RECONNAISSANCE INVENTORY OF

CHISHOLM LAKE

WATERSHED CODE 460-6006-445-01

Bulkley R Morice R Pacific

SURVEY DATES : SEPTEMBER 26 - 28, 1996

Prepared for:

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1. SUMMARY

Chisholm Lake is located in the Morice Forest District, 42 km southwest of the town of Houston. Reconnaissance inventory of the lake was made September 26 - 28, 1996. The lake covers 121.8 surface hectares, is roughly crescent shaped and deep (mean and maximum depths of 9.2 m and 24 m). It lies 757 m above sea level and drains via Tagit Creek to the Morice River in the Skeena watershed. Access was achieved by 2WD logging road. The closest road is located less that 50 m from the south shore. Moose sign was observed during the survey.

During the survey the lake was thermally stratified and oxygen was moderately depleted in the hypolimnion. The lake is neutral and has very low specific conductance. Nitrogen and phosphorus concentrations indicate oligotrophy and the N : P ratio suggests that either phosphorus or nitrogen may be limiting primary productivity. Chlorophyll *a* concentration in the surface water suggested low phytoplankton standing crop at time of survey.

The Chisholm 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. Five fish species were captured: cutthroat trout (*Oncorhynchus clarki*), peamouth chub (*Mylocheilus caurinus*), longnose sucker (*Catostomus catostomus*), redside shiner (*Richardsonius balteatus*) and prickly sculpin (*Cottus asper*). Cutthroat trout were at intermediate population density relative to other small lake populations in the region. The trout were fairly fast growing and in very good condition and of moderate size. Peamouth chub were at intermediate to high population density. Longnose sucker, redside shiner and prickly sculpin were captured in low numbers, relative to the other species.

The lake outlet stream and three inlet channels were examined for fisheries potential and sampled for fish presence with minnow traps, dip netting and visual observation. Tagit Creek, the primary inlet and outlet offers good spawning and rearing habitat. One inlet contains a beaver dam that would form a barrier to fish passage 113 m upstream of the lake. The other inlet bears mostly stagnant water. Fish were captured in all the surveyed streams and salmonids in all the inlets. Beaver have been active in the drainage historically and dams are common. No sign of recent beaver activity was observed by the survey crew and many of the dams are breached.

Lack of distant views, unremarkable surroundings and extensive nearby timber harvest create moderately low aesthetic value for Chisholm Lake. The Chisholm Forest Service Road passes along the south shore of the lake and many cutblocks are visible from the lake surface. A campsite with a fire pit is located at the west end of the lake near where the road reaches the lakeshore. Although access to Chisholm Lake is via 2WD logging roads, it would not attract intense fishing effort as sport fish size is unremarkable. The presence of cutthroat trout in Chisholm Lake requires that its inlet and outlet streams be classified as fish bearing under the Forest Practices Code. Access management or special angling restrictions are not recommended for Chisholm 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 Chisholm Lake 460-6006-445-01 performed to the current standards provided by the Resources Inventory Committee (RIC). Chisholm Lake 460-6006-445-01 is located in the Morice Forest District, 42 km southwest of the town of Houston. 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 Joe DeGisi (crew leader) and Jay Leopkey (assistant) September 23 - 25, 1996. Chris Schell, Joe Jazvac and Jay Leopkey contributed to data compilation. Chris Schell and Joseph DeGisi co-authored this report. Stream cards, photographs, 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	√	Dissolved Oxygen Profile	√
Physical Data	√	Temperature Profile	√
Bench Mark	√	Netting Record	√
Terrain Features	√	Lake Catch Summary	√
Access	√	Fisheries Comments	√
Resorts & Campsites	√	Individual Fish Data	√
Other Developments	√	Fish Preserved	–
Obstructions and Pollutions	√	Stomach Analysis	–
Special Restrictions	√	Scale Reading	√
Aquatic Plants	√	History of Previous Surveys	√
Wildlife Observations	√	Location of Inventory Sites	√
Miscellaneous Comments	√	Photograph Directory	√
Lake Drainage	√	Appendices	√
Inlets/Outlets	√	Bathymetric Reduction	√
Water Chemistry	√	Contour Map	√

4. GEOGRAPHIC AND MORPHOLOGIC INFORMATION

4.1 Location

Survey Dates ..... September 26 - 28, 1996

Location ..... 42 km southwest of the town of Houston

Elevation ..... 757 m

Drainage ..... Tagit C → Morice R → Bulkley R → Skeena R

Watershed Code..... 460-6006-445-01

Latitude / Longitude ..... 54° 12' 20'' / 127° 13' 15''

U.T.M..... 09.615950.6008017(NAD 27)

Biogeoclimatic Zone..... SBS-mc2

N.T.S. Map..... 93 L/03 (1:50,000 scale)

TRIM Map ..... 93L.024/025 (1:20,000 scale)

