul-07	RBFT-WB	Roberts Bay				
488	ARFL	114	20	1.35						16-Jul-07	RBFT-WB	Roberts Bay				
489	ARFL	217	150	1.47						16-Jul-07	RBFT-WB	Roberts Bay				
490	ARFL	213	150	1.55						16-Jul-07	RBFT-WB	Roberts Bay				
491	ARFL	209	125	1.37						16-Jul-07	RBFT-WB	Roberts Bay				
492	ARFL	113	16	1.11						16-Jul-07	RBFT-WB	Roberts Bay				
493	ARFL	95	9	1.05						16-Jul-07	RBFT-WB	Roberts Bay				

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
494	ARFL	89	8	1.13						16-Jul-07	RBFT-WB	Roberts Bay				
495	ARFL	45	1	1.10						16-Jul-07	RBFT-WB	Roberts Bay				
496	ARCH	684	3160	0.99	F	Green	3998	985153000021470	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
497	ARCH	730	4375	1.12	M	Green	3997	985153000021486	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
498	ARCH	697	3390	1.00	F	Green	3996	985153000021463	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
499	LKTR	582	2170	1.10		Green	3995	985153000021434	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
500	LKTR	549	2040	1.23		Green	3994	985153000021428	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
501	LKTR	264	164.5	0.89				985153000021417	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
502	LKTR	545				Green	3999	985120031599153	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
503	ARCH	223	99.5	0.90				985153000021411	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
504	ARCH	248	130.5	0.86				985120031626774	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
505	ARCH	219	98	0.93				985153000021456	TF	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
506	ARCH	179	50	0.87						17-Jul-07	RBFT-EB	Roberts Bay				
507	ARFL	143	35	1.20						17-Jul-07	RBFT-EB	Roberts Bay				
508	ARFL	158	50	1.27						17-Jul-07	RBFT-EB	Roberts Bay				
509	ARFL	157	48	1.24						17-Jul-07	RBFT-EB	Roberts Bay				
510	ARFL	211	117	1.25						17-Jul-07	RBFT-EB	Roberts Bay				
511	ARFL	186	84	1.31						17-Jul-07	RBFT-EB	Roberts Bay				
512	ARFL	197	100	1.31						17-Jul-07	RBFT-EB	Roberts Bay				
513	ARFL	214	125	1.28						17-Jul-07	RBFT-EB	Roberts Bay				
514	ARFL	143	38	1.30						17-Jul-07	RBFT-EB	Roberts Bay				
515	ARFL	161	54	1.29						17-Jul-07	RBFT-EB	Roberts Bay				
516	ARFL	178	58	1.03						17-Jul-07	RBFT-EB	Roberts Bay				
517	ARFL	198	100	1.29						17-Jul-07	RBFT-EB	Roberts Bay				
518	ARFL	186	90	1.40						17-Jul-07	RBFT-EB	Roberts Bay				
519	ARFL	202	105	1.27						17-Jul-07	RBFT-EB	Roberts Bay				
520	ARFL	157	50	1.29						17-Jul-07	RBFT-EB	Roberts Bay				
521	ARFL	156	50	1.32						17-Jul-07	RBFT-EB	Roberts Bay				
522	ARFL	151	48	1.39						17-Jul-07	RBFT-EB	Roberts Bay				
523	ARFL	180	75	1.29						17-Jul-07	RBFT-EB	Roberts Bay				
524	ARFL	179	72	1.26						17-Jul-07	RBFT-EB	Roberts Bay				
525	ARFL	177	74	1.33						17-Jul-07	RBFT-EB	Roberts Bay				
526	ARFL	112	18	1.28						17-Jul-07	RBFT-EB	Roberts Bay				
527	ARFL	110	16	1.20						17-Jul-07	RBFT-EB	Roberts Bay				
528	ARFL	98	11	1.17						17-Jul-07	RBFT-EB	Roberts Bay				
529	FRSC	115	16	1.05						17-Jul-07	RBFT-EB	Roberts Bay				
530	FRSC	103	12	1.10						17-Jul-07	RBFT-EB	Roberts Bay				
531	FRSC	97	10	1.10						17-Jul-07	RBFT-EB	Roberts Bay				
532	ARCH	116	10	0.64						17-Jul-07	RBFT-WB	Roberts Bay				
533	LKTR	316	290	0.92						17-Jul-07	RBFT-WB	Roberts Bay				
534	ARFL	347	480	1.15						17-Jul-07	RBFT-WB	Roberts Bay				
535	ARFL	322	412	1.23						17-Jul-07	RBFT-WB	Roberts Bay				
536	ARFL	205	108	1.25						17-Jul-07	RBFT-WB	Roberts Bay				
537	ARFL	153	55	1.54						17-Jul-07	RBFT-WB	Roberts Bay				
538	ARFL	146	41	1.32						17-Jul-07	RBFT-WB	Roberts Bay				
539	ARFL	170	50	1.02						17-Jul-07	RBFT-WB	Roberts Bay				
540	ARFL	182	77	1.28						17-Jul-07	RBFT-WB	Roberts Bay				
541	ARFL	121	21	1.19						17-Jul-07	RBFT-WB	Roberts Bay				
542	ARFL	107	15	1.22						17-Jul-07	RBFT-WB	Roberts Bay				
543	ARFL	99	11	1.13						17-Jul-07	RBFT-WB	Roberts Bay				
544	ARFL	212	125	1.31						17-Jul-07	RBFT-WB	Roberts Bay				
545	ARFL	180	78	1.34						17-Jul-07	RBFT-WB	Roberts Bay				
546	ARFL	214	132	1.35						17-Jul-07	RBFT-WB	Roberts Bay				
547	ARFL	118	20	1.22						17-Jul-07	RBFT-WB	Roberts Bay				
548	ARFL	332	418	1.14						17-Jul-07	RBFT-WB	Roberts Bay				
549	ARFL	202	110	1.33						17-Jul-07	RBFT-WB	Roberts Bay				
550	ARFL	155	55	1.48						17-Jul-07	RBFT-WB	Roberts Bay				
551	ARFL	144	42	1.41						17-Jul-07	RBFT-WB	Roberts Bay				
552	ARFL	181	70	1.18						17-Jul-07	RBFT-WB	Roberts Bay				
553	ARFL	123	22	1.18						17-Jul-07	RBFT-WB	Roberts Bay				
554	ARFL	127	24	1.17						17-Jul-07	RBFT-WB	Roberts Bay				
555	ARFL	112	18	1.28						17-Jul-07	RBFT-WB	Roberts Bay				

