

RECONNAISSANCE INVENTORY OF

SMOKEE LAKE

00713MSKE

WATERSHED CODE 400-6166-01

SURVEY DATES : AUGUST 22 - 23, 1996

Ecocat report id = 2431

Prepared for:

MINISTRY OF ENVIRONMENT, LANDS AND PARKS

Fisheries Branch

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1. SUMMARY

Smokee Lake is located in the Kispiox Forest District, 78 km north of the town of Hazelton. Reconnaissance inventory of the lake was made August 22 - 23, 1996. The lake covers 33.7 surface hectares, is narrow in shape and moderately deep (mean and maximum depths of 5.4 m and 18.9 m). It lies 840 m above sea level and drains via an unnamed creek to the Skeena River. Access was achieved by floatplane from Tyhee Lake in Telkwa. The closest road is located over 10 km distant but road construction is planned within 500 m of the lake by 1998.

During the survey the lake was thermally stratified. Dissolved oxygen was depleted in the hypolimnion but not to anoxia. The lake is neutral and has low specific conductance. Nitrogen and phosphorus concentrations indicate oligotrophy and the N : P ratio suggests that phosphorus is likely limiting primary productivity. Chlorophyll *a* concentration in the surface water showed low phytoplankton standing crop at the time of survey.

The Smokee Lake fish community was sampled with two standard experimental multi-mesh gillnets (one floating and one sinking) and five Gee-type minnow traps baited with salmon roe. Inlets and the outlet were sampled for fish by electrofishing. No fish were captured during the survey by any method. No sign of fish activity was observed. Zooplankton collected from surface water at midday were highly suggestive of fish absence from Smokee Lake.

The lake outlet stream and two inlet channels were examined for fisheries potential. No barriers to fish passage were found. Both inlets became increasingly confined and steeper further upstream of the lake. Good spawning substrate is located in the outlet and one of the inlets. The inlets would offer some fair rearing potential adjacent to the lake and the outlet contained good rearing habitat.

The mountain views and pristine setting of Smokee Lake create moderately high aesthetic value. Timber harvest is planned for the area beginning in 1998. A helicopter fuel cache was found at the lake and the camp site used by the survey crew showed signs of previous use. No other evidence of recreational use of the area was found. Fish absence from Smokee Lake is likely due to a barrier to fish passage downstream of the lake. This survey should satisfy resource agencies that the inlets and near lake outlet reaches of Smokee Lake are non-fish bearing streams under the Forest Practices Code. Access management is not recommended for Smokee Lake at this time.

2. INTRODUCTION

This document was prepared to fulfill requirements of Service Contract CSK 2043 between Joseph S. DeGisi and the Province of British Columbia for the term of July 22, 1996 to March 31, 1997. The contract was funded by Forest Renewal BC and administered by the Ministry of Environment, Lands and Parks, Fisheries Branch, Skeena Region.

The report presents the results of a reconnaissance level "Fish and Fish Habitat Inventory" of Smokee Lake 400-6166-01 performed to the current standards provided by the Resources Inventory Committee (RIC). Smokee Lake 400-6166-01 is located in the Kispiox Forest District, 78 km north of the town of Hazelton. A search of Ministry files revealed no previous survey of the lake and its tributaries. In addition to the lake inventory as per the contract terms of reference, inlets and the outlet were surveyed to 500 channel metres from the lake.

The field component of the survey was carried out by Joseph DeGisi (crew leader) and Chris Schell (assistant) August 22-23, 1996. Chris Schell, Joe Jazvac and Jay Leopkey contributed to data compilation. Chris Schell and Joseph DeGisi co-authored this report. Stream cards, photographs and negatives, field notes, lab reports and all other materials associated with this survey were deposited with the Ministry of Environment, Lands and Parks, Fisheries Branch, Skeena Region.

3. DATA ON FILE

Location	<u>√</u>	Dissolved Oxygen Profile	<u>√</u>
Physical Data	<u>√</u>	Temperature Profile	<u>√</u>
Bench Mark	<u>√</u>	Netting Record	<u>√</u>
Terrain Features	<u>√</u>	Lake Catch Summary	<u>√</u>
Access	<u>√</u>	Fisheries Comments	<u>√</u>
Resorts & Campsites	<u>√</u>	Individual Fish Data	<u>-</u>
Other Developments	<u>√</u>	Fish Preserved	<u>-</u>
Obstructions and Pollutions	<u>√</u>	Stomach Analysis	<u>-</u>
Special Restrictions	<u>√</u>	Scale Reading	<u>-</u>
Aquatic Plants	<u>√</u>	History of Previous Surveys	<u>√</u>
Wildlife Observations	<u>√</u>	Location of Inventory Sites	<u>√</u>
Miscellaneous Comments	<u>√</u>	Photograph Directory	<u>√</u>
Lake Drainage	<u>√</u>	Appendices	<u>√</u>
Inlets/Outlets	<u>√</u>	Bathymetric Reduction	<u>√</u>
Water Chemistry	<u>√</u>	Contour Map	<u>√</u>

4. GEOGRAPHIC AND MORPHOLOGIC INFORMATION

4.1 Location

Survey Dates August 22-23, 1996

Location 78 km north of the town of Hazelton

Elevation 840 m

Drainage Unnamed C → Unnamed C → Skeena R

Watershed Code 400-6166-01

Latitude / Longitude 55° 57' 20'' / 127° 49' 45''

U.T.M. 09.573073.6201847 (Watershed Atlas)

Biogeoclimatic Zone ICH mcl

N.T.S. Map 93M/13 (1:50,000 scale)

TRIM Map 93M. 091 (1:20,000 scale)

Forest Region Prince Rupert

Forest District Kispiox

Management Unit 6-7

Native Land Claims Gitxsan Nation

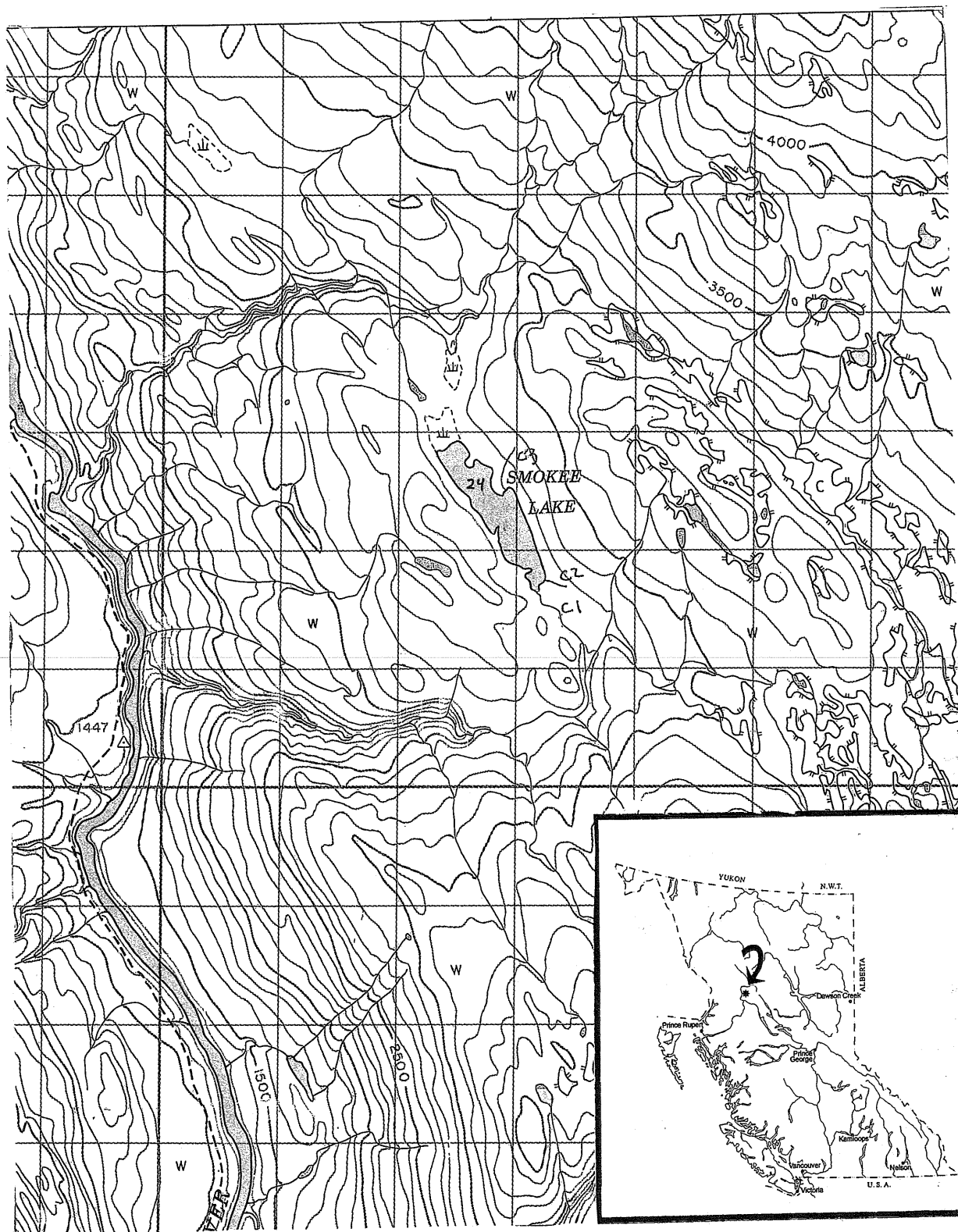


Figure 1. Smoke Lake and surrounding features, as depicted on NTS mapsheet 93M/13 (1:50,000 scale). Inset map shows the location within the province of British Columbia.