Forest Region..... Prince Rupert

Forest District ..... Morice

Management Unit 06-09

Native Land Claims ..... Wet'suwet'en Nation; Sekanni Carrier Nation

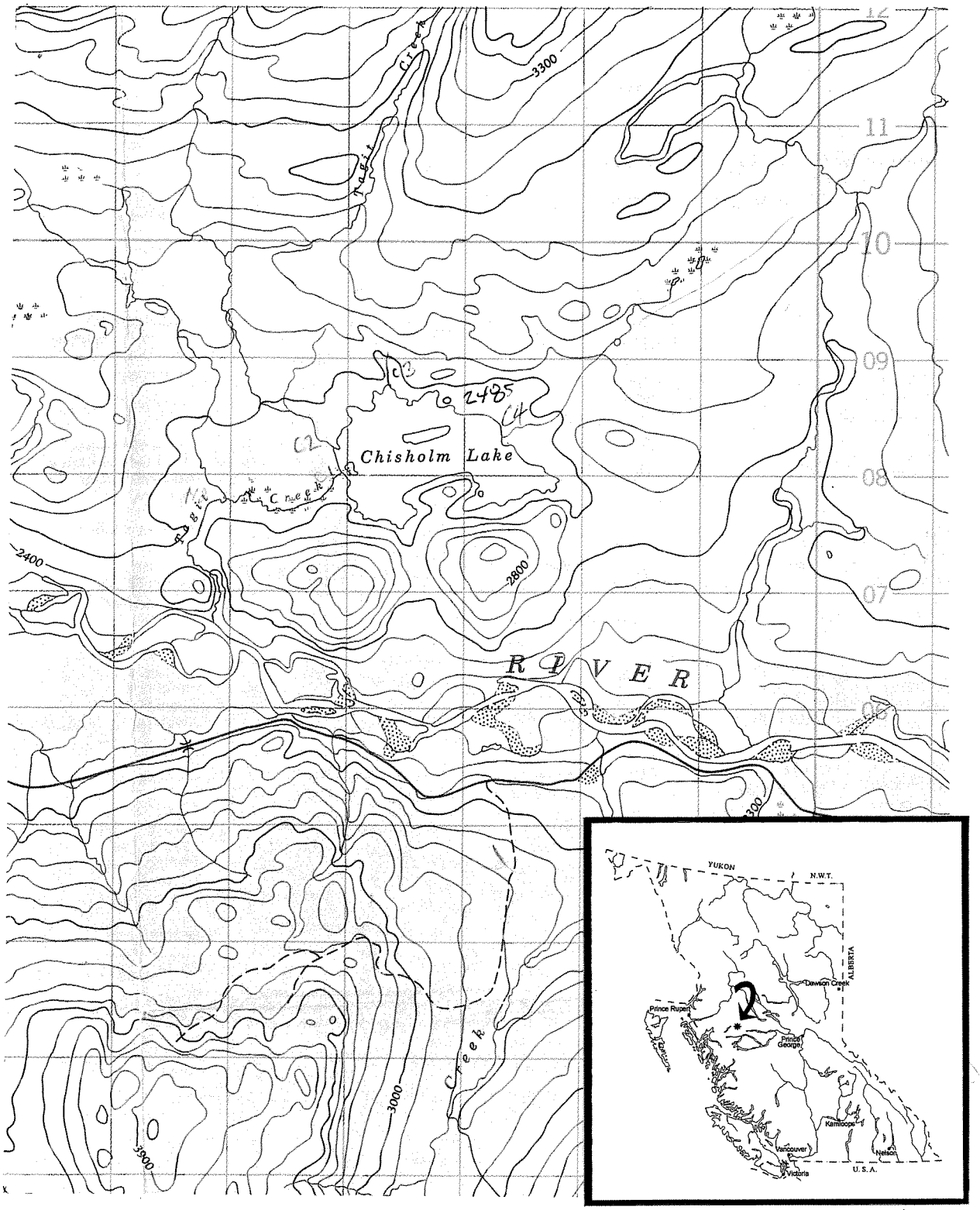
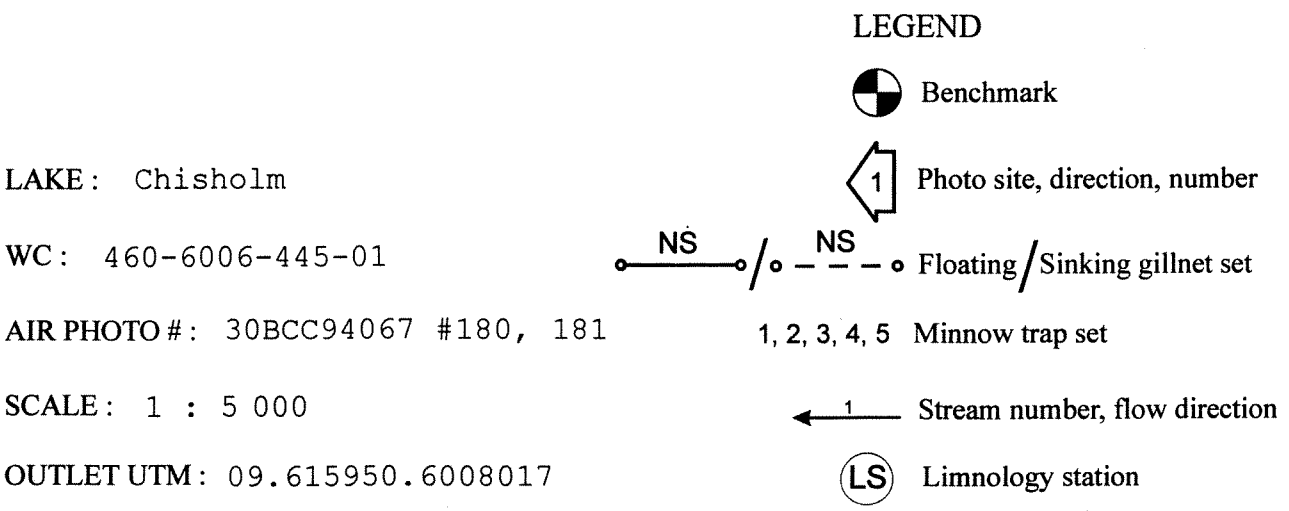
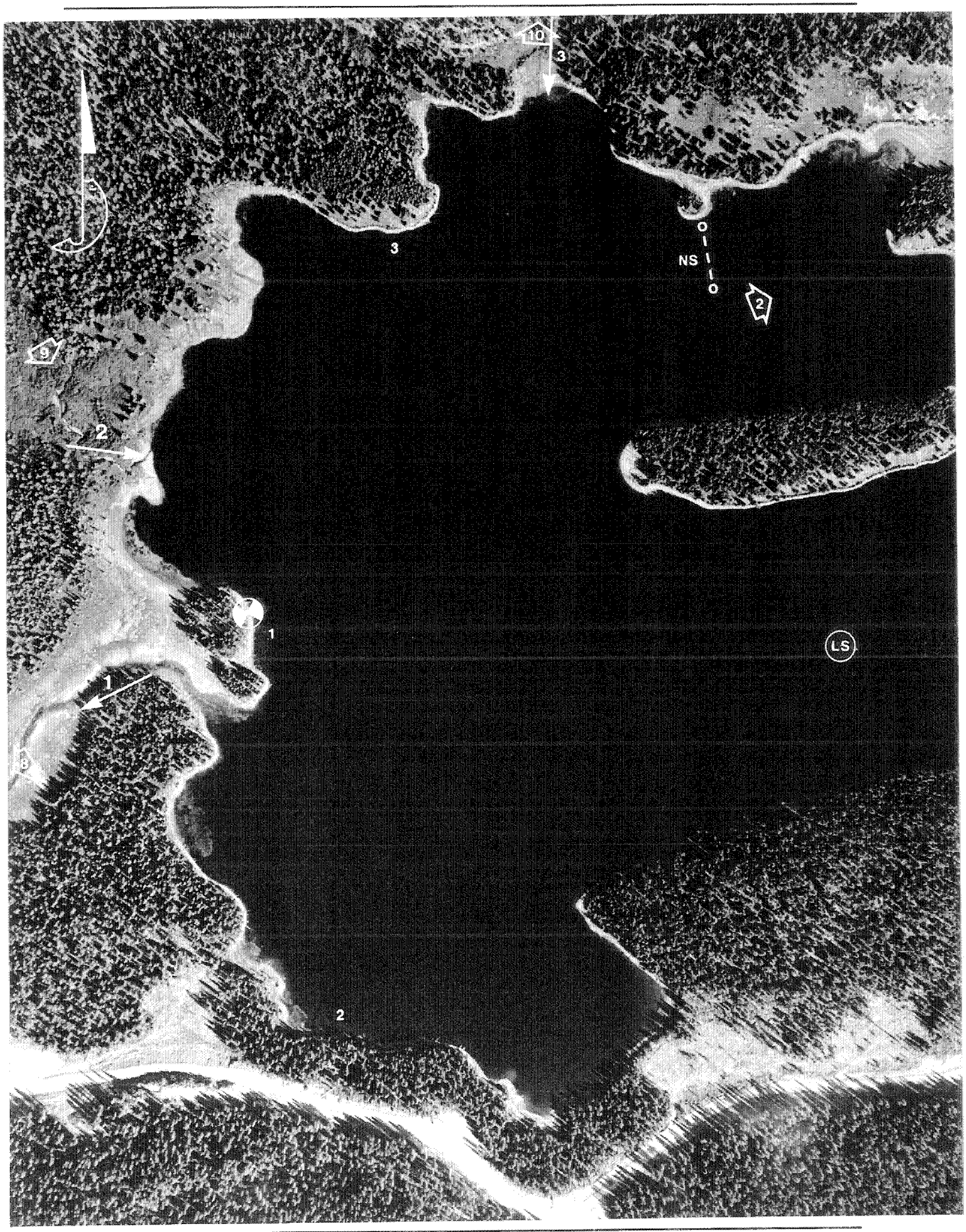