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
556	ARFL	114	17	1.15						17-Jul-07	RBFT-WB	Roberts Bay				
557	ARFL	184	78	1.25						17-Jul-07	RBFT-WB	Roberts Bay				
558	ARFL	179	76	1.33						17-Jul-07	RBFT-WB	Roberts Bay				
559	ARFL	150	48	1.42						17-Jul-07	RBFT-WB	Roberts Bay				
560	ARFL	123	24	1.29						17-Jul-07	RBFT-WB	Roberts Bay				
561	ARFL	127	25	1.22						17-Jul-07	RBFT-WB	Roberts Bay				
562	ARFL	119	20	1.19						17-Jul-07	RBFT-WB	Roberts Bay				
563	ARFL	123	20	1.07						17-Jul-07	RBFT-WB	Roberts Bay				
564	ARFL	108	18	1.43						17-Jul-07	RBFT-WB	Roberts Bay				
565	ARFL	121	21	1.19						17-Jul-07	RBFT-WB	Roberts Bay				
566	ARFL	98	12	1.27						17-Jul-07	RBFT-WB	Roberts Bay				
567	ARFL	109	16	1.24						17-Jul-07	RBFT-WB	Roberts Bay				
568	ARFL	140	33	1.20						17-Jul-07	RBFT-WB	Roberts Bay				
569	ARFL	128	26	1.24						17-Jul-07	RBFT-WB	Roberts Bay				
570	ARFL	119	22	1.31						17-Jul-07	RBFT-WB	Roberts Bay				
571	ARFL	115	20	1.32						17-Jul-07	RBFT-WB	Roberts Bay				
572	ARFL	137	31	1.21						17-Jul-07	RBFT-WB	Roberts Bay				
573	ARFL	98	12	1.27						17-Jul-07	RBFT-WB	Roberts Bay				
574	FRSC	127	22	1.07						17-Jul-07	RBFT-WB	Roberts Bay				
575	FRSC	107	13	1.06						17-Jul-07	RBFT-WB	Roberts Bay				
576	FRSC	98	11	1.17						17-Jul-07	RBFT-WB	Roberts Bay				
577	FRSC	97	10	1.10						17-Jul-07	RBFT-WB	Roberts Bay				
578	SFCD	99	8	0.82						17-Jul-07	RBFT-WB	Roberts Bay				
579	SFCD	75	3	0.71						17-Jul-07	RBFT-WB	Roberts Bay				
580	SFCD	95	5	0.58						17-Jul-07	RBFT-WB	Roberts Bay				
581	SFCD	77	2	0.44						17-Jul-07	RBFT-WB	Roberts Bay				
582	ARCH	770	5440	1.19					TF	18-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
583	LKTR	558	2145	1.23					TF	18-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
584	LKTR	800	5550	1.08		Green	4696	985120031583479	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
585	LKTR	609	3000	1.33		Green	4724	985120031617593	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
586	LKTR	622	2335	0.97		Green	4684	985120031569853	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
587	LKTR	577	2189	1.14					TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
588	BRWH	543	1930	1.21		White	4707	985120031627717	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
589	LKTR	843	6120	1.02		Green	3084	985120031616234	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
590	LKTR	612	2059	0.90		Green	3978	985120031573894	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
591	BRWH	499	1940	1.56		Green	3056	985120031571206	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
592	LKTR	699	4060	1.19					TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
593	LKTR	577	2275	1.18					TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
594	LKTR	630	3100	1.24					TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
595	ARCH	206	79.5	0.91				985120031571786	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
596	ARCH	214	79	0.81				985120031623677	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
597	ARCH	223	133.5	1.20				985120031562788	TF	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
598	NNST	44			U				BP	20-Jul-07	E14BP-01	E14		C		
599	NNST	32			U				BP	20-Jul-07	E14BP-01	E14		C		
600	NNST	39			U				BP	20-Jul-07	E14BP-01	E14		C		
601	NNST	52			U				BP	20-Jul-07	E14BP-01	E14		C		
602	ARCH	90			U				BP	20-Jul-07	E14BP-01	E14		C		
603	ARCH	84			U				BP	20-Jul-07	E14BP-01	E14		C		
604	ARCH	68			U				BP	20-Jul-07	E14BP-01	E14		C		
605	ARCH	74			U				BP	20-Jul-07	E14BP-01	E14		C		
606	ARCH	77			U				BP	20-Jul-07	E14BP-01	E14		C		
607	ARCH	88			U				BP	20-Jul-07	E14BP-01	E14		C		
608	ARCH	73			U				BP	20-Jul-07	E14BP-01	E14		C		
609	ARCH	74			U				BP	20-Jul-07	E14BP-01	E14		C		
610	ARCH	75			U				BP	20-Jul-07	E14BP-01	E14		C		
611	ARCH	85			U				BP	20-Jul-07	E14BP-01	E14		C		
612	ARCH	67			U				BP	20-Jul-07	E14BP-01	E14		C		
613	ARCH	61			U				BP	20-Jul-07	E14BP-01	E14		C		
614	ARCH	77			U				BP	20-Jul-07	E14BP-01	E14		C		
615	ARCH	81			U				BP	20-Jul-07	E14BP-01	E14		C		
616	ARCH	92			U				BP	20-Jul-07	E14BP-01	E14		C		
617	ARCH	111			U				BP	20-Jul-07	E14BP-01	E14		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
618	ARCH	256			U				BP	20-Jul-07	E14BP-01	E14		C		
619	ARCH	82			U				BP	20-Jul-07	E14BP-01	E14		M		
620	ARCH	78			U				BP	20-Jul-07	E14BP-01	E14		M		
621	ARCH	75			U				BP	20-Jul-07	E14BP-01	E14		M		
622	ARCH	74			U				BP	20-Jul-07	E14BP-01	E14		M		
623	ARCH	271	188.5	0.95				985153000021401	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
624	ARCH	266	176.5	0.94				985153000021440	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
625	ARCH	269	185.5	0.95				985153000021404	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
626	ARCH	460	639.5	0.66				985153000021485	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
627	ARCH	263	168.5	0.93				985153000021458	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
628	ARCH	216	92.5	0.92				985153000021471	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
629	ARCH	214	84.5	0.86				985153000021480	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
630	ARCH	214	88.5	0.90				985153000021476	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
631	ARCH	207	92	1.04				985153000021437	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
632	ARCH	250	133.5	0.85				985153000021406	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
633	ARCH	211	90.5	0.96				985153000021407	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
634	ARCH	225	106	0.93				985153000021488	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
635	ARCH	277	158	0.74				985153000021454	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
636	ARCH	251	149	0.94				985153000021416	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
637	ARCH	229	132	1.10				985153000021473	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
638	ARCH	204	90	1.06				985153000021462	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
639	ARCH	245	156	1.06				985153000021441	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
640	ARCH	235	187	1.44				985153000021418	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
641	ARCH	214	105	1.07				985153000021498	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
642	ARCH	254	165	1.01				985153000021465	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
643	ARCH	252	149	0.93				985153000021459	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
644	ARCH	237	114	0.86				985153000021448	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
645	ARCH	210	92	0.99				985153000021466	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
646	LKTR	562	2220	1.25		Green	3993	985153000021419	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
647	LKTR	589	2805	1.37		Green	3992	985153000021435	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
648	LKTR	579	3000	1.55		Green	3990	985153000021495	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
649	LKTR	551	2270	1.36		Green	3989	985153000021455	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
650	LKTR	559	2320	1.33		Green	3987	985153000021439	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
651	LKTR	559	1740	1.00		Green	4266	985153000021438	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
652	LKTR	510	1735	1.31		Green	4176	985153000021414	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
653	LKTR	525	1770	1.22		Green	4298	985153000021403	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
654	LKTR	469	1105	1.07		Green	3575	985153000021442	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
655	LKTR	689	3345	1.02		Green	3985	985153000021475	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
656	LKTR	581	2650	1.35		Green	3984	985153000021457	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
657	LKTR	519	1730	1.24		Green	4293	985153000021410	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
658	LKTR	508	1540	1.17		Green	4010	985153000021496	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
659	LKTR	817	6135	1.12		Green	4636	985153000021436	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
660	LKTR	572	2110	1.13		Green	4063	985153000021420	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
661	LKTR	523	1625	1.14		Blue	16	985153000021444	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2000	
662	LKTR	460	1130	1.16		Green	4312	985153000021446	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
663	LKTR	575	2350	1.24		Green	3983	985153000021489	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
664	LKTR	548	2165	1.32		Green	4055	985153000021447	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
665	LKTR	460	1095	1.12		Green	4016	985153000021493	TF	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
1502	LKWH	166	29	0.63					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
1501	LKWH	170	30	0.61					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
668	LKTR	226	105	0.91	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
669	ARCH	84	3.5	0.59	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
670	ARCH	87	4.5	0.68	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
671	ARCH	82	4	0.73	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
672	ARCH	80	4	0.78	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
673	ARCH	75	3	0.71	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
674	NNST	45			U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
1503	LKWH	174	42	0.80					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
782	LKWH	229	162.5	1.35	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
677	LKTR	255	165	1.00	U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		
678	ARCH	126	30	1.50	U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		
679	ARCH	74			U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
680	ARCH	86	4	0.63	U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		
681	LKTR	575	2250	1.18		Green	3981	985153000021483	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
682	LKTR	542	2070	1.30		Green	3982	985153000021484	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
683	ARCH	699	4255	1.25	F	Green	4678	985153000021445	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
684	ARCH	780	5700	1.20					TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
685	LKTR	525	1865	1.29		Green	4034	985153000021422	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
686	LKTR	538	1740	1.12		Blue	45	985153000021467	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	1997	
687	LKTR	586	2045	1.02		Green	4009	985153000021478	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
688	LKTR	553	2185	1.29		Green	3988	985153000021460	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
689	LKTR	726	4440	1.16				985153000021409	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
690	LKTR	609	2270	1.01				985153000021443	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
691	LKTR	510	1690	1.27				985153000021492	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
692	LKTR	586	2640	1.31				985153000021461	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		Mortality: Found dead u/s of fence (kept for Heidi)
693	ARCH	678	3730	1.20	F	Green	4673	985153000021481	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
694	ARCH	715	3620	0.99					TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
695	LKTR	459	995	1.03				985153000021478	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
696	LKTR	535	1980	1.29				985153000021469	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
697	LKTR	590	2350	1.14				985153000021449	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
698	LKTR	589	2905	1.42				985153000021405	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
699	LKTR	537	1815	1.17				985153000021427	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
700	LKTR	508	1420	1.08				985153000021402	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
701	ARCH	699	4255	1.25	F	Green	4678	985153000021445	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
702	LKTR							985153000021479	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	Mortality (kept for Heidi)
703	LKTR	562	2220	1.25		Green	3993	985153000021419	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
704	LKTR	508	1420	1.08				985153000021402	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
705	LKTR	575	2350	1.24		Green	3983	985153000021489	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
706	LKTR	330	295	0.82				985153000021429	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
707	ARCH	338	335	0.87				985153000021433	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
708	ARCH	204	66.5	0.78					TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
709	LKTR	396	536	0.86				985153000021464	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
710	ARCH	195	52	0.70					TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
711	ARCH	345	433	1.05				985153000021425	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
712	ARCH	368	429	0.86				985153000021500	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
713	ARCH	301	235	0.86				985153000021430	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
714	ARCH	209	73	0.80				985153000021477	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
715	ARCH	270	172	0.87				985153000021426	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
716	ARCH	214	80.5	0.82				985153000021431	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
717	ARCH	190	62	0.90				985153000021413	TF	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
718	ARCH	294	235	0.92					TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Was dying-sacrificed for Heidi
719	ARCH	216	103	1.02					TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
720	ARCH	189	82.5	1.22				985153000021491	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
721	ARCH	333	342	0.93		Green	4603	985153000021468	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
722	ARCH	428	745	0.95				985153000021487	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
723	ARCH	339	345	0.89				985120031611172	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
724	ARCH	214	120	1.22				985153000021432	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
725	ARCH	183	93.5	1.53				985153000021450	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
726	LSCS	96							TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
727	LKTR	803	5580	1.08		Green	4206	985153000021452	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
728	ARCH	769	5975	1.31		Green	4898	985153000021494	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
729	LKTR	532	1900	1.26		White	2149	985153000021423	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2002	
730	LKTR	449	865	0.96		Green	4897	985153000021453	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
731	LKTR	523	1385	0.97		Green	4627	985153000021490	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
732	LKTR	605	2420	1.09		Green	3806	985153000021424	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	PIT tag 985120031577260 inserted 28 jun 07
733	LKTR	620	2955	1.24		Green	4896	985153000021472	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
734	LKTR	627	2730	1.11		Green	4895	985153000021482	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
735	LKTR	464	1345	1.35		Green	4894	985153000021497	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
736	LKTR	575	2250	1.18		Green	4893	985153000021451	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
737	LKTR	554	1805	1.06		Green	4096	985153000021421	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
738	LKTR	545	1870	1.16		Green	4892	985153000021415	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
739	ARCH	175	64.5	1.20					TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
740	ARCH	201	81.5	1.00				985153000021041	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
741	ARCH	220	105.5	0.99				985153000021069	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
742	ARCH	215	105.5	1.06				985153000021029	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
743	ARCH	219	115.5	1.10				985153000021012	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
744	ARCH	245	165	1.12				985153000021071	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
745	ARCH	208						985153000021412	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
746	ARCH	215	113	1.14				985153000021055	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
747	ARCH	240	132.5	0.96				985153000021474	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
748	ARCH	261	177.5	1.00				985153000021408	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
749	ARCH	188	84	1.26				985153000021095	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
750	ARCH	194	82.5	1.13				985153000021023	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
751	ARCH	204	108.5	1.28				985153000021499	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
752	ARCH	250	128	0.82				985153000021074	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
753	ARCH	350	375.5	0.88				985153000021096	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
754	ARCH	257	165.5	0.97				985153000021091	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
755	ARCH	289	265	1.10				985153000021064	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
756	ARCH	261	175	0.98				985153000021019	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
757	ARCH	238	147	1.09				985153000021066	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
758	ARCH	226	110.5	0.96				985153000021080	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
759	ARCH	230	137	1.13				985153000021075	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
760	ARCH	257	155	0.91				985153000021009	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
761	ARCH	361	385	0.82				985153000021100	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
762	ARCH	262	173.5	0.96				985153000021028	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
763	ARCH	336	331	0.87				985153000021049	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
764	ARCH	319	299	0.92				985153000021036	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
765	ARCH	254	143	0.87				985153000021004	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
766	ARCH	295	249.5	0.97				985153000021096	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
767	ARCH	246	129.5	0.87				985120031579487	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
768	ARCH	231	111.5	0.90				985153000021052	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
769	ARCH	238	115	0.85				985153000021048	TF	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
770	LKTR	505	1578	1.23	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1508	LKWH	241	182	1.30					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
1506	LKWH	251	208	1.32					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
824	CISC	85	5	0.81	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
822	CISC	119	10	0.59	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
820	CISC	146	40	1.29	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
774	CISC	160	66	1.61	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
780	CISC	169	66.5	1.38	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
775	CISC	170	55	1.12	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
819	CISC	171	65	1.30	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
784	CISC	180	83.5	1.43	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1259	LKWH	275	260	1.25	M				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1500	LKWH	290	288	1.18					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
783	LKTR	304	312.5	1.11	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
790	CISC	190	67	0.98	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
785	ARCH	181	49.5	0.83	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
786	LKTR	210	88.5	0.96	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
787	NNST	46			U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
788	NNST	71	2	0.56	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1504	LKWH	297	301	1.15					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
1545	CISC	190	70	1.02					GN	11-Sep-07	RLGN-18	Roberts Lake		C		
791	NNST	55	1	0.60	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
792	NNST	54	1	0.64	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
793	NNST	52	1	0.71	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
794	ARCH	81	5	0.94	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
795	ARCH	117	13.5	0.84	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
796	ARCH	74	3	0.74	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
797	ARCH	105	7	0.60	U				FT	23-Jul-07	RLFT-02	Roberts Lake		C		
798	LKTR	122	21	1.16	U				BP	23-Jul-07	E10BP-01	E10		C		
799	ARCH	82	9	1.63	U				BP	23-Jul-07	E10BP-01	E10		C		
800	ARCH	80	3.5	0.68	U				BP	23-Jul-07	E10BP-01	E10		C		
801	ARCH	106	7.5	0.63	U				BP	23-Jul-07	E10BP-01	E10		C		
802	ARCH	78	4	0.84	U				BP	23-Jul-07	E10BP-01	E10		C		
803	ARCH	113	14	0.97	U				BP	23-Jul-07	E10BP-01	E10		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
804	NNST	34			U				BP	23-Jul-07	E10BP-01	E10		C		
805	NNST	32			U				BP	23-Jul-07	E10BP-01	E10		C		
806	ARCH	100	11	1.10	U				BP	23-Jul-07	E10BP-01	E10		C		
807	LKTR	99	12	1.24	U				BP	23-Jul-07	E10BP-01	E10		C		
808	LKTR	852	6260	1.01		Green	4699	985153000021076	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
809	LKTR	604	3015	1.37		Green	4891	985153000021002	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
810	LKTR	545	2450	1.51		Green	4269	985153000021044	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
811	ARCH	773	4705	1.02		Green	4425	985153000021035	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
812	ARCH	242	133.5	0.94				985153000021021	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		C		
813	ARCH	219	113	1.08				985153000021097	TF	23-Jul-07	LROTFF-01	Little Roberts Outflow		C		
814	ARCH	678	3095	0.99	U	Green	3971		FT	24-Jul-07	RLFT-01	Roberts Lake		R	2007	
777	CISC	199	92.5	1.17	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1498	CISC	205	73	0.85					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
781	LKWH	303	383	1.38	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
818	LKTR	279	205	0.94	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
779	CISC	211	116.5	1.24	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1497	CISC	228	139	1.17					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
821	ARCH	149	20	0.60	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
776	CISC	233	118.5	0.94	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
823	ARCH	115	10	0.66	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
1546	CISC	236	127	0.97					GN	11-Sep-07	RLGN-18	Roberts Lake		C		
825	NNST	64			U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
826	NNST	42			U				FT	24-Jul-07	RLFT-02	Roberts Lake		C		
827	ARCH	185	50	0.79	U				FT	24-Jul-07	RLFT-02	Roberts Lake		C		
828	ARCH	119	20	1.19	U				FT	24-Jul-07	RLFT-02	Roberts Lake		C		
829	LKTR	433			U				BP	24-Jul-07	E04BP-01	E04		C		
830	LKTR	389			U	Green	3445		BP	24-Jul-07	E04BP-01	E04		C	2007	
831	ARCH	126			U				BP	24-Jul-07	E04BP-01	E04		C		
832	ARCH	127			U				BP	24-Jul-07	E04BP-01	E04		C		
833	ARCH	225			U				BP	24-Jul-07	E04BP-01	E04		C		
834	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
835	NNST	57			U				BP	24-Jul-07	E04BP-01	E04		C		
836	NNST	44			U				BP	24-Jul-07	E04BP-01	E04		C		
837	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
838	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
839	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
840	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
841	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
842	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
843	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
844	NNST	65			U				BP	24-Jul-07	E04BP-01	E04		C		
845	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
846	NNST	44			U				BP	24-Jul-07	E04BP-01	E04		C		
847	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
848	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
849	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
850	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
851	NNST	53			U				BP	24-Jul-07	E04BP-01	E04		C		
852	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
853	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
854	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
855	NNST	49			U				BP	24-Jul-07	E04BP-01	E04		C		
856	NNST	35			U				BP	24-Jul-07	E04BP-01	E04		C		
857	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
858	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
859	NNST	57			U				BP	24-Jul-07	E04BP-01	E04		C		
860	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
861	NNST	37			U				BP	24-Jul-07	E04BP-01	E04		C		
862	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
863	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
864	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
865	NNST	60			U				BP	24-Jul-07	E04BP-01	E04		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
866	NNST	35			U				BP	24-Jul-07	E04BP-01	E04		C		
867	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
868	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
869	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
870	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
871	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
872	NNST	57			U				BP	24-Jul-07	E04BP-01	E04		C		
873	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
874	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
875	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
876	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
877	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
878	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
879	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
880	NNST	38			U				BP	24-Jul-07	E04BP-01	E04		C		
881	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
882	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
883	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
884	NNST	53			U				BP	24-Jul-07	E04BP-01	E04		C		
885	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
886	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
887	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
888	NNST	44			U				BP	24-Jul-07	E04BP-01	E04		C		
889	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
890	NNST	47			U				BP	24-Jul-07	E04BP-01	E04		C		
891	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
892	NNST	53			U				BP	24-Jul-07	E04BP-01	E04		C		
893	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
894	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
895	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
896	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
897	NNST	53			U				BP	24-Jul-07	E04BP-01	E04		C		
898	NNST	37			U				BP	24-Jul-07	E04BP-01	E04		C		
899	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
900	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
901	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
902	NNST	47			U				BP	24-Jul-07	E04BP-01	E04		C		
903	ARCH	445			U				BP	24-Jul-07	E04BP-01	E04		C		
904	ARCH	178			U				BP	24-Jul-07	E04BP-01	E04		C		
905	ARCH	124			U				BP	24-Jul-07	E04BP-01	E04		C		
906	ARCH	137			U				BP	24-Jul-07	E04BP-01	E04		C		
907	ARCH	160			U				BP	24-Jul-07	E04BP-01	E04		C		
908	LKTR	165			U				BP	24-Jul-07	E04BP-01	E04		C		
909	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
910	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
911	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
912	NNST	41			U				BP	24-Jul-07	E04BP-01	E04		C		
913	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
914	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
915	NNST	48			U				BP	24-Jul-07	E04BP-01	E04		C		
916	NNST	44			U				BP	24-Jul-07	E04BP-01	E04		C		
917	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
918	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
919	NNST	35			U				BP	24-Jul-07	E04BP-01	E04		C		
920	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
921	NNST	58			U				BP	24-Jul-07	E04BP-01	E04		C		
922	NNST	60			U				BP	24-Jul-07	E04BP-01	E04		C		
923	NNST	36			U				BP	24-Jul-07	E04BP-01	E04		C		
924	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
925	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
926	NNST	65			U				BP	24-Jul-07	E04BP-01	E04		C		
927	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
928	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
929	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
930	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
931	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
932	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
933	NNST	55			U				BP	24-Jul-07	E04BP-01	E04		C		
934	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
935	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
936	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
937	NNST	48			U				BP	24-Jul-07	E04BP-01	E04		C		
938	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
939	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
940	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
941	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
942	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
943	NNST	43			U				BP	24-Jul-07	E04BP-01	E04		C		
944	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
945	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
946	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
947	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
948	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
949	LKTR	410			U				BP	24-Jul-07	E04BP-01	E04		C		
950	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
951	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
952	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
953	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
954	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
955	NNST	47			U				BP	24-Jul-07	E04BP-01	E04		C		
956	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
957	NNST	57			U				BP	24-Jul-07	E04BP-01	E04		C		
958	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
959	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
960	NNST	54			U				BP	24-Jul-07	E04BP-01	E04		C		
961	NNST	70			U				BP	24-Jul-07	E04BP-01	E04		C		
962	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
963	NNST	54			U				BP	24-Jul-07	E04BP-01	E04		C		
964	NNST	39			U				BP	24-Jul-07	E04BP-01	E04		C		
965	NNST	40			U				BP	24-Jul-07	E04BP-01	E04		C		
966	NNST	54			U				BP	24-Jul-07	E04BP-01	E04		C		
967	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
968	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
969	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
970	NNST	47			U				BP	24-Jul-07	E04BP-01	E04		C		
971	NNST	51			U				BP	24-Jul-07	E04BP-01	E04		C		
972	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
973	NNST	52			U				BP	24-Jul-07	E04BP-01	E04		C		
974	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
975	NNST	47			U				BP	24-Jul-07	E04BP-01	E04		C		
976	NNST	44			U				BP	24-Jul-07	E04BP-01	E04		C		
977	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
978	NNST	42			U				BP	24-Jul-07	E04BP-01	E04		C		
979	NNST	56			U				BP	24-Jul-07	E04BP-01	E04		C		
980	NNST	50			U				BP	24-Jul-07	E04BP-01	E04		C		
981	NNST	57			U				BP	24-Jul-07	E04BP-01	E04		C		
982	NNST	45			U				BP	24-Jul-07	E04BP-01	E04		C		
983	NNST	46			U				BP	24-Jul-07	E04BP-01	E04		C		
984	NNST	61			U				BP	24-Jul-07	E04BP-01	E04		C		
985	LSCS	208			U				BP	24-Jul-07	E04BP-01	E04		C		
986	LKTR	571	2410	1.29		Green	4890	985120031573982	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
987	LKTR	547	2155	1.32		Green	4889	985120031630304	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
988	ARCH	658	3535	1.24		Green	4888	985120031623378	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
989	ARCH	735	4975	1.25		Green	4886	985120031631488	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	