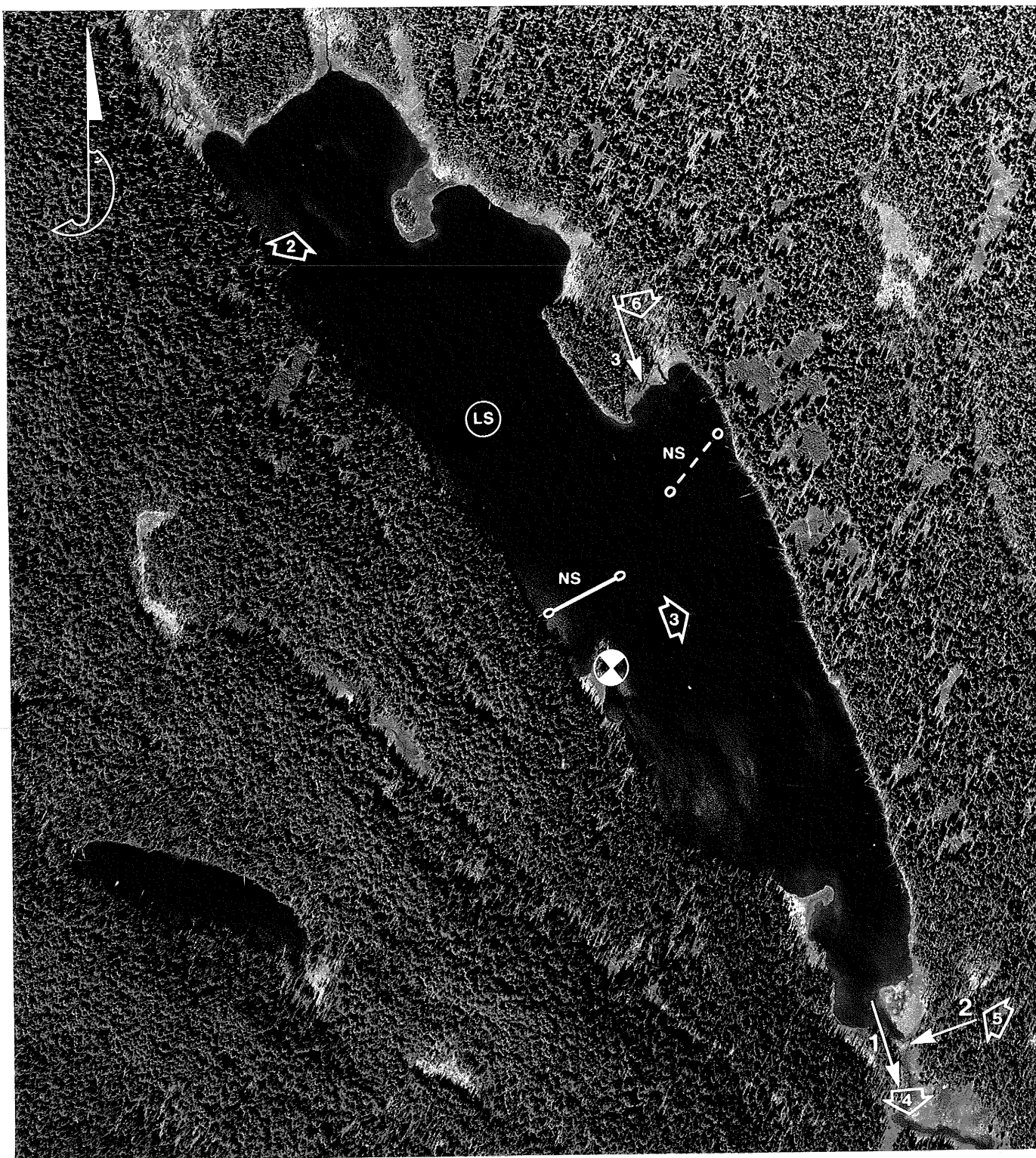


Figure 2. Enlargement from air photo.

LAKE: Smokee

WC: 400-6166-01


AIR PHOTO #: BCB92072 #168

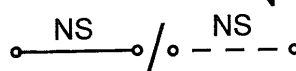
SCALE: 1 : 6 000

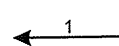
OUTLET UTM: 09.573073.6201847

LEGEND

 Benchmark

 Photo site, direction, number

 Floating/Sinking gillnet set

 Stream number, flow direction

LS Limnology station

4.2 Physical Data

Elevation	840 m	Elevation Source.....	NTS Mapsheet
Water Surface Area.....	337484 m ²	Area Above 6 m Contour.....	201835 m ²
Lake Drainage Area.....	3.20 km ²	Flushing Time.....	114 days
Shoreline Perimeter	3935 m	Volume	1778120 m ³
Number of Islands.....	0	Perimeter of Islands	N/A
Maximum Depth	18.9 m	Mean Depth	5.4 m
Secchi Depth.....	6.6 m	Filterable Residue (T.D.S.)...	36 mg/L
Sounding Device	Lowrance X15A		

4.3 Benchmark

The benchmark was established in a 40 cm dbh subalpine fir on the forested point on the west lakeshore, 10 m from shore, facing southeast toward the lake. An iron spike was placed in an orange circle painted on the tree trunk, 2.1 m above the current lake level. The location of the benchmark is shown in Figure 2. The high water mark was located 0.05 m above the current lake level.

4.4 Prior Surveys

A search of Skeena Region inventory files yielded no records for Smokee Lake, its outlet or inlets.

4.5 Lake Drainage

Quantitative characteristics of the stream surveys and fish sampling can be found on the stream survey forms in Appendix B and in Table 1. Numbering of the streams (C1, C2, etc.) in this section corresponds to labels on Figure 2 and other figures and tables in this report.

Three channels were examined.

- C1. Unnamed channel, WC 400-6166, outlet from the south shore of Smokee Lake at UTM 09.573175.6201650 (NAD27). Proposed classification S6. Three reaches are located within the 500 m channel length surveyed. The stream traverses a wetland adjacent to the lake before falling over a beaver dam (0.5 m high) 100 m from the lake. The channel then bears slow flow through an open sedge wetland at 1% gradient. 400 m from the lake flow velocity increases and the channel becomes more confined and enters forest at 2.5% gradient. Discharge was estimated at 0.18 m³/s. Electrofishing for 98 seconds captured no fish.
- C2. Unnamed channel (WC pending), inlet to the south shore of Smokee Lake at UTM 09.573250.6201750 (NAD27). Order 1, magnitude 1, drainage area 0.45 km², proposed classification, S6. The mouth of C2 is located only 3 m east of the outlet. Adjacent to the lake the channel meanders at 2% gradient and bears riffle and run flow over primarily gravel substrate. 300 m further upstream the channel becomes more confined and gradient increases to 22%. Flow appears perennial and discharge was estimated at 0.09 m³/s. Electrofishing for 105 seconds captured no fish.

- C3. Unnamed channel (WC pending), inlet to the east shore of Smokee Lake at UTM 09.572900.6202517 (NAD27). Order 1, magnitude 1, drainage area 0.81 km², proposed classification S6. The channel bears primarily run and riffle flow over gravel and cobble substrate at an average gradient of 12.5%. An area of extensive blowdown was traversed by the channel. Flow appears to be moderately ephemeral and discharge was estimated at 0.04 m³/s. A short, lower gradient reach is located adjacent to the lake. Electrofishing captured no fish.

Good salmonid spawning substrate is located in the forested reach of the outlet and the meandering reach of C2. The inlets would provide fair rearing habitat immediately adjacent to Smokee Lake. Good rearing habitat was found in the outlet as it passes through the open sedge wetland.

4.6 Terrain and Vegetation

4.6.1 Immediate Shore

The immediate shoreline consists of steep banks which drop immediately into 50 cm to 70 cm of water. Bank substrate is fines. Sedges and wet soft ground form a 3 to 5 m wide band around much of the lakeshore before abruptly yielding to mature forest. Dead standing trees are found along much of the transition line. Sweepers are abundant, making access to the shore difficult in some places. Wetlands are found at both the north and south ends of the lake, and along some of the points of land on the east and west shores.

4.6.2 Surrounding Country

The lake is located in the Nass variant of the Moist Cold subzone of the Interior Cedar - Hemlock biogeoclimatic zone. The surrounding country consists of low rolling hills, forested with spruce and subalpine fir and some mountain hemlock near the lake. The Atna Range is visible to the east.

5. ACCESS, DEVELOPMENTS AND LAND USE

5.1 Access

Access to the lake was by DeHavilland Otter from Tyhee Lake in Telkwa, an air distance of 130 km. The crew disembarked at the forested point on the west shore. A campsite was established here. The crew departed the lake from the unforested point south of the point where the crew disembarked.

5.2 Development and Land Use

5.2.1 Resorts and Campsites

The survey crew camped at a site located on the forested point on the west shore. The campsite appeared to have been used in the past, though brush clearing was required to clear a small space for a tent. No cabins or other campsites were observed by the survey crew.

5.2.2 Mining Claims

No evidence of mining claims or mineral exploration was observed at the lake. Omineca Mining Division four-post registration files for the locale showed no claims. No placer staking is allowed in this area of the province.

5.2.3 Timber Harvest

The lake lies within the Repap - Carnaby operating area, in the Kispiox TSA. No evidence of timber harvest was observed by the survey crew at the lake or during the approach flight. Road construction and timber harvest are planned for the area by 1998. The closest cutblock will be located 300 m to the south. Two more cutblocks 200 m north of the lake are planned for harvest in 2000.

5.2.4 Waste Permits

A search of the provincial waste management database (WASTE) showed no active effluent permits in the watershed of Smokee Lake.

5.2.5 Water Permits

A search of Skeena Region water permit files yielded no records for Smokee Lake.

5.2.6 Obstructions and Pollutions

Remains of a very old beaver dam were found in the outlet. Another old dam was found 100 m downstream of the lake. No evidence of recent beaver activity was observed by the survey crew.

5.2.7 Recreation Resource Inventory

The latest Forest Service Recreation Resource Inventory for the Smokee Lake area was completed June 1994. IGDS-format coding for the polygon which includes the lake is:

X1E3
ajC1
1

ROS status is thus "Primitive". Note that although the "feature-related recreational activities" code includes angling, no fish were captured at Smokee Lake.

5.2.8 Special Regulations and Restrictions

None known; none listed in the BC Freshwater Angling Regulations synopsis for 1996.

5.2.9 Comments

Pristine surroundings and mountain views create moderately high aesthetic value for the lake. A helicopter fuel cache comprised of seven full or partially full fuel drums labelled "Jet B" was found on the small, northern most point on the east lakeshore.