Figure 1. Chisholm Lake and surrounding features, as depicted on NTS mapsheet 93 L/03 (1:50,000 scale). The road adjacent to the south shore is not mapped. Inset map shows the location within the province of British Columbia.

Figure 2. West half of Chisholm Lake, enlargement from air photo (see next page).

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3
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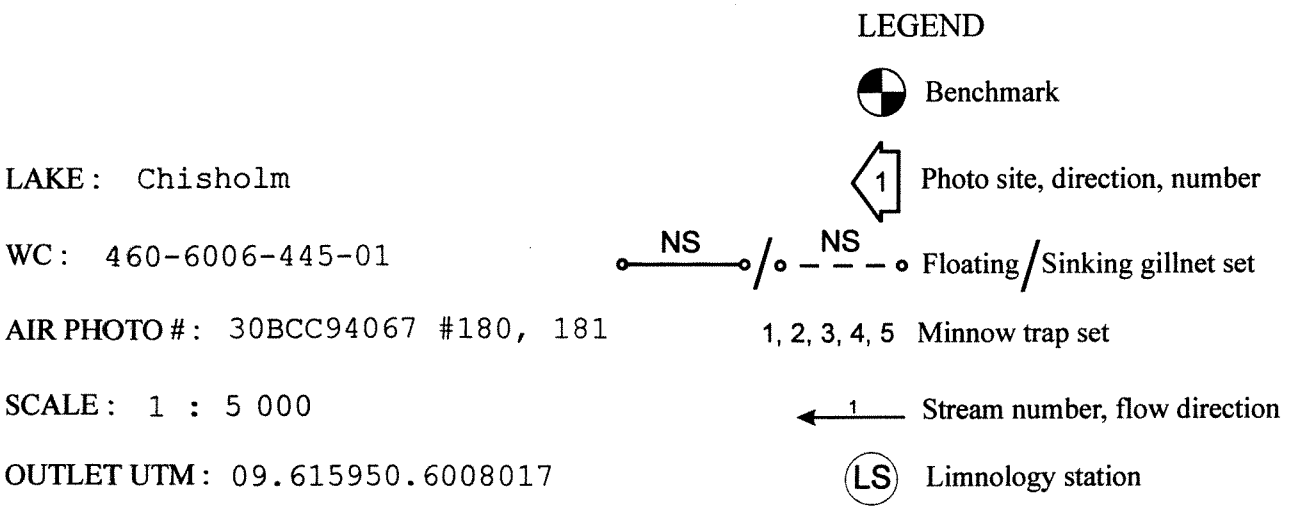
Figure 3. East half of Chisholm Lake, enlargement from air photo (see next page).




11
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NS
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4.2 Physical Data

Elevation	757 m	Elevation Source	NTS mapsheet
Water Surface Area	1 217 839 m^2	Area Above 6 m Contour	445 672 m^2
Lake Drainage Area	29.4 km^2	Flushing Rate	588 days
Shoreline Perimeter	7 213 m	Volume	10 662 410 m^3
Number of Islands	1	Perimeter of Islands	938 m
Maximum Depth	24 m	Mean Depth	9.2 m
Secchi Depth	3.8 m	Filterable Residue (T.D.S.)	46 mg/L
Sounding Device	Lowrance X15A		

4.3 Benchmark

The benchmark was established in a 53 cm dbh lodgepole pine 8 m from shore, on the point of land between where Tagit Creek enters and exits the lake . A steel spike was placed in an orange circle painted on the tree trunk, 2.4 m above the current lake level. The location of the benchmark is shown in Figure 2. The high water mark was located 0.1 m above the current lake level.

4.4 Prior Surveys

A search of Skeena Region inventory files yielded no records for Chisholm 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 channels (C1, C2 etc.) in this section corresponds to labels on Figures 2 and 3 and other figures and tables in this report. Four channels were examined.

C1. Tagit Creek WC 460-6006-445, outlet from the west shore of Chisholm Lake at UTM 09.615950.6008017 (NAD27). See Photograph 8. Proposed classification S2. The channel was surveyed to a breached beaver dam 630 m downstream of the lake. The entire reach consists of a continuous pool with barely discernible flow. *Nuphar polysepalum, Potamogeton epihydrus, Sparganium* sp. and *Hippuris vulgaris* grow in abundance in the channel. The bank and bed materials were made up of fines. Stage was medium at time of survey and discharge was estimated at 0.21 m^3/s. Small pockets of fair to good salmonid spawning substrate were found and rearing potential is good to excellent. Three minnow traps fished overnight captured 2 redside shiner and a white sucker.

C2. Tagit Creek WC 460-6006-445, inlet to the west shore of Chisholm Lake at UTM 09.615875.6008234 (NAD27). See Photograph 9. Order 3, magnitude 7, drainage area 20.7 km^2, proposed classification S3. The channel caries mostly run and riffle flow over gravel and larges at 2.0 % gradient. Stage was medium at time of survey and discharge was estimated at 0.12 m^3/s. Excellent salmonid spawning substrate was found and rearing potential was fair to good. Three minnow traps fished overnight captured 2 cutthroat trout.

C3. Unnamed channel (WC pending), inlet to the north shore of Chisholm Lake at UTM 09.616350.6008775 (NAD27). See Photograph 10. Order 1, magnitude 1, drainage area 1.5 km^2, proposed classification S4. Two reaches are contained in the 113 m survey length. The reach adjacent to the lake bears pool and riffle flow over fines at 2.5 % average gradient. At 45 m from the lake the average gradient increases to 7 % and flow is almost entirely run over gravels and larges. The survey ended at a 1.5 m high beaver dam that forms a barrier to fish passage. Further upstream a 15 m length of channel at 45 % gradient would also prevent fish passage. Some fair rearing habitat is located in the reach adjacent to the lake. Dip netting and visual observation revealed many juvenile cutthroat trout.