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Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
990	ARCH	799	6355	1.25		Green	4885	985120031628310	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
991	LKTR	547	2265	1.38		Blue	28	985153000021068	TF	24-Jul-07	LROTFF-01	Little Roberts Outflow		R	2000	
992	ARCH	72			U				BP	25-Jul-07	E14BP-02	E14		C		
993	ARCH	80			U				BP	25-Jul-07	E14BP-02	E14		C		
994	ARCH	67			U				BP	25-Jul-07	E14BP-02	E14		C		
995	ARCH	68			U				BP	25-Jul-07	E14BP-02	E14		C		
996	ARCH	82			U				BP	25-Jul-07	E14BP-02	E14		C		
997	NNST	71			U				BP	25-Jul-07	E14BP-02	E14		C		
998	NNST	41			U				BP	25-Jul-07	E14BP-02	E14		C		
999	ARCH	103			U				BP	25-Jul-07	E14BP-02	E14		C		
1000	ARCH	68			U				BP	25-Jul-07	E14BP-02	E14		C		
1001	ARCH	107			U				BP	25-Jul-07	E14BP-02	E14		C		
1002	ARCH	93			U				BP	25-Jul-07	E14BP-02	E14		C		
1003	ARCH	84			U				BP	25-Jul-07	E14BP-02	E14		C		
1004	ARCH	92			U				BP	25-Jul-07	E14BP-02	E14		C		
1005	ARCH	75			U				BP	25-Jul-07	E14BP-02	E14		C		
1006	ARCH	80			U				BP	25-Jul-07	E14BP-02	E14		C		
1007	NNST	48			U				BP	25-Jul-07	E14BP-02	E14		C		
1008	ARCH	77			U				BP	25-Jul-07	E14BP-02	E14		C		
1009	ARCH	74			U				BP	25-Jul-07	E14BP-02	E14		C		
1010	ARCH	75			U				BP	25-Jul-07	E14BP-02	E14		C		
1011	ARCH	139	30	1.12	U				BP	25-Jul-07	E14BP-02	E14		C		
1012	ARCH	69			U				BP	25-Jul-07	E14BP-02	E14		C		
1013	ARCH	74			U				BP	25-Jul-07	E14BP-02	E14		C		
1014	ARCH	74			U				BP	25-Jul-07	E14BP-02	E14		C		
1015	ARCH	71			U				BP	25-Jul-07	E14BP-02	E14		C		
1016	ARCH	73			U				BP	25-Jul-07	E14BP-02	E14		C		
1017	ARCH	72			U				BP	25-Jul-07	E14BP-02	E14		C		
1018	ARCH	75			U				BP	25-Jul-07	E14BP-02	E14		C		
1019	ARCH	77			U				BP	25-Jul-07	E14BP-02	E14		C		
1020	ARCH	77			U				BP	25-Jul-07	E14BP-02	E14		C		
1021	ARCH	76			U				BP	25-Jul-07	E14BP-02	E14		C		
1022	ARCH	74			U				BP	25-Jul-07	E14BP-02	E14		C		
1023	ARCH	67			U				BP	25-Jul-07	E14BP-02	E14		C		
1024	ARCH	77			U				BP	25-Jul-07	E14BP-02	E14		C		
1025	ARCH	39			U				BP	25-Jul-07	E14BP-02	E14		C		
1026	NNST	55			U				BP	25-Jul-07	E14BP-02	E14		C		
1027	NNST	47			U				BP	25-Jul-07	E14BP-02	E14		C		
1028	NNST	42			U				BP	25-Jul-07	E14BP-02	E14		C		
1029	NNST	42			U				BP	25-Jul-07	E14BP-02	E14		C		
1030	NNST	44			U				BP	25-Jul-07	E14BP-02	E14		C		
1031	NNST	43			U				BP	25-Jul-07	E14BP-02	E14		C		
1032	NNST	49			U				BP	25-Jul-07	E14BP-02	E14		C		
1033	NNST	38			U				BP	25-Jul-07	E14BP-02	E14		C		
1034	ARCH	99			U				BP	25-Jul-07	E14BP-02	E14		C		
1035	ARCH	94			U				BP	25-Jul-07	E14BP-02	E14		C		
1036	ARCH	68			U				BP	25-Jul-07	E14BP-02	E14		C		
1037	NNST	56			U				BP	25-Jul-07	E14BP-02	E14		C		
1038	NNST	45			U				BP	25-Jul-07	E14BP-02	E14		C		
1039	NNST	46			U				BP	25-Jul-07	E14BP-02	E14		C		
1040	NNST	47			U				BP	25-Jul-07	E14BP-02	E14		C		
1041	NNST	49			U				BP	25-Jul-07	E14BP-02	E14		C		
1042	NNST	35			U				BP	25-Jul-07	E14BP-02	E14		C		
1043	NNST	35			U				BP	25-Jul-07	E14BP-02	E14		C		
1044	NNST	41			U				BP	25-Jul-07	E14BP-02	E14		C		
1045	NNST	42			U				BP	25-Jul-07	E14BP-02	E14		C		
1046	ARCH	72			U				BP	25-Jul-07	E14BP-02	E14		C		
1047	ARCH	82			U				BP	25-Jul-07	E14BP-02	E14		C		
1048	ARCH	79			U				BP	25-Jul-07	E14BP-02	E14		C		
1049	ARCH	79			U				BP	25-Jul-07	E14BP-02	E14		C		
1050	ARCH	73			U				BP	25-Jul-07	E14BP-02	E14		C		
1051	ARCH	75			U				BP	25-Jul-07	E14BP-02	E14		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1052	ARCH	77			U				BP	25-Jul-07	E14BP-02	E14		C		
1053	ARCH	117			U				BP	25-Jul-07	E14BP-02	E14		C		
1054	ARCH	100			U				BP	25-Jul-07	E11BP-01	E11		C		
1055	ARCH	138			U				BP	25-Jul-07	E11BP-01	E11		C		
1056	ARCH	668	3760	1.26	F	Green	4883	985153000021088	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1057	LKTR	677	3955	1.27		Green	4884	985153000021042	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1058	ARCH	694	3870	1.16	F	Green	3374	985153000021083	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
1059	ARCH	890	7060	1.00	M	Green	4882	985153000021026	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1060	ARCH	822	6040	1.09	M	Green	4880	985153000021007	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1061	ARCH	742	5010	1.23	F	Green	4631	985153000021016	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1062	LKTR	550	2470	1.48		Green	4090	985153000021085	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
1063	ARCH	765	4675	1.04	F	Green	4879	985153000021067	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1064	ARCH	898	6925	0.96	M	Green	4878	985153000021038	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1065	LKTR	239	135	0.99				985153000021010	TF	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1066	LKTR	821	6330	1.14	M	Green	4694	985153000021020	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1067	ARCH	746	5180	1.25	F	Green	4640	985153000021058	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1068	LKTR	664	3715	1.27		Green	4877	985153000021086	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1069	ARCH	790	5310	1.08	M	Green	4876	985153000021081	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1070	LKTR	614	2615	1.13		Green	4875	985153000021011	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1071	ARCH	708	3905	1.10	F	Green	4626	985153000021087	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1072	ARCH	687	3790	1.17	F	Green	4874	985153000021065	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1073	ARCH	636	3210	1.25	F	Green	4873	985153000021006	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1074	LKTR	524				Green	4030	985120031587003	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
1075	LKTR	560	2530	1.44		Green	4872	985153000021017	TF	26-Jul-07	LROTFF-01	Little Roberts Outflow		C	2007	
1076	CISC	245	160	1.09	M				GN	24-Aug-07	DLGN-H4	Doris Lake		M		kept for Heidi
1077	CISC	239	135	0.99	M				GN	24-Aug-07	DLGN-H4	Doris Lake		M		kept for Heidi
1078	CISC	235	125	0.96	F				GN	24-Aug-07	DLGN-H4	Doris Lake		M		kept for Heidi
1079	CISC	241	150	1.07	M				GN	24-Aug-07	DLGN-H4	Doris Lake		M		kept for Heidi
1080	CISC	165	40	0.89	M				GN	24-Aug-07	DLGN-H4	Doris Lake		M		kept for Heidi
1081	LKWH	390	800	1.35	M				GN	24-Aug-07	DLGN-H2	Doris Lake		M		kept for Heidi
1082	LKWH	370	675	1.33	F				GN	24-Aug-07	DLGN-H3	Doris Lake		M		kept for Heidi
1083	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1084	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1085	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1086	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1087	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1088	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1089	CISC								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1090	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1091	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1092	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1093	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1094	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1095	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1096	LKWH								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1097	LKTR								GN	24-Aug-07	DLGN-H1	Doris Lake		C		
1098	LKTR								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1099	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1100	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1101	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1102	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1103	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1104	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1105	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1106	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1107	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1108	CISC								GN	24-Aug-07	DLGN-H2	Doris Lake		C		
1109	LKWH								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1110	LKTR								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1111	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1112	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1113	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1114	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1115	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1116	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1117	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1118	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1119	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1120	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1121	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1122	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1123	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1124	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1125	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1126	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1127	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1128	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1129	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1130	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1131	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1132	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1133	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1134	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1135	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1136	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1137	CISC								GN	24-Aug-07	DLGN-H3	Doris Lake		C		
1138	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1139	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1140	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1141	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1142	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1143	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1144	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1145	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1146	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1147	CISC								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1148	LKTR								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1149	LKWH								GN	24-Aug-07	DLGN-H4	Doris Lake		C		
1150	LKWH								GN	24-Aug-07	DLGN-H5	Doris Lake		C		
1151	CISC								GN	24-Aug-07	DLGN-H5	Doris Lake		C		
1152	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1153	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1154	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1155	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1156	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1157	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1158	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1159	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1160	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1161	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1162	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1163	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1164	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1165	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1166	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1167	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1168	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1169	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1170	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1171	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1172	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1173	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1174	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1175	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1176	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1177	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1178	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1179	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1180	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1181	CISC								GN	24-Aug-07	DLGN-H6	Doris Lake		C		
1182	LKTR	579	1865	0.96	F				GN	25-Aug-07	DLGN-H7	Doris Lake		M		kept for Heidi
1183	LKTR	488	1130	0.97	F				GN	25-Aug-07	DLGN-H7	Doris Lake		M		kept for Heidi
1184	LKWH	335	465	1.24	F				GN	25-Aug-07	DLGN-H7	Doris Lake		M		kept for Heidi
1185	LKWH	372	675	1.31	M				GN	25-Aug-07	DLGN-H7	Doris Lake		M		kept for Heidi
1186	LKWH	475	1590	1.48	M				GN	25-Aug-07	DLGN-H9	Doris Lake		M		kept for Heidi
1187	LKWH								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1188	LKTR								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1189	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1190	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1191	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1192	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1193	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1194	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1195	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1196	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1197	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1198	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1199	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1200	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1201	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1202	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1203	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1204	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1205	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1206	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1207	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1208	CISC								GN	25-Aug-07	DLGN-H7	Doris Lake		C		
1209	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1210	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1211	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1212	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1213	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1214	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1215	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1216	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1217	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1218	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1219	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1220	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1221	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1222	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1223	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1224	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1225	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1226	CISC								GN	25-Aug-07	DLGN-H8	Doris Lake		C		
1227	LKTR								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1228	LKWH								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1229	LKWH								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1230	LKTR								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1231	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1232	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1233	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1234	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1235	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1236	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1237	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1238	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1239	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1240	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1241	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1242	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1243	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1244	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1245	CISC								GN	25-Aug-07	DLGN-H9	Doris Lake		C		
1246	ARCH	672	3370	1.11	F				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1247	ARCH	820	5965	1.08	M				GN	26-Aug-07	RLGN-H4	Roberts Lake		M		kept for Heidi
1248	ARCH	810	6070	1.14	M				GN	26-Aug-07	RLGN-H4	Roberts Lake		M		kept for Heidi
816	CISC	242	175	1.23	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
1547	CISC	249	190	1.23					GN	11-Sep-07	RLGN-18	Roberts Lake		C		
773	CISC	250	184.5	1.18	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1252	LKTR	880	7485	1.10	F				GN	26-Aug-07	RLGN-H1	Roberts Lake		M		kept for Heidi
1253	LKTR	738	4470	1.11	M				GN	26-Aug-07	RLGN-H2	Roberts Lake		M		kept for Heidi
1254	LKTR	725	4915	1.29	F				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1255	LKTR	875	7155	1.07	F				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1256	LKTR	415	750	1.05	M				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1257	LKTR	276	195	0.93	F				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
817	LKWH	311	400	1.33	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
1550	LKWH	313	387	1.26					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1260	LKTR								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1261	LKTR								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1262	LKTR								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1263	LKTR								GN	26-Aug-07	RLGN-H4	Roberts Lake		C		
1264	LKTR								GN	26-Aug-07	RLGN-H4	Roberts Lake		C		
1265	LKWH								GN	26-Aug-07	RLGN-H1	Roberts Lake		C		
1266	LKWH								GN	26-Aug-07	RLGN-H1	Roberts Lake		C		
1267	LKWH								GN	26-Aug-07	RLGN-H1	Roberts Lake		C		
1268	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1269	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1270	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1271	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1272	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1273	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1274	LKWH								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1275	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1276	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1277	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1278	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1279	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1280	LKWH								GN	26-Aug-07	RLGN-H4	Roberts Lake		C		
1281	LKWH								GN	26-Aug-07	RLGN-H4	Roberts Lake		C		
1282	LKWH								GN	26-Aug-07	RLGN-H4	Roberts Lake		C		
1283	LKWH								GN	26-Aug-07	RLGN-H3	Roberts Lake		C		
1284	CISC								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1285	CISC								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1286	CISC								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1287	CISC								GN	26-Aug-07	RLGN-H2	Roberts Lake		C		
1288	ARCH	777	4795	1.02	F				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1289	ARCH	355	625	1.40	F				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1290	LKTR	790	6720	1.36	F				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1291	LKTR	755	4830	1.12	F				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1292	LKTR	412	675	0.97	F				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1293	LKTR	395	670	1.09	M				GN	27-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
1294	LKTR	380	760	1.39	F				GN	27-Aug-07	RLGN-H4	Roberts Lake		M		kept for Heidi
1295	LKTR								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1296	LKTR								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1297	LKTR								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1298	LKTR								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1299	LKTR								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1300	LKTR								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1301	LKTR								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1302	LKTR								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1303	LKTR								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1304	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1305	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1306	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1307	CISC								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1308	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1309	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1310	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1311	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1312	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1313	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1314	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1315	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1316	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1317	CISC								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1318	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1319	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1320	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1321	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1322	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1323	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1324	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1325	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1326	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1327	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1328	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1329	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1330	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1331	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1332	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1333	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1334	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1335	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1336	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1337	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1338	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1339	LKWH								GN	27-Aug-07	RLGN-H3	Roberts Lake		C		
1340	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1341	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1342	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1343	LKWH								GN	27-Aug-07	RLGN-H4	Roberts Lake		C		
1344	ARCH	105							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1345	ARCH	112							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1346	ARCH	98							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1347	LKTR	770	6195	1.36	F				GN	28-Aug-07	RLGN-H4	Roberts Lake		M		kept for Heidi
1348	LKTR	115							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1349	NNST	40							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1350	NNST	45							BP	28-Aug-07	RLBP-H1	Roberts Lake		M		kept for Heidi
1351	LKTR								GN	28-Aug-07	RLGN-H3	Roberts Lake		C		
1352	LKTR								GN	28-Aug-07	RLGN-H3	Roberts Lake		C		
1353	ARCH								BP	28-Aug-07	RLBP-H1	Roberts Lake		O		
1354	ARCH								BP	28-Aug-07	RLBP-H1	Roberts Lake		O		
1355	LKTR								BP	28-Aug-07	RLBP-H1	Roberts Lake		O		
1356	LKWH								GN	28-Aug-07	RLGN-H3	Roberts Lake		C		
1357	LKWH								GN	28-Aug-07	RLGN-H3	Roberts Lake		C		
1358	LKWH								GN	28-Aug-07	RLGN-H3	Roberts Lake		C		
1359	LKWH								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1360	LKWH								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1361	LKWH								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1362	LKWH								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1363	LKWH								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1364	CISC								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1365	CISC								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1366	CISC								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1367	CISC								GN	28-Aug-07	RLGN-H4	Roberts Lake		C		
1368	ARCH	400	775	1.21					GN	04-Sep-07	L10GN-H6	Lake 10		M		kept for Heidi
1369	ARCH	450	875	0.96					GN	04-Sep-07	L10GN-H6	Lake 10		M		kept for Heidi
1370	LKTR	440	910	1.07					GN	04-Sep-07	L10GN-H2	Lake 10		M		kept for Heidi
1371	NNST	38							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1372	NNST	45							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1373	NNST	62							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1374	NNST	54							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1375	NNST	48							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1376	NNST	59							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1377	NNST	34							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1378	NNST	44							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1379	NNST	32							BP	04-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1380	ARCH	59							BP	05-Sep-07	L10BP-H1	Lake 10		M		kept for Heidi
1381	ARCH	451	950	1.04					GN	05-Sep-07	L10GN-H6	Lake 10		M		kept for Heidi
1382	ARCH	430	799	1.00					GN	05-Sep-07	L10GN-H6	Lake 10		M		kept for Heidi
1383	ARCH	425	806	1.05					GN	05-Sep-07	L10GN-H7	Lake 10		M		kept for Heidi
1384	ARCH	440	860	1.01					GN	05-Sep-07	L10GN-H8	Lake 10		M		kept for Heidi
1385	LKTR								GN	05-Sep-07	L10GN-H6	Lake 10		E		
1386	ARCH	286	220	0.94	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1387	ARCH	370	530	1.05	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1388	ARCH	356	465	1.03	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1389	ARCH	365	430	0.88	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1390	ARCH	361	377	0.80	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1391	ARCH	345	433	1.05	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1392	ARCH	295	252	0.98	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1393	ARCH	360	446	0.96	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1394	ARCH	274	174	0.85	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1395	ARCH	380	446	0.81	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1396	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1397	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1398	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1399	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1400	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1401	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1402	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1403	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1404	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1405	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1406	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1407	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1408	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1409	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1410	ARCH								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1411	ARCH								GN	06-Sep-07	L32GN-H2	Lake 32		C		
1412	ARCH								GN	06-Sep-07	L32GN-H2	Lake 32		C		
1413	ARCH	412	727	1.04	M				GN	06-Sep-07	L32GN-H2	Lake 32		M		kept for Heidi
1414	LKTR	393	847	1.40	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1415	LKTR	354	486	1.10	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1416	LKTR	370	559	1.10	F				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1417	LKTR	346	471	1.14	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1418	LKTR	362	523	1.10	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1419	LKTR	380	638	1.16	M				GN	06-Sep-07	L32GN-H1	Lake 32		M		kept for Heidi
1420	LKTR								GN	06-Sep-07	L32GN-H1	Lake 32		C		
1421	ARCH	95							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1422	ARCH								BP	07-Sep-07	L32BP-H1	Lake 32		C		
1423	LKTR	324	355	1.04	F				BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1424	LKTR	100							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1425	NNST	48							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1426	NNST	52							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1427	NNST	34							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1428	NNST	29							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1429	NNST	42							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1430	NNST	48							BP	07-Sep-07	L32BP-H1	Lake 32		M		kept for Heidi
1431	NNST								MB	07-Sep-07	L32MB-H1	Lake 32		C		
1432	NNST								MB	07-Sep-07	L32MB-H1	Lake 32		C		
1433	NNST								MB	07-Sep-07	L32MB-H1	Lake 32		C		
1434	LKTR	721	3900	1.04		Green	4868	985153000021222	GN	09-Sep-07	RLGN-01	Roberts Lake	Fin clip	C	2007	no eggs or milt
1435	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		E		escaped
1436	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		E		escaped
1437	LKTR	614	2360	1.02	U	Green	4222	985120031616738	GN	09-Sep-07	RLGN-02	Roberts Lake		R	2004	
1438	LKTR	309	320	1.08		Green	4586	985153000021213	GN	09-Sep-07	RLGN-02	Roberts Lake		R	2005	
1439	LKTR	407	928	1.38		Green	4867	985153000021203	GN	09-Sep-07	RLGN-02	Roberts Lake	Fin clip	C	2007	
1453	LKWH	325	408	1.19					GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1549	LKWH	331	490	1.35					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1441	LKWH	339	529	1.36					GN	09-Sep-07	RLGN-02	Roberts Lake		C		
1454	LKWH	350	540	1.26					GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1473	LKWH	361	530	1.13					GN	10-Sep-07	RLGN-05	Roberts Lake		C		
1531	LKWH	366	620	1.26					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1543	LKWH	370	690	1.36					GN	11-Sep-07	RLGN-17	Roberts Lake		C		
1551	LKWH	370	650	1.28					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1448	LKTR	478	1098	1.01	M				GN	09-Sep-07	RLGN-02	Roberts Lake	Fin clip	M		beige liver, cisco in stomach, stomach parasites
1449	LKTR	323	368	1.09	F				GN	09-Sep-07	RLGN-02	Roberts Lake	Fin clip	M		stomach full of parasites - split open
1450	LKTR	591	2019	0.98		Green	3981	985153000021483	GN	09-Sep-07	RLGN-03	Roberts Lake		R	2007	
1451	LKTR	431	829	1.04				985153000021212	GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1452	LKTR	465	966	0.96				985153000021276	GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1444	LKWH	371	709	1.39					GN	09-Sep-07	RLGN-02	Roberts Lake		C		
789	LKWH	372	790	1.53	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1505	LKWH	373	648	1.25					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
1480	LKWH	375	754	1.43					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1442	LKWH	376	757	1.42					GN	09-Sep-07	RLGN-02	Roberts Lake		C		
1458	LKTR								GN	09-Sep-07	RLGN-03	Roberts Lake		E		
1459	LKWH								GN	09-Sep-07	RLGN-04	Roberts Lake		E		
1460	LKWH								GN	09-Sep-07	RLGN-04	Roberts Lake		E		
1461	LKTR	670				Green	4866	985153000021227	GN	09-Sep-07	RLGN-01	Roberts Lake		C	2007	
1462	CISC								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1463	CISC								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1464	CISC								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1465	CISC								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1466	CISC								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1467	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1468	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1469	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1470	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1471	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
1472	LKWH								GN	09-Sep-07	RLGN-01	Roberts Lake		C		released - no data
675	LKWH	387	768.5	1.33	U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		
1474	LKTR	752	5100	1.20		Green	4460	985153000021228	GN	10-Sep-07	RLGN-06	Roberts Lake	Fin clip	R	2005	
1249	CISC	270	250	1.27	M				GN	26-Aug-07	RLGN-H2	Roberts Lake		M		kept for Heidi
1251	CISC	280	260	1.18	F				GN	26-Aug-07	RLGN-H3	Roberts Lake		M		kept for Heidi
778	CISC	286	226.5	0.97	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
815	CISC	301	275	1.01	U				FT	24-Jul-07	RLFT-01	Roberts Lake		C		
1250	CISC	325	420	1.22	M				GN	26-Aug-07	RLGN-H2	Roberts Lake		M		kept for Heidi
1532	LKWH	389	761	1.29					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1258	LKWH	391	820	1.37	M				GN	26-Aug-07	RLGN-H2	Roberts Lake		M		kept for Heidi
1553	LKWH	392	798	1.32					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1542	LKWH	394	776	1.27					GN	11-Sep-07	RLGN-17	Roberts Lake		C		
1499	CISC	328	373	1.06					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
771	LKWH	395	865	1.40	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1486	LKTR	401	749	1.16				985153000021293	GN	10-Sep-07	RLGN-07	Roberts Lake	Fin clip	C		
1487	LKTR	282	218	0.97					GN	10-Sep-07	RLGN-07	Roberts Lake		M		kept for Heidi
1488	LKWH	531							GN	10-Sep-07	RLGN-07	Roberts Lake		C		
1552	LKWH	399	921	1.45					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1495	LKWH	401	932	1.45					GN	10-Sep-07	RLGN-09	Roberts Lake		C		
1491	LKTR	690	3000	0.91		Green	4865	985153000021286	GN	10-Sep-07	RLGN-08	Roberts Lake	Fin clip	C	2007	
1482	LKWH	402	933	1.44					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1492	LKWH	402	1113	1.71					GN	10-Sep-07	RLGN-08	Roberts Lake		C		
1494	ARCH							985120031598500	GN	10-Sep-07	RLGN-09	Roberts Lake	Fin clip	R		
772	LKWH	404	996	1.51	U				FT	23-Jul-07	RLFT-01	Roberts Lake		C		
1496	LKTR	380	673	1.23	M			985153000021224	GN	10-Sep-07	RLGN-10	Roberts Lake	Fin clip	C		
1477	CISC	330	413	1.15					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1476	CISC	333	418	1.13					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1536	CISC	334	400	1.07	F				GN	11-Sep-07	RLGN-15	Roberts Lake		M		
1509	LKWH	405	1014	1.53	M				GN	10-Sep-07	RLGN-10	Roberts Lake		M		
1555	LKWH	405	932	1.40					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1445	LKWH	406	968	1.45					GN	09-Sep-07	RLGN-02	Roberts Lake		C		
1443	LKWH	408	987	1.45					GN	09-Sep-07	RLGN-02	Roberts Lake		C		
1519	LKWH	411	870	1.25					GN	11-Sep-07	RLGN-12	Roberts Lake		C		
676	LKWH	412	913.5	1.31	U				FT	21-Jul-07	RLFT-02	Roberts Lake		C		
1510	LKWH	412	883	1.26	F				GN	10-Sep-07	RLGN-10	Roberts Lake		M		
1490	LKWH	414	1030	1.45	F				GN	10-Sep-07	RLGN-07	Roberts Lake		M		lots of fat
1493	LKWH	414	1032	1.45	M				GN	10-Sep-07	RLGN-08	Roberts Lake		M		
1507	LKWH	414	1048	1.48					GN	10-Sep-07	RLGN-10	Roberts Lake		C		
1533	LKWH	415	1098	1.54					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1511	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1512	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1513	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1514	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1515	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1516	LKWH								GN	10-Sep-07	RLGN-11	Roberts Lake		C		released - no data
1517	LKTR	353	510	1.16				985153000021246	GN	11-Sep-07	RLGN-12	Roberts Lake	Fin clip	C		
1539	LKWH	415	919	1.29					GN	11-Sep-07	RLGN-16	Roberts Lake		C		
1481	LKWH	416	1012	1.41					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1540	LKWH	418	971	1.33					GN	11-Sep-07	RLGN-16	Roberts Lake		C		
1521	LKTR	765	4000	0.89		Green	4271	985153000021209	GN	11-Sep-07	RLGN-13	Roberts Lake		R	2005	
1446	LKWH	419	943	1.28					GN	09-Sep-07	RLGN-02	Roberts Lake		M		
1523	ARCH	670	4000	1.33	F	Green	4864	985153000021248	GN	11-Sep-07	RLGN-15	Roberts Lake		C	2007	
1524	LKTR	396	681	1.10	M			985153000021291	GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1478	CISC	338	416	1.08					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1526	CISC	340	380	0.97					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1484	CISC	341	512	1.29	F				GN	10-Sep-07	RLGN-06	Roberts Lake		M		cysts on stomach, stomach worms
1527	CISC	344	461	1.13					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1529	LKWH	474							GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1530	LKWH	419	1102	1.50					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1457	LKWH	420	918	1.24					GN	09-Sep-07	RLGN-03	Roberts Lake		M		
1518	LKWH	422	985	1.31					GN	11-Sep-07	RLGN-12	Roberts Lake		C		
1554	LKWH	425	962	1.25					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1489	LKWH	426	1076	1.39	M				GN	10-Sep-07	RLGN-07	Roberts Lake		M		yellowish liver, gravel in stomach
1535	LKWH	439	1200	1.42	M				GN	11-Sep-07	RLGN-15	Roberts Lake		M		
1479	CISC	345	545	1.33					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1537	LKTR	455	1426	1.51	F			985153000021256	GN	11-Sep-07	RLGN-16	Roberts Lake	Fin clip	C		
1538	LKTR	405	961	1.45				985153000021247	GN	11-Sep-07	RLGN-16	Roberts Lake	Fin clip	C		
1485	LKWH	442	1201	1.39	M				GN	10-Sep-07	RLGN-06	Roberts Lake		M		old scars, very red liver, stomach full of inverts
666	LKWH	446	1190.5	1.34	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
1541	LKTR	271	188	0.94				985153000021225	GN	11-Sep-07	RLGN-17	Roberts Lake		C		
667	LKWH	447	1241	1.39	U				FT	21-Jul-07	RLFT-01	Roberts Lake		C		
1556	LKWH	451	1328	1.45					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1544	LKTR	410	627	0.91					GN	11-Sep-07	RLGN-18	Roberts Lake		C		
1475	CISC	346	439	1.06					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1525	CISC	380	460	0.84					GN	11-Sep-07	RLGN-15	Roberts Lake		C		
1528	CISC	385	625	1.10					GN	11-Sep-07	RLGN-15	Roberts Lake		C		