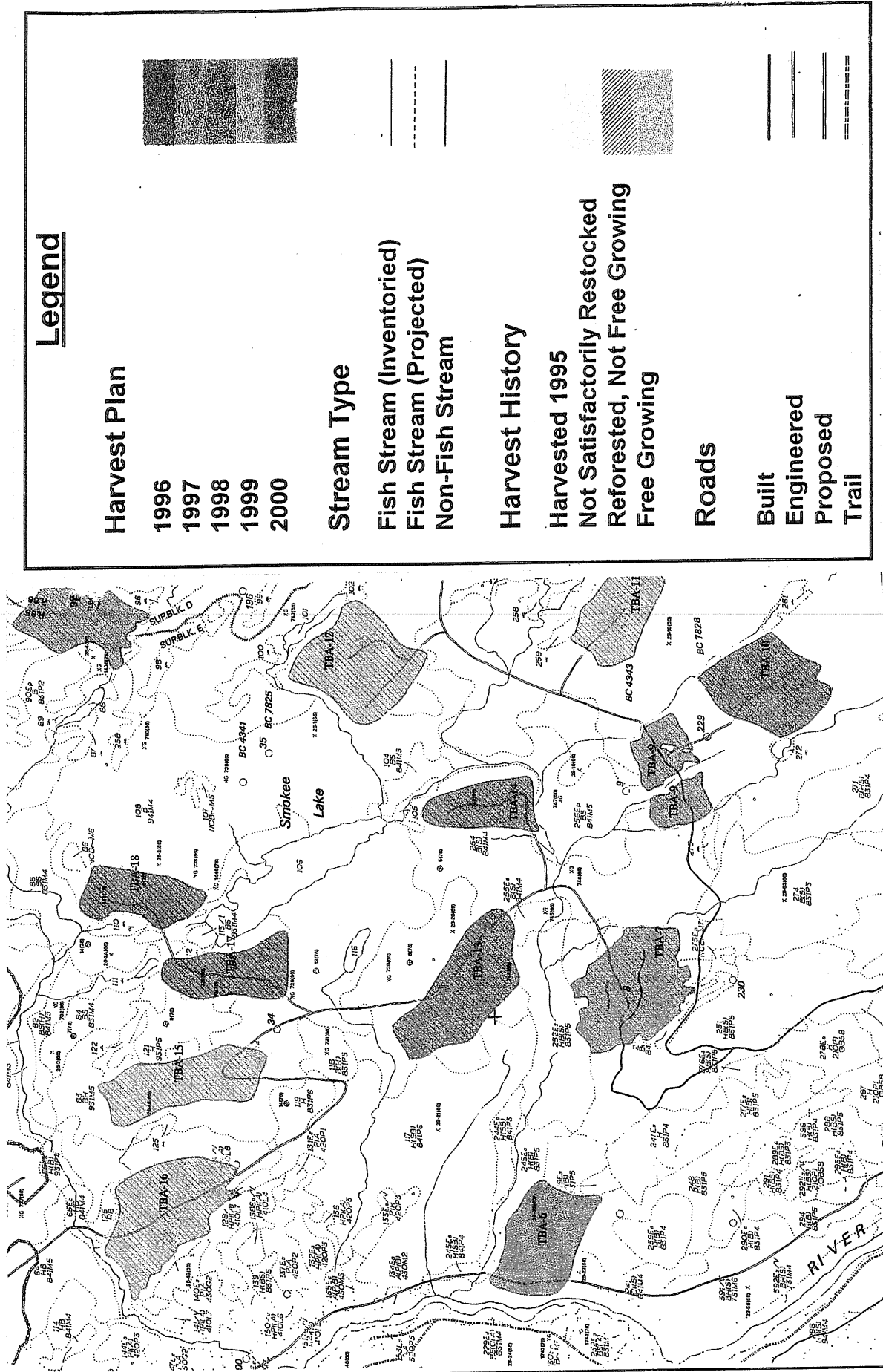


Figure 3. Planned cutblocks in the Smoke Lake area. Reproduced with permission from Repap - Carnaby.

6. FISH POPULATION SAMPLING

Details of fish population sampling in Smokee Lake and its inlets and outlet are given in Table 1. The raw data were recorded on RIC standard "Fish Collection Method Information Form" which is reproduced in Appendix C. No fish were captured in Smokee Lake, its inlets or outlet. No sign of fish activity was seen during the survey.

Table 1. Fish sampling effort for all methods used at Smokee Lake and its inlet-outlet streams, August 22 - 23, 1996. **Water Body** gives the location where the gear was fished, where Lake = Smokee Lake; and C1, C2 etc. are streams numbered as in Section 4.5. **Date** is the date of set for gear fished overnight. **Capture Effort** gives the time in minutes for which the gear was deployed. **Depth** unit is metres. GN(S) and GN(F) = MOE / RIC standard experimental sinking and floating gillnets, length 91.2 m and depth 2.4 m with panels (in order) of 25, 76, 51, 89, 38, and 64 mm mesh. The sinking net set was made with the smallest mesh close to shore. See Figure 2 for exact set locations and orientation. MT = Gee-type minnow trap baited with salmon roe; EL = electrofishing.

Water Body	Capture Method	Site or Trap #	Date	Set Time	Haul Time	Capture Effort	Depth
Lake	MT	1	96/08/22	1720	1435	1275	0.4
Lake	MT	2	96/08/22	1735	1425	1250	1.5
Lake	MT	3	96/08/22	1745	1420	1235	0.7
Lake	MT	4	96/08/22	1805	1555	1310	0.5
Lake	MT	5	96/08/22	1835	1545	1270	0.6
Lake	GN(F)	-	96/08/22	2045	640	595	0 to 2.4
Lake	GN(S)	-	96/08/22	2100	655	595	0 to 7
C1	EL	1	96/08/23	-	-	1.6	-
C2	EL	1	96/08/23	-	-	1.75	-
C3	EL	1	96/08/23	-	-	-	-

7. LIMNOLOGICAL SAMPLING

Limnological sampling was conducted at midday on August 23, 1996 at the Smokee Lake limnology station labelled on Figure 2. High cloud filled the sky during the survey and a light southerly wind made for calm surface conditions. Raw data and associated information were recorded on the RIC standard "Lake Biophysical Data Form" which is reproduced in Appendix D. Water samples were collected at 0.0 m, 7.5 m and 18.0 m depths, apportioned into aliquots for general chemistry and metals analysis, and shipped on ice to Zenon Laboratories for processing. Zenon's records show that the Smokee Lake samples were received on August 26, 1996, within the 72 hr RIC standard time frame for water sample transport.

7.1 Stratification

The oxygen - temperature profile of Smokee Lake on August 23, 1996 is shown in Figure 4. The lake was thermally stratified at time of survey. The thermocline was located between 4 m and 7 m. The hypolimnion was oxygen depleted but not anoxic.

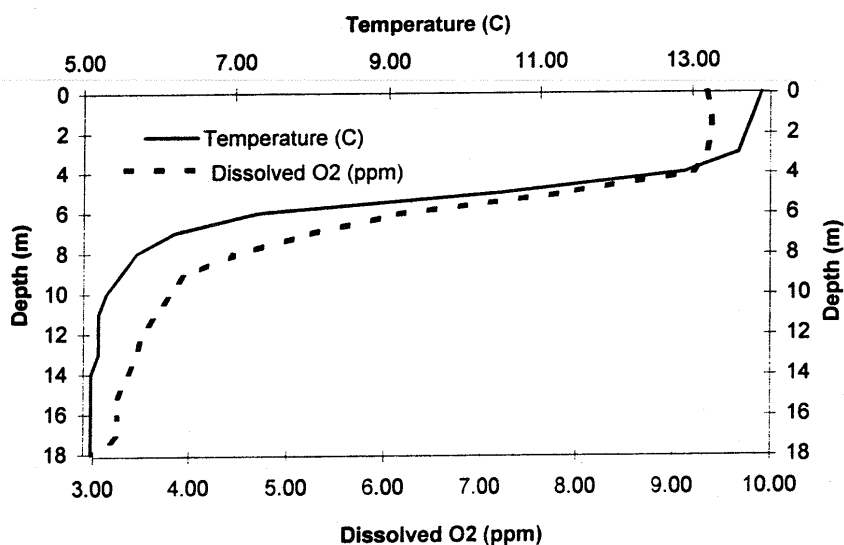


Figure 4. Temperature and dissolved O₂ profiles for Smokee Lake on August 23, 1996. The sampling device was a YSI 57 temperature/oxygen meter. Sample interval was 1.0 m.

Table 2. Water chemistry parameters estimated by Zenon Laboratories. Samples were collected at the limnology station labelled in Figure 2. Each sample was collected by a single cast of a 3.2 L non-metallic Van Dorn bottle on August 23, 1996 and received by Zenon on August 26, 1996. MDC = minimum detectable concentration for the analytic method.

Parameter	Shallow	Thermocline	Deep	Unit	MDC	Method
Time of Day	13:15	13:10	13:00	h	-	-
Depth	0.0	7.5	18.0	m	-	-
pH	7.2	6.6	6.8	pH	0.1	Automated pH Meter
Specific Conductance	24	30	26	uS/cm	1	Cond.Meter Siebold
Residue Filterable 1.0u (TDS)	36	42	38	mg/L	4	Grav; Subsamp Buch 105C
Alkalinity Phen. 8.3	< 0.5	< 0.5	< 0.5	mg/L	0.5	Automated Electrometer
Alkalinity Total 4.5	12.7	15.9	13.9	mg/L	0.5	Automated Electrometer
Carbonate	< 0.5	< 0.5	< 0.5	mg/L		Calculated Result
Bicarbonate	15.5	19.4	16.9	mg/L		Calculated Result
Hydroxide	< 0.5	< 0.5	< 0.5	mg/L		Calculated Result
Organic Nitrogen - Total	0.18	0.17	0.18	mg/L		Calculated Result
Total Kjeldahl Nitrogen	0.18	0.17	0.18	mg/L	0.04	HgSO ₄ Dig.Auto.Colour.
Total Nitrogen	0.18	0.17	0.18	mg/L		Calculated Result
Ammonia Nitrogen	< 0.005	< 0.005	< 0.005	mg/L	0.005	Berthelot Reaction
Nitrate+Nitrite (N)	< 0.02	< 0.02	< 0.02	mg/L	0.02	Auto. Cadmium Reduction
Nitrate Nitrogen Dissolved	< 0.02	< 0.02	< 0.02	mg/L		Calculated Result
Nitrite Nitrogen	< 0.005	< 0.005	< 0.005	mg/L	0.005	Auto. Diazotization
Phosphorus Total Dissolved	< 0.003	< 0.003	0.004	mg/L	0.003	Dig.Auto.Ascorbic Acid
Phosphorus - Total	0.004	0.004	0.009	mg/L	0.003	Pres.Dig.Auto.Ascorbic A

7.2 Water Chemistry

Results of the general chemistry and metals analyses are given in Tables 2 and 4. Smokee Lake is neutral with low specific conductance and filterable residue. Lake water was clear at time of survey. Phosphorus and nitrogen concentrations imply ultra-oligotrophy and the estimated N : P ratio (Table 3) is greater than 15 : 1, indicating phosphorus is likely limiting primary productivity. Chlorophyll *a* concentration in the surface water suggested low phytoplankton standing crop at time of survey.

Table 3. Estimated nitrogen : phosphorus ratio, and chlorophyll *a* concentration for surface water samples from Smokee Lake. All analyses were performed by Zenon Laboratories, except calculation of ratio. Suction was used to draw 1.0 L of surface water through a 0.45 µ membrane filter which was desiccated immediately and shipped on ice to Zenon Laboratories for chlorophyll *a* extraction.