C4. Unnamed channel WC 460-6006-445-214, inlet to the north shore of Chisholm Lake at UTM 09.617300.6008325 (NAD27). See Photograph 11. Order 1, magnitude 1, drainage area 2.02 km^2, proposed classification S4. A beaver dam is located 105 m upstream of the Lake. Much of the channel contains stagnant water. Most of the flow is in pools over organic fines. Stage was medium at time of survey and discharge was estimated at 0.01 m^3/s. Salmonid spawning was poor due to lack of suitable substrate and rearing habitat was fair. Visual observation during the survey detected no fish.

4.6 Terrain and Vegetation

4.6.1 Immediate Shore

Shoreline substrate is predominantly cobble with some gravels. The immediate shore is vegetated by a 5 m to 10 m band of grasses, followed by alders, and mature forest. Sweepers are abundant but do not obstruct shoreline access in most places.

4.6.2 Surrounding Country

The lake is located in the Babine variant of the Moist Cold subzone of the Sub-Boreal Spruce biogeoclimatic zone. The surrounding country consists of short steep ridges and hills, forested with a mix of fir and hybrid spruce in the south, and lodgepole pine in the north. Mid-distant views of moderately steep forested hills, with the occasional glade and rock outcrop, occur to the north, east and west

5. ACCESS, DEVELOPMENTS AND LAND USE

5.1 Access

The lake was accessed by 2WD logging roads. Odometer readings from Houston are cumulative.

1. At Houston, turn off Highway 16 onto the Morice Forest Service Road at odometer 0.0 km.
2. Turn right onto the Morice West Forest Service Road at odometer 27.5 km.
3. Turn right onto the Chisholm Forest Service Road at odometer 29.5 km.
4. Park in the pullout on the north side of the road at odometer 56.7 km. A short road leads to the lakeshore.
5. Note: The pullout for the lake is located just past km 30 on the new Chisholm Main. The directions listed above apply to the older (southern) Chisholm Main.

5.2 Development and Land Use

5.2.1 Resorts and Campsites

A campsite with a fire pit is located at the west end of the lake near where the road reaches the lakeshore. The survey crew camped here. No cabins were observed at the lake.

5.2.2 Mining Claims

No evidence of mineral exploration or mining 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 Houston Forest Products operating area in the Morice TSA. The closest existing cutblock to the lake lies 200 m to the northeast. The block was logged in 1994 and is visible from the west end of the lake. Another cutblock located 1.2 km northeast of the lake was also logged in 1994. A third cutblock was visible to the southwest from vantage points on the east side of the lake. The Chisholm Forest Service Road passes along the south shore of the lake, within 50 m to 100 m from the shore in many places. The road cut was visible from most vantage points on the lake surface. A cutblock is planned 1.2 km to the west of the lake in 2001 (see Figure 4).

5.2.4 Waste Permits

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

5.2.5 Water Permits

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

5.2.6 Obstructions and Pollutions

The outlet of Chisholm Lake has been severely impounded by beavers in the recent past though the dams near the lake have been breached. All of the channels entering Chisholm Lake showed evidence of having been impounded, and several large abandoned lodges exist around the lakeshore. There was no sign of recent beaver activity. Many of the dams near the lake have been breached.

5.2.7 Recreation Resource Inventory

The latest Forest Service Recreation Resource Inventory for the Morice Forest District area was completed over several years. IGDS-format coding for the polygon which includes Chisholm Lake is:

M3T1E3
ajlC1
3

ROS status is thus "Semi-Private Motorized".

5.2.8 Special Regulations and Restrictions

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

5.2.9 Comments

Lack of distant views and unremarkable surroundings create low to moderate aesthetic value for Chisholm Lake. Water level appears to have risen approximately 1.5 m and then dropped again to the current level over the past several decades. Alders have not yet recolonized the wide grassy area along the lake perimeter, which features some dead standing timber and dead alder. The changes in the lake level are almost certainly due to beaver activity, followed by breaching of dams in the outlet.