Appendix C1. Data for individual fish captured in the Doris North Project area, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1548	ARCH	370	491	0.97					GN	11-Sep-07	RLGN-19	Roberts Lake		C		
1534	LKWH	456	1429	1.51	F				GN	11-Sep-07	RLGN-15	Roberts Lake		M		
1483	LKWH	458	1455	1.51					GN	10-Sep-07	RLGN-06	Roberts Lake		C		
1456	LKWH	478	1828	1.67					GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1522	LKWH	498	1576	1.28					GN	11-Sep-07	RLGN-13	Roberts Lake		C		
1447	LKWH	500	2028	1.62	F				GN	09-Sep-07	RLGN-02	Roberts Lake		M		
1440	LKWH	503	2038	1.60	M				GN	09-Sep-07	RLGN-02	Roberts Lake		C		
1455	LKWH	505	2189	1.70					GN	09-Sep-07	RLGN-03	Roberts Lake		C		
1520	LKWH	525	2323	1.61					GN	11-Sep-07	RLGN-12	Roberts Lake		C		
1557	LKTR	388	610	1.04					GN	11-Sep-07	RLGN-19	Roberts Lake		M		kept for Heidi

Method:
BP Backpack Electrofishing
DN Dip Net
FT Fyke Net
GN Gill Net
KN Kick Net
MB Minnow Trap
SN Beach Seine
TF Fish Fence

Sex: F = Female, M = Male

Capture Codes: C = first capture, E = escaped, M = mortality, O = observed, R = re-capture

Species:
ARCH Arctic char
ARFL Arctic flounder
BRWH Broad whitefish
CISC Cisco
FRSC Fourhorn sculpin
LKTR Lake trout
LKWH Lake whitefish
LSCS Least Cisco
NNST Ninespine stickleback
PCHR Pacific herring
SFCD Saffron cod

Condition Factor = Weight [in g] X 10^5/ (FL [in mm])^3 **Length*** = Total Length for NNST
Length* = Fork Length for CISC, BRWH, LKWH, LKTR, ARCH, ARGR, LSCS

