LT-0086

WMC INTERNATIONAL LIMITED

AMERICAS DIVISION - EXPLORATION

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To: Henry Kablalik **Date:** December 09, 1996

Company: INAC (DIAND)
P.O Box 129
Rankin Inlet, N.T.
X0C 0G0

From: Joe Campbell

Subject: Preliminary Water Quality and Fish Habitat Investigations at the Meliadine West Gold Project

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Henry,

Please accept the attached report prepared by Ben Hubert and Associates Ltd., done on behalf of WMC International Limited. This report outlines the limited work done to date on the fish habitat and water regimes in the Meliadine area. WMC anticipates beginning more extensive testing of the environment in the area next year, including more work on fish and water.

If you have any questions concerning this report, please contact WMC at the above address. It was a pleasure to meet you at the airport in Rankin last week and until we meet again,

Regards,

Joe Campbell

Joe Campbell
Project Manager, Meliadine West Project

c.c. Ben
Alan
Brad
Rex

PRELIMINARY WATER QUALITY AND FISH HABITAT INVESTIGATIONS AT THE MELIADINE WEST GOLD PROJECT

Prepared for: Meliadine West Gold Project
WMC INTERNATIONAL LIMITED.

Prepared By: Hubert and Associates Ltd.
Yellowknife, NT
September 1996

INTRODUCTION

The Meliadine West Gold Project is located in an area of numerous lakes and ponds. Protecting the aquatic environment is therefore a priority that requires constant vigilance by both WMC International Limited and its contractors. The lakes and ponds in the project area also provide a platform for diamond drilling operations during the periods of maximum ice cover. This report is a consolidation of several water quality protection and management initiatives by WMC International Limited at the Meliadine West Project.

With the increase in mineral exploration in the NWT has come an increased awareness for the potential impact of aquatic disposal of drilling fluids from small diameter core drilling from ice platforms. Drilling fluids may contain elevated levels of suspended solids and other substances that may be deleterious to fish and other aquatic organisms in the lake under the ice platform. Under the *Fisheries Act* there is a general prohibition on introducing deleterious substances into fish habitat. To date there have been no further regulations to guide ice based drilling other than the Canadian Water Quality Guidelines which for total suspended solids (TSS) offer the following:

> "Suspended solids should not exceed 10 mg/L when background suspended solids are equal to or less than 100 mg/L. Suspended solids should not exceed 10% of background concentrations when background concentrations are greater than 100 mg/L."

DATA COLLECTION METHODS

Water quality

In preparing for the late winter drilling at Meliadine West, WMC International Limited adopted the practice of recirculating drilling fluid and in the process separating out the solids by centrifuge, collecting these and disposing them in the municipal dump at Rankin Inlet. While this process adds significant costs and time required to complete holes, it eliminated the risk of negative impacts on fish and other organisms in the lake during late winter drilling from ice.

In addition to recirculating drilling fluids, water quality in the lakes under ice platform drilling was monitored. Surface water samples were taken before drilling started to establish a reference standard for the samples taken during the drilling program.

Bioassays

WMC International Limited participated in a government / industry workshop on the subject of "Small Diameter Core Drilling From Ice" hosted by the federal departments of Environment

and Fisheries and Oceans, and the NWT Chamber of Mines. Preliminary results of a drilling wastewater testing program were reported at this workshop. Waste water from drilling in kimberlite was shown to be acutely toxic in both 96 hr. rainbow trout bioassay and the Microtox tests. Non-kimberlite sample analyses available at the time of the workshop were reported to be not acutely toxic in either the rainbow trout or the Microtox tests. The Meliadine West program provided four samples for bioassay testing - two samples of drilling fluids taken directly from the return drilling fluid stream and two samples taken after drilling fluids had been recirculated to remove most of the solids.

To date the issue of waste water discharges at drilling sites has been considered in the context of the CCME (1987) Canadian water quality guidelines. Discussions at the workshop showed these guidelines to be inadequate for discharging drilling fluids from ice. Their most significant shortcoming is perhaps the lack of methodology on where in relation to the discharge point to take samples. The workshop participants made recommendations for changes to the guidelines to take effect for the 1996 - 97 winter drilling season.

While removal of cuttings from the ice was seen to be a reasonable requirement in general, it was a practise that could be unreasonably expensive, especially at exploration sites that are served by air only. Options discussed in the workshop included:

- discharging wastewater and cuttings to the bottom of the lake
- discharging wastewater and fluids into the water at the ice/water interface
- accumulating the cuttings on the ice and allowing these to disperse and settle during break-up (more research was suggested for this option to test the assumption on natural dispersal of particles at break-up)

Of these options there was general agreement that deep discharge would minimize the potential for adverse effects on Arctic lakes.

These discussions and recommended changes notwithstanding, WMC decided to explore the latitude offered by a literal application to the CCME TSS guidelines to a Meliadine West late winter drilling program. Data on TSS values in the winter water column of lakes are known from pre drilling samples taken in 1996. Bathymetry of the lakes most likely to be used in late winter 1997 was completed in August 1996. Ice thickness was measured during the 1996 sampling program and so the late winter water volumes can be calculated and the total suspended solid threshold for each lake estimated.

Lake bathymetry

In consultation with project geologists, the lakes likely to used as operating platforms for a winter drilling program were identified based on the distribution and configuration of drilling targets (see Figure 1. for a general location map). A bathymetric profile of each lake selected

was produced using a Raytheon DE - 719 Fathometer Depth Recorder operated from an inflatable boat equipped with an outboard motor. Sounding transects were planned using aerial photographs which showed the shallows and areas of depth for each lake. These were plotted on a 1:10,000 scale map. All soundings were completed at a constant speed. The resulting strip chart trace was scaled to the particular transect to produce the lake bottom profile for each particular transect.

Fish habitat

The concern for the effects of ice based drilling in winter is based on the risk of impact on fish and fish habitat. The drilling program of April and May of 1996 documented ice thickness and water depth at ice based drill sites. All lakes in the area were known to be shallow (less than 5 m) with most freezing to the bottom; winter drilling on Wolf Lake in April 1996 for example, required a water supply from a nearby lake.

Two separate activities were undertaken to assess the presence of fish in the drainage basins in the area of the Meliadine West Project. Streams were tested for spawning grayling in spring and a variable mesh gill net was set in summer at the time that the bathymetry was conducted. Notwithstanding that some of the lakes in the area freeze to the bottom in winter, the streams in the area may be used by grayling for spawning at break-up. These were examined and tested by angling at break-up (Figure 2). Water temperatures were taken and stretches of stream that fit the description for spawning beds (Scott and Crossman, 1973) were tested by angling.

The bathymetry data would show which lakes have sufficient depth to support overwintering fish populations. This information was supplemented by setting variable mesh gill net (50 m) to assess which fish species are present in August. See Figures 3 to 7 for gill net locations. A fork length measurement was taken for each fish caught.

RESULTS

Water Quality - turbidity and total suspended solids (TSS)

These parameters measure the presence of suspended matter in the water column. Turbidity is a measure of clarity and TSS is a measure of solid matter retained in a 1.2 micron filter (filt. res. in lab reports). Table 1. shows the turbidity and TSS values for these samples.

Table 1. Turbidity and TSS measurements for lakes where ice based drilling occurred in April & May 1996

		Drilling status			
Lake		Pre drilling	During drilling		Post drilling
Bud	Turbidity	7.7	1.2	1.6	4.1
	TSS	250	216	270	217
Meliadine	Turbidity	8.7	1.4	2.7	2.2
	TSS	47	21	23	35
Pump	Turbidity	1.7			2.1
	TSS	223			178

The water quality samples taken from Bud Lake show turbidity at 7.7 and TSS at 250 in a pre drilling sample. Samples taken during drilling showed values of 1.6 on Day 1 (250 m distant) and 1.2 on day 2 (20 m distant) for turbidity and 216 and 270 respectively for TSS. The sample taken 4 days post drilling showed a turbidity level of 4.1 and TSS at 217.

A similar sequence of samples taken on Meliadine Lake showed a pre drilling turbidity of 8.7 and TSS at 47. On day 2 of operations samples were taken at 70 and 80 metres from the drill which showed turbidity levels of 1.4 and 2.7 and TSS at 21 and 23 respectively. Post drilling turbidity and TSS levels on the Meliadine Lake drill site were 2.2 and 35 respectively.

A series of samples from Pump Lake showed turbidity levels of 1.7 pre drilling and 2.1 a day after drilling was completed. Complimentary TSS levels were 223 and 178. Copies of lab reports showing all water quality parameters appear in Appendix 1.

Bioassay

All 4 samples submitted to Environment Canada passed the bioassay tests with zero mortality reported for each sample. Please see Appendix 2 for copies of the bioassay reports.

Fish habitat

Angling at prospective spawning sites on streams in the area was done between 13 and 17 June, 1996. Water temperature ranged between 4 and 10 degrees C. The rapids between the upper and lower portions of Meliadine Lake were tested every day. Other water courses were tested on successive days. Please see Figure 2 for stretches of stream tested.

No grayling were caught by angling and no spawning activity was observed at any of the locations tested.

four fish species were caught by gill net in August: grayling, cisco, burbot and sculpin.

Lake No. 1 is above the Teriruniaq Zone. It produced 30 grayling and 7 cisco. The maximum depth recorded was 4.3 metres which is at least 1.5 metres deeper than the maximum ice thickness measured on any of the lakes used for drilling in April and May of 1996. The overall area of the lake bottom that would not freeze is approximately 1/4 and so may be capable of supporting an overwintering population.

Bud Lake lies over the Teriruniaq Zone. It produced 13 grayling, 2 cisco and 3 burbot. Maximum depth measured with the sounder was 3.2 m. The area not freezing to the bottom is approximately 1/5 of the lake.

Wolf Lake lies over the Wolf Zone and produced 13 grayling. The maximum depth recorded was 2.5 m; a depth that froze to the bottom in 1996 as no water was available for drilling there. The grayling present seem to be seasonal migrants.

The net setting in Lake No. 4 produced no fish. This lake lies below the Wolf Zone. The maximum depth recorded was 2.5 m, which is probably too shallow to support overwintering fish populations.

Lake No. 5 produced no fish. Its maximum depth is 4 m. This lake lies adjacent to the Wolf Zone. The total area of that depth is very small however and most of the lake will freeze to the bottom in winter and so the overwinter potential for fish is considered very low.