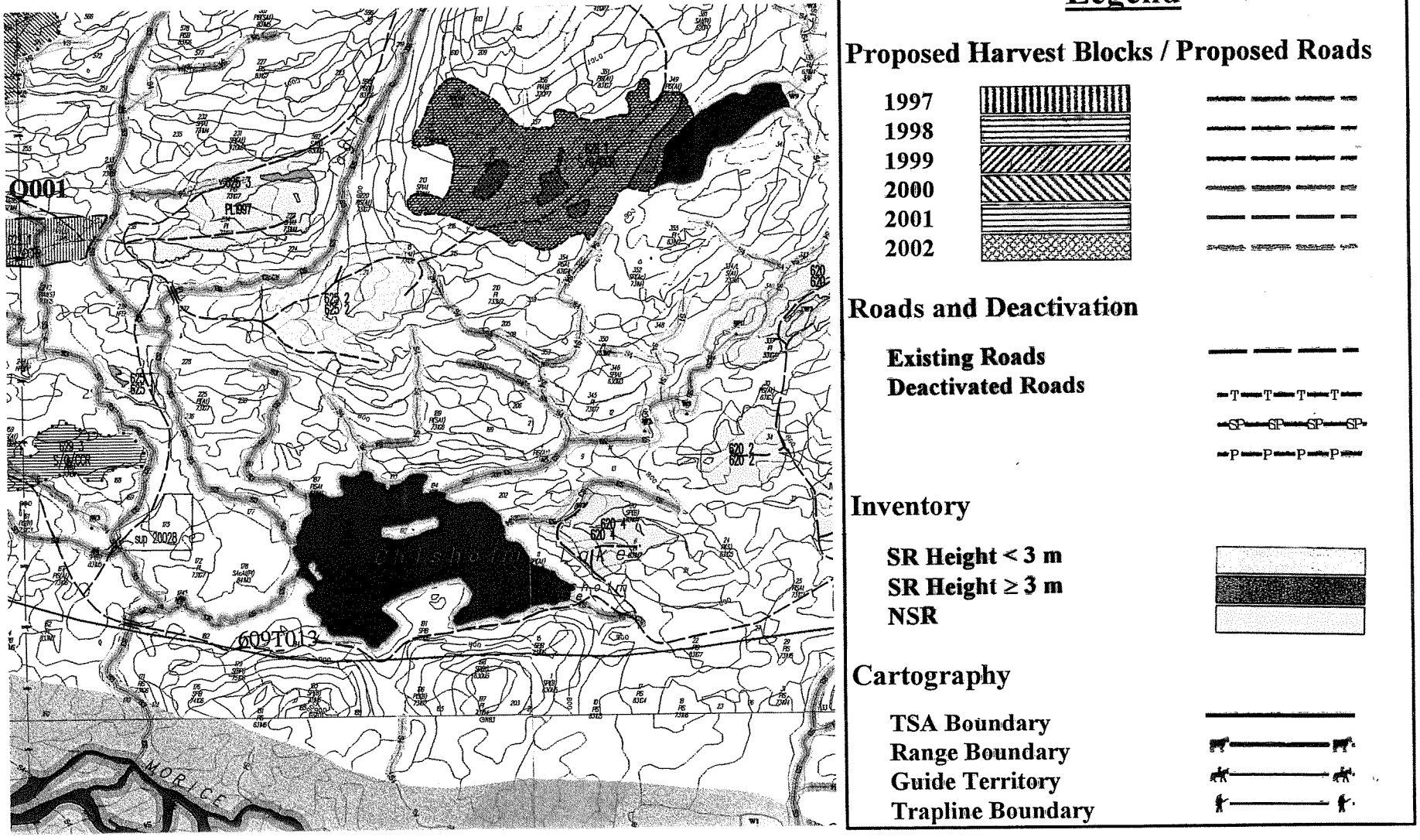


Figure 4. Planned cutblocks in the Chisholm Lake area. Reproduced with permission from Houston Forest Products.

6. FISH POPULATION SAMPLING

Details of fish population sampling in Chisholm Lake and its inlets and outlet are given in Table 1. The raw data were recorded on RIC standard "Fish Collection Method Information Form" and "Fish Collection Data Form" which are reproduced in Appendix C. All landed catch was sampled for length and salmonids were subsampled for further parameters. Subsampling followed sorting of catch into size classes so that subsample would be representative of catch size structure.

Table 1. Fish sampling effort, catch and catch per effort for all methods used at Chisholm Lake and its inlet-outlet streams, September 26 - 28, 1996. **Loc** gives the location where the gear was fished, where Lake = Chisholm Lake; and C1, C2 etc. are streams numbered as in Section 4.5. **Date** is the date of set for gear fished overnight. See appendix C for set and haul times. **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 Figures 2 and 3 for exact set locations and orientation. MT = Gee-type minnow trap baited with salmon roe, VO = visual observation, DN = dip net. **Number Sampled** refers to the number of fish measured for length (non-salmonids) or all parameters (salmonids). All salmonid catch was measured for length at least. **CPE** unit is catch per hour. Species codes: **CT** = cutthroat trout, **RSC** = redside shiner, **LSU** = longnose sucker, **PCC** = peamouth chub, **CAS** = prickly sculpin.

Loc	Date	Capture Method	Depth	Capture Effort	Catch (Number Sampled) [CPE]					
					CT	LSU	RSC	PCC	CAS	
Lake	96/09/26	MT-1	1.5	1410						
Lake	96/09/26	MT-2	1	1399					3	[0.1]
Lake	96/09/26	MT-3	0.3	1388			2 [0.1]			
Lake	96/09/26	MT-4	1.5	1253	1 [0.]		1 [0.05]			
Lake	96/09/26	MT-5	0.5	1243			1 [0.05]		1	[0.]
Lake	96/09/26	GN (S)	1 to 12.0	710	24 (8) [2.]	11 (11) [0.93]	3 (3) [0.25]	15 (15) [0.6]	2 (2)	[0.2]
Lake	96/09/26	GN (F)	1 to 2.4	710	68 (24) [5.7]			45 (45) [1.9]		
C1	96/09/27	MT-1		1525						
C1	96/09/27	MT-2		1525						
C1	96/09/27	MT-3		1525		1 [0.04]	2 [0.08]			
C2	96/09/27	MT-1		1505	2 [0.1]					
C2	96/09/27	MT-2		1505						
C2	96/09/27	MT-3		1505						
C3-R1	96/09/28	DN		-	1					
C3-R2	96/09/28	VO		-	2					
C4	96/09/28	VO		-	2					

6.1 Fish Species Composition

Five species of fish were captured in Chisholm Lake and its watershed: cutthroat trout (*Oncorhynchus clarki*), redside shiner (*Richardsonius balteatus*), longnose sucker (*Catostomus catostomus*), peamouth chub (*Mylocheilus caurinus*) and prickly sculpin (*Cottus asper*). Special status in MOE Region 6 is not currently attached to any of these species. The presence of cutthroat trout in Chisholm Lake requires that its low-gradient inlets and outlet be considered fish-bearing streams under the Forest Practices Code.