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
1	ARCH	180	65	1.11	U				TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow	Otoliths, pelvic fin	M		Mortality
2	ARCH	469	855	0.83	U			985120031545975	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		also tag # 985120031571230 would not read
3	ARCH	735	3145	0.79	U	Green	3802	985120031571230	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
4	ARCH	855	4275	0.68	M	Green	4286	985120031583443	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow		R	2005	
5	ARCH	808	4115	0.78	F	Green	3804	985120031602650	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
6	ARCH	225	85	0.75	U				TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		
7	LKTR	589			U	Green	3806	985120031577260	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		PIT tag may have fallen out and been retagged upon recapture on 22-Jul
8	ARCH	218	85	0.82	U				TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		
9	LKTR	535	1615	1.05	U	Green	3809	985120031623702	TF	TD	28-Jun-07	LROTFF-01	Little Roberts Outflow		C		
10	LKTR	318	295	0.92	U			985120031587303	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
11	ARCH	290	195	0.80	U			985120031586022	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
12	ARCH	755	3425	0.80	M	Green	3810	985120031596021	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
13	ARCH	222	90	0.82	U			985120031629910	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
14	LKWH	349	460	1.08					TF	TU	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		Mortality
15	ARCH	205	70	0.81	U			985120031581998	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
16	ARCH	757	3505	0.81	M	Green	3815	985120031632160	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
17	ARCH	680	2770	0.88	F	Green	3818	985120031583409	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
18	ARCH	643	2045	0.77	F	Green	3819	985120031630268	TF	TD	29-Jun-07	LROTFF-01	Little Roberts Outflow		C		
19	ARCH	253	190	1.17				985120031625937	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
20	ARCH	259	130	0.75				985120031625315	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
21	ARCH	216	90	0.89				985120031565801	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
22	ARCH	260	125	0.71				985120031630881	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
23	ARCH	690	2070	0.63		Green	4078	985120031459610	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2004	skinny
24	ARCH	557	1560	0.90	F	Green	4355	985120031573231	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2005	
25	ARCH	779	4825	1.02	M	Green	3820	985120031571562	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
26	ARCH	754	3115	0.73	M	Green	3821	985120031628538	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	C		
27	LKTR	496	1010	0.83		Green	4454	985120031613687	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Scales	R	2005	
28	ARCH	680	2770	0.88	F	Green	3818	985120031583409	TF	TU	30-Jun-07	LROTFF-01	Little Roberts Outflow		R	2007	
29	ARCH	735	4660	1.17	F	Green	4815	985120031633272	TF	TU	30-Jun-07	LROTFF-01	Little Roberts Outflow		R	2006	
30	ARCH	195	65	0.88					TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow	Otolith, scales, fin ray	M		Mortality
31	ARCH	217	90	0.88					TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow		M		Mortality
32	ARCH	218	95	0.92					TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow		M		Mortality
33	ARCH	624	1900	0.78	F	Green	3822	985120031657089	TF	TD	30-Jun-07	LROTFF-01	Little Roberts Outflow		C		Ripe
34	ARCH	238	114.5	0.85				985120031570978	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
35	ARCH	279	170	0.78				985120031582489	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
36	ARCH	203	69	0.82					TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		Too small to tag
37	ARCH	355	370.5	0.83				985120031558457	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
38	ARCH	353	415	0.94				985120031604893	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
39	LKTR	622	2040	0.85	U	Green	3823	985120031600297	TF	TU	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
40	ARCH	724	3750	0.99	F	Green	3824	985120031585074	TF	TU	06-Jul-07	LROTFF-01	Little Roberts Outflow		C		
41	ARCH	668	3080	1.03	M	Green	3826	985120031570430	TF	TU	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
42	ARCH	259	149	0.86				985120031622245	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
43	ARCH	244	121	0.83				985120031583955	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
44	ARCH	227	101	0.86				985120031576866	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	C		
45	ARCH	389	502	0.85		Green	4237	985120031657335	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Scales	R	2004	
46	ARCH	329	303.5	0.85	U			985120031565195	TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow		C		
47	ARCH	224	96.5	0.86					TF	TD	06-Jul-07	LROTFF-01	Little Roberts Outflow	Otoliths, scales	M		Mortality
48	LKTR	378	618	1.14				985120031582448	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
49	ARCH	203	72.5	0.87				985120031620156	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
50	ARCH	243	118	0.82				985120031566173	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
51	ARCH	195	60	0.81					TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
52	ARCH	215	80.5	0.81				985120031581649	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
53	LKTR	724	4040	1.06		Green	4646	985120031632031	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
54	LKTR	724	4470	1.18		Green	4702	985120031627753	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
55	ARCH	685	3390	1.05	F			985120031569430	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
56	ARCH	775	6110	1.31	M	Green	3827	985120031555092	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
57	ARCH	381	410	0.74				985120031587705	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
58	ARCH	456	831.5	0.88				985120031625477	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		*
59	ARCH	363	402.5	0.84				985120031568671	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
60	ARCH	456	864.5	0.91				985120031552967	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
61	LKTR	366	570	1.16				985120031605864	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
62	ARCH	264	161	0.88				985120031598500	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
63	ARCH	242	113.5	0.80				985120031573385	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
64	ARCH	241	107.5	0.77				985120031617845	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
65	ARCH	263	147	0.81				985120031597605	TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
66	ARCH	224	95.5	0.85					TF	TD	07-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality
67	LKTR	595	2105	1.00		Green	3828	985120031587258	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
68	ARCH	713	3595	0.99	F	Green	3829	985120031629788	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
69	ARCH	695	4550	1.36	F	Green	3830	985120031660308	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
70	ARCH	285	182	0.79				985120031624361	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
71	ARCH	380	506	0.92				985120031446512	TF	TU	07-Jul-07	LROTFF-01	Little Roberts Outflow		C		
72	LKTR	813	5375	1.00		Green	4617	985120031578163	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
73	ARCH	244	115.5	0.80				985120031569196	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
74	ARCH	769	5590	1.23	F	Green	3831	985120031567585	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
75	ARCH	690	3085	0.94		Green	3832	985120031575713	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
76	ARCH	804	5235	1.01	U	Green	3833	985120031452028	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
77	ARCH	694	3620	1.08	F	Green	3834	985120031597952	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
78	ARCH	670	3485	1.16		Green	3835	985120031629826	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
79	ARCH	228	107	0.90				985120031626429	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
80	ARCH	668	3080	1.03	M	Green	3826	985120031570430	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	Captured previous day
81	ARCH	237	107	0.80				985120031615909	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
82	ARCH	299	230	0.86				985120031586142	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
83	LKTR	450	920	1.01		Green	4016	985120031599158	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
84	ARCH	193	50	0.70					TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
85	ARCH	198	67.5	0.87				985120031623435	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
86	ARCH	286	194	0.83				985120031608942	TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
87	ARCH	715	4090	1.12		Green	3836	985120031607457	TF	TU	08-Jul-07	LROTFF-01	Little Roberts Outflow		C		
88	ARCH	210	81	0.87	M				TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
89	ARCH	249	115	0.74	F				TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
90	ARCH	215	82	0.83	F				TF	TD	08-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
91	ARCH	840	5895	0.99	M	Green	3837	985120031601288	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
92	ARCH	690	3085	0.94		Green	3832	985120031575713	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
93	ARCH	341	343	0.87	U			985120031571281	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
94	ARCH	241	110	0.79	U			985120031573385	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
95	ARCH	354	360	0.81	U			985120031485563	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
96	ARCH	730	3750	0.96	F	Green	3838	985120031657736	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
97	ARCH	796	6335	1.26	M	Green	3839	985120031565858	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
98	ARCH	838	6015	1.02	M	Green	3840	985120031659859	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
99	ARCH	788	4865	0.99	M	Green	3842	985120031556295	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
100	ARCH	748	4209	1.01	F	Green	3843	985120031582585	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
101	LKTR	802	5240	1.02	U	Green	4506	985120031626888	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
102	ARCH	730	3555	0.91	F	Green	3844	985120031618446	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
103	LKTR	518	1345	0.97	F				TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
104	ARCH	801	5700	1.11	M				TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
105	ARCH	225	101	0.89	U				TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality (See Heidi's data for assessment and age)
106	ARCH	389	485	0.82	U			985120031620913	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
107	ARCH	385	475	0.83	U			985120031582740	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
108	ARCH	343	350	0.87	U			985120031561130	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
109	ARCH	276	180	0.86	U			985120031604677	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
110	ARCH	458	830	0.86	U			985120031554967	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
111	ARCH	354	355	0.80	U			985120031458563	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
112	ARCH	361	430	0.91	U			985120031554977	TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		
113	ARCH	203	65	0.78	U				TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
114	ARCH	708	3765	1.06	U	Green	3845/3846	985120031586231	TF	TU	09-Jul-07	LROTFF-01	Little Roberts Outflow		C		Floy number not recorded; either 3846 or 3845
115	ARCH	219	80	0.76	U				TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
116	ARCH	279	175	0.81	M				TF	TD	09-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
117	LKTR	517	1480	1.07	U	Green	4030	985120031587003	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
118	ARCH	205			U			985120031565429	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
119	ARCH	295	415	1.62	U			985120031603045	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
120	ARCH	283	180	0.79	U			985120031618209	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
121	ARCH	249	128	0.83	U			985120031621904	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
122	ARCH	238	107	0.79	U			985120031620547	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
123	ARCH	225	89	0.78	U			985120031613532	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
124	ARCH	249	128	0.83	U			985120031583608	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
125	ARCH	209	73	0.80	U			985120031618662	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
126	ARCH	236	103	0.78	U			985120031617845	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
127	ARCH	336	352	0.93	U			985120031563666	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
128	ARCH	264	142	0.77	U			985120031564581	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
129	LKTR	797	4740	0.94	U	Green	4330	985120031621279	TF	TU	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
130	LKTR	760	5410	1.23	U	Green	4709	985120031631174	TF	TU	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
131	ARCH	720	4600	1.23	F	Green	3281	985120031629675	TF	TU	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
132	ARCH	685	3010	0.94	F	Green	3847	985120031564136	TF	TU	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
133	ARCH	785	5635	1.16	M	Green	3848	985120031579917	TF	TU	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
134	ARCH	820	5170	0.94	M	Green	3849	985120031610936	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
135	ARCH	645	1985	0.74	F	Green	3950	985120031600704	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
136	ARCH	237	107	0.80	U			985120031615909	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
137	ARCH	271	171	0.86	U			985120031602037	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
138	ARCH	286	266	1.14	U			985120031566677	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
139	ARCH	214	78	0.80	U			985120031603318	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
140	ARCH	190	60	0.87	U				TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
141	ARCH	206	64	0.73	U				TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
142	ARCH	219	82	0.78	U			985120031601944	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
143	ARCH	201	50	0.62	U				TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
144	ARCH	211	81	0.86	U			985120031656727	TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		
145	ARCH	188	56	0.84	U				TF	TD	10-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
146	LKTR	885	7350	1.06	U	Green	4343	985120031573882	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
147	ARCH	680	3630	1.15	F	Green	3953	985120031656281	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
148	ARCH	804	4950	0.95		Green	3954	985120031561969	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
149	ARCH	640	2010	0.77		Green	3950	985120031600704	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
150	LKTR	470	1120	1.08		Green	4274	985120031620239	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
151	ARCH	775	4635	1.00		Green	3955	985120031564788	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
152	ARCH	821	5775	1.04		Green	3956	985120031657382	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
153	ARCH	840	6505	1.10	M	Green	3957	985120031632345	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
154	ARCH	760	4400	1.00	M	Green	3499	985120031567055	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
155	ARCH	823	5490	0.98	M	Green	3958	985120031578113	TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
156	ARCH	440	606	0.71	U			985120031614759	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
157	ARCH	275	186	0.89	U			985120031569428	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
158	ARCH	382	486.5	0.87	U			985120031605415	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
159	ARCH	255	149	0.90	U			985120031630467	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
160	ARCH	228	91	0.77	U			985120031445529	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
161	ARCH	260	144	0.82	U			985120031562647	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
162	ARCH	241	104	0.74	U			985120031603675	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
163	ARCH	796	4930	0.98					TF	TU	11-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
164	ARCH	300	202	0.75				985120031630110	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
165	LKTR	650	2695	0.98		Green	3960	985120031604311	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
166	ARCH	323	286	0.85				985120031624204	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
167	ARCH	359	385	0.83				985120031567446	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
168	ARCH	315	258	0.83				985120031653966	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
169	ARCH	347	354.5	0.85				985120031562614	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
170	ARCH	280	190	0.87				985120031618209	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
171	ARCH	345	360	0.88				985120031573506	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
172	ARCH	350	342	0.80				985120031621941	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
173	ARCH	345	360	0.88				985120031611172	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
174	ARCH	230	98	0.81				985120031660711	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
175	ARCH	319	262	0.81				985120031617064	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
176	ARCH	288	262	1.10				985120031587703	TF	TD	11-Jul-07	LROTFF-01	Little Roberts Outflow		C		
177	LKTR	874	6915	1.04		Green	3961	985120031660110	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
178	ARCH	253	168	1.04				985120031585134	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
179	ARCH	443	757	0.87				985120031622282	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
180	ARCH	210	80.5	0.87				985120031655919	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
181	ARCH	231	93	0.75				985120031633147	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
182	ARCH	835	5770	0.99	M	Green	3962	985120031564007	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
183	ARCH	800	5850	1.14	M	Green	3963	985120031564809	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
184	LKTR	794	4850	0.97		Green	4695	985120031554950	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
185	ARCH	804	5240	1.01	F	Green	3964	985120031581259	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
186	LKTR	795	4800	0.96		Green	4685	985120031583871	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
187	ARCH	679	3240	1.03		Green	3965	985120031570589	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
188	ARCH	715	3500	0.96	F	Green	3966	985120031624111	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
189	ARCH	873	6105	0.92	M	Green	3967	985120031568619	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
190	LKTR	785	5080	1.05		Green	4614	985120031562158	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
191	LKTR	330	361	1.00				985120031550763	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
192	ARCH	680	3630	1.15	F	Green	3953	985120031656281	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
193	LKTR	800	5165	1.01					TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
194	ARCH	315	280	0.90					TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
195	ARCH	275	199	0.96					TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
196	ARCH	284	195	0.85				985120031620807	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
197	ARCH	226	94	0.81				985120031580017	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
198	ARCH	293						985120031655529	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
199	ARCH	284	220	0.96				985120031613877	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
200	ARCH	204	73	0.86				985120031606073	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		
201	ARCH	255	149	0.90	U			985120031630467	TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
202	ARCH	194	54	0.74					TF	TD	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		Did not tag
203	ARCH	187	57	0.87					TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		C		Did not tag
204	LKTR	330	361	1.00				985120031550763	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	Recaptured on same day
205	LKTR	517	1452	1.05		Green	4017	985120031559386	TF	TU	12-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
232	ARCH	264	159	0.86	U			985120031556676	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
233	ARCH	205	77.5	0.90	U			985120031567716	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
234	ARCH	265	150	0.81	U			985120031603799	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
235	ARCH	195	70.5	0.95	U			985120031576356	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
236	ARCH	226	83.5	0.72	U			985120031584182	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
237	ARCH	256	138	0.82	U			985120031630467	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
238	ARCH	214	76	0.78	U			985120031449019	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
239	ARCH	203			U			985120031607446	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
240	LKTR	376	552	1.04	U			985120031656284	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
241	ARCH	234	87.5	0.68	U			985120031586441	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
242	ARCH	191	68	0.98	U				TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		Fish small and stressed-no tag
243	ARCH	224	99.5	0.89	U			985120031584205	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
244	ARCH	267	160	0.84	U			985120031633661	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
245	ARCH	870	6890	1.05	M	Green	3968	985120031565228	TF	TU	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
246	ARCH	694	3690	1.10	F	Green	3969	985120031631406	TF	TU	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
247	ARCH	698	3355	0.99	F	Green	3970	985120031661438	TF	TU	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
248	LKTR	835	6480	1.11	U	Green	4667	985120031614241	TF	TU	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	Fish had eaten fish with tag 985120031556676
249	LKTR	614	2360	1.02	U	Green	4222	985120031616738	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
250	ARCH	416	616	0.86	U			985120031603159	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
251	ARCH	380	559	1.02	U			985120031579731	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
252	ARCH	449	800	0.88	U			985120031548669	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
253	ARCH	307	255	0.88	U			985120031622166	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
254	ARCH	281	186	0.84	U			985120031557697	TF	TD	13-Jul-07	LROTFF-01	Little Roberts Outflow		C		
328	ARCH	336	339	0.89	U			985120031582437	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
329	ARCH	353	386	0.88				985120031585335	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
330	ARCH	406	625	0.93				985120031575355	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
331	ARCH	210	78	0.84					TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
332	ARCH	295	223	0.87				985120031621171	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
333	ARCH	335	312	0.83				985120031565195	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
334	ARCH	250	122	0.78				985120031551053	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
335	ARCH	268	173	0.90				985120031567943	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
336	ARCH	268	154	0.80				985120031633098	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
337	ARCH	371	426	0.83				985120031443140	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
338	ARCH	278	199	0.93				985120031576259	TF	TD	14-Jul-07	LROTFF-01	Little Roberts Outflow		C		
354	ARCH	333	320	0.87	U			985120031549784	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
355	LKTR	685	3035	0.94		Green	4726	985120031445296	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
356	ARCH	681	3145	1.00	F	Green	3972	985120031630764	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
357	LKTR	710	3870	1.08		Green	4178	985120031607609	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
358	ARCH	753	4180	0.98	F	Green	3974	985120031560885	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
359	LKTR	464	1060	1.06		Green	3976	985120031565262	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
360	LKTR	581	2005	1.02		Green	3977	985120031607615	TF	TU	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
361	ARCH	285	200	0.86	U			985120031655529	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
362	ARCH	386	555	0.97	U			985120031630943	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
363	ARCH	292	225	0.90	U			985120031620847	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
364	ARCH	216	85	0.84				985120031613532	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
365	ARCH	270	175	0.89				985120031660199	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
366	ARCH	264	180	0.98				985120031455104	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
367	ARCH	239	120	0.88				985120031631719	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
368	ARCH	244	130	0.89				985120031577891	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
369	ARCH	198	65	0.84					TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
370	ARCH	226	100	0.87				985120031633147	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
371	ARCH	235	115	0.89				985120031578354	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
372	ARCH	325	309	0.90				985120031572647	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
373	ARCH	193	60	0.83					TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
374	ARCH	248	125	0.82				985120031626774	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
375	ARCH	204	70	0.82				985120031631921	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
376	ARCH	245	125	0.85				985120031578764	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
377	ARCH	358	390	0.85				985120031612947	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
378	ARCH	260	130	0.74				985120031659507	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
379	ARCH	260	140	0.80				985120031584694	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
380	ARCH	434	635	0.78				985120031567021	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
381	ARCH	233	85	0.67				985120031660711	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
382	ARCH	293	220	0.87				985120031632838	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
383	ARCH	267	140	0.74				985120031633961	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
384	ARCH	275	175	0.84				985120031588078	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
385	ARCH	260	140	0.80				985120031656898	TF	TD	15-Jul-07	LROTFF-01	Little Roberts Outflow		C		
409	LKTR	613	2050	0.89		Green	3978	985120031573894	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		LKTR in trap eating smolts
410	LKWH	425	1125	1.47				985120031603275	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
411	ARCH	342	374	0.93				985120031443581	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
412	LKTR	251	160.5	1.01				985120031626109	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
413	ARCH	248	134	0.88					TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality due to LKTR
414	ARCH	694	3555	1.06	F	Green	3979	985120031631635	TF	TU	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
415	ARCH	812	5350	1.00	M	Green	3980	985120031629734	TF	TU	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
416	LKTR	545	1545	0.95		Green	3999	985120031599153	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
417	ARCH	202	77.5	0.94					TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		Huge gash on side
418	ARCH	426	699	0.90				985120031573531	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
419	ARCH	276	177	0.84				985120031629637	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
420	ARCH	297	252.5	0.96				985120031660002	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
421	ARCH	285	229	0.99				985120031575248	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
422	ARCH	285	252	1.09				985120031587703	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
423	ARCH	346	384	0.93				985120031609034	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
424	ARCH	225	106	0.93				985120031612308	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
425	ARCH	301	271.5	1.00				985120031579684	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
426	ARCH	242	122	0.86				985120031579487	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
427	ARCH	260	160.5	0.91				985120031455222	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
428	ARCH	266	147	0.78				985120031633098	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
429	ARCH	276	213	1.01				985120031550949	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
430	ARCH	273	171.5	0.84				985120031619425	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
431	ARCH	316	278.5	0.88				985120031561336	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
432	ARCH	283	204.5	0.90				985120031629261	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
433	ARCH	345	350	0.85				985120031573506	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
434	ARCH	381	536	0.97				985120031630943	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
435	ARCH	276	235	1.12				985120031563432	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
436	ARCH	265	192.5	1.03				985120031564891	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
437	ARCH	302	290	1.05				985120031569294	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
438	ARCH	269	188	0.97				985120031602037	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
439	ARCH	255	171.5	1.03				985120031567214	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
440	ARCH	225	110.5	0.97				985120031578188	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
441	ARCH	218	99	0.96				985120031605760	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
442	ARCH	204	75.5	0.89				985120031609300	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
443	ARCH	198	73	0.94				985120031568624	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
444	ARCH	193	57	0.79				985120031630471	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
445	ARCH	204	81	0.95				985120031655919	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
446	ARCH	260	149	0.85				985120031586093	TF	TD	16-Jul-07	LROTFF-01	Little Roberts Outflow		C		
496	ARCH	684	3160	0.99	F	Green	3998	985153000021470	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
497	ARCH	730	4375	1.12	M	Green	3997	985153000021486	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
498	ARCH	697	3390	1.00	F	Green	3996	985153000021463	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
499	LKTR	582	2170	1.10		Green	3995	985153000021434	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
500	LKTR	549	2040	1.23		Green	3994	985153000021428	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
501	LKTR	264	164.5	0.89				985153000021417	TF	TD	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
502	LKTR	545				Green	3999	985120031599153	TF	TU	17-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
503	ARCH	223	99.5	0.90				985153000021411	TF	TD	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
504	ARCH	248	130.5	0.86				985120031626774	TF	TD	17-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
505	ARCH	219	98	0.93				985153000021456	TF	TD	17-Jul-07	LROTFF-01	Little Roberts Outflow		C		
582	ARCH	770	5440	1.19					TF	TU	18-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
583	LKTR	558	2145	1.23					TF	TU	18-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
584	LKTR	800	5550	1.08		Green	4696	985120031583479	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
585	LKTR	609	3000	1.33		Green	4724	985120031617593	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
586	LKTR	622	2335	0.97		Green	4684	985120031569853	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
587	LKTR	577	2189	1.14					TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
588	BRWH	543	1930	1.21		White	4707	985120031627717	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
589	LKTR	843	6120	1.02		Green	3084	985120031616234	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
590	LKTR	612	2059	0.90		Green	3978	985120031573894	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
591	BRWH	499	1940	1.56		Green	3056	985120031571206	TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
592	LKTR	699	4060	1.19					TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
593	LKTR	577	2275	1.18					TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
594	LKTR	630	3100	1.24					TF	TU	19-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
595	ARCH	206	79.5	0.91				985120031571786	TF	TD	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
596	ARCH	214	79	0.81				985120031623677	TF	TD	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
597	ARCH	223	133.5	1.20				985120031562788	TF	TD	19-Jul-07	LROTFF-01	Little Roberts Outflow		C		
623	ARCH	271	188.5	0.95				985153000021401	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
624	ARCH	266	176.5	0.94				985153000021440	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
625	ARCH	269	185.5	0.95				985153000021404	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
626	ARCH	460	639.5	0.66				985153000021485	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
627	ARCH	263	168.5	0.93				985153000021458	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
628	ARCH	216	92.5	0.92				985153000021471	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
629	ARCH	214	84.5	0.86				985153000021480	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
630	ARCH	214	88.5	0.90				985153000021476	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
631	ARCH	207	92	1.04				985153000021437	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
632	ARCH	250	133.5	0.85				985153000021406	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
633	ARCH	211	90.5	0.96				985153000021407	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
634	ARCH	225	106	0.93				985153000021488	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
635	ARCH	277	158	0.74				985153000021454	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
636	ARCH	251	149	0.94				985153000021416	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
637	ARCH	229	132	1.10				985153000021473	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
638	ARCH	204	90	1.06				985153000021462	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
639	ARCH	245	156	1.06				985153000021441	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
640	ARCH	235	187	1.44				985153000021418	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
641	ARCH	214	105	1.07				985153000021498	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
642	ARCH	254	165	1.01				985153000021465	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
643	ARCH	252	149	0.93				985153000021459	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
644	ARCH	237	114	0.86				985153000021448	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
645	ARCH	210	92	0.99				985153000021466	TF	TD	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
646	LKTR	562	2220	1.25		Green	3993	985153000021419	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
647	LKTR	589	2805	1.37		Green	3992	985153000021435	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
648	LKTR	579	3000	1.55		Green	3990	985153000021495	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
649	LKTR	551	2270	1.36		Green	3989	985153000021455	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
650	LKTR	559	2320	1.33		Green	3987	985153000021439	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
651	LKTR	559	1740	1.00		Green	4266	985153000021438	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
652	LKTR	510	1735	1.31		Green	4176	985153000021414	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
653	LKTR	525	1770	1.22		Green	4298	985153000021403	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
654	LKTR	469	1105	1.07		Green	3575	985153000021442	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
655	LKTR	689	3345	1.02		Green	3985	985153000021475	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
656	LKTR	581	2650	1.35		Green	3984	985153000021457	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
657	LKTR	519	1730	1.24		Green	4293	985153000021410	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
658	LKTR	508	1540	1.17		Green	4010	985153000021496	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
659	LKTR	817	6135	1.12		Green	4636	985153000021436	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
660	LKTR	572	2110	1.13		Green	4063	985153000021420	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
661	LKTR	523	1625	1.14		Blue	16	985153000021444	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2000	
662	LKTR	460	1130	1.16		Green	4312	985153000021446	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
663	LKTR	575	2350	1.24		Green	3983	985153000021489	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		C		
664	LKTR	548	2165	1.32		Green	4055	985153000021447	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
665	LKTR	460	1095	1.12		Green	4016	985153000021493	TF	TU	20-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
681	LKTR	575	2250	1.18		Green	3981	985153000021483	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
682	LKTR	542	2070	1.30		Green	3982	985153000021484	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
683	ARCH	699	4255	1.25	F	Green	4678	985153000021445	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
684	ARCH	780	5700	1.20					TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
685	LKTR	525	1865	1.29		Green	4034	985153000021422	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
686	LKTR	538	1740	1.12		Blue	45	985153000021467	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	1997	
687	LKTR	586	2045	1.02		Green	4009	985153000021478	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
688	LKTR	553	2185	1.29		Green	3988	985153000021460	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
689	LKTR	726	4440	1.16				985153000021409	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
690	LKTR	609	2270	1.01				985153000021443	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
691	LKTR	510	1690	1.27				985153000021492	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
692	LKTR	586	2640	1.31				985153000021461	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		Mortality: Found dead u/s of fence (kept for Heidi)
693	ARCH	678	3730	1.20	F	Green	4673	985153000021481	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
694	ARCH	715	3620	0.99					TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Sacrifice (See Heidi's data for assessment and age)
695	LKTR	459	995	1.03				985153000021478	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
696	LKTR	535	1980	1.29				985153000021469	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
697	LKTR	590	2350	1.14				985153000021449	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
698	LKTR	589	2905	1.42				985153000021405	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
699	LKTR	537	1815	1.17				985153000021427	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
700	LKTR	508	1420	1.08				985153000021402	TF	TU	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
701	ARCH	699	4255	1.25	F	Green	4678	985153000021445	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
702	LKTR							985153000021479	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		Mortality (kept for Heidi)
703	LKTR	562	2220	1.25		Green	3993	985153000021419	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
704	LKTR	508	1420	1.08				985153000021402	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
705	LKTR	575	2350	1.24		Green	3983	985153000021489	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
706	LKTR	330	295	0.82				985153000021429	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
707	ARCH	338	335	0.87				985153000021433	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
708	ARCH	204	66.5	0.78					TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
709	LKTR	396	536	0.86				985153000021464	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
710	ARCH	195	52	0.70					TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
711	ARCH	345	433	1.05				985153000021425	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
712	ARCH	368	429	0.86				985153000021500	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
713	ARCH	301	235	0.86				985153000021430	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
714	ARCH	209	73	0.80				985153000021477	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
715	ARCH	270	172	0.87				985153000021426	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
716	ARCH	214	80.5	0.82				985153000021431	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
717	ARCH	190	62	0.90				985153000021413	TF	TD	21-Jul-07	LROTFF-01	Little Roberts Outflow		C		
718	ARCH	294	235	0.92					TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Was dying-sacrificed for Heidi
719	ARCH	216	103	1.02					TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
720	ARCH	189	82.5	1.22				985153000021491	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
721	ARCH	333	342	0.93		Green	4603	985153000021468	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
722	ARCH	428	745	0.95				985153000021487	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
723	ARCH	339	345	0.89				985120031611172	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
724	ARCH	214	120	1.22				985153000021432	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
725	ARCH	183	93.5	1.53				985153000021450	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
726	LSCS	96							TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		M		Mortality: pinned in trap (kept for Heidi)
727	LKTR	803	5580	1.08		Green	4206	985153000021452	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
728	ARCH	769	5975	1.31		Green	4898	985153000021494	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
729	LKTR	532	1900	1.26		White	2149	985153000021423	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2002	
730	LKTR	449	865	0.96		Green	4897	985153000021453	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
731	LKTR	523	1385	0.97		Green	4627	985153000021490	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
732	LKTR	605	2420	1.09		Green	3806	985153000021424	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	PIT tag 985120031577260 inserted 28 jun 07
733	LKTR	620	2955	1.24		Green	4896	985153000021472	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
734	LKTR	627	2730	1.11		Green	4895	985153000021482	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
735	LKTR	464	1345	1.35		Green	4894	985153000021497	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
736	LKTR	575	2250	1.18		Green	4893	985153000021451	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
737	LKTR	554	1805	1.06		Green	4096	985153000021421	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
738	LKTR	545	1870	1.16		Green	4892	985153000021415	TF	TU	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
739	ARCH	175	64.5	1.20					TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		Too small to tag
740	ARCH	201	81.5	1.00				985153000021041	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
741	ARCH	220	105.5	0.99				985153000021069	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
742	ARCH	215	105.5	1.06				985153000021029	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
743	ARCH	219	115.5	1.10				985153000021012	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
744	ARCH	245	165	1.12				985153000021071	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
745	ARCH	208						985153000021412	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
746	ARCH	215	113	1.14				985153000021055	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
747	ARCH	240	132.5	0.96				985153000021474	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
748	ARCH	261	177.5	1.00				985153000021408	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
749	ARCH	188	84	1.26				985153000021095	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
750	ARCH	194	82.5	1.13				985153000021023	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
751	ARCH	204	108.5	1.28				985153000021499	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
752	ARCH	250	128	0.82				985153000021074	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
753	ARCH	350	375.5	0.88				985153000021096	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
754	ARCH	257	165.5	0.97				985153000021091	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Appendix C2. Data for individual fish captured at the fish fence in Little Roberts Outflow, 2007