Pump Lake lies adjacent to the Pump Zone and above the F and F2 Zones. It is relatively large but generally shallow. The gill net produced 19 grayling and two sculpin. The maximum depth recorded was 3+ metres covering a small area of the overall lake. The capacity to support overwintering fish populations in Pump Lake is very low.

DISCUSSION

Water Quality

The pattern that emerges in the turbidity and TSS parameters suggests that there is a greater effect from the turbulence caused when cutting the hole in the ice with a power auger, than there is from diamond drilling. The turbulence generated in the water column of a shallow lake by the power auger probably puts more particulate matter into suspension than does the drill. This observation is especially compelling when comparing the data for these parameters for Bud and Pump Lakes to Meliadine Lake which is much deeper. In any event there is no consistent pattern in the data which suggests that the drilling activity introduces a deleterious substance to the fish habitat. This observation is also a preliminary conclusion in the review of

the drilling guidelines undertaken by Fisheries and Oceans Canada and Environment Canada. A revised guideline for ice based drilling is in draft form and should be available for review within four weeks (by October 31, 1996).

Fish Habitat

Fish were taken from four of the six lakes tested and so it is concluded that these lakes are fish habitat even though they may freeze to the bottom in winter as is the case with Wolf Lake. Four different species of fish were caught three of which are reported to be migratory. Relevant details on the migratory habits of these species are reviewed briefly below.

The seasonal movements of grayling have been studied in several northern locations. Their general habitat is that of "large, cold rivers, rocky creeks and lakes" (Scott and Crossman, 1973). The catch in the area of the Meliadine project ranges is size to cover both immature and breeding age fish. It remains uncertain as to the presence of spawning beds in the streams of the exploration area. The grayling caught in the lakes within the area of the exploration program are probably summer migrants that will probably return to Meliadine Lake for overwintering. Table 2. summarises the sizes caught in the area.

Table 2. Size Distribution of Grayling from selected lakes, August 1996

Cohorts* Size (mm)	1 <100	2 100-200	3 201-250	4 251-300	5 301-340	6 341-360	7 361-380	8 381-400	9 401-410	Net Settings (hrs)
Lake										
No.1	0	10	0	11	8	1		12		12
BUD	0	8	1	0	1	2	1			12
Wolf	1	3	4	4	1					6/12
Pump	0	4	0	9	4	1	1	0	1	6/12
No.4	0	0	0	0	0	0	0	0	0	6/12
No.5	0	0	0	0	0	0	0	0	0	8/12

* cohorts based on age/length relationships for Great Bear Lake (Scott and Crossman, 1973)

Grayling spawn in spring at the time that streams are breaking up but the lakes still ice covered. Spawning fish migrate from large lakes to rocky and gravel bottomed tributaries. Spawning takes place over gravel in water temperatures between 7 and 10 degrees C. (Scott and Crossman, 1973). Studies in the Mackenzie and Great Bear Rivers show extensive grayling migrations between spawning areas on tributaries of the Great Bear River and lakes downstream of its confluence with the Mackenzie River (Chang -Kue and Cameron, 1980). It

seems certain that the grayling in Wolf Lake and perhaps Pump Lake are summer migrants as both these lakes have very small (if any) winter carrying capacity for fish populations. More study of the fish populations in these lakes is needed to determine the seasonal or year round presence of grayling in the lakes in the area of the Meliadine West Gold Project..

Cisco are a lake species but do undertake local spawning migrations (Scott and Crossman, 1973) concentrating in dense schools just at the time that ice first starts to form on lake margins. The fish caught in Lake No. 1 and Bud Lake were near or in the range of spawning sized fish using the size/age relationships (260 - 350 mm) reported for the species in Scott and Crossman for Great Bear Lake. More study is needed to determine if this species overwinters in these smaller lakes or if the fish caught were early arrivals for fall spawning.

Burbot are winter spawners. In spring they often will move into shallower waters including streams and lakes some distance from their spawning area (Scott and Crossman, 1973). The three burbot caught in Bud Lake were of a size large enough to be mature and of spawning age (370 - 400 mm). Further study is needed to determine the seasonal distribution of burbot in the exploration area.

CONCLUSIONS

1. The drilling completed from ice platforms in April and May does not seem to have elevated water quality parameters like turbidity and TSS.

2. The small lakes perched above Meliadine Lake making up the small basins are general very shallow. Water volumes under the ice are such that winter carrying capacity for fish populations is low to negligible.

3. Some (and perhaps all) lakes that freeze to the bottom in winter are occupied by fish in summer and so must be considered and treated as fish habitat

RECOMMENDATIONS

These recommendations assume that the Meliadine West Gold Project is exploring economic targets.

1. A comprehensive fish and fish habitat study should be undertaken to determine the seasonal distribution of fish frequenting the lakes over the gold bearing zones of the Meliadine West Gold project. This study should include a consideration of the potential impact of a gold mine on the water quality and fish habitat in Meliadine Lake. This study should get underway in June 1997 and continue through to October 1998.

2. A drilling fluids management strategy for future ice based drilling in the Meliadine West Gold exploration program should be developed in the context of the new guidelines currently in preparation by Environment Canada and Fisheries and Oceans Canada. These guidelines are expected to be available in draft form for discussions between government and industry by October 31, 1996.

ACKNOWLEDGMENTS

It has been a pleasure to work with the many individuals that contribute to the work reported here. The WMC field staff at the Meliadine West camp and the Custom Helicopters personnel were always helpful and accommodating to unpredictable schedules and support requirements. The Department of Fisheries and Oceans staff in Rankin Inlet kindly provided items of equipment that saved significant time and effort in arrangements and shipping from elsewhere. The officer in charge, Robert Luke also shared information on the progression of spring breakup and so helped significantly in planning the spring spawning investigations. Overall the ongoing interest and concern for environmental quality by WMC International Ltd. generally creates a stimulating and proactive working environment in which to in develop the Meliadine West Gold Project.

REFERENCES

Canadian Council of Resource and Environment Ministers. 1987. *Canadian water quality guidelines for total suspended solids.*

Chang-Kue, K.T.J. and R.A. Cameron. 1980. *A survey of the fish resources of the Great Bear River, Northwest Territories 1974.* Fisheries and Marine Service Manuscript Report No. 1510. 59p.

Falk, M.R. and M.M. Roberge, D.V. Gillman and G. Low. 1982. *The Arctic grayling, Thymallus arcticus (Pallas), in Providence Creek, Northwest Territories, 1976 - 79.* Department of Fisheries and Oceans Winnipeg.

Scott, W.B. and E.J. Crossman 1973. *Freshwater Fishes of Canada.* Fisheries Research Board of Canada Bulletin 184. 966p.

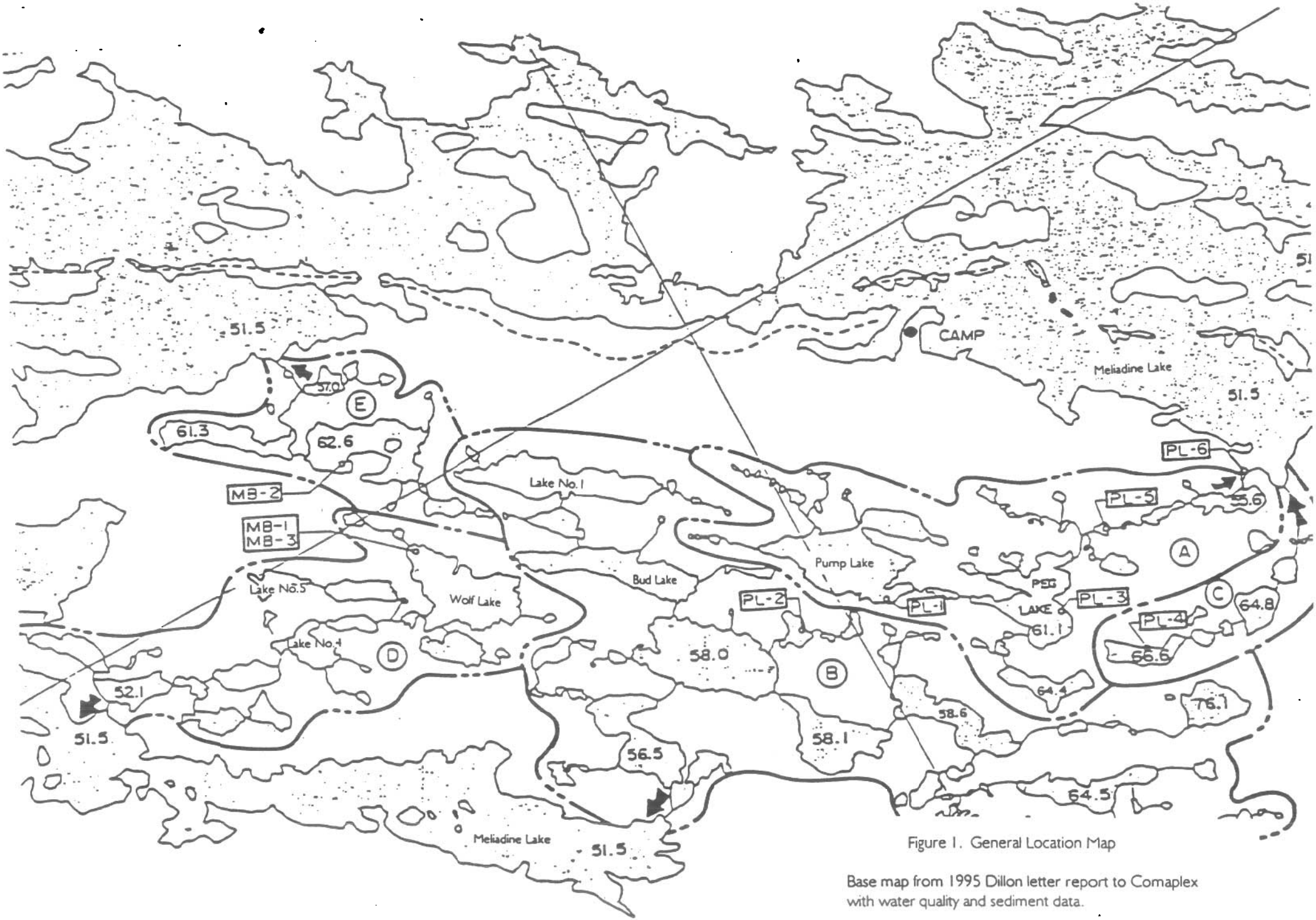

Figure 1. General Location Map

Base map from 1995 Dillon letter report to Comaplex with water quality and sediment data.