Parameter	Value	Unit	MDC	Method
Chlorophyll <i>a</i>	1.9	ug/L	0.5	Spectrophotometer
Nitrogen - Total	0.18	mg/L		Calculated result
Phosphorus - Total	0.004	mg/L	0.003	Pres. Dig. Auto Ascorbic Acid
N : P RATIO	45 : 1			Calculated result (total N / total P)

Table 4. Metals concentrations estimated by Zenon Laboratories. Sample collection is described in the caption to Table 2. All metals aliquots were fixed immediately after collection with 1 ml HNO₃ and subjected to HNO₃ digestion by Zenon. Analysis was performed using a Jarrell-Ash Model 61E (inductively coupled argon plasma analysis). MDC = minimum detectable concentration for the analytic method.

Parameter	Shallow	Thermocline	Deep	Unit	MDC	Method
Time of Day	13:15	13:10	13:00	h	-	-
Depth	0.0	7.5	18.0	m	-	-
Silver	< 0.03	< 0.03	< 0.03	mg/L	0.03	ICAP 61E
Aluminum	0.07	< 0.06	0.07	mg/L	0.06	ICAP 61E
Arsenic	< 0.04	0.07	0.05	mg/L	0.04	ICAP 61E
Boron	< 0.04	< 0.04	< 0.04	mg/L	0.04	ICAP 61E
Barium	0.004	0.005	0.004	mg/L	0.001	ICAP 61E
Beryllium	< 0.001	< 0.001	< 0.001	mg/L	0.001	ICAP 61E
Bismuth	< 0.02	0.03	< 0.02	mg/L	0.02	ICAP 61E
Calcium	3.56	4.1	3.73	mg/L	0.05	ICAP 61E
Cadmium	< 0.002	< 0.002	< 0.002	mg/L	0.002	ICAP 61E
Cobalt	< 0.004	< 0.004	< 0.004	mg/L	0.004	ICAP 61E
Chromium	< 0.002	0.003	< 0.002	mg/L	0.002	ICAP 61E
Copper	< 0.002	< 0.002	< 0.002	mg/L	0.002	ICAP 61E
Iron	< 0.05	< 0.05	< 0.05	mg/L	0.05	ICAP 61E
Potassium	< 0.4	0.6	< 0.4	mg/L	0.4	ICAP 61E
Magnesium	0.33	0.39	0.35	mg/L	0.02	ICAP 61E
Manganese	< 0.002	< 0.002	0.002	mg/L	0.002	ICAP 61E
Molybdenum	< 0.004	< 0.004	< 0.004	mg/L	0.004	ICAP 61E
Sodium	1.4	2.2	1.6	mg/L	0.4	ICAP 61E
Nickel	< 0.01	< 0.01	< 0.01	mg/L	0.01	ICAP 61E
Phosphorus	< 0.04	< 0.04	< 0.04	mg/L	0.04	ICAP 61E
Lead	< 0.03	< 0.03	< 0.03	mg/L	0.03	ICAP 61E
Sulphur	0.2	0.2	0.2	mg/L	0.1	ICAP 61E
Antimony	< 0.02	< 0.02	< 0.02	mg/L	0.02	ICAP 61E
Selenium	< 0.03	< 0.03	< 0.03	mg/L	0.03	ICAP 61E
Silicon	0.8	0.9	0.8	mg/L	0.8	ICAP 61E
Tin	< 0.02	< 0.02	< 0.02	mg/L	0.02	ICAP 61E
Strontium	0.022	0.027	0.024	mg/L	0.001	ICAP 61E
Tellurium	< 0.02	< 0.02	< 0.02	mg/L	0.02	ICAP 61E
Titanium	< 0.003	< 0.003	< 0.003	mg/L	0.003	ICAP 61E
Thallium	< 0.03	< 0.03	< 0.03	mg/L	0.03	ICAP 61E
Vanadium	< 0.003	< 0.003	< 0.003	mg/L	0.003	ICAP 61E
Zinc	< 0.01	< 0.01	< 0.01	mg/L	0.01	ICAP 61E
Zirconium	< 0.003	< 0.003	< 0.003	mg/L	0.003	ICAP 61E

8. OTHER FLORA AND FAUNA

8.1 Aquatic Plants

Greater than 98 % of the lake surface is open water. *Nuphar polysepalum* and *Potamogeton gramineus* occur in low abundance in sheltered bays. Flooded sedges are abundant around the lakeshore. Lake level appeared high at time of survey, and most wetlands were flooded. Identification references used for aquatic plants are listed in Appendix A.

8.2 Zooplankton

The Smokee Lake zooplankton community was numerically dominated by calanoid copepods, some of which were quite large. Smaller cyclopoid copepods and *Daphnia* sp. were also present. Very large numbers of water boatmen (Corixidae) were observed near shoreline. Zooplankton size structure was highly suggestive of fish absence in Smokee Lake.

Table 5. Zooplankton collected by horizontal tow of a 150 μ mesh conical plankton net, Smokee Lake offshore, 13:45 h. on August 23, 1996. Net mouth diameter was 30 cm and net length was 1 m. Tow duration was 2.0 minutes, at velocity of 0.13 m/sec and depth between 0 m and 2 m.

Taxa	No. / L	Max (mm)	Mode (mm)
<i>Daphnia</i> sp.	0.2	0.4	0.4
Calanoida	22.9	2.5	0.9
Cyclopoida	9.0	0.7	0.6
Nauplii	3.0	-	-

8.3 Waterfowl and Other Fauna

Osprey were seen soaring over the lake. Barrow's goldeneye and loons were present on the lake at the time of survey. Rough-skinned newts were captured in minnow traps. No molluscs were found during the survey.

8.4 Summary of Rare and Endangered Species

No tailed frogs were observed during the survey.

9. MANAGEMENT COMMENTS

The mountain views and pristine setting of Smokee Lake create moderately high aesthetic value. Timber harvest planned to begin in the area by 1998 may impact the viewscape. The helicopter fuel cache and signs of past use of the survey crew's campsite were the only evidence of human activity at Smokee Lake.

The survey found no limnological explanation for fish absence from Smokee Lake. NTS map review found a 400 m long section of the outlet with an average gradient $> 30\%$. Fish absence from Smokee Lake is likely due to barriers to fish passage along this section. This survey should satisfy resource agencies that the inlets and near lake outlet reaches of Smokee Lake are non-fish bearing streams under the Forest Practices Code. Special access management is not recommended for Smokee Lake at this time.

10. PHOTOGRAPHS



Photograph 1. Aerial view of north half of Smokee Lake.



Photograph 2. View north from Smokee Lake.



Photograph 3. View of east shore of Smokee Lake, from mid-lake.



Photograph 4. Downstream view of C1, WC 400-6166, outlet of Smokee Lake.



Photograph 5. Downstream view of C2 (WC pending), inlet to the south end of Smokee Lake.



Photograph 6. Downstream view of C3 (WC pending), inlet to the east shore of Smokee Lake.

APPENDIX A. ABBREVIATIONS AND OTHER NOTES

MOE = Ministry of Environment, Lands and Parks
RIC = Resources Inventory Committee
TSA = Timber Supply Area
UTM = Universal Transverse Mercator
WC = Watershed Code
WCD = Watershed Code Dictionary
NTS = National Topographic Survey
NAD27 = North American Datum 1927

Note: UTM values were derived from two sources:

1. For lakes, UTM at the outlet was obtained from the WCD, and this is noted after the UTM.
2. For streams, UTM at the point they enter/exit the lake was estimated from NTS 1:50,000 mapsheets, using interpolation. UTM datum year (i.e. NAD27) is recorded after the estimate.

NTS 1 : 50,000 scale mapsheets were used to determine lake drainage area, stream order, stream magnitude and stream drainage area. Corrections were made for NTS mapsheet inaccuracies noted during the survey.

Native land claims information was derived from the following source:

“Native Land Claims in Skeena Region.” Skeena Region GIS. Ministry of Environment Lands and Parks. February 1995. Map scale 1 : 1,500,000.

All information from the above source was confirmed current as of February 1997 by the following First Nation band council offices:

Gitanyow Hereditary Chiefs
Gitxsan Hereditary Chiefs
Lake Babine Nation (Nat’oot’en)
Wet’suwet’en Nation
Nisga’a Nation

Aquatic plants were identified using the following sources:

Brayshaw, T.C. 1985. Pondweeds and bur-reeds, and their relatives, of British Columbia. British Columbia Provincial Museum No. 26 Occasional papers series.

Pojar, J. and A. MacKinnon. 1994. Plants of coastal British Columbia including Washington, Oregon and Alaska. B.C. Ministry of Forests and Lone Pine Publishing.

Warrington, P.D. 1994. Identification keys to the aquatic plants of British Columbia. Resources Inventory Committee Report 029. Discussion Document.

The contractor assigned a reference number of 9624 to Smokee Lake 400-6166-01. This number appears in field notes and other contractor records associated with this survey.

DFO/MoELP Stream Survey Form

15-Mar-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

Stream/Valley Cross-Section

Fish Summary



Obstructions

Comments

- 1 105 sec of electrofishing yielded no fish.
- 2 Channel enters the lake 3-4 m E of the outlet.
- 3 The channel flows through sedge wetland for 10 - 20 m u/s of the lake, and then enters forest; the first reach in the forest has a relatively low gradient (2%), and the meandering channel offers good salmonid spawning potential.
- 4 Approx. 300 m u/s of the lake, the channel becomes more confined and the gradient increases (22%); the channel offers poor salmonid spawning and rearing potential along this reach.
- 5 All distances estimated by ground estimate.