Sample	Species	Length* (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Colour	Floy Tag Number	PIT Tag Number	Capture Method	Trap	Date	Site	Location	Ageing Structures	Capture Code	Tag Year	Comments
755	ARCH	289	265	1.10				985153000021064	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
756	ARCH	261	175	0.98				985153000021019	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
757	ARCH	238	147	1.09				985153000021066	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
758	ARCH	226	110.5	0.96				985153000021080	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
759	ARCH	230	137	1.13				985153000021075	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
760	ARCH	257	155	0.91				985153000021009	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
761	ARCH	361	385	0.82				985153000021100	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
762	ARCH	262	173.5	0.96				985153000021028	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
763	ARCH	336	331	0.87				985153000021049	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
764	ARCH	319	299	0.92				985153000021036	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
765	ARCH	254	143	0.87				985153000021004	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
766	ARCH	295	249.5	0.97				985153000021096	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
767	ARCH	246	129.5	0.87				985120031579487	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		R	2007	
768	ARCH	231	111.5	0.90				985153000021052	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
769	ARCH	238	115	0.85				985153000021048	TF	TD	22-Jul-07	LROTFF-01	Little Roberts Outflow		C		
808	LKTR	852	6260	1.01		Green	4699	985153000021076	TF	TU	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
809	LKTR	604	3015	1.37		Green	4891	985153000021002	TF	TU	23-Jul-07	LROTFF-01	Little Roberts Outflow		C		
810	LKTR	545	2450	1.51		Green	4269	985153000021044	TF	TU	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
811	ARCH	773	4705	1.02		Green	4425	985153000021035	TF	TU	23-Jul-07	LROTFF-01	Little Roberts Outflow		R	2005	
812	ARCH	242	133.5	0.94				985153000021021	TF	TD	23-Jul-07	LROTFF-01	Little Roberts Outflow		C		
813	ARCH	219	113	1.08				985153000021097	TF	TD	23-Jul-07	LROTFF-01	Little Roberts Outflow		C		
986	LKTR	571	2410	1.29		Green	4890	985120031573982	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		C		
987	LKTR	547	2155	1.32		Green	4889	985120031630304	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		C		
988	ARCH	658	3535	1.24		Green	4888	985120031623378	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		C		
989	ARCH	735	4975	1.25		Green	4886	985120031631488	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		C		
990	ARCH	799	6355	1.25		Green	4885	985120031628310	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		C		
991	LKTR	547	2265	1.38		Blue	28	985153000021068	TF	TU	24-Jul-07	LROTFF-01	Little Roberts Outflow		R	2000	
1056	ARCH	668	3760	1.26	F	Green	4883	985153000021088	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1057	LKTR	677	3955	1.27		Green	4884	985153000021042	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1058	ARCH	694	3870	1.16	F	Green	3374	985153000021083	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2003	
1059	ARCH	890	7060	1.00	M	Green	4882	985153000021026	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1060	ARCH	822	6040	1.09	M	Green	4880	985153000021007	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1061	ARCH	742	5010	1.23	F	Green	4631	985153000021016	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1062	LKTR	550	2470	1.48		Green	4090	985153000021085	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
1063	ARCH	765	4675	1.04	F	Green	4879	985153000021067	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1064	ARCH	898	6925	0.96	M	Green	4878	985153000021038	TF	TU	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1065	LKTR	239	135	0.99				985153000021010	TF	TD	25-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1066	LKTR	821	6330	1.14	M	Green	4694	985153000021020	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1067	ARCH	746	5180	1.25	F	Green	4640	985153000021058	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1068	LKTR	664	3715	1.27		Green	4877	985153000021086	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1069	ARCH	790	5310	1.08	M	Green	4876	985153000021081	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1070	LKTR	614	2615	1.13		Green	4875	985153000021011	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1071	ARCH	708	3905	1.10	F	Green	4626	985153000021087	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2006	
1072	ARCH	687	3790	1.17	F	Green	4874	985153000021065	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1073	ARCH	636	3210	1.25	F	Green	4873	985153000021006	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		
1074	LKTR	524				Green	4030	985120031587003	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		R	2004	
1075	LKTR	560	2530	1.44		Green	4872	985153000021017	TF	TU	26-Jul-07	LROTFF-01	Little Roberts Outflow		C		