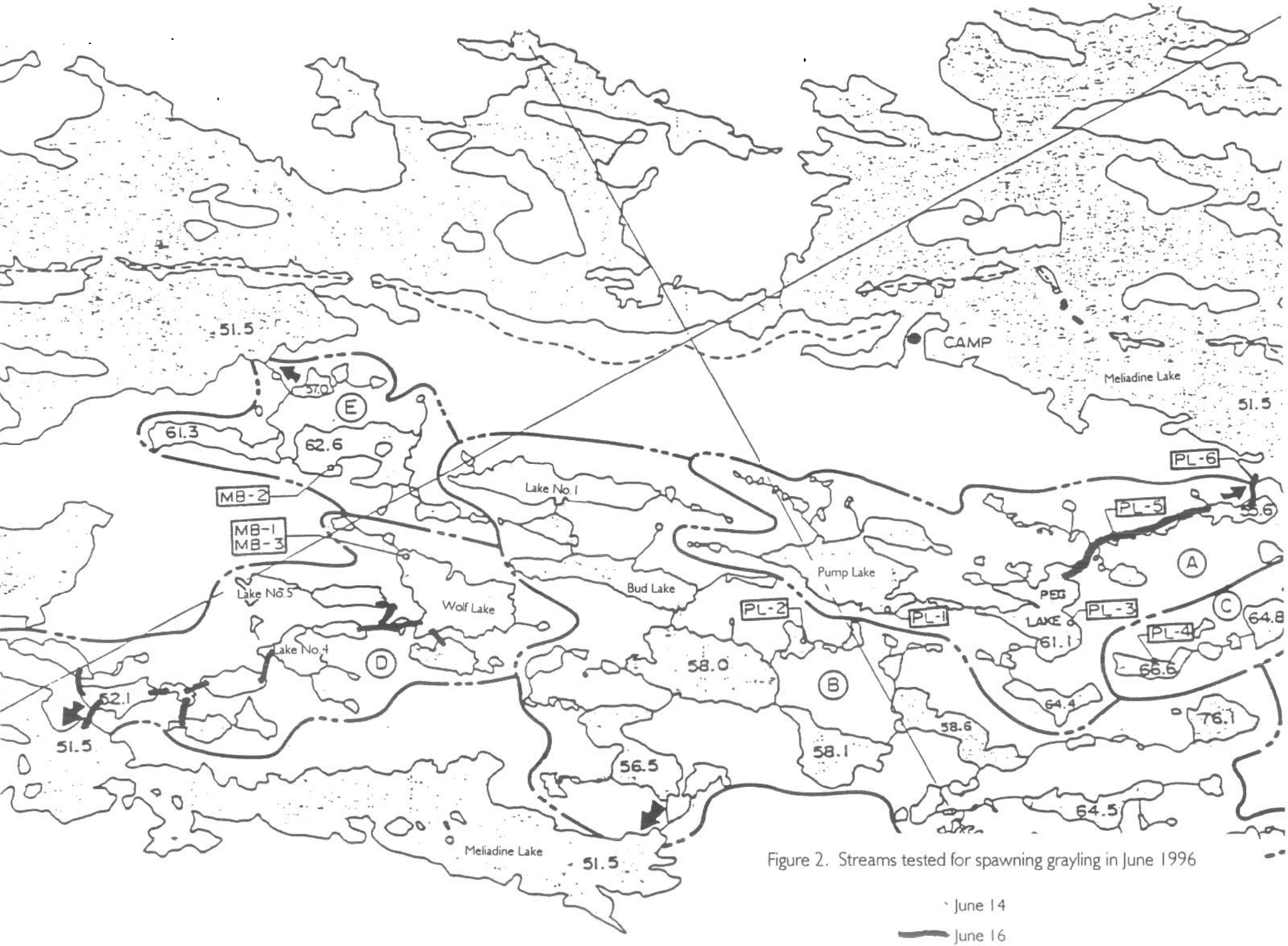

Figure 2. Streams tested for spawning grayling in June 1996

June 14

June 16

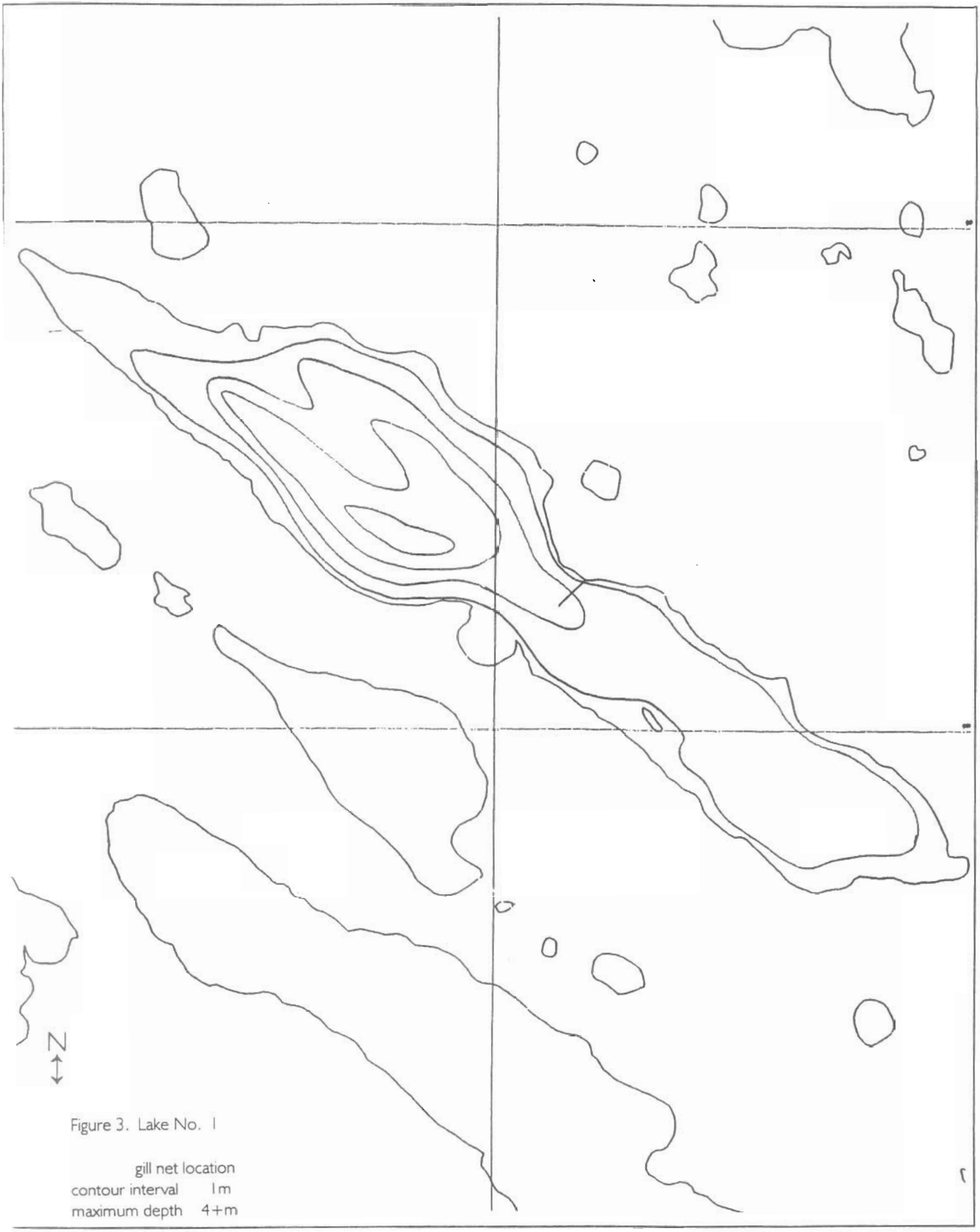

Figure 3. Lake No. 1

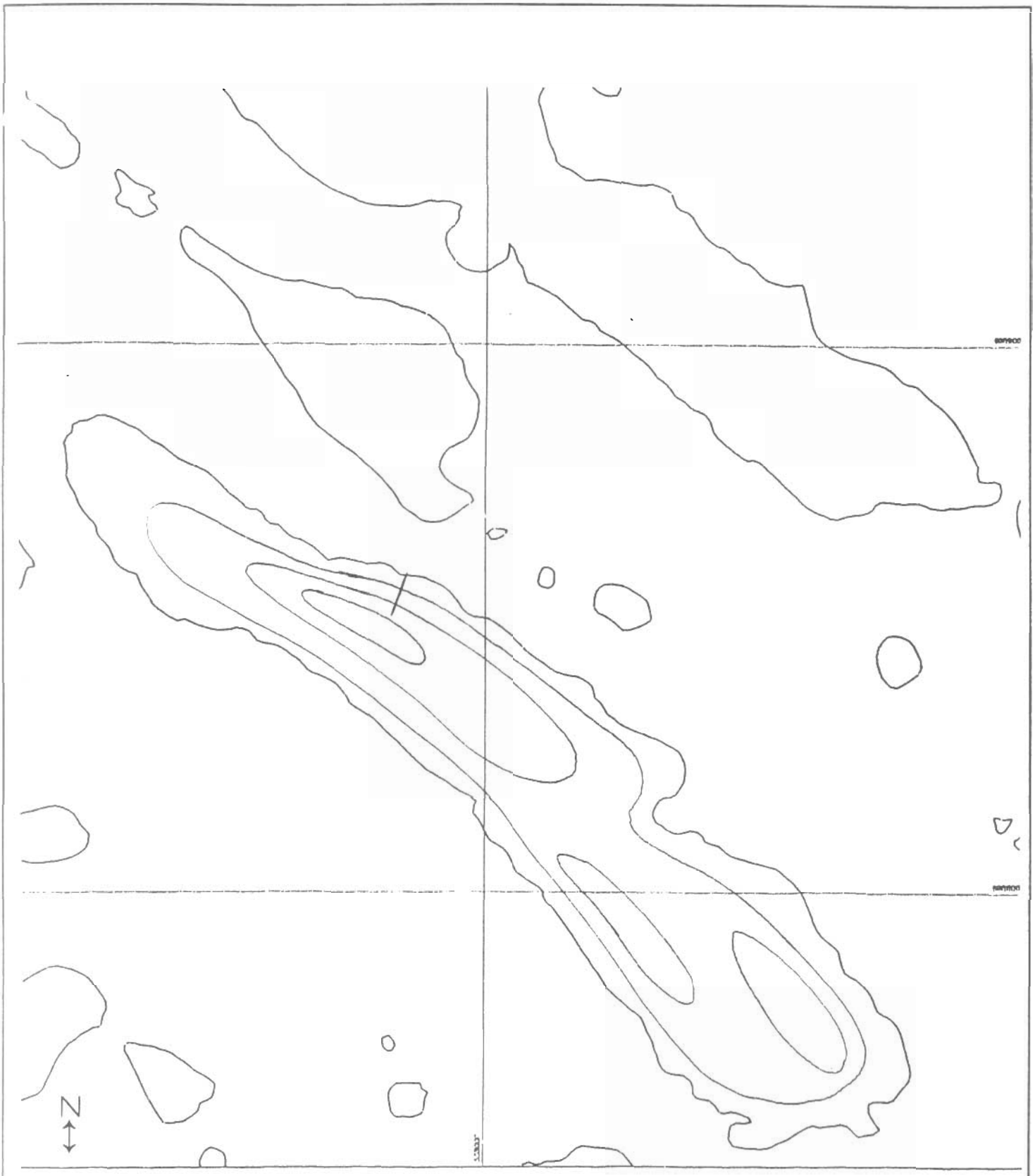

Figure 4. Bud Lake

gill net location
contour interval 1m
maximum depth 3+m

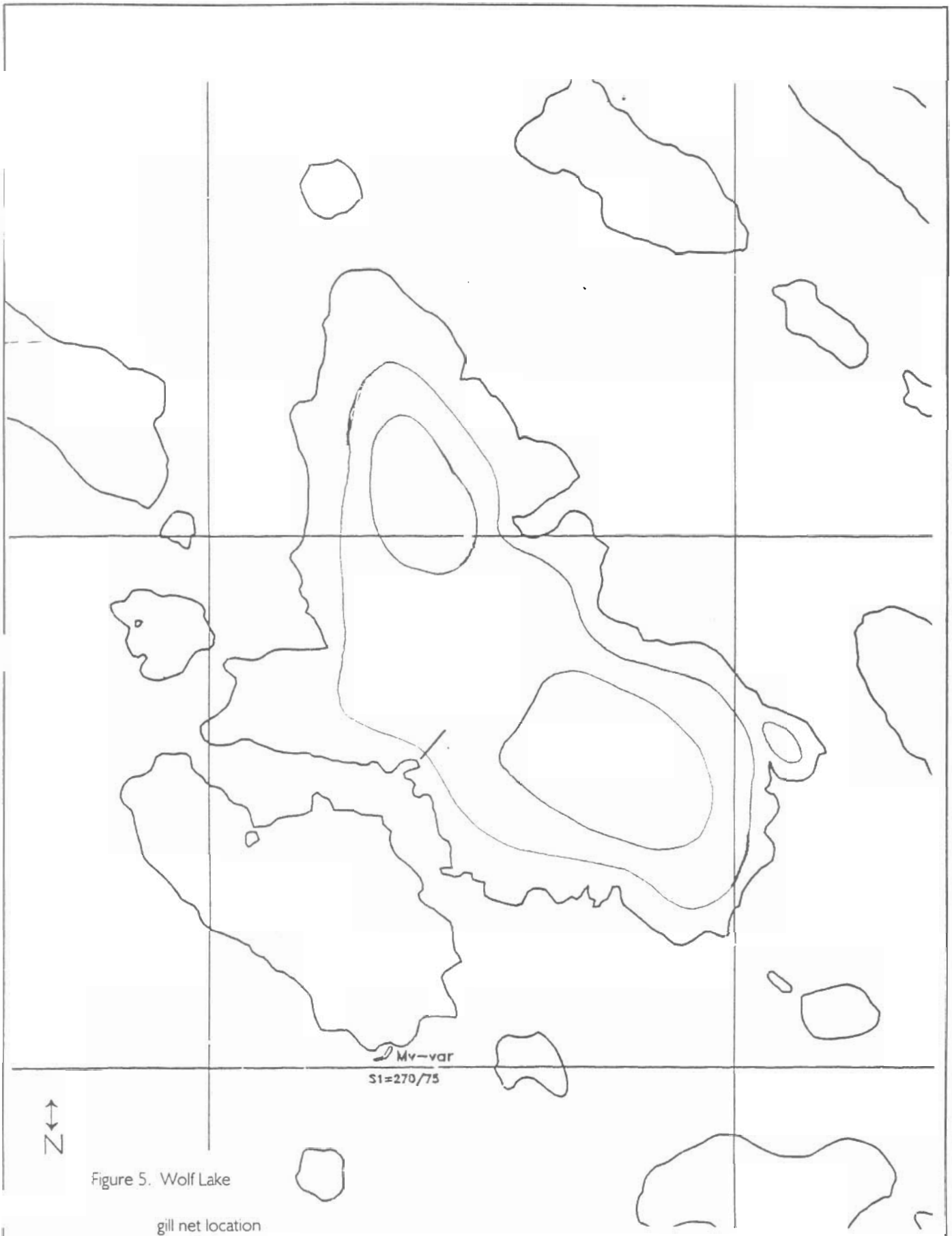

Figure 5. Wolf Lake

gill net location
contour interval 1m
maximum depth 2+m

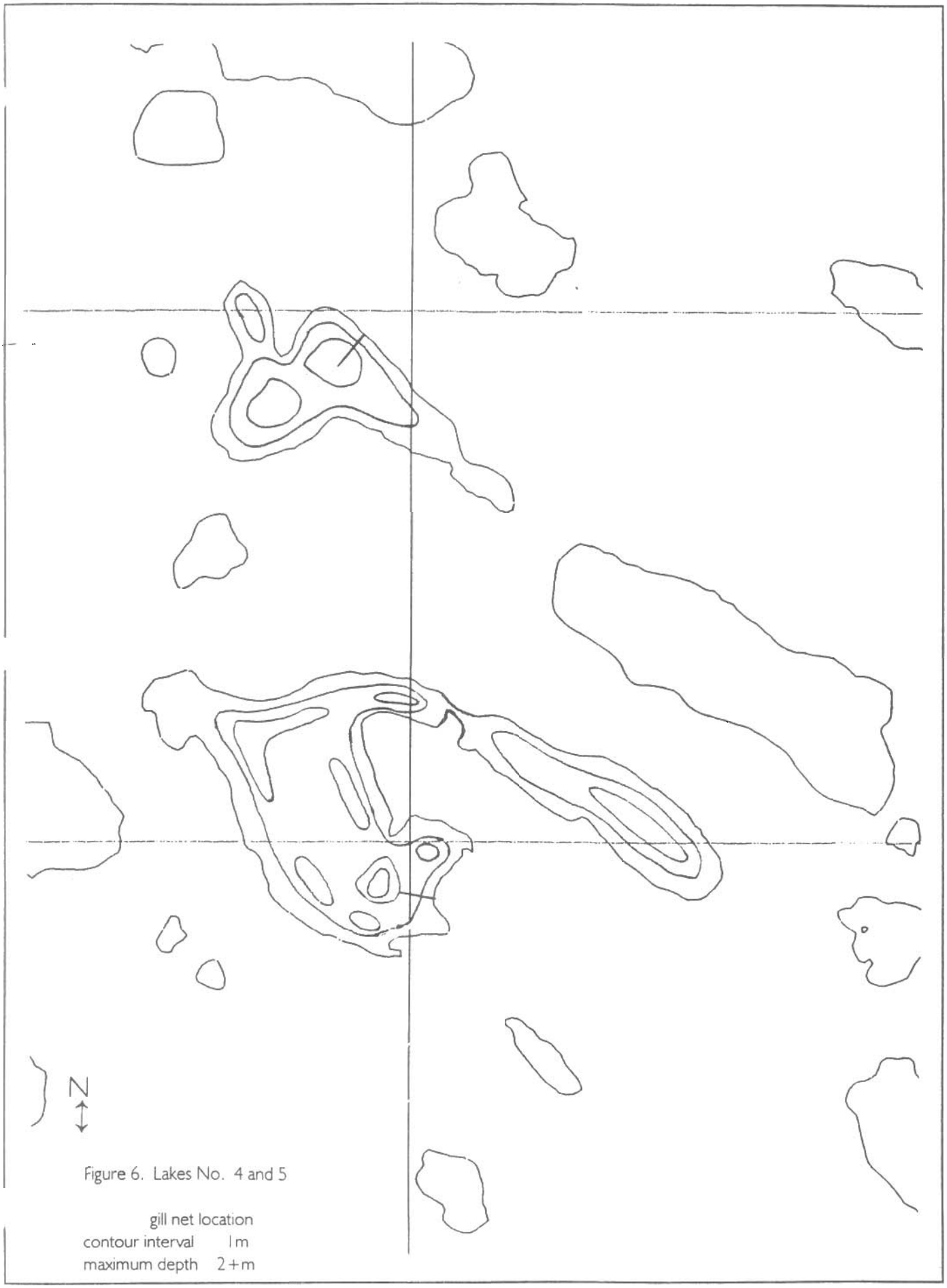

Figure 6. Lakes No. 4 and 5

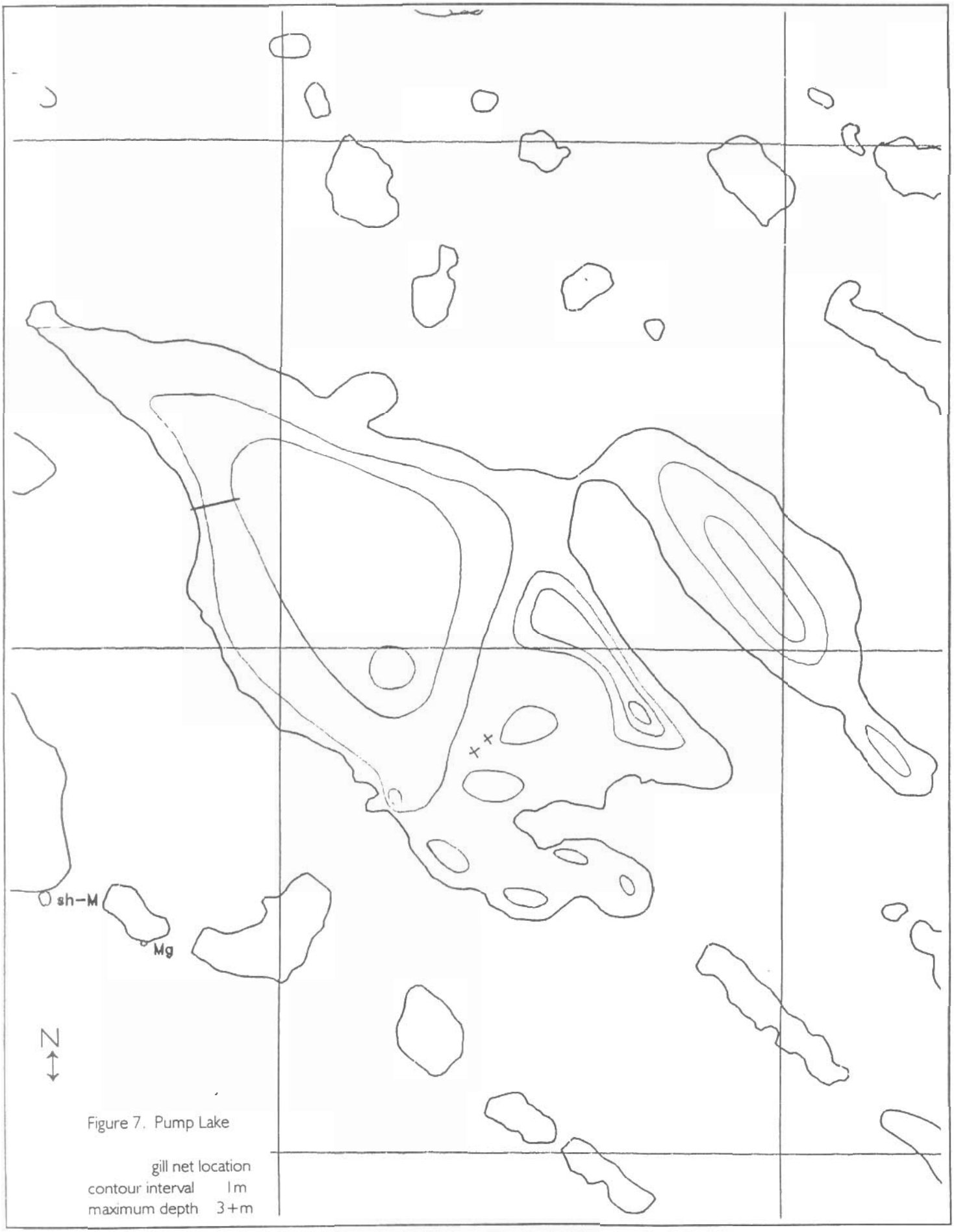

Figure 7. Pump Lake

gill net location
contour interval 1m
maximum depth 3+m

Appendix I

1996 Meliadine Water Samples

Water Quality Laboratory Reports

Arctic Environmental Laboratory, Yellowknife

INDIAN & NORTHERN AFFAIRS
WATER RESOURCES LABORATORY
Box 1500
Yellowknife, NT. X1A 2R3
Tel. (403) 920-8129
Fax. (403) 873-9300

To: (Ben) Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
Chris Newman
==>

SAMPLE INFORMATION

Our Lab # : 960384
Your Sample ID: MEL 96-1 3740E 5120N
Sample Matrix : grab

Collection:
Location: Meliadine (WMC)
Date: 04/25/96
By: C.Newman

Account No.:

MAY 17 1996

Report Date: 05/16/96

Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960384	T.Silver ICP-MS	L0.1	ug/L	0.100	100131
	Alkalinity	163.0	mg/L	0.300	10101
	T.Aluminum-ICP-MS	348.0	ug/L	0.500	100107
	T.Barium ICP-MS	70.3	ug/L	0.100	100139
	T.Beryllium ICP-MS	L0.1	ug/L	0.100	100105
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	Calcium	51.50	mg/L	0.040	20103
	T.Cadmium ICP-MS	0.2	ug/L	0.100	100133
	Chloride	18.80	mg/L	0.080	17206
	Colour	10	Colour	5.000	02021
	Conductivity	387.0	uS/cm	0.100	02041
	T.Cobalt ICP-MS	0.5	ug/L	0.100	100115
	T.Chromium ICP-MS	2.8	ug/L	0.200	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	T.Copper ICP-MS	4.5	ug/L	0.100	100119
	Fluoride	0.09	mg/L	0.050	09105