6.2 Relative Abundance

Gillnet catch per effort for cutthroat trout was 5.7 fish per net·hr, indicating intermediate population density for the species relative to other small lake populations in the region. Peamouth chub were at intermediate to high population density. Longnose sucker, redside shiner and prickly sculpin were captured in low numbers, relative to the other species (Table 1).

6.3 Size, Age and Growth

Characteristics of the length distributions of fish captured by gillnet and minnow trap in Chisholm Lake and its inlets and outlet, are shown in Table 2, Figure 5 and Figure 6. Due to gear selectivity, the samples are probably not representative of the true length structure of Chisholm Lake fish populations. Cutthroat trout growth in Chisholm Lake does not conform well to the Von Bertelanffy model (Figure 8). This may be for any combination of the following reasons: early ages follow a different growth trajectory, sample sizes are small, or the growth model is inappropriate for this population.

Table 2. Descriptive statistics for length distributions of six fish species captured in Chisholm Lake and its inlets and outlet stream, September 26 - 28, 1996. Fork lengths are given in mm.
CT = cutthroat trout, **RSC** = redside shiner, **LSU** = longnose sucker, **PCC** = peamouth chub, **CAS** = prickly sculpin.

Parameter	CT	PCC	LSU	CAS	RSC
Mean	194	176	176	73	66
Standard Error	4.2	2.8	12.6	7.4	12.8
Median	202	182	163	75	50
Mode	205	180	159	-	30
Standard Deviation	40	22	42	18	34
Range	232	83	121	46	75
Minimum	28	124	115	50	30
Maximum	260	207	236	96	105
Count	93	60	11	6	7
Confidence Level (95.0%)	8.3	5.6	28.0	19.0	31.2

6.3.1 Non-salmonid Species

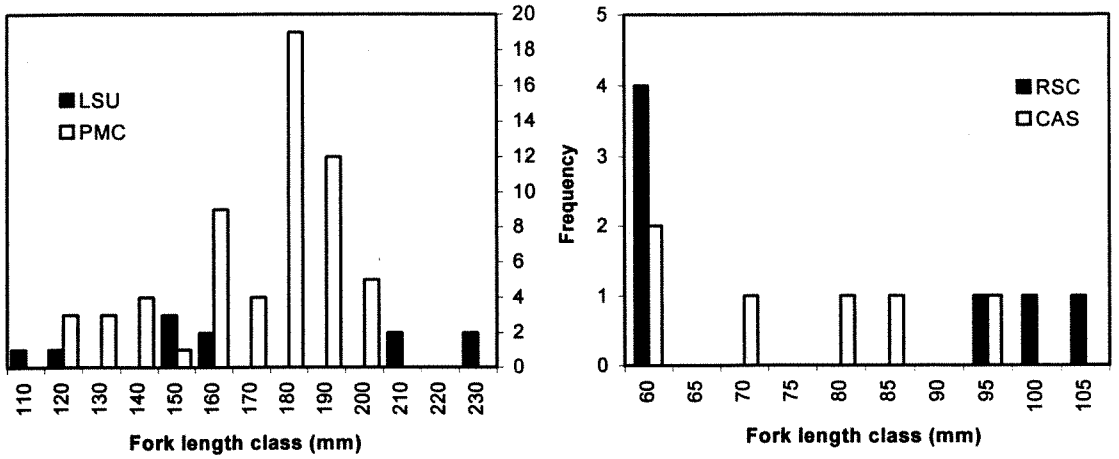


Figure 5. Length frequency histograms for abundant non-salmonid species captured by gillnet and minnow traps in Chisholm Lake. The x-axis class labels are lower bounds for the length classes.

6.3.2 Cutthroat Trout

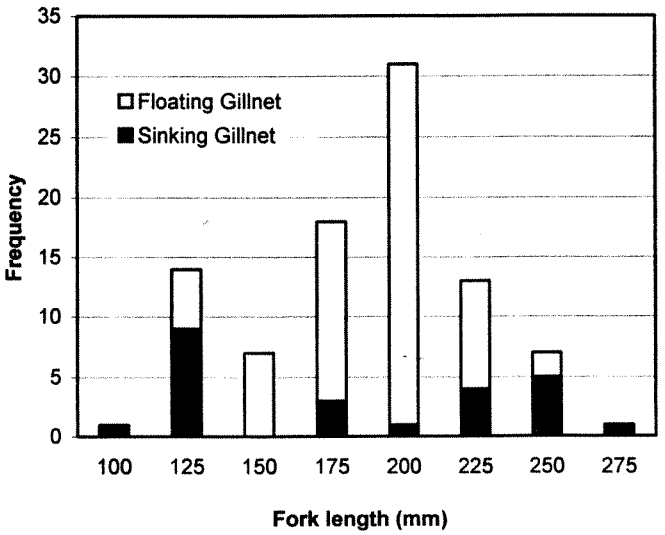


Figure 6. Length frequency distribution of cutthroat trout caught by sinking gillnet (shaded bar areas) and floating gillnet (open bar areas) at Chisholm Lake, September 26 - 28, 1996. The x-axis labels are the lower boundaries of length classes.