DFO/MoELP Stream Survey Form

13-Mar-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

Stream/Valley Cross-Section

Fish Summary

Obstructions

Comments

- 1 The first 30 m of the channel flows through a sedge wetland adjacent to the lake, then it enters an area with extensive blowdown.
- 2 All distances estimated by ground estimate

APPENDIX D. LIMNOLOGICAL SAMPLING FORMS

Lake Biophysical Data Form					
Date (yy/mm/dd):	<u>96/08/23</u>	Crew:	<u>JD / CS</u>		
Site ID		Sequence No.:	<u>1</u>		
Watershed code:	<u>400-6166</u>	Alias:	<u>N/A</u>		
Gazetted name:	<u>Smokee</u>	UTM : Zone	<u>09</u>		
FW Region:	<u>06</u>	Easting	<u>573073</u>		
Management Unit:	<u>07</u>	Northing	<u>6201847</u>		
NTS Map No.:	<u>93M/ 13</u>	Source	<u>Watershed Atlas</u>		
<i>Biophysical</i>					
Biogeo Zone	<u>ICH mcl</u>				
Benchmark (Y/N)	<u>Y</u>				
Benchmark details:	<u>see report</u>				
<i>Nutrient Status</i>					
SEAM No.:	<u>E223346</u>	Limno Station No:	<u>01</u>		
Secchi depth (m)	<u>6.6</u>	H2S (mg/l)	<u>none</u>		
Other samples taken:	<u>Zooplankton</u>	H2S comments	<u>no odour</u>		
		TDS method			
		DO method	<u>YSI 57</u>		
		TEMP method	<u>YSI 57</u>		
		Alkalinity			
<i>Field Conditions</i>					
wind velocity (km/h)	<u><5</u>	wind direction:	<u>S</u>	air temp. (c):	<u>12</u>
cloud cover (/10 O.C.)	<u>10</u>	surface condition:	<u>Calm</u>	water colour:	<u>Clear</u>
<i>Development</i>					
MOF rec sites (Y/N)	<u>N</u>	Resort cmprsts (Y/N)	<u>N</u>	Residences (Y/N)	<u>N</u>
MOF campsites (Y/N)	<u>N</u>	Resorts (Y/N)	<u>N</u>	Co. Rec facilities	<u>N</u>
Parks campgrds (Y/N)	<u>N</u>	Resort cabins (Y/N)	<u>N</u>		
<i>Recreation</i>					
ROS	<u>1</u>	Biophys features:		Biophys sub-feat.:	
<i>Inlets/Outlets</i>					
	<u>see Stream Survey Card for mandatory fields</u>				
<i>Biological</i>					
Fish Card attached (Y/N)	<u>y</u>	Fish. Man. Com.	<u>see report</u>		
Wildlife:	<u>see report</u>	Reptiles:	<u>see report</u>		
Aquatic birds:	<u>common loons</u>	Invertebrates:	<u>see report</u>		
Amphibians:	<u>see report</u>	Aquatic Plants:	<u>see report</u>		
<i>Comments:</i>					
Water samples:	<u>18.0 m @ 1300</u>	Chlorophyll-a:	<u>1.0 L filtered</u>		
	<u>7.5 m @ 1310</u>				
	<u>0.0 m @ 1315</u>				
<u>Zooplankton: horizontal tow for 120 sec @ @ 1345; 150 um mesh, 30 cm diameter net</u>					

Lake Survey Profile Data

Sequence number: 01

Date : 96/08/23 Time: 12:45
 (yy/mm/dd) (hhmm)

Limnology station: 01

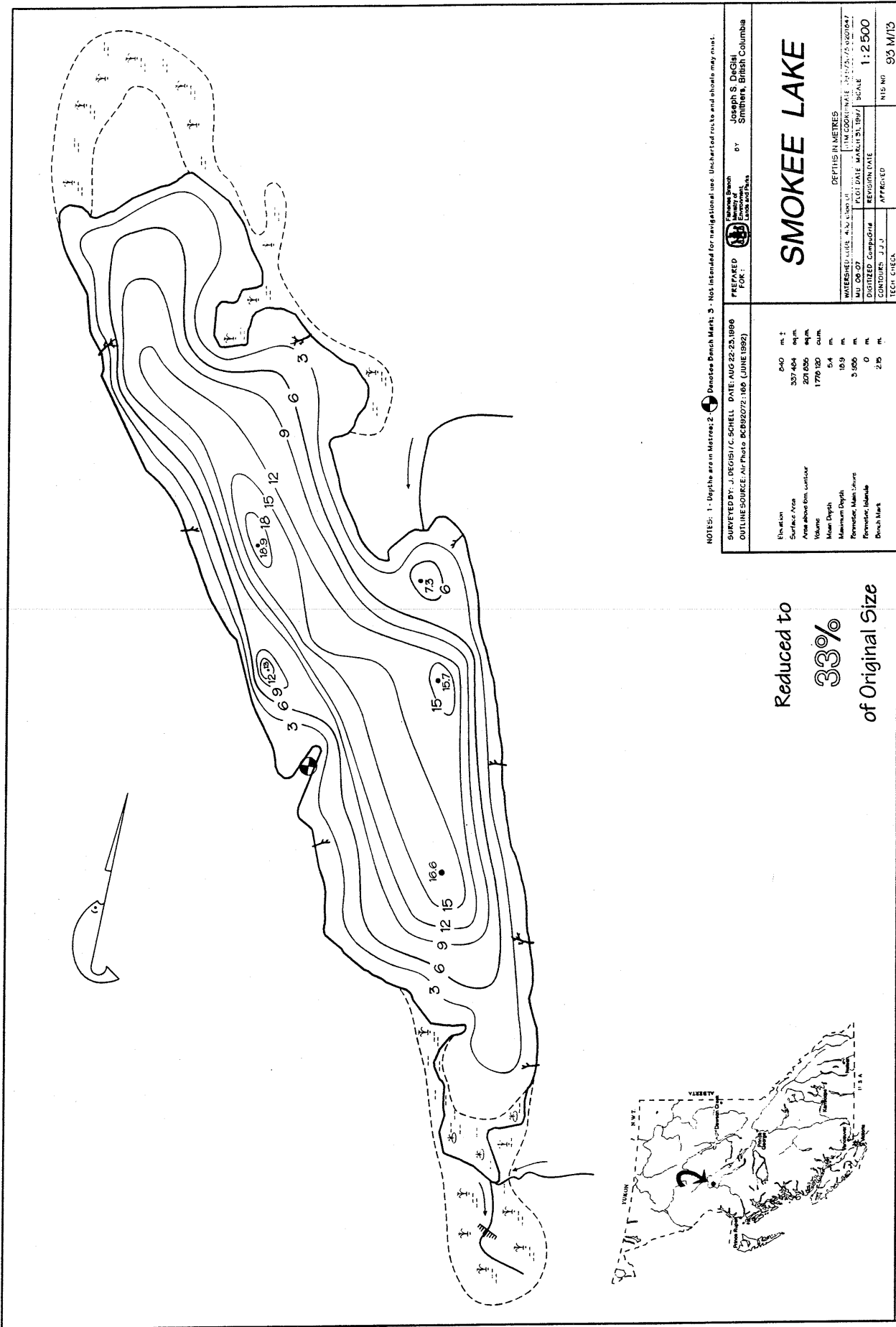
Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
surface	9.35	13.9		
0.5				
1.0	9.40	13.8		
1.5				
2.0	9.40	13.7		
2.5				
3.0	9.35	13.6		
3.5				
4.0	9.20	12.9		
4.5				
5.0	7.85	10.5		
5.5				
6.0	6.15	7.3		
6.5				
7.0	5.20	6.2		
7.5				
8.0	4.45	5.7		
8.5				
9.0	3.95	5.5		
9.5				
10.0	3.80	5.3		
10.5				
11.0	3.65	5.2		
11.5				
12.0	3.50	5.2		
12.5				
13.0	3.45	5.2		
13.5				
14.0	3.35	5.1		
14.5				
15.0	3.25	5.1		
15.5				
16.0	3.25	5.1		
16.5				
17.0	3.25	5.1		
17.5				
18.0	3.05	5.1		
18.5				
19.0				
19.5				
20.0				

Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
20.5				
21.0				
21.5				
22.0				
22.5				
23.0				
23.5				
24.0				
24.5				
25.0				
25.5				
26.0				
26.5				
27.0				
27.5				
28.0				
28.5				
29.0				
29.5				
30.0				
30.5				
31.0				
31.5				
32.0				
32.5				
33.0				
33.5				
34.0				
34.5				
35.0				
35.5				
36.0				
36.5				
37.0				
37.5				
38.0				
38.5				
39.0				
39.5				
40.0				

APPENDIX E. PHOTOGRAPH / NEGATIVE DIRECTORY

Negative #	Photo # (report)	Description
9624 - 1	4	unnamed channel C1, WC 400-6166, outlet of Smokee Lake; downstream view, 25 m downstream of the lake
9624 - 2		unnamed channel C1, WC 400-6166, outlet of Smokee Lake; downstream view, 25 m downstream of the lake
9624 - 3		unnamed channel C2 (WC pending), inlet to the SE end of Smokee Lake; downstream view, 50 m downstream of the lake
9624 - 4	5	unnamed channel C2 (WC pending), inlet to the SE end of Smokee Lake; downstream view, 50 m downstream of the lake
9624 - 5		start of a 180° clockwise panorama of the SE end of the lake, taken from just NW of the center of the lake, view to the NE
9624 - 6		panorama continued, view to the E
9624 - 7		panorama continued, view to the S
9624 - 8		panorama continued, view to the SW
9624 - 9		start of a 180° clockwise panorama of the SE end of the lake, taken from just SE of the center of the lake, view to the SW
9624 - 10		panorama continued, view to the W
9624 - 11		panorama continued, view to the NW
9624 - 12		panorama continued, view to the N
9624 - 13	3	panorama continued, view to the NE
9624 - 14	2	view of mountains NE of Smokee Lake
9624 - 15		unnamed channel C3 (WC pending), inlet to the NE shore of Smokee Lake; upstream view of the channel as it passes through a blowdown area
9624 - 16	6	unnamed channel C3 (WC pending), inlet to the NE shore of Smokee Lake; downstream view
9624 - 17	1	aerial view of Smokee Lake
9624 - 18		aerial view of Smokee Lake
9624 - 19		aerial view of Smokee Lake

APPENDIX F. BATHYMETRIC MAP



NOTES: 1 - Depths are in Metres; 2 - Denotes Beach Mark; 3 - Not intended for navigational use. Underlined rocks and shoals may exist.