	Filt.Residue	250	mg/L	10.000	10451
	Tot.Hardness	159.0	mg/L	0.100	10602
	T.Indium ICP-MS	0.2	ug/L	0.100	100135
	Potassium	3.78	mg/L	0.050	19106
	T. Lithium ICP-MS	4.0	ug/L	0.100	100103
	Magnesium	7.32	mg/L	0.010	12102
	T.Manganese ICP-MS	54.3	ug/L	0.100	100113
	T.Molybdenum ICP-M	L0.1	ug/L	0.100	100153
	Sodium	11.80	mg/L	0.040	11102
	Non-Filt_Res.	22	mg/L	3.000	10406
	T.Nickel ICP-MS	6.0	ug/L	0.100	100117
	Nitrite	L0.008	mg/L	0.008	07206
	Nitrate	0.011	mg/L	0.008	7301
	T.Lead ICP-MS	0.4	ug/L	0.200	100145

Lab	Parameter	Result	Units	Detect Limit	Method Code
960384	pH	6.98	pH	0.050	10301
	T.Rubidium ICP-MS	4.5	ug/L	0.100	100127
	T.Selenium ICP-MS	L10	ug/L	10.000	100125
	Reac.Silica	1.430	mg/L	0.005	14106
	Sulphate	11.0	mg/L	3.000	16306
	Strontium ICP-MS	251.0	ug/L	0.100	100129
	T.Arsenic-Hyd.	3.2	ug/L	0.300	33011
	T.Iron	659	ug/L	20.000	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	80011
	T.Thallium ICP-MS	L0.1	ug/L	0.100	100141
	T-Phosphorous	0.042	mg/L	0.002	15403
	Turbidity	7.7	NTU	0.100	02081
	T.Uranium ICP-MS	L0.1	ug/L	0.100	100151
	T.Vanadium ICP-MS	1.3	ug/L	0.100	100109
	T.Zinc ICP-MS	15.0	ug/L	5.000	100121

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To: (Ben) Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
C. Newman
==>

SAMPLE INFORMATION

Our Lab # : 960395
Your Sample ID: MEL 96-4 5120N 3760E
Sample Matrix : grab

Collection:
Location: Meliadine - WMC
Date: 05/08/96
By: C.Newman

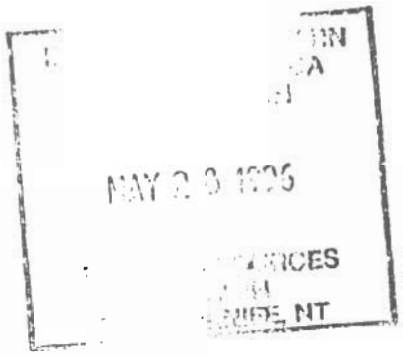
Account No.:

Report Date: 05/27/96
Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960395	T.Silver ICP-MS	L0.1	ug/L	0.100	100131
	Alkalinity	139.0	mg/L	0.300	10101
	T.Aluminum-ICP-MS	28.0	ug/L	5.000	100107
	T.Barium ICP-MS	60.8	ug/L	0.100	100139
	T.Beryllium ICP-MS	0.1	ug/L	0.100	100105
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	Calcium	47.40	mg/L	0.040	20103
	T.Cadmium ICP-MS	0.2	ug/L	0.100	100133