Codes:

Species: ARCH Arctic char; BRWH Broad whitefish; LKTR Lake trout; LKWH Lake whitefish; LSCS Least Cisco

Sex: F = Female; M = Male

Capture Codes: C = first capture; M = mortality; R = re-capture

Condition Factor = Weight [in g] X 10^5/ (FL [in mm])^3

Length* = Fork Length for CISC, LKWH, LKTR, ARCH, ARGR, LSCS

Length* = Total Length for NNST, ARFL, FHSC

Appendix C3a. Catch, and CPUE data at the upstream fish fence in Little Roberts Outflow, 2007

Trap Check		Water Temp (°C)	Set Period (h)	Number Captured / CPUE (fish/24 h)								Total	
				ARCH		LKTR		LKWH		BRWH			
Date	Time			n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE
28-Jun-07	09:30	5.2	22.50									**0**	**0.00**
29-Jun-07	09:00	5.2	23.50					1	1.02			**1**	**1.02**
30-Jun-07	11:30	5.5	26.50	2	1.81							**2**	**1.81**
30-Jun-07	17:30	6.9	6.00									**2**	**8.00**
6-Jul-07	11:00	6.2	15.50	2	3.10	1	1.55					**7**	**10.84**
7-Jul-07	09:22	7.6	22.37	6	6.44	3	3.22					**10**	**10.73**
8-Jul-07	08:15	8.2	22.88	7	7.34	1	1.05					**10**	**10.49**
9-Jul-07	08:30	8.2	24.25	9	8.91	2	1.98					**5**	**4.95**
10-Jul-07	09:00	9.0	24.50	3	2.94	2	1.96					**11**	**10.78**
11-Jul-07	08:50	11.7	23.83	9	9.06	2	2.01					**9**	**9.06**
12-Jul-07	08:30	11.5	23.67	7	7.10	8	8.11					**11**	**11.15**
13-Jul-07	09:00	10.5	24.50	3	2.94	1	0.98					**3**	**2.94**
14-Jul-07	09:00		24.00									**2**	**2.00**
15-Jul-07	08:30	10.7	23.50	2	2.04	4	4.09					**7**	**7.15**
16-Jul-07	09:00	12.0	24.50	2	1.96		0.00					**1**	**0.98**
17-Jul-07	08:35	11.0	23.58	3	3.05	3	3.05					**3**	**3.05**
18-Jul-07	08:00	11.6	23.42	1	1.02	1	1.02					**1**	**1.02**
19-Jul-07	08:35	15.5	24.58			9	8.79			2	1.95	**15**	**14.64**
20-Jul-07	08:30	16.0	18.45			20	26.02					**21**	**27.32**
21-Jul-07	09:30	16.7	23.79	4	4.04	16	16.14					**17**	**17.15**
22-Jul-07	09:00	13.1	23.50	1	1.02	11	11.23					**14**	**14.30**
23-Jul-07	08:35	12.0	23.58	1	1.02	3	3.05					**10**	**10.18**
24-Jul-07	08:35	10.4	24.00	3	3.00	3	3.00					**8**	**8.00**
25-Jul-07	08:35	10.7	71.58	7	2.35	2	0.67					**79**	**26.49**
26-Jul-07	09:05	10.9	24.50	5	4.90	5	4.90					**5**	**4.90**
Total			**612.99**	**77**	**3.01**	**97**	**3.80**	**1**	**0.04**	**2**	**0.08**	**177**	**6.93**

NOTES:

n = number of captured fish

CPUE = catch per unit effort (fish/24 h)

Total CPUE = total (n) / total (h) *24

Appendix C3b. Catch, and CPUE data at the downstream fish fence in Little Roberts Outflow, 2007

Trap Check		Water Temp (°C)	Set Period (h)	Number Captured / CPUE (fish/24 h)								Total	
				ARCH		LKTR		LKWH		LSCS			
Date	Time			n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE
28-Jun-07	09:30	5.2	22.50	7	7.47	2	2.13					**7**	**7.47**
29-Jun-07	09:00	5.2	23.50	7	7.15	1	1.02					**7**	**7.15**
30-Jun-07	11:30	5.5	26.50	11		1						**11**	**9.96**
30-Jun-07	17:00	6.9	5.50	1								**1**	**4.36**
6-Jul-07	11:00	6.2	15.50	11	17.03							**11**	**17.03**
7-Jul-07	09:22	7.6	22.37	13	13.95	2	2.15					**13**	**13.95**
8-Jul-07	08:15	8.2	22.88	10	10.49	1	1.05					**10**	**10.49**
9-Jul-07	08:30	8.2	24.25	15	14.85							**15**	**14.85**
10-Jul-07	09:00	9.0	24.50	23	22.53	1	0.98					**23**	**22.53**
11-Jul-07	08:50	11.7	23.83	19	19.13	1	1.01					**19**	**19.13**
12-Jul-07	08:30	11.5	23.67	14	14.20							**14**	**14.20**
13-Jul-07	09:00	10.5	24.50	17	16.65	2	1.96					**17**	**16.65**
14-Jul-07	09:00		24.00	11	11.00							**11**	**11.00**
15-Jul-07	08:30	10.7	23.50	26	26.55							**26**	**26.55**
16-Jul-07	09:00	12.0	24.50	32	31.35	3	2.94	1	0.98			**33**	**32.33**
17-Jul-07	08:35	11.0	23.58	3	3.05	1	1.02					**3**	**3.05**
18-Jul-07	08:00	11.6	23.42										
19-Jul-07	08:35	15.5	24.58	3	2.93							**3**	**2.93**
20-Jul-07	08:30	16.0	18.45	23	29.92							**23**	**29.92**
21-Jul-07	09:30	16.7	23.79	11	11.10	6	6.05					**11**	**11.10**
22-Jul-07	09:00	13.1	23.50	39	39.83					1	1.02	**39**	**39.83**
23-Jul-07	08:35	12.0	23.58	2	2.04							**2**	**2.04**
24-Jul-07	08:35	10.4	24.00										
25-Jul-07	08:35	10.7	71.58			1	0.34						
26-Jul-07	09:05	10.9	24.50										
Total			**612.49**	**298**	**11.68**	**22**	**0.86**	**1**	**0.04**	**1**	**0.04**	**322**	**12.62**

NOTES:

n = number of captured fish

CPUE = catch per unit effort (fish/24 h)

Total CPUE = total (n) / total (h) *24

Appendix C4. Length, weight, and condition factor statistics for fish captured in Doris North Project area, 2007.

Waterbody	Species	Fork Length (mm)					Weight (g)					Condition Factor				
		n	**Mean**	SD	Min	Max	*n*	**Mean**	SD	Min	Max	*n*	**Mean**	SD	Min	Max
Roberts Bay	Arctic char	*6*	**204**	48	116	246	*6*	**77**	41	10	121	*6*	**0.79**	0.10	0.64	0.92
	Lake trout	*7*	**619**	144	316	719	*7*	**3016**	1579	290	4472	*7*	**1.09**	0.14	0.92	1.25
	Fourhorn sculpin	*16*	**100**	20	70	143	*16*	**12**	7	3	32	*16*	**1.02**	0.12	0.81	1.24
	Pacific herring	*54*	**74**	4	66	86	*54*	**2**	1	1	3	*54*	**0.52**	0.11	0.25	0.77
	Saffron cod	*34*	**144**	59	73	269	*34*	**25**	24	2	105	*34*	**0.61**	0.15	0.44	1.19
	Arctic flounder	*145*	**173**	58	45	368	*145*	**91**	101	1	560	*145*	**1.28**	0.14	0.84	1.65
Little Roberts Outflow	Arctic char	*375*	**382**	213	175	898	*371*	**1210**	1883	50	7060	*371*	**0.93**	0.15	0.62	1.62
	Broad whitefish	*2*	**521**	31	499	543	*2*	**1935**	7	1930	1940	*2*	**1.38**	0.25	1.21	1.56
	Lake trout	*118*	**580**	133	239	885	*115*	**2552**	1615	135	7350	*115*	**1.13**	0.15	0.82	1.55
	Lake whitefish	*2*	**387**	54	349	425	*2*	**793**	470	460	1125	*2*	**1.27**	0.27	1.08	1.47
	Least Cisco	*1*	**96**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
Roberts Lake	Arctic char	*28*	**260**	266	74	820	*24*	**1193**	2073	3	6070	*24*	**0.91**	0.26	0.59	1.50
	Cisco	*36*	**257**	80	85	385	*36*	**239**	178	5	625	*36*	**1.12**	0.19	0.59	1.61
	Lake trout	*42*	**482**	203	115	880	*40*	**1970**	2225	89	7485	*40*	**1.10**	0.16	0.89	1.51
	Lake whitefish	*71*	**387**	77	166	531	*69*	**886**	484	29	2323	*69*	**1.35**	0.19	0.61	1.71
	Ninespine stickleback	*10*	**51**	10	40	71	*4*	**1**	1	1	2	*4*	**0.63**	0.06	0.56	0.71
Stream E04	Arctic char	*8*	**190**	109	124	445	-	**-**	-	-	-	-	**-**	-	-	-
	Lake trout	*4*	**349**	124	165	433	-	**-**	-	-	-	-	**-**	-	-	-
	Least Cisco	*1*	**208**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
	Ninespine stickleback	*144*	**48**	6	35	70	-	**-**	-	-	-	-	**-**	-	-	-
Stream E10	Arctic char	*6*	**93**	15	78	113	*6*	**8**	4	4	14	*6*	**0.98**	0.37	0.63	1.63
	Lake trout	*2*	**111**	16	99	122	*2*	**17**	6	12	21	*2*	**1.20**	0.06	1.16	1.24
	Ninespine stickleback	*2*	**33**	1	32	34	-	**-**	-	-	-	-	**-**	-	-	-
Stream E11	Arctic char	*2*	**119**	27	100	138	-	**-**	-	-	-	-	**-**	-	-	-
Stream E14	Arctic char	*63*	**82**	26	39	256	*1*	**30**	-	-	-	*1*	**1.12**	-	-	-
	Ninespine stickleback	*24*	**45**	8	32	71	-	**-**	-	-	-	-	**-**	-	-	-
Doris Lake	Cisco	*5*	**225**	34	165	245	*5*	**122**	48	40	160	*5*	**1.00**	0.08	0.89	1.09
	Lake trout	*2*	**534**	64	488	579	*2*	**1498**	520	1130	1865	*2*	**0.97**	0.01	0.96	0.97
	Lake whitefish	*5*	**388**	52	335	475	*5*	**841**	436	465	1590	*5*	**1.34**	0.10	1.24	1.48
Lake 10	Arctic char	*7*	**379**	142	59	451	*6*	**844**	64	775	950	*6*	**1.05**	0.10	0.96	1.21
	Lake trout	*1*	**440**	-	-	-	*1*	**910**	-	-	-	*1*	**1.07**	-	-	-
	Ninespine stickleback	*9*	**46**	11	32	62	-	**-**	-	-	-	-	**-**	-	-	-
Lake 32	Arctic char	*12*	**325**	83	95	412	*11*	**409**	155	174	727	*11*	**0.94**	0.10	0.80	1.05
	Lake trout	*8*	**329**	95	100	393	*7*	**554**	155	355	847	*7*	**1.15**	0.11	1.04	1.40
	Ninespine stickleback	*6*	**42**	9	29	52	-	**-**	-	-	-	-	**-**	-	-	-

Appendix C5. Backpack electrofishing sampling locations, effort, catch and CPUE in the Doris North Project area, 2007

Waterbody	Site ID	Date	Start UTM (13W)		End UTM (13W)		Effort		Number of Fish Captured/CPUE (fish/100 s)							
									ARCH		LKTR		LSCS		NNST	
			Easting	Northing	Easting	Northing	(m)	(s)	n	CPUE	n	CPUE	n	CPUE	n	CPUE
Stream E04	E14EF-01	24-Jul-07	436456	7559367	436462	7559325	50	600	3	0.50	2	0.33			69	11.50
	E14EF-01	24-Jul-07	436456	7559367	436462	7559325	50	564	5	0.89	1	0.18			40	7.09
	E14EF-01	24-Jul-07	436456	7559367	436462	7559325	50	529			1	0.19			28	5.29
	E14EF-01	24-Jul-07	436456	7559367	436462	7559325	50	471					1	0.21	7	1.49
	Total							**676**	**8**	**1.18**	**4**	**0.59**	**1**	**0.15**	**144**	**21.30**
Stream E10	E10BP-01	23-Jul-07	441122	7559625	441077	7559539	100	591	5	0.85	1	0.17			1	0.17
	E10BP-01	23-Jul-07	441122	7559625	441077	7559539	100	492	1	0.20					1	0.20
	E10BP-01	23-Jul-07	441122	7559625	441077	7559539	100	452			1	0.22				
	Total							**1535**	**6**	0.39	**2**	**0.13**			**2**	**0.13**
Stream E11	E11BP-01	25-Jul-07	441277	7559519	441253	7559491	30	127	2	1.57						
	E11BP-01	25-Jul-07	441277	7559519	441253	7559491	30	55								
	E11BP-01	25-Jul-07	441277	7559519	441253	7559491	30	85								
	Total							**441**	**2**	**0.45**						
Stream E14	E14BP-01	20-Jul-07	436775	7563362	436810	7563362	135	510	21	4.12					4	0.78
	E14BP-02	25-Jul-07	436771	7563325	436316	7559668	70	590	26	4.41					3	0.51
	E14BP-02	25-Jul-07	436771	7563325	436316	7559668	70	498	5	1.00					8	1.61
	E14BP-02	25-Jul-07	436771	7563325	436316	7559668	70	426	3	0.70					7	1.64
	E14BP-02	25-Jul-07	436771	7563325	436316	7559668	70	401	4	1.00					2	0.50
	E14BP-02	25-Jul-07	436771	7563325	436316	7559668	70	281	4	1.42						
	Total							**2706**	**63**	**2.33**					**24**	**0.89**
Roberts Lake	RLBP-H1	28-Aug-07						700	5	0.71	2	0.29			2	0.29
	Total							**700**	**5**	**0.71**	**2**	**0.29**			**2**	**0.29**
Lake 10	L10BP-H1	04-Sep-07						947	1	0.11					9	0.95
	Total							**947**	**1**	**0.11**					**9**	**0.95**
Lake 32	L32BP-H1	07-Sep-07						313	2	0.64	2	0.64			6	1.92
	Total							**313**	**2**	**0.64**	**2**	**0.64**			**6**	**1.92**