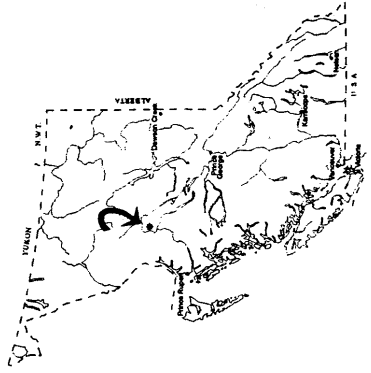
SURVEYED BY: J. DEGBIS / C. SCHELL DATE: AUG 22-23, 1986
 OUTLINE SOURCE: Air Photo RCB92072:168 (JUNE 1982)

PREPARED FOR: by Joseph S. DeGisi, Smithers, British Columbia

Direction	240	m	1
Surface Area	337.404	sqm	
Area above 6m contour	201.036	sqm	
Volume	1776.92	cum.	
Mean Depth	5.4	m	
Maximum Depth	19.9	m	
Perimeter: Main Shore	3.585	m	
Perimeter: Islands	0	m	
Beach Mark	2.15	m	

Reduced to
33%
 of Original Size

DEPTH IN METRES	
WATERSHED AREA: 4.3 sq km	DATE: 1986
AU 06-07	PROJECT: SMOKEE LAKE
DRAWN: Comp/Gra	SCALE: 1:2,500
CONT'DRS: J.J.J.	APPROVED:
TECH: L.V.E.C.A.	NIS NO: 93 M/13



APPENDIX G. WATER CHEMISTRY ANALYSIS BY ZENON LABORATORIES



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05-Sep-96
Page 1 of 5

ZENON LABORATORIES
Certificate of Analysis

8577 Commerce Court
Burnaby, B.C.
Canada V5A 4N5
Tel 604 444 4808
Fax 604 444 4511

Reported To :

JOSEPH S. DEGISI

Client Code DJ

R.R.#1, SITE 27, C2
SMITHERS, B.C.
VOJ 2N0

Attention : JOE DEGISI
Phone : (604) 847-3575
FAX : (604) 847-2959

Project Information :

Project ID : SMOKEE LAKE
Submitted By : J.DEGISI

Requisition Forms :

Form 06111167 logged on 26-Aug-96 completed on 5-Sep-96

Remarks :

- ☞ All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- ☞ 'MDC' = Minimum Detectable Concentration, '<' = Less than MDC, '---' = Not analyzed
- ☞ Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- ☞ Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods. (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- ☞ All Groundwater samples are decanted and/or filtered prior to analysis

Methods used by Zenon are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 18th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied.
Your samples will be retained at Zenon for a period of 30 days from receipt of data or as per contract.

ZENON Project Manager: Jack Wilson

Smoke
9621



A division of PHILIP Analytical Services Corp.

**ANALYTICAL REPORT
Form 06111167**

05-Sep-96
Page 2 of 5

Client : JOSEPH S. DEGISI
Project : SMOKE LAKE

Zenon ID :	METHOD	96023274	96023275	96023275	96023276
Client ID :	BLANK	E223346	E223346	Duplicate	E223346
		0.0m	7.5m		18.0m

Sparcode	Parameter	Unit	MDC					
PHYSICAL								
00041220	pH	pH units	0.1	n/a	7.2	6.6	---	6.8
00111160	Specific Conductance	uS/cm	1	< 1	24	30	---	26
007H1033	Residue Filterable 1.0u (TDS)	mg/L	4	4	36	42	---	38
GENERAL INORGANICS								
01011211	Alkalinity Phen. 8.3	mg/L	0.5	< 0.5	< 0.5	< 0.5	---	< 0.5
01021210	Alkalinity Total 4.5	mg/L	0.5	2.1	12.7	15.9	---	13.9
CO3-CALC	Carbonate	mg/L			< 0.5	< 0.5		< 0.5
HCO3CALC	Bicarbonate	mg/L			15.5	19.4		16.9
OH--CALC	Hydroxide	mg/L			< 0.5	< 0.5		< 0.5
NITROGEN								
0112CALC	Organic Nitrogen - Total	mg/L			0.18	0.17		0.18
0113136A	Total Kjeldahl Nitrogen	mg/L	0.04	< 0.04	0.18	0.17	---	0.18
0114CALC	Total Nitrogen	mg/L			0.18	0.17		0.18
11081351	Ammonia Nitrogen	mg/L	0.005	< 0.005	< 0.005	< 0.005	---	< 0.005
11091350	Nitrate+Nitrite (N)	mg/L	0.02	< 0.02	< 0.02	< 0.02	---	< 0.02
1110CALC	Nitrate Nitrogen Dissolved	mg/L			< 0.02	< 0.02		< 0.02
11111354	Nitrite Nitrogen	mg/L	0.005	< 0.005	< 0.005	< 0.005	---	< 0.005
PHOSPHORUS								
P--D1390	Phosphorus Total Dissolved	mg/L	0.003	0.004	< 0.003	< 0.003	---	0.004
P--T139A	Phosphorus - Total	mg/L	0.003	0.004	0.004	0.004	0.004	0.009
METALS TOTAL								
Ag-T0042	Silver	mg/L	0.03	< 0.03	< 0.03	< 0.03	---	< 0.03
Al-T0042	Aluminum	mg/L	0.06	< 0.06	0.07	< 0.06	---	0.07
As-T0042	Arsenic	mg/L	0.04	< 0.04	< 0.04	0.07	---	0.05
B--T0042	Boron	mg/L	0.04	< 0.04	< 0.04	< 0.04	---	< 0.04
Ba-T0042	Barium	mg/L	0.001	< 0.001	0.004	0.005	---	0.004
Be-T0042	Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001	---	< 0.001
Bi-T0042	Bismuth	mg/L	0.02	< 0.02	< 0.02	0.03	---	< 0.02
Ca-T0042	Calcium	mg/L	0.05	< 0.05	3.56	4.10	---	3.73
Cd-T0042	Cadmium	mg/L	0.002	< 0.002	< 0.002	< 0.002	---	< 0.002
Co-T0042	Cobalt	mg/L	0.004	< 0.004	< 0.004	< 0.004	---	< 0.004
Cr-T0042	Chromium	mg/L	0.002	0.003	< 0.002	0.003	---	< 0.002
Cu-T0042	Copper	mg/L	0.002	< 0.002	< 0.002	< 0.002	---	< 0.002
Fe-T0042	Iron	mg/L	0.05	< 0.05	< 0.05	< 0.05	---	< 0.05

Matrix :	Fresh Water	Fresh Water	Fresh Water
Sampled on:	96/08/23 13:15	96/08/23 13:10	96/08/23 13:00

CONTINUED on page 3



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ANALYTICAL REPORT
Form 06111167

Client : JOSEPH S. DEGISI
Project : SMOKEE LAKE

Zenon ID :	METHOD	96023274	96023275	96023275	96023276
Client ID :	BLANK	E223346	E223346	Duplicate	E223346
		0.0m	7.5m		18.0m

Sparcode	Parameter	Unit	MDC					
K_T0042	Potassium	mg/L	0.4	< 0.4	< 0.4	0.6	---	< 0.4
Mg-T0042	Magnesium	mg/L	0.02	< 0.02	0.33	0.39	---	0.35
Mn-T0042	Manganese	mg/L	0.002	< 0.002	< 0.002	< 0.002	---	0.002
Mo-T0042	Molybdenum	mg/L	0.004	< 0.004	< 0.004	< 0.004	---	< 0.004
Na_T0042	Sodium	mg/L	0.4	< 0.4	1.4	2.2	---	1.6
Ni-T0042	Nickel	mg/L	0.01	< 0.01	< 0.01	< 0.01	---	< 0.01
P_T0042	Phosphorus	mg/L	0.04	< 0.04	< 0.04	< 0.04	---	< 0.04
Pb-T0042	Lead	mg/L	0.03	< 0.03	< 0.03	< 0.03	---	< 0.03
S_T0042	Sulphur	mg/L	0.1	< 0.1	0.2	0.2	---	0.2
Sb-T0042	Antimony	mg/L	0.02	< 0.02	< 0.02	< 0.02	---	< 0.02
Se-T0042	Selenium	mg/L	0.03	< 0.03	< 0.03	< 0.03	---	< 0.03
Si-T0042	Silicon	mg/L	0.8	< 0.8	0.8	0.9	---	0.8
Sn-T0042	Tin	mg/L	0.02	< 0.02	< 0.02	< 0.02	---	< 0.02
Sr-T0042	Strontium	mg/L	0.001	< 0.001	0.022	0.027	---	0.024
Te-T0042	Tellurium	mg/L	0.02	< 0.02	< 0.02	< 0.02	---	< 0.02
Ti-T0042	Titanium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---	< 0.003
Tl-T0042	Thallium	mg/L	0.03	< 0.03	< 0.03	< 0.03	---	< 0.03
V-T0042	Vanadium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---	< 0.003
Zn-T0042	Zinc	mg/L	0.01	< 0.01	< 0.01	< 0.01	---	< 0.01
Zr-T0042	Zirconium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---	< 0.003
GENERAL BIOLOGY								
01431810	Chlorophyll A	ug/L	0.5	n/a	1.9	---	---	---

Matrix :	Fresh Water	Fresh Water	Fresh Water
Sampled on:	96/08/23 13:15	96/08/23 13:10	96/08/23 13:00



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SPIKE SUMMARY
Form 06111167

Parameter	Client ID	Zenon ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Copper	Blank Spike. Batch :	64201931	< 0.002	0.226	.2	mg/L	112
pH	Blank Spike. Batch :	64402568	< 0.1	6.2	6	pH units	103
Specific Conductance	Blank Spike. Batch :	64402570	< 1	147	147	uS/cm	100
Alkalinity Total 4.5	Blank Spike. Batch :	64402569	2.1	49.6	50	mg/L	95
Residue Filterable 1.0u (TDS)	Blank Spike. Batch :	64402559	4	114	100	mg/L	110
Nitrite Nitrogen	Blank Spike. Batch :	64100908	< 0.005	0.105	.1	mg/L	103
Nitrate + Nitrite (N)	Blank Spike. Batch :	64100908	< 0.02	0.41	.4	mg/L	104
Ammonia Nitrogen	Blank Spike. Batch :	64100908	< 0.005	0.091	.1	mg/L	87



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ANALYSIS DATES
Form 06111167

Zenon ID:	96023274	96023275	96023276
Client ID:	E223346	E223346	E223346
	0.0m	7.5m	18.0m

00041220	pH	28-AUG-1996	28-AUG-1996	28-AUG-1996
00111160	Specific Conductance	28-AUG-1996	28-AUG-1996	28-AUG-1996
007H1033	Residue Filterable 1.0u (TDS)	28-AUG-1996	28-AUG-1996	28-AUG-1996
01011211	Alkalinity Phen. 8.3	28-AUG-1996	28-AUG-1996	28-AUG-1996
01021210	Alkalinity Total 4.5	28-AUG-1996	28-AUG-1996	28-AUG-1996
0113136A	Total Kjeldahl Nitrogen	28-AUG-1996	28-AUG-1996	28-AUG-1996
11081351	Ammonia Nitrogen	29-AUG-1996	29-AUG-1996	29-AUG-1996
11091350	Nitrate+Nitrite (N)	29-AUG-1996	29-AUG-1996	29-AUG-1996
11111354	Nitrite Nitrogen	29-AUG-1996	29-AUG-1996	29-AUG-1996
P--D1390	Phosphorus Total Dissolved	03-SEP-1996	03-SEP-1996	03-SEP-1996
P--T139A	Phosphorus - Total	03-SEP-1996	03-SEP-1996	03-SEP-1996
MET-F	Water: Total Metal Pk:ICP	29-AUG-1996	29-AUG-1996	29-AUG-1996
01431810	Chlorophyll A	30-AUG-1996	---	---

Matrix:	Fresh Water	Fresh Water	Fresh Water
Sampled on:	23-AUG-1996	23-AUG-1996	23-AUG-1996

APPENDIX H. ORIGINAL FIELD NOTES

Reconnaissance Lake Inventory Field Notes

Gazetted Name : Smokee

Alias :

Location and Access

Watershed code (including sequence no.) :

UTM (with source) :

N.T.S. map no. :

SEAM site no. :

Forest District : Kispiox

Drainage :

Accessed by otter from Tukee Lake
flout plane base

Details

(Road: surface condition; directions; odometer distances; Air: mode, distance, flight path, time, disembarkment point)

Landing direction was north to south.