	Chloride	16.60	mg/L	0.080	17206
	Colour	10	Colour	5.000	02021
	Conductivity	338.0	uS/cm	0.100	02041
	T.Cobalt ICP-MS	0.1	ug/L	0.100	100115
	T.Chromium ICP-MS	1.1	ug/L	0.200	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	T.Copper ICP-MS	6.9	ug/L	0.100	100119
	Fluoride	0.07	mg/L	0.050	09105
	Filt.Residue	216	mg/L	10.000	10451
	Tot.Hardness	145.0	mg/L	0.100	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	100135
	Potassium	3.79	mg/L	0.050	19106
	T. Lithium ICP-MS	3.7	ug/L	0.100	100103
	Magnesium	6.35	mg/L	0.010	12102
	T.Manganese ICP-MS	14.9	ug/L	0.100	100113
	T.Molybdenum ICP-M	0.2	ug/L	0.100	100153
	Sodium	10.40	mg/L	0.040	11102
	Non-Filt_Res.	7	mg/L	3.000	10406
	T.Nickel ICP-MS	4.5	ug/L	0.100	100117
	Nitrite	L0.008	mg/L	0.008	07206
	Nitrate	0.039	mg/L	0.008	7301
	T.Lead ICP-MS	2.2	ug/L	0.200	100145

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960395	pH	7.15	pH	0.050	10301
	T.Rubidium ICP-MS	4.3	ug/L	0.100	100127
	T.Selenium ICP-MS	L10	ug/L	10.000	100125
	Reac.Silica	0.889	mg/L	0.005	14106
	Sulphate	10.0	mg/L	3.000	16306
	Strontium ICP-MS	228.0	ug/L	0.100	100129
	T.Arsenic-Hyd.	0.9	ug/L	0.300	33011
	T.Iron	88	ug/L	20.000	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	80011
	T.Thallium ICP-MS	L0.1	ug/L	0.100	100141
	T-Phosphorous	0.022	mg/L	0.002	15403
	Turbidity	1.2	NTU	0.100	02081
	T.Uranium ICP-MS	0.1	ug/L	0.100	100151
	T.Vanadium ICP-MS	0.2	ug/L	0.100	100109
	T.Zinc ICP-MS	18.2	ug/L	0.500	100121



INDIAN & NORTHERN AFFAIRS
WATER RESOURCES LABORATORY
Box 1500
Yellowknife, NT. X1A 2R3
Tel. (403) 920-8129
Fax. (403) 873-9300

To: (Ben) Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
C. Newman
==>

SAMPLE INFORMATION

Our Lab # : 960394
Your Sample ID: MEL 96-3 6986890N 540200
Sample Matrix : grab

Collection:
Location: Meliadine - WMC
Date: 05/07/96
By: C.Newman

Account No.:

Report Date: 05/27/96
Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960394	T.Silver ICP-MS	0.1	ug/L	0.100	100131
	Alkalinity	145.0	mg/L	0.300	10101
	T.Aluminum-ICP-MS	11.3	ug/L	0.500	100107
	T.Barium ICP-MS	57.1	ug/L	0.100	100139
	T.Beryllium ICP-MS	0.2	ug/L	0.100	100105
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	Calcium	48.30	mg/L	0.040	20103
	T.Cadmium ICP-MS	0.1	ug/L	0.100	100133
	Chloride	14.80	mg/L	0.080	17206
	Colour	10	Colour	5.000	02021
	Conductivity	342.0	uS/cm	0.100	02041
	T.Cobalt ICP-MS	0.2	ug/L	0.100	100115
	T.Chromium ICP-MS	2.8	ug/L	0.200	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	T.Copper ICP-MS	7.1	ug/L	0.100	100119
	Fluoride	0.09	mg/L	0.050	09105
	Filt.Residue	223	mg/L	10.000	10451
	Tot.Hardness	149.0	mg/L	0.100	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	100135
	Potassium	3.48	mg/L	0.050	19106
	T. Lithium ICP-MS	3.6	ug/L	0.100	100103
	Magnesium	6.81	mg/L	0.010	12102
	T.Manganese ICP-MS	5.1	ug/L	0.100	100113
	T.Molybdenum ICP-M	0.4	ug/L	0.100	100153
	Sodium	9.00	mg/L	0.040	11102
	Non-Filt_Res.	L3	mg/L	3.000	10406
	T.Nickel ICP-MS	5.4	ug/L	0.100	100117
	Nitrite	L0.008	mg/L	0.008	07206
	Nitrate	0.033	mg/L	0.008	7301
	T.Lead ICP-MS	1.9	ug/L	0.200	100145

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960394	pH	7.29	pH	0.050	10301
	T.Rubidium ICP-MS	4.4	ug/L	0.100	100127
	T.Selenium ICP-MS	2.0	ug/L	1.000	100125
	Reac.Silica	3.370	mg/L	0.005	14106
	Sulphate	12.0	mg/L	3.000	16306
	Strontium ICP-MS	216.0	ug/L	0.100	100129
	T.Arsenic-Hyd.	1.4	ug/L	0.300	33011
	T.Iron	97	ug/L	20.000	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	80011
	T.Thallium ICP-MS	0.4	ug/L	0.100	100141
	T-Phosphorous	0.016	mg/L	0.002	15403
	Turbidity	1.7	NTU	0.100	02081
	T.Uranium ICP-MS	0.1	ug/L	0.100	100151
	T.Vanadium ICP-MS	0.6	ug/L	0.100	100109
	T.Zinc ICP-MS	14.0	ug/L	0.500	100121

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To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960508
Your Sample ID: MEL 96-07
Sample Matrix : grab water

Collection:
Location: Meliadine Lake (WMC)
Date: 05/25/96
By: C. Newman

Account No.: Hubert

Report Date: 06/27/96

Approved by: WCook

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
960508	T.Silver ICP-MS	L0.1	ug/L	0.100	06/12/96	100131
	Alkalinity	125.0	mg/L	0.300	06/10/96	10101
	T.Aluminum-ICP-	33.0	ug/L	0.500	06/18/96	100107
	T.Barium ICP-MS	45.9	ug/L	0.100	06/12/96	100139
	T.Beryllium ICP	L0.1	ug/L	0.100	06/12/96	100105
	T.Bismith ICP-M	L0.1	ug/L	0.100	06/12/96	100149
	Calcium	40.00	mg/L	0.040	06/25/96	20103
	T.Cadmium ICP-M	1.3	ug/L	0.100	06/12/96	100133
	Chloride	12.10	mg/L	0.080	06/10/96	17206
	Colour	8	Colour	5.000	06/13/96	02021
	Conductivity	295.0	uS/cm	0.100	06/10/96	02041
	T.Cobalt ICP-MS	0.1	ug/L	0.100	06/12/96	100115
	T.Chromium ICP-	2.0	ug/L	2.000	06/12/96	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	06/12/96	100137
	T.Copper ICP-MS	5.9	ug/L	0.100	06/12/96	100119
	Fluoride	0.08	mg/L	0.050	06/13/96	09105
	Filt.Residue	178	mg/L	10.000	06/14/96	10451
	Tot.Hardness	123.0	mg/L	0.100	06/25/96	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	06/12/96	100135
	Potassium	2.84	mg/L	0.050	06/12/96	19106
	T. Lithium ICP-	2.6	ug/L	0.100	06/12/96	100103
	Magnesium	5.55	mg/L	0.010	06/25/96	12102
	T.Manganese ICP	7.2	ug/L	0.100	06/12/96	100113
	T.Molybdenum IC	0.4	ug/L	0.100	06/12/96	100153
	Sodium	7.09	mg/L	0.020	06/12/96	11102
	Non-Filt_Res.	7	mg/L	3.000	06/14/96	10406
	T.Nickel ICP-MS	4.2	ug/L	0.100	06/12/96	100117
	Nitrite	L0.008	mg/L	0.008	06/12/96	07206
	Nitrate	0.162	mg/L	0.008	06/12/96	7301
	Nitrate+Nitrite	0.162	mg/L	0.008	06/12/96	07110
	T.Lead ICP-MS	11.5	ug/L	0.200	06/12/96	100145
	pH	6.99	pH	0.050	06/10/96	10301

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
96050	T.Rubidium ICP-	3.5	ug/L	0.100	06/12/96	100127
	T.Selenium ICP-	L10	ug/L	10.000	06/12/96	100125
	Reac.Silica	2.913	mg/L	0.005	06/07/96	14106
	Sulphate	10.0	mg/L	3.000	06/10/96	16306
	Strontium ICP-M	181.0	ug/L	0.100	06/12/96	100129
	T.Arsenic-Hyd.	1.4	ug/L	0.300	06/10/96	33011
	T.Iron	95	ug/L	20.000	06/17/96	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	06/20/96	80011
	T.Thallium ICP-	0.1	ug/L	0.100	06/12/96	100141
	T-Phosphorous	0.023	mg/L	0.002	06/07/96	15403
	Turbidity	2.1	NTU	0.100	06/14/96	02081
	T.Uranium ICP-M	0.1	ug/L	0.100	06/12/96	100151
	T.Vanadium ICP-	L0.1	ug/L	0.100	06/12/96	100109
	T.Zinc ICP-MS	20.3	ug/L	0.500	06/12/96	100121

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WATER RESOURCES LABORATORY
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Fax. (403) 873-9300

To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960414
Your Sample ID: MEL96-06
Sample Matrix : grab water

Collection:
Location: Meliadine Lake (WMC)
Date: 05/11/96
By:

Account No.: Hubert

Report Date: 06/06/96

Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960414	T.Copper ICP-MS	3.0	ug/L	0.100	100119
	T.Cadmium ICP-MS	0.6	ug/L	0.100	100133
	T.Iron	166	ug/L	20.000	26004
	T. Lithium ICP-MS	4.5	ug/L	0.100	100103
	T.Lead ICP-MS	2.0	ug/L	2.000	100145
	T.Silver ICP-MS	L0.1	ug/L	0.100	100131
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	T.Chromium ICP-MS	L2	ug/L	2.000	100111
	T.Cobalt ICP-MS	0.4	ug/L	0.100	100115
	T.Rubidium ICP-MS	4.4	ug/L	0.100	100127
	Strontium ICP-MS	271.0	ug/L	0.100	100129
	Calcium	49.60	mg/L	0.040	20103
	Magnesium	7.69	mg/L	0.010	12102
	T.Nickel ICP-MS	5.7	ug/L	0.100	100117
	T.Zinc ICP-MS	12.0	ug/L	5.000	100121
	Potassium	3.67	mg/L	0.050	19106
	Conductivity	406.0	uS/cm	0.100	02041
	Colour	10	Colour	5.000	02021
	Alkalinity	173.0	mg/L	0.300	10101
	T.Mercury-C/V	L0.02	ug/L	0.020	80011
	T.Manganese ICP-MS	126.0	ug/L	0.100	100113
	Tot.Hardness	156.0	mg/L	0.100	10602
	Sodium	12.30	mg/L	0.040	11102
	T.Indium ICP-MS	L0.1	ug/L	0.100	100135
	Chloride	19.70	mg/L	0.080	17206
	Sulphate	9.0	mg/L	3.000	16306
	Reac.Silica	1.558	mg/L	0.005	14106
	T-Phosphorous	0.016	mg/L	0.002	15403
	T.Aluminum-ICP-MS	8.0	ug/L	0.500	100107
	T.Vanadium ICP-MS	0.2	ug/L	0.100	100109

	Parameter	Result	Units	Detect Limit	Method Code
960414	T.Molybdenum ICP-M	L0.1	ug/L	0.100	100153
	T.Barium ICP-MS	73.3	ug/L	0.100	100139
	T.Selenium ICP-MS	11.0	ug/L	10.000	100125
	T.Arsenic-Hyd.	0.7	ug/L	0.300	33011
	T.Beryllium ICP-MS	L0.1	ug/L	0.100	100105
	T.Thallium ICP-MS	L0.1	ug/L	0.100	100141
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	Nitrate	0.023	mg/L	0.008	7301
	pH	6.85	pH	0.050	10301
	Fluoride	0.11	mg/L	0.050	09105
	Filt.Residue	270	mg/L	10.000	10451
	T.Uranium ICP-MS	0.1	ug/L	0.100	100151
	Non-Filt_Res.	3	mg/L	3.000	10406
	Nitrite	L0.008	mg/L	0.008	07206
	Turbidity	1.6	NTU	0.100	02081

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Fax. (403) 873-9300

To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960413
Your Sample ID: MEL96-BUD-PD1
Sample Matrix : grab water

Collection:
Location: Meliadine Lake
Date: 05/13/96
By:

Account No.: Hubert

Report Date: 06/06/96

Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960413	Magnesium	6.64	mg/L	0.010	12102
	Alkalinity	144.0	mg/L	0.300	10101
	Calcium	48.30	mg/L	0.040	20103
	T.Arsenic-Hyd.	1.2	ug/L	0.300	33011
	T.Vanadium ICP-MS	0.1	ug/L	0.100	100109
	Reac.Silica	1.091	mg/L	0.005	14106
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	T. Lithium ICP-MS	3.7	ug/L	0.100	100103
	Sulphate	11.0	mg/L	3.000	16306
	T.Molybdenum ICP-M	L0.1	ug/L	0.100	100153
	T.Barium ICP-MS	61.8	ug/L	0.100	100139
	T.Beryllium ICP-MS	L0.1	ug/L	0.100	100105
	Chloride	16.70	mg/L	0.080	17206
	T-Phosphorous	0.159	mg/L	0.002	15403
	T.Mercury-C/V	L0.02	ug/L	0.020	80011
	Fluoride	0.08	mg/L	0.050	09105
	Conductivity	344.0	uS/cm	0.100	02041
	Colour	5	Colour	5.000	02021
	Turbidity	4.1	NTU	0.100	02081
	T.Selenium ICP-MS	L10	ug/L	10.000	100125
	T.Silver ICP-MS	L0.1	ug/L	0.100	100131
	Potassium	3.10	mg/L	0.050	19106
	T.Cadmium ICP-MS	0.2	ug/L	0.100	100133
	T.Copper ICP-MS	3.3	ug/L	0.100	100119
	T.Iron	208	ug/L	20.000	26004
	pH	6.96	pH	0.050	10301
	Non-Filt Res.	7	mg/L	3.000	10406
	Filt.Residue	217	mg/L	10.000	10451
	Nitrite	L0.008	mg/L	0.008	07206
	Nitrate	0.013	mg/L	0.008	7301

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960413	T.Manganese ICP-MS	49.6	ug/L	0.100	100113
	T.Aluminum-ICP-MS	41.0	ug/L	0.500	100107
	T.Cobalt ICP-MS	0.2	ug/L	0.100	100115
	T.Indium ICP-MS	L0.1	ug/L	0.100	100135
	T.Rubidium ICP-MS	3.7	ug/L	0.100	100127
	Strontium ICP-MS	240.0	ug/L	0.100	100129
	Tot.Hardness	148.0	mg/L	0.100	10602
	Sodium	10.70	mg/L	0.040	11102
	T.Uranium ICP-MS	0.1	ug/L	0.100	100151
	T.Lead ICP-MS	2.0	ug/L	2.000	100145
	T.Thallium ICP-MS	L0.1	ug/L	0.100	100141
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	T.Chromium ICP-MS	L2	ug/L	2.000	100111
	T.Nickel ICP-MS	4.7	ug/L	0.100	100117
	T.Zinc ICP-MS	5.0	ug/L	5.000	100121

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Fax. (403) 873-9300

To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960510
Your Sample ID: MEL 96-09
Sample Matrix : grab water

Account No.: Hubert

Collection:
Location: Meliadine Lake (WMC)
Date: 05/25/96
By: C. Newman

Report Date: 06/27/96
Approved by: W Coad

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
960510	T.Silver ICP-MS	0.1	ug/L	0.100	06/12/96	100131
	Alkalinity	3.7	mg/L	0.300	06/10/96	10101
	T.Aluminum-ICP-	21.0	ug/L	0.500	06/12/96	100107
	T.Barium ICP-MS	8.8	ug/L	0.100	06/12/96	100139
	T.Beryllium ICP	L0.1	ug/L	0.100	06/12/96	100105
	T.Bismith ICP-M	L0.1	ug/L	0.100	06/12/96	100149
	Calcium	1.34	mg/L	0.040	06/25/96	20103
	T.Cadmium ICP-M	0.3	ug/L	0.100	06/12/96	100133
	Chloride	4.28	mg/L	0.080	06/10/96	17206
	Colour	L5	Colour	5.000	06/13/96	02021
	Conductivity	29.0	uS/cm	0.100	06/10/96	02041
	T.Cobalt ICP-MS	L0.1	ug/L	0.100	06/12/96	100115
	T.Chromium ICP-	1.6	ug/L	0.200	06/12/96	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	06/12/96	100137
	T.Copper ICP-MS	8.1	ug/L	0.100	06/12/96	100119
	Fluoride	L0.05	mg/L	0.050	06/13/96	09105
	Filt.Residue	23	mg/L	10.000	06/14/96	10451
	Tot.Hardness	3.9	mg/L	0.100	06/25/96	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	06/12/96	100135
	Potassium	0.86	mg/L	0.050	06/12/96	19106
	T. Lithium ICP-	0.5	ug/L	0.100	06/12/96	100103
	Magnesium	0.40	mg/L	0.010	06/25/96	12102
	T.Manganese ICP	4.1	ug/L	0.100	06/12/96	100113
	T.Molybdenum IC	0.1	ug/L	0.100	06/12/96	100153
	Sodium	2.34	mg/L	0.020	06/12/96	11102
	Non-Filt_Res.	L3	mg/L	3.000	06/14/96	10406
	T.Nickel ICP-MS	0.7	ug/L	0.100	06/12/96	100117
	Nitrite	L0.008	mg/L	0.008	06/12/96	07206
	Nitrate	0.106	mg/L	0.008	06/12/96	7301
	T.Lead ICP-MS	13.1	ug/L	0.200	06/12/96	100145
	pH	6.36	pH	0.050	06/10/96	10301
	T.Rubidium ICP-	0.8	ug/L	0.100	06/12/96	100127

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
960510	T.Selenium ICP-	10.0	ug/L	10.000	06/12/96	100125
	Reac.Silica	0.042	mg/L	0.005	06/07/96	14106
	Sulphate	L3	mg/L	3.000	06/10/96	16306
	Strontium ICP-M	7.5	ug/L	0.100	06/12/96	100129
	T.Arsenic-Hyd.	0.4	ug/L	0.300	06/10/96	33011
	T.Iron	106	ug/L	20.000	06/17/96	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	06/20/96	80011
	T.Thallium ICP-	L0.1	ug/L	0.100	06/12/96	100141
	T-Phosphorous	0.013	mg/L	0.002	06/07/96	15403
	Turbidity	2.7	NTU	0.100	06/14/96	02081
	T.Uranium ICP-M	L0.1	ug/L	0.100	06/12/96	100151
	T.Vanadium ICP-	0.4	ug/L	0.100	06/12/96	100109
	T.Zinc ICP-MS	42.9	ug/L	0.500	06/12/96	100121

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To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960511
Your Sample ID: MEL 96-010
Sample Matrix : grab water

Collection:
Location: Meliadine Lake (WMC)
Date: 05/25/96
By: C. Newman

Account No.: Hubert

Report Date: 06/27/96

Approved by: WCook

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
960511	T.Silver ICP-MS	L0.1	ug/L	0.100	06/12/96	100131
	Alkalinity	13.5	mg/L	0.300	06/10/96	10101
	T.Aluminum-ICP-	12.8	ug/L	0.500	06/12/96	100107
	T.Barium ICP-MS	9.3	ug/L	0.100	06/12/96	100139
	T.Beryllium ICP	0.2	ug/L	0.100	06/12/96	100105
	T.Bismith ICP-M	L0.1	ug/L	0.100	06/12/96	100149
	Calcium	5.61	mg/L	0.040	06/25/96	20103
	T.Cadmium ICP-M	0.3	ug/L	0.100	06/12/96	100133
	Chloride	5.02	mg/L	0.080	06/10/96	17206
	Colour	L5	Colour	5.000	06/13/96	02021
	Conductivity	1.0	uS/cm	0.100	06/10/96	02041
	T.Cobalt ICP-MS	L0.1	ug/L	0.100	06/12/96	100115
	T.Chromium ICP-	1.4	ug/L	0.200	06/12/96	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	06/12/96	100137
	T.Copper ICP-MS	6.3	ug/L	0.100	06/12/96	100119
	Fluoride	L0.05	mg/L	0.050	06/13/96	09105
	Filt.Residue	35	mg/L	10.000	06/14/96	10451
	Tot.Hardness	17.4	mg/L	0.100	06/25/96	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	06/12/96	100135
	Potassium	1.01	mg/L	0.050	06/12/96	19106
	T. Lithium ICP-	0.9	ug/L	0.100	06/12/96	100103
	Magnesium	0.81	mg/L	0.010	06/25/96	12102
	T.Manganese ICP	3.8	ug/L	0.100	06/12/96	100113
	T.Molybdenum IC	0.1	ug/L	0.100	06/12/96	100153
	Sodium	2.69	mg/L	0.020	06/12/96	11102
	Non-Filt_Res.	L3	mg/L	3.000	06/14/96	10406
	T.Nickel ICP-MS	1.1	ug/L	0.100	06/12/96	100117
	Nitrite	L0.008	mg/L	0.008	06/12/96	07206
	Nitrate	0.039	mg/L	0.008	06/12/96	7301
	T.Lead ICP-MS	2.6	ug/L	0.200	06/12/96	100145
	pH	6.76	pH	0.050	06/10/96	10301
	T.Rubidium ICP-	1.4	ug/L	0.100	06/12/96	100127

Lab#		Parameter	Result	Units	Detect Limit	analdate	Method
960	1	T.Selenium ICP-	10.0	ug/L	10.000	06/12/96	100125
		Reac.Silica	0.174	mg/L	0.005	06/07/96	14106
		Sulphate	L3	mg/L	3.000	06/10/96	16306
		Strontium ICP-M	28.7	ug/L	0.100	06/12/96	100129
		T.Arsenic-Hyd.	0.3	ug/L	0.300	06/10/96	33011
		T.Iron	88	ug/L	20.000	06/17/96	26004
		T.Mercury-C/V	L0.01	ug/L	0.020	06/20/96	80011
		T.Thallium ICP-	L0.1	ug/L	0.100	06/12/96	100141
		T-Phosphorous	0.018	mg/L	0.002	06/07/96	15403
		Turbidity	2.2	NTU	0.100	06/14/96	02081
		T.Uranium ICP-M	L0.1	ug/L	0.100	06/12/96	100151
		T.Vanadium ICP-	0.9	ug/L	0.100	06/12/96	100109
		T.Zinc ICP-MS	19.3	ug/L	0.500	06/12/96	100121

INDIAN & NORTHERN AFFAIRS
WATER RESOURCES LABORATORY
Box 1500
Yellowknife, NT. X1A 2R3
Tel. (403) 920-8129
Fax. (403) 873-9300

To: (Ben) Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
Chris Newman
==>

SAMPLE INFORMATION

Our Lab # : 960385
Your Sample ID: ~~MEL 96-2~~ 4090E 267N
Sample Matrix : grab

Collection:
Location: Meliadine (WMC)
Date: 04/25/96
By: C.Newman

Account No.:

Report Date: 05/16/96
Approved by:

MAY 17 1996

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960385	T.Silver ICP-MS	L0.1	ug/L	0.100	100131
	Alkalinity	15.7	mg/L	0.300	10101
	T.Aluminum-ICP-MS	2.8	ug/L	0.500	100107
	T.Barium ICP-MS	7.3	ug/L	0.100	100139
	T.Beryllium ICP-MS	L0.1	ug/L	0.100	100105
	T.Bismith ICP-MS	L0.1	ug/L	0.100	100149
	Calcium	5.93	mg/L	0.040	20103
	T.Cadmium ICP-MS	0.1	ug/L	0.100	100133
	Chloride	6.09	mg/L	0.080	17206
	Colour	L5	Colour	5.000	02021
	Conductivity	59.3	uS/cm	0.100	02041
	T.Cobalt ICP-MS	L0.1	ug/L	0.100	100115
	T.Chromium ICP-MS	0.6	ug/L	0.200	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	100137
	T.Copper ICP-MS	1.9	ug/L	0.100	100119
	Fluoride	L0.05	mg/L	0.050	09105
	Filt.Residue	47	mg/L	10.000	10451
	Tot.Hardness	18.5	mg/L	0.100	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	100135
	Potassium	1.16	mg/L	0.050	19106
	T. Lithium ICP-MS	0.5	ug/L	0.100	100103
	Magnesium	0.89	mg/L	0.010	12102
	T.Manganese ICP-MS	1.4	ug/L	0.100	100113
	T.Molybdenum ICP-M	0.1	ug/L	0.100	100153
	Sodium	3.72	mg/L	0.040	11102
	Non-Filt_Res.	4	mg/L	3.000	10406
	T.Nickel ICP-MS	0.9	ug/L	0.100	100117
	Nitrite	L0.008	mg/L	0.008	07206
	Nitrate	0.018	mg/L	0.008	7301
	T.Lead ICP-MS	0.4	ug/L	0.200	100145

Lab#	Parameter	Result	Units	Detect Limit	Method Code
960385	pH	6.96	pH	0.050	10301
	T.Rubidium ICP-MS	1.5	ug/L	0.100	100127
	T.Selenium ICP-MS	L1	ug/L	1.000	100125
	Reac.Silica	0.339	mg/L	0.005	14106
	Sulphate	3.0	mg/L	3.000	16306
	Strontium ICP-MS	24.7	ug/L	0.100	100129
	T.Arsenic-Hyd.	L0.3	ug/L	0.300	33011
	T.Iron	125	ug/L	20.000	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	80011
	T.Thallium ICP-MS	L0.1	ug/L	0.100	100141
	T-Phosphorous	0.009	mg/L	0.002	15403
	Turbidity	8.7	NTU	0.100	02081
	T.Uranium ICP-MS	L0.1	ug/L	0.100	100151
	T.Vanadium ICP-MS	0.1	ug/L	0.100	100109
	T.Zinc ICP-MS	12.0	ug/L	5.000	100121

IND N & NORTHERN AFFAIRS
WAT.. RESOURCES LABORATORY
Box 1500
Yellowknife, NT. X1A 2R3
Tel. (403) 920-8129
Fax. (403) 873-9300

To: Meliadine Lake
Hubert & Associates Ltd.
Box 277
Yellowknife NT X1A 2N2
==> Ben Hubert

SAMPLE INFORMATION

Our Lab # : 960509
Your Sample ID: MEL 96-08
Sample Matrix : grab water

Collection:
Location: Meliadine Lake (WMC)
Date: 05/25/96
By: C. Newman

Account No.: Hubert

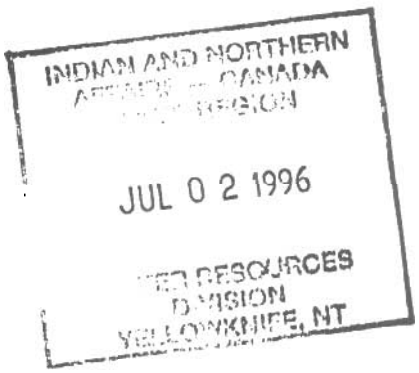
Report Date: 06/27/96

Approved by: WCourly

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
960509	T.Silver ICP-MS	L0.1	ug/L	0.100	06/12/96	100131
	Alkalinity	3.4	mg/L	0.300	06/10/96	10101
	T.Aluminum-ICP-	19.1	ug/L	0.500	06/12/96	100107
	T.Barium ICP-MS	5.3	ug/L	0.100	06/12/96	100139
	T.Beryllium ICP	L0.1	ug/L	0.100	06/12/96	100105
	T.Bismith ICP-M	L0.1	ug/L	0.100	06/12/96	100149
	Calcium	1.38	mg/L	0.040	06/25/96	20103
	T.Cadmium ICP-M	1.3	ug/L	0.100	06/12/96	100133
	Chloride	8.64	mg/L	0.080	06/10/96	17206
	Colour	L5	Colour	5.000	06/13/96	02021
	Conductivity	49.4	uS/cm	0.100	06/10/96	02041
	T.Cobalt ICP-MS	0.1	ug/L	0.100	06/12/96	100115
	T.Chromium ICP-	0.9	ug/L	0.200	06/12/96	100111
	T.Cesium ICP-MS	L0.1	ug/L	0.030	06/12/96	100137
	T.Copper ICP-MS	3.0	ug/L	0.100	06/12/96	100119
	Fluoride	L0.05	mg/L	0.050	06/13/96	09105
	Filt.Residue	21	mg/L	10.000	06/14/96	10451
	Tot.Hardness	6.6	mg/L	0.100	06/25/96	10602
	T.Indium ICP-MS	L0.1	ug/L	0.100	06/12/96	100135
	Potassium	0.75	mg/L	0.050	06/12/96	19106
	T. Lithium ICP-	0.4	ug/L	0.100	06/12/96	100103
	Magnesium	0.77	mg/L	0.010	06/25/96	12102
	T.Manganese ICP	4.0	ug/L	0.100	06/12/96	100113
	T.Molybdenum IC	0.2	ug/L	0.100	06/12/96	100153
	Sodium	4.49	mg/L	0.020	06/12/96	11102
	Non-Filt_Res.	L3	mg/L	3.000	06/14/96	10406
	T.Nickel ICP-MS	0.4	ug/L	0.100	06/12/96	100117
	Nitrite	L0.008	mg/L	0.008	06/12/96	07206
	Nitrate	0.263	mg/L	0.008	06/12/96	7301
	T.Lead ICP-MS	4.0	ug/L	0.200	06/12/96	100145
	pH	6.17	pH	0.050	06/10/96	10301
	T.Rubidium ICP-	0.7	ug/L	0.100	06/12/96	100127

Lab#	Parameter	Result	Units	Detect Limit	analdate	Method
9605	T.Selenium ICP-	L10	ug/L	10.000	06/12/96	100125
	Reac.Silica	0.039	mg/L	0.005	06/07/96	14106
	Sulphate	L3	mg/L	3.000	06/10/96	16306
	Strontium ICP-M	8.5	ug/L	0.100	06/12/96	100129
	T.Arsenic-Hyd.	0.6	ug/L	0.300	06/10/96	33011
	T.Iron	66	ug/L	20.000	06/17/96	26004
	T.Mercury-C/V	L0.01	ug/L	0.020	06/20/96	80011
	T.Thallium ICP-	L0.1	ug/L	0.100	06/12/96	100141
	T-Phosphorous	0.026	mg/L	0.002	06/07/96	15403
	Turbidity	1.4	NTU	0.100	06/14/96	02081
	T.Uranium ICP-M	L0.1	ug/L	0.100	06/12/96	100151
	T.Vanadium ICP-	L0.1	ug/L	0.100	06/12/96	100109
	T.Zinc ICP-MS	21.5	ug/L	0.500	06/12/96	100121



Appendix 2

Bioassay Reports

Environment Canada | Environnement Canada

MEMORANDUM NOTE DE SERVICE

To / À
Steve Harbicht
Environmental Protection
NWT Division
Prairie & Northern Region
Yellowknife, NWT

From / De
Senior Technician
Ecotoxicology Laboratory
Environmental Protection
Toxic Substances Division
Prairie & Northern Region

Security - Classification - de Sécurité: unclassified

Our File - Notre Référence: 96-0049 & 96-0050

Your File - Votre Référence:

Date: May 27, 1996

BJECT Toxicity Results of WMC- Clean sample and WMC - Drill Cuttings sample (Lab.No.96-0049 & 96-0050)

On May 17, 1996, two samples from Hubert and Associates were received. The samples were collected in 6 white plastic pails of approximately 20 litres, for a total volume of 60 litres for each sample. The samples were tested for toxicity by the *Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, July 1990, EPS 1/RM/13, Pass/Fail procedure.*

Both samples Lab.No.96-0049 and Lab No. 96-0050 were found to be not acutely lethal by the rainbow trout acute lethality test. At 100% concentration of sample, no mortality of trout underyearlings was observed during 96 hours of exposure.

Attached are the trout data sheets.

If you have any questions please contact me at (403)495-7197.

Best regards,

Nancy J. Kruper

Nancy Kruper
cc.Ray Orr

Environment Canada | Environnement Canada

MEMORANDUM **NOTE DE SERVICE**

To / À
Steve Harbicht
Environmental Protection
NWT Division
Prairie & Northern Region
Yellowknife, NWT

From / De
Senior Technician
Ecotoxicology Laboratory
Environmental Protection
Toxic Substances Division
Prairie & Northern Region

Security - Classification - de Sécurité
unclassified
Our File - Notre Référence
96-0054 & 96-0055
Your File - Votre Référence
Date
June 11, 1996

SUBJECT **Toxicity Results of WMC- Dirty sample and WMC - Clean sample (Lab No. 96-0054 & 96-0055)**

On June 3, 1996, two samples from Hubbert and Associates were received. The samples were collected in 6 white plastic pails of approximately 20 litres, for a total volume of 60 litres for each sample. The samples were tested for toxicity by the *Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, July 1990, EPS 1/RM/13, Pass/Fail procedure.*

Both samples Lab No.96-0054 and Lab No. 96-0055 were found to be not acutely lethal by the rainbow trout acute lethality test. At 100% concentration of sample, no mortality of trout underyearlings was observed during 96 hours of exposure.

Attached are the trout data sheets.

If you have any questions please contact me at (403)495-7197.

Best regards,

Nancy Kruper

Nancy Kruper
cc.Ray Orr