NOTES:
n = number of captured fish
CPUE = catch per unit effort (fish/100s)
Total CPUE = total (n) / total (s) *100

Appendix C6. Location, effort, catch, and CPUE data for fyke nets in the Doris North Project area, 2007

Water-body	Site ID	UTM (13W) NAD27		Set Date	Set Time	Pull Date	Pull Time	Set Period (h)	Number of Fish Captured/CPUE (fish/24 h)																			
									ARCH		LKTR		LKWH		CISC		LSCS		FRSC		NNST		PCHR		SFCD		ARFL		Total	
		Easting	Northing						n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE
Roberts Lake	RLFT-01	435742	7562207	20-Jul-07	16:56	24-Jul-07	16:12	95	9	2.3	5	1.3	8	2.0	16	4.0	16	4.0			4	1.0							42	10.6
	RLFT-02	435186	7562607	20-Jul-07	17:58	24-Jul-07	13:55	92	9	2.3	1	0.3	2	0.5							4	1.0							16	4.2
	Total							**187**	**18**	**2.3**	**6**	**0.8**	**10**	**1.3**	**16**	**2.1**	**16**	**2.1**			**8**	**1.0**							**58**	**7.4**
Roberts Bay	RBFT-EB	432626	7563341	12-Jul-07	13:00	17-Jul-07	10:00	117	2	0.4	4	0.8					7	1.4	7	1.4			31	6.4	5	1.0	50	10.3	99	20.3
	RBFT-WB	432626	7563341	12-Jul-07	13:00	17-Jul-07	10:00	117	4	0.8	3	0.6					9	1.8	9	1.8			23	4.7	29	5.9	95	19.5	163	33.4
	Total							**234**	**6**	**0.6**	**7**	**0.7**					**16**	**1.6**	**16**	**1.6**			**54**	**5.5**	**34**	**3.5**	**145**	**14.9**	**262**	**26.9**

NOTES:

n = number of captured fish

CPUE = catch per unit effort

Total CPUE = total (n) / total (h) *24

Appendix C7. Gill Net locations, effort, catch, and CPUE in the Doris North Project area, 2007

Water-body	Site ID	Set No.	UTM (13W) NAD27		Set Date	Set Time	Pull Date	Pull Time	Set Period (h)	Net Area (m^2)	No. Panels	Net Units[a]	Mesh Sizes (cm)	Number of Fish Captured/CPUE									
														ARCH		CISC		LKTR		LKWH		Total	
			Easting	Northing										n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE
Roberts Lake	RLGN-H1	1	436776	7563333	26/08/2007	9:05	26-Aug-07	11:35	2.5	27.36	3	0.09						1	11.7	3	35.1	**4**	**46.8**
	RLGN-H2	1	436773	7563338	26/08/2007	9:10	26-Aug-07	11:50	2.7	27.36	3	0.09				6	65.8	1	11.0	8	87.7	**15**	**164.5**
	RLGN-H3	1	436776	7563340	26/08/2007	12:35	26-Aug-07	14:30	1.9	27.36	3	0.07		1	15.3			5	76.3	6	91.5	**12**	**183.1**
	RLGN-H3	2	436776	7563340	26/08/2007	14:45	26-Aug-07	15:10	0.4	27.36	3	0.01				1	70.2	2	140.4	1	70.2	**4**	**280.7**
	RLGN-H3	3	436776	7563340	27/08/2007	9:30	27-Aug-07	10:55	1.4	27.36	3	0.05		1	20.6	3	61.9	4	82.6	6	123.8	**14**	**289.0**
	RLGN-H3	4	436776	7563340	27/08/2007	11:20	27-Aug-07	13:35	2.3	27.36	3	0.08		1	13.0	1	13.0	2	26.0	4	52.0	**8**	**104.0**
	RLGN-H3	5	436776	7563340	27/08/2007	13:45	27-Aug-07	16:00	2.3	27.36	3	0.08				9	117.0	3	39.0	5	65.0	**17**	**220.9**
	RLGN-H4	6	436776	7563340	28/08/2007	8:45	28-Aug-07	10:10	1.4	27.36	3	0.05						2	41.3	3	61.9	**5**	**103.2**
	RLGN-H4	1	436783	7563346	26/08/2007	12:40	26-Aug-07	14:50	2.2	27.36	3	0.07		2	27.0			2	27.0	3	40.5	**7**	**94.5**
	RLGN-H4	2	436783	7563346	27/08/2007	9:40	27-Aug-07	11:10	1.5	27.36	3	0.05				1	19.5	2	39.0	1	19.5	**4**	**78.0**
	RLGN-H4	3	436783	7563346	27/08/2007	11:25	27-Aug-07	13:15	1.8	27.36	3	0.06						1	15.9	6	95.7	**7**	**111.6**
	RLGN-H4	4	436783	7563346	27/08/2007	13:55	27-Aug-07	16:05	2.2	27.36	3	0.07						2	27.0	4	54.0	**6**	**81.0**
	RLGN-H4	5	436783	7563346	28/08/2007	8:55	28-Aug-07	10:20	1.4	27.36	3	0.05				4	82.6	1	20.6	5	103.2	**10**	**206.4**
	RLGN-01	1	436577	7562512	09/09/2007	12:00	09-Sep-07	14:15	2.3	27.36	3	0.08	3.5,5.1,3.8					1	13.0	2	26.0	**3**	**39.0**
	RLGN-01	2	436577	7562512	09/09/2007	14:23	09-Sep-07	16:40	2.3	27.36	3	0.08	3.5,5.1,3.8			5	64.0	1	12.8	6	76.8	**12**	**153.7**
	RLGN-02	1	436564	7562844	09/09/2007	12:10	09-Sep-07	15:15	3.1	27.36	3	0.11	3.5,5.1,3.8					5	47.4	8	75.9	**13**	**123.3**
	RLGN-03	1	436744	7562826	09/09/2007	12:20	09-Sep-07	16:00	3.7	27.36	3	0.13	3.5,5.1,6.4					4	31.9	5	39.9	**9**	**71.8**
	RLGN-04	1	436371	7562552	09/09/2007	14:00	09-Sep-07	16:30	2.5	27.36	3	0.09	3.5,5.1,6.4							2	23.4	**2**	**23.4**
	RLGN-05	1	436329	7561981	10/09/2007	10:20	10-Sep-07	12:10	1.8	27.36	3	0.06	3.5,5.1,3.8							1	15.9	**1**	**15.9**
	RLGN-06	1	436090	7562127	10/09/2007	10:25	10-Sep-07	12:40	2.3	27.36	3	0.08	3.5,5.1,6.4			6	78.0	1	13.0	5	65.0	**12**	**155.9**
	RLGN-07	1	436003	7562515	10/09/2007	10:30	10-Sep-07	14:10	3.7	27.36	3	0.13	3.5,5.1,6.4					2	15.9	3	23.9	**5**	**39.9**
	RLGN-08	1	435835	7562380	10/09/2007	10:40	10-Sep-07	15:00	4.3	27.36	3	0.15	3.5,5.1,6.4					1	6.7	2	13.5	**3**	**20.2**
	RLGN-09	1	436290	7562462	10/09/2007	12:20	10-Sep-07	15:30	3.2	27.36	3	0.11	3.5,5.1,3.8	1	9.2					1	9.2	**2**	**18.5**
	RLGN-10	1	436996	7562314	10/09/2007	13:40	10-Sep-07	16:40	3.0	27.36	3	0.10	3.5,5.1,6.4			3	29.2	1	9.7	11	107.2	**15**	**146.2**
	RLGN-11	1	436771	7561562	10/09/2007	14:50	10-Sep-07	17:30	2.7	27.36	3	0.09	3.5,5.1,6.4							6	65.8	**6**	**65.8**
	RLGN-12	1	439034	7561318	11/09/2007	10:20	11-Sep-07	12:15	1.9	27.36	3	0.07	3.5,5.1,6.4					1	15.3	3	45.8	**4**	**61.0**
	RLGN-13	1	439049	7561274	11/09/2007	10:30	11-Sep-07	12:30	2.0	27.36	3	0.07	3.5,5.1,6.4					1	14.6	1	14.6	**2**	**29.2**
	RLGN-14	1	438930	7561046	11/09/2007	10:40	11-Sep-07	12:50	2.2	27.36	3	0.07	3.5,5.1,3.8										
	RLGN-15	1	439063	7560836	11/09/2007	10:50	11-Sep-07	13:00	2.2	27.36	3	0.07	3.5,5.1,6.4	1	13.5	5	67.5	1	13.5	7	94.5	**14**	**188.9**
	RLGN-16	1	440142	7560620	11/09/2007	14:10	11-Sep-07	15:30	1.3	27.36	3	0.05	3.5,5.1,6.4					2	43.9	2	43.9	**4**	**87.7**
	RLGN-17	1	440387	7560365	11/09/2007	14:15	11-Sep-07	16:00	1.7	27.36	3	0.06	3.5,5.1,3.8					1	16.7	2	33.4	**3**	**50.1**
	RLGN-18	1	440653	7559670	11/09/2007	14:25	11-Sep-07	16:30	2.1	27.36	3	0.07	3.5,5.1,6.4			3	42.1	1	14.0			**4**	**56.1**
	RLGN-19	1	441044	7559802	11/09/2007	14:35	11-Sep-07	16:50	2.3	27.36	3	0.08	3.5,5.1,6.4	1	13.0			1	13.0	8	104.0	**10**	**130.0**
	Total								**74.3**			**2.5**		**8**	**3.1**	**47**	**18.5**	**52**	**20.5**	**130**	**51.2**	**237**	**93.3**
Lake 10	L10GN-H1	1	440992	7558623	04-Sep-07	10:40	04-Sep-07	12:20	1.7	27.36	3	0.1											
	L10GN-H2	1	436782	7563368	04-Sep-07	10:50	04-Sep-07	12:25	1.6	27.36	3	0.1						1	18.5			1	18.5
	L10GN-H3	1	436786	7563383	04-Sep-07	12:39	04-Sep-07	14:15	1.6	27.36	3	0.1											
	L10GN-H4	1	436807	7563435	04-Sep-07	12:35	04-Sep-07	14:20	1.7	27.36	3	0.1											
	L10GN-H5	1	440764	7558582	04-Sep-07	14:25	04-Sep-07	15:30	1.1	27.36	3	0.04											
	L10GN-H6	1	435745	7562207	04-Sep-07	14:30	04-Sep-07	15:40	1.2	27.36	3	0.04		2	50.1							2	50.1
	L10GN-H6	2	435745	7562207	05-Sep-07	8:55	05-Sep-07	10:50	1.9	27.36	3	0.07		2	30.5			1	15.3			3	45.8
	L10GN-H7	1			05-Sep-07	9:00	05-Sep-07	10:55	1.9	27.36	3	0.07		1								1	15.3
	L10GN-H8	1	435186	7562607	05-Sep-07	9:30	05-Sep-07	11:05	1.6	27.36	3	0.05		1	18.5							1	18.5
	Total								**14.3**			**0.5**		**6**	**12.3**			**2**	**4.1**			**8**	**16.4**

Appendix C7. Gill Net locations, effort, catch, and CPUE in the Doris North Project area, 2007

Water-body	Site ID	Set No.	UTM (13W) NAD27		Set Date	Set Time	Pull Date	Pull Time	Set Period (h)	Net Area (m^2)	No. Panels	Net Units[a]	Mesh Sizes (cm)	Number of Fish Captured/CPUE									
														ARCH		CISC		LKTR		LKWH		Total	
			Easting	Northing										n	CPUE	n	CPUE	n	CPUE	n	CPUE	n	CPUE
Lake 32	L32GN-H1	1	441114	7559616	06-Sep-07	14:15	06-Sep-07	15:35	1.3	27.36	3	0.05		25				7	15.3			32	701.8
	L32GN-H2	1	441112	7559608	06-Sep-07	14:20	06-Sep-07	16:10	1.8	27.36	3	0.06		3	47.8							3	47.8
	Total								**3.2**			**0.1**		**28**	**258.5**			**7**	**64.6**			**35**	**323.2**
Doris Lake	DLGN-H1	1	433764	7558857	24-Aug-07	8:50	24-Aug-07	11:15	2.4	27.36	3	0.1				7	84.7	1	12.1	7	84.7	15	181.5
	DLGN-H2	1	433690	7558839	24-Aug-07	9:00	24-Aug-07	11:05	2.1	27.36	3	0.1				10	140.4	1	14.0	1	14.0	12	168.4
	DLGN-H3	1	433999	7559159	24-Aug-07	11:25	24-Aug-07	14:10	2.8	27.36	3	0.1				27	287.1	1	10.6	2	21.3	30	319.0
	DLGN-H4	1	433918	7559190	24-Aug-07	11:35	24-Aug-07	14:00	2.4	27.36	3	0.1				15	181.5	1	12.1	1	12.1	17	205.7
	DLGN-H5	1	433783	7557445	24-Aug-07	14:30	24-Aug-07	15:40	1.2	27.36	3	0.04				1	25.1			1	25.1	2	50.1
	DLGN-H6	1	433775	7557368	24-Aug-07	14:37	24-Aug-07	15:25	0.8	27.36	3	0.03				30	1096.5					30	1096.5
	DLGN-H7	1	434719	7550901	25-Aug-07	9:15	25-Aug-07	11:00	1.8	27.36	3	0.06				20	334.2	3	50.1	3	50.1	26	434.4
	DLGN-H8	1	434857	7549708	25-Aug-07	9:20	25-Aug-07	11:10	1.8	27.36	3	0.06				18	287.1	1	15.9			19	303.0
	DLGN-H9	1			25-Aug-07	11:50	25-Aug-07	13:10	1.3	27.36	3	0.05				15	328.9	1	21.9	3	65.8	19	416.7
	DLGN-H10	1			25-Aug-07	12:00	25-Aug-07	13:20	1.3	27.36	3	0.05											
	Total								**17.9**			**0.6**				**143**	**233.8**	**9**	**14.7**	**18**	**29.4**	**170**	**278.0**

NOTES:

n = number of captured fish

CPUE = fish / Net Unit[a]

[a] one net unit equals 100 m^2 of net set for 24 hours

Total CPUE = total (n) / (100 m^2 * total (h) *24)

Appendix C8. Location, effort, catch, and CPUE data for minnow traps in the Doris North Project area, 2007

Water-body	Site ID	Set Date	Set Time	Pull Date	Pull Time	Set Period (h)	Number of Fish Captured/24 h	
							NNST	
							n	CPUE
Lake 32	L32MB-H1	06-Sep-07	17:25	07-Sep-07	9:00	15.6	2	3.1
	L32MB-H2	06-Sep-07	17:25	07-Sep-07	9:00	15.6	0	0.0
	L32MB-H3	06-Sep-07	17:25	07-Sep-07	9:00	15.6	0	0.0
	L32MB-H1	07-Sep-07	9:00	07-Sep-07	10:15	1.3	1	19.2
	L32MB-H2	07-Sep-07	9:00	07-Sep-07	10:15	1.3	0	0.0
	L32MB-H3	07-Sep-07	9:00	07-Sep-07	10:15	1.3	0	0.0
	Total					**50.5**	**3**	**1.4**

NOTES:

n = number of captured fish

CPUE = catch per unit effort

Total CPUE = total (n) / total (h) *24