Disembarked at forested point on west lakeshore, towards south end of lake. The point makes a marginal campsite, but good place to deplane.

Physical Data and Sources

Elevation _____ m

Elevation Source _____

Sounding Device Lowrance X15A

Contractor lake reference number: 9624

Benchmark

The benchmark was established in a 40 cm dbh subalpine fir located on the forested point on the west lakeshore, about 1/3 of the distance to the N end of the lake from the south end of the lake.

An iron spike was placed in an orange circle painted on the tree trunk, 2.10 m above the current lake level. The high water mark was located .05 m above the current lake level.

The benchmark tree is 10 m from shore and about 25 m SW of the end of the point; the benchmark faces SE towards the lake.

Terrain and Vegetation

Immediate shore

(shoreline substrates; immediate shoreline vegetation; transition to forest; wetland locations; sweepers)

The immediate shore is mainly vegetated by sedges. The bank is composed of fines, and generally drops off immediately to 50 cm - 70 cm depth. Littoral substrates are variable but generally composed of or overlain by fines. Sedges (wet, soft ground) form a 3-5 wide band around much of the lakeshore, before giving way immediately to mature forest; with dead standing trees along much of the transition line. Sweepers are abundant along much of the shoreline. Wetlands are found at the north end of the lake, on some points, and at the south end of the lake.

Surrounding country

(terrain; forest cover; cliffs / rock outcrops / meadows; mountains or other ^{low to} visible features)

The surrounding terrain is composed of rolling hills near the lake, forested mainly by spruce with a secondary component of subalpine fir. Alpine and rocky peaks of the Atna Ranges can be seen in the middle to far distance, to the N, S and E.

(Some mountain hemlock also found near the lake)
Meadows, cliffs/rock outcrops otherwise not visible.

Aquatic macrophytes

(types, relative abundance, location of beds)

N. polysepalum , Potamogeton gramineus

(both sparse, no major beds but most plants located in bays).

Also flooded sedges abundant around lakeshore.

The lake level appeared high; most of the wetlands were very wet at the date of survey.

Development and Land UseCampsites or cabins

No cabins were found. The campsite used by the survey crew appeared to have been used before, but was not even roughly developed. No other campsites were noted.

Timber harvest

(locations visible from lake; along inlets or outlet)

None visible from the lake, nor audible. None visible in the vicinity during air approach.

Mining claims, trapping or other human activity

A "Jet B" fuel depot was located on the (small) northernmost point on the east lakeshore. Seven fuel drums were stowed at that location, most full to partially full. (could have been water) (apparently)

Obstructions and pollutions

(beaver dams; beaver activity; other obstructions - waterfalls, cascades, etc. near the lake)

No recent/current beaver activity was seen. Some old evidence was found, especially on the outlet channel; the lake point-of-outflow may be a very old dam and an old dam is found ~200 m d/s of the point of outflow.

Comments, including fish population / angling quality

(trails; aesthetics; fish condition/ appearance; other features/characteristics of interest not previously mentioned)

- Rough-skinned newts in minnow traps
- Lake is aesthetic, views of peaks to N, E, S when visibility allows (not often during the survey)
- Water boatmen were extremely abundant, with large schools evident along much of the lakeshore

Lake Biophysical Data Form

Date (yy/mm/dd): 96/08/23 Crew: JD/CS

Site ID _____

Watershed code: _____ Sequence No.: _____

Gazetted name: SMOKEE Alias: _____

FW Region: _____ UTM (Zone, Easting, Northing): _____

Management Unit: _____ NTS Map No.: _____

Biophysical

Biogeo Zone _____

Benchmark (Y/N) _____

Benchmark details: _____

Nutrient Status

SEAM No.: E 223346

Secchi depth (m) 6.6 m

Other samples taken: _____

Limno Station No:			
H2S (mg/l)	<u>0</u>		
H2S comments	<u>no odor</u>		
TDS method			
DO method			
TEMP method			
Alkalinity			

Field Conditions

wind velocity (km/h) < 5 wind direction: S air temp. (c): 12

cloud cover (/10 O.C.) 10 surface condition: CALM water colour: CLEAR

Development

MOF rec sites (Y/N) _____ Resort cmpsts (Y/N) _____ Residences (Y/N) _____

MOF campsites (Y/N) _____ Resorts (Y/N) _____ Co. Rec facilities _____

Parks campgrds (Y/N) _____ Resort cabins (Y/N) _____

Recreation

ROS _____ Biophys features: _____ Biophys sub-feat.: _____

Inlets/Outlets

see Stream Survey Card for mandatory fields

Biological

Fish Card attached (Y/N) _____ Fish. Man. Com. _____

Wildlife: _____ Reptiles: _____

Aquatic birds: Loons Invertebrates: _____

Amphibians: _____ Aquatic Plants: _____

Comments:

Water samples 18.0 m @ 1300

7.5 @ 1310

0.0 @ 1315 chlorophyll-a 1.0 L filtered

PLANKTON TOW = 120 sec @ 0.43 m/s 30cm DIA NET OPENING 150µ MESH

= 13:45

Check sample
speed is very slow.

Lake Survey Profile Data

Sequence number: _____

Date : 960323 1245
(yy/mm/dd)

Limnology station: 1

Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
surface	9.35	13.9		
0.5				
1.0	9.40	13.8		
1.5				
2.0	9.40	13.7		
2.5				
3.0	9.35	13.6		
3.5				
4.0	9.20	12.9		
4.5				
5.0	7.85	10.5		
5.5				
6.0	6.15	7.3		
6.5				
7.0	5.20	6.2		
7.5				
8.0	4.45	5.7		
8.5				
9.0	3.95	5.5		
9.5				
10.0	3.80	5.3		
10.5				
11.0	3.65	5.2		
11.5				
12.0	3.50	5.2		
12.5				
13.0	3.45	5.2		
13.5				
14.0	3.35	5.1		
14.5				
15.0	3.25	5.1		
15.5				
16.0	3.25	5.1		
16.5				
17.0	3.25	5.1		
17.5				
18.0	3.05	5.1		
18.5				
19.0				
19.5				
20.0				

Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
20.5				
21.0				
21.5				
22.0				
22.5				
23.0				
23.5				
24.0				
24.5				
25.0				
25.5				
26.0				
26.5				
27.0				
27.5				
28.0				
28.5				
29.0				
29.5				
30.0				
30.5				
31.0				
31.5				
32.0				
32.5				
33.0				
33.5				
34.0				
34.5				
35.0				
35.5				
36.0				
36.5				
37.0				
37.5				
38.0				
38.5				
39.0				
39.5				
40.0				



MOKEE LAKE

OWNED BY:

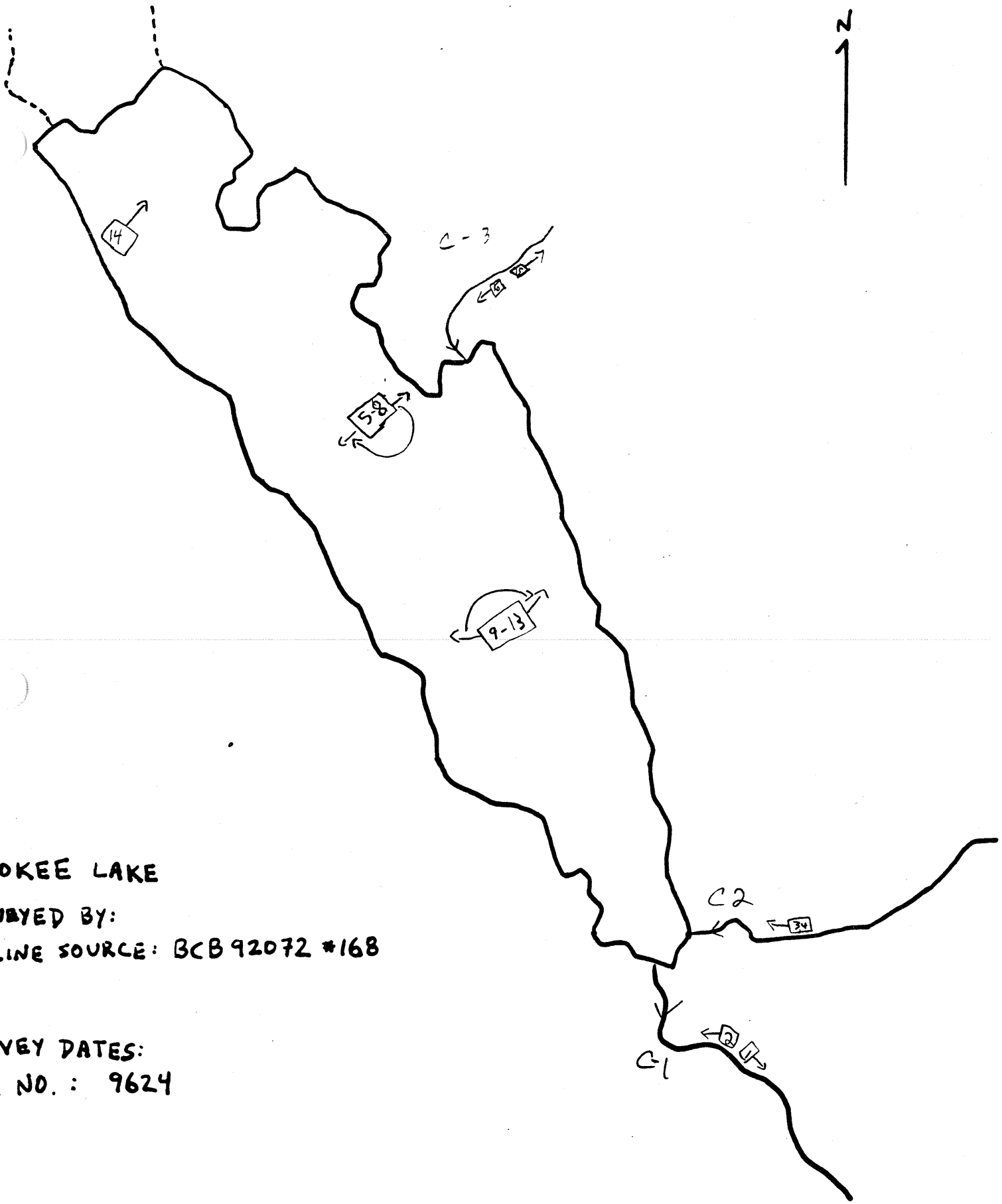
LINE SOURCE: BCB 92072 #168

A

:

RYEY DATES:

F. NO. : 9624



MOKEE LAKE

TRACED BY:

PLINE SOURCE: BCB 92072 #168

M

C

TRACED DATES:

F. NO. : 9624

DFO / MOE
STREAM SURVEY FORM

Stream Name (gaz)		(local)		Access	Method
Watershed Code		Location		Length (km)	
OUTFLOW OF SMOKEE LAKE		UTM		Y	N
Date YMD		0835		CS	JD/CS
PARAMETER		VALUE	METH	SPECIFIC DATA	
Ave. Chan. Width (m)			MS	0.95, 3.1, 2.63, 2.45, 2.25, 2.20	
Ave. Max. Riffle Depth (cm)			MS	1.95, 3.1, 2.65, 3.45, 2.25, 2.20	
Ave. Max. Pool Depth (cm)			MS	15, 22, 31, 20	
Gradient		2.5/100	EL	BED WATER (A) %	
Side Chan. %			GE	BANKS	
Debris Stable %		50	GE	Height (m) 0.25 % Unstable 5	
COVER: Total %		40	GE	Texture (F) G L R	
Comp. sum 100%			GE	Confinement EN CO FC 00 UC N/A	
Crown Closure %		10	SE	Valley Channel Ratio 0-2 2-5 5-10 10+ N/A	
DISCHARGE		Parameter		REACH SYMBOL (Fish)	
Wetted Width (m)		1.95	MS	_____	
Mean Depth (m)			MS	_____	
Mean Velocity (m/s)		0.3	F	_____	
Discharge (m3/s)				_____	

FISH SUMMARY				STREAM/VALLEY CROSS-SECTION (Looking Downstream)	
C	No.	Size Range (mm)	Use	PLANIMETRIC VIEW	
1	0			_____	
COMMENTS				Channel Stability <input type="checkbox"/> Debris <input type="checkbox"/> Management Concerns <input type="checkbox"/> Obstructions <input type="checkbox"/> Riparian Zone <input type="checkbox"/> Valley Wall Processes <input type="checkbox"/> Etc.	
2 - CHANNEL FLOWS THROUGH WETLAND ADJACENT TO LAKE AND FALLS OVER HISTORIC BEAVER DAM (0.5 m DROP) ~ 100m FROM LAKE					
- CHANNEL FLOWS THROUGH OPEN SEDGE WETLAND AFTER BEAVER DAM FOR 300m. CHANNEL IS DEEP WITH SLOWER FLOW AND VERY LOW GRADIENT AT THIS POINT.					
- ~ 400m FROM LAKE CHANNEL ENTERS FOREST. CHANNEL BECOMES MORE CONFINED, SHALLOWER AND FASTER FLOWING. GRADIENT = 2.5 AT THIS POINT					
- EXCELLENT REARING HABITAT SOME GOOD SPAWNING GRAVEL IN REACH FURTHEST FROM LAKE					
1 - 98 SECS OF ELECTRO FISHING CAPTURED NO FISH				Elected by: _____	
				Date YMD _____	

98 SECS

9624-C1

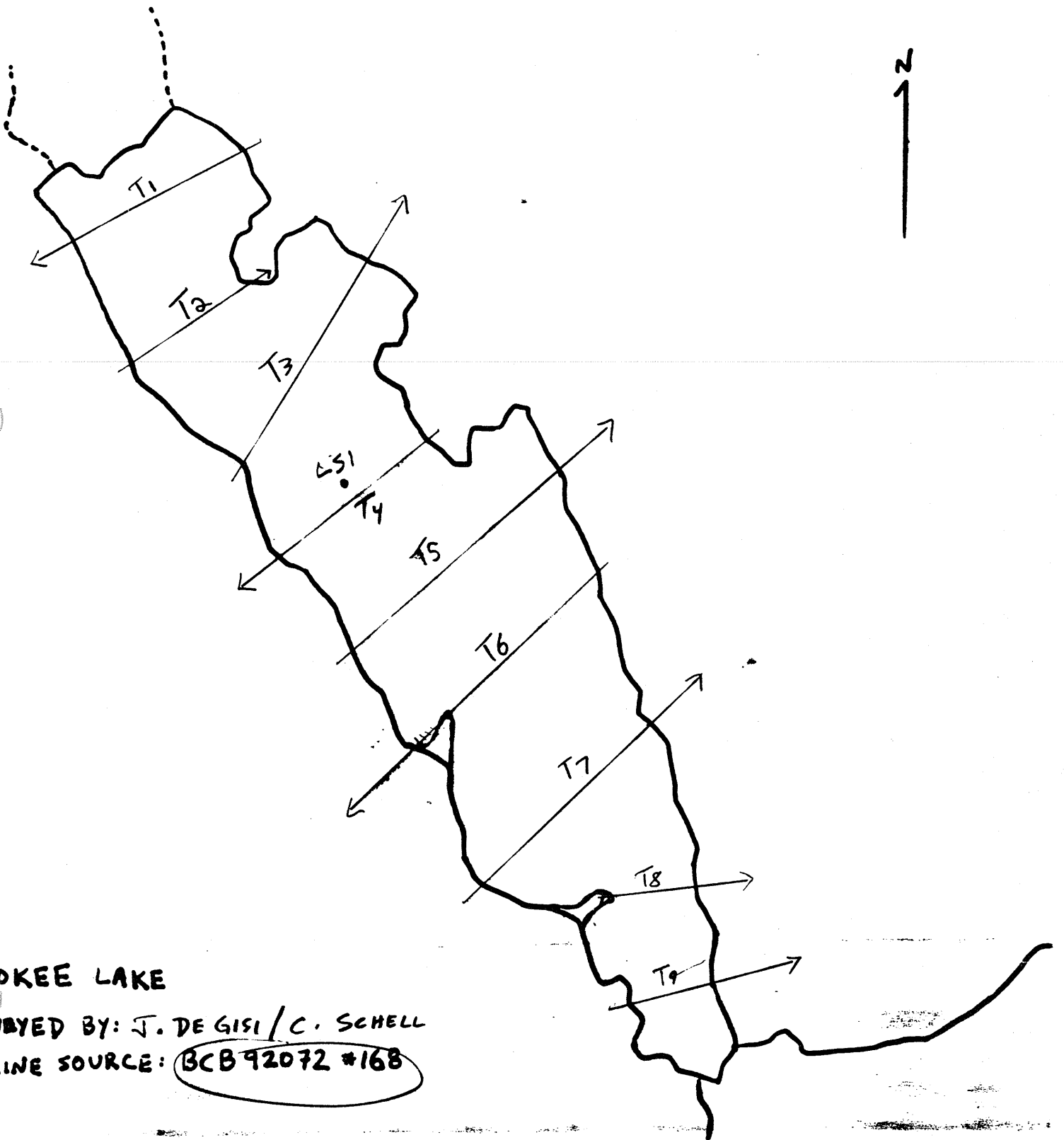
DFO / MOE
STREAM SURVEY FORM

Stream Name: (gaz)		(local)		Access	Method
Watershed Code		Length (km)		500m	
Location: INLET INTO SMOKE LAKE					
JUST EAST OF OUTLET		U.T.M.	Y N C		
Date: 4 6 08 22	Time: 1030	CSB	JD/CS	Photos	AirPhotos
C	PARAMETER	VALUE	METH	SPECIFIC DATA	
	Ave. Chan. Width (m)		MS	3.8, 1.35, 1.6, 2-15, 2.03, 1.34	
	Ave. Wet Width (m)		MS	2.05, 1.35, 1.6, 2-15, 2.03, 1.34	
	Ave. Max. Riffle Depth (cm)		MS	8, 13, 10, 7, 16	
	Ave. Max. Pool Depth (cm)		MS	22, 18, 36, 23, 33	
	Gradient	2.2/9/2	CL	BED MATERIAL	
	% Pool	10	GE	clay, silt, sand (<2mm)	20
	Side Chan. %	45	GE	small (2-16mm)	30
	Debris	60	GE	large (16-64mm)	30
	COVER: Total%	30	GE	sm. cobble (64-128mm)	10
	Comp.	Dp.Pool L.O.D. Boulder InVeg OverVeg Cutbank		lge. cobble (128-256mm)	8
	sum 100%	- 35 - 10 25 30		boulder >256mm	2
	Crown Closure %	60	Aspect NW	D90 (cm)	Compaction UH
DISCHARGE					
	Parameter	Value	Method	Specific Data	
	Wetted Width (m)	1.34	MS		
	Mean Depth (m)		MS	0.08, 0.07, 0.08, 0.19, 0.08, 0.04, 0.06	
	Mean Velocity (m/s)	0.67	F		
	Discharge (m3/s)				
REACH SYMBOL (Fish)					
(Width: Valley/Channel Slope) Bed Material					

FISH SUMMARY				STREAM/VALLEY CROSS-SECTION (Looking Downstream)	
C	No.	Size Range (mm)	Use	L	R
1	0				
PLANIMETRIC VIEW					
COMMENTS					
Channel Stability <input type="checkbox"/> Debris <input type="checkbox"/> Management Concerns <input type="checkbox"/> Obstructions <input type="checkbox"/> Riparian Zone <input type="checkbox"/> Valley Wall Processes <input type="checkbox"/> Etc.					
- CHANNEL ENTERS LAKE 3-4 m EAST OF OUTLET					
- CHANNEL FLOWS THROUGH SEDGE WETLAND FOR 10-20 m FROM LAKE BUT QUICKLY ENTERS FOREST.					
- 1st REACH IN FOREST IS FAIRLY LOW GRADEMENT (2%) AND HAS GOOD SPAWNING HABITAT. CHANNEL MEANDERS THROUGH THIS REACH.					
- ~ 300 m FROM LAKE CHANNEL BECOMES MORE CONFINED AND GRADEMENT INCREASES. POOR SPAWNING AND REARING IN THIS REACH					
- 105 SECS OF ELECTROFISHING CAPTURED NO FISH.					
					Edited by:
					Date YMD

105 secs

9624-C2



MOKEE LAKE
SURVEYED BY: J. DE GISI / C. SCHELL
OUTLINE SOURCE: BCB 92072 #168
JTM
WC