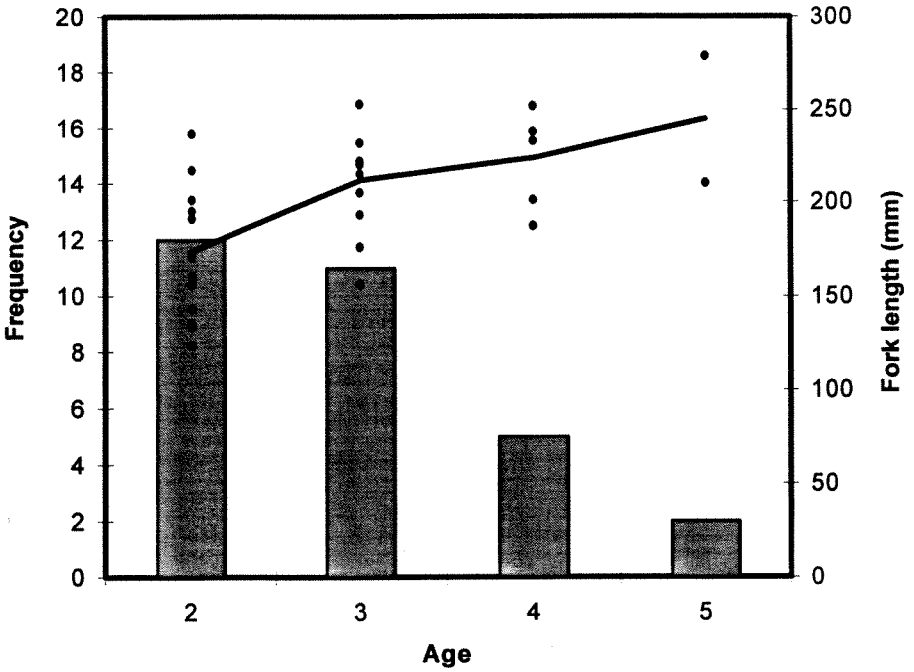


Figure 7. Age frequency histogram and length-at-age for cutthroat trout captured at Chisholm Lake and its inlets and outlet, September 26 - 28, 1996. The solid line shows mean fork length-at-age, while the filled circles indicate lengths-at-age for individual fish.

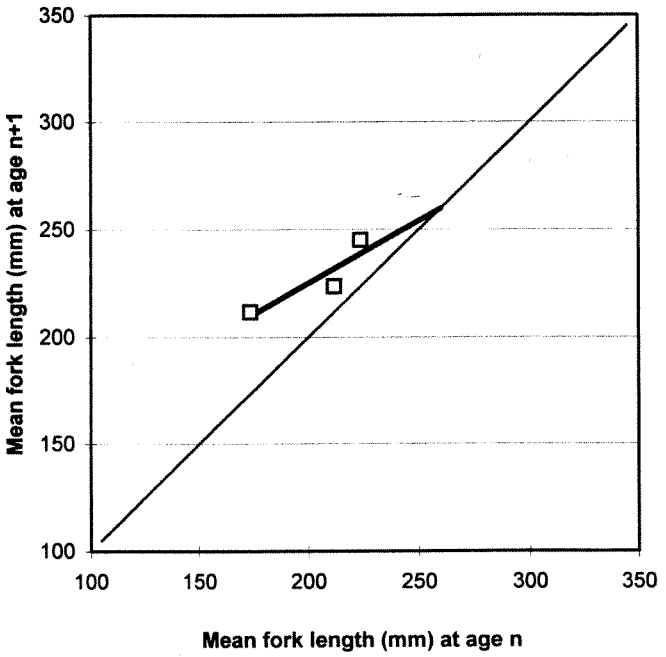


Figure 8. Ford-Walford plot for cutthroat trout captured at Chisholm Lake. Lengths-at-age are mean values. The heavy line shows the least-squares regression of {length-at-age n+1} on {length-at-age n}. The first two points were excluded from the fit. Estimated terminal length (L_∞) occurs at the intersection of the regression line with the diagonal reference line; the parameters from the regression give k = 0.581 and L_∞ = 260 mm.

6.4 Sexual Maturity and Condition

6.4.1 Cutthroat Trout

Sample sizes are low, but cutthroat trout sexual maturity appears to occur by age 3 or 4 for females in Chisholm Lake. The majority of males in each age class below age 4 were immature, while all age 5 males were mature. The population condition factor is very high, relative to other small lake cutthroat trout populations in Skeena region during late summer (Figure 9).

Table 3. Sexual maturity of Chisholm Lake cutthroat trout, by age. For the total catch, the ratio of males to females was 1 : 1.

	Females		Males	
Age	number	% mature	number	% mature
2	6	0	6	33
3	6	83	5	40
4	2	100	3	33
5	1	100	1	100
TOTAL	15	53	15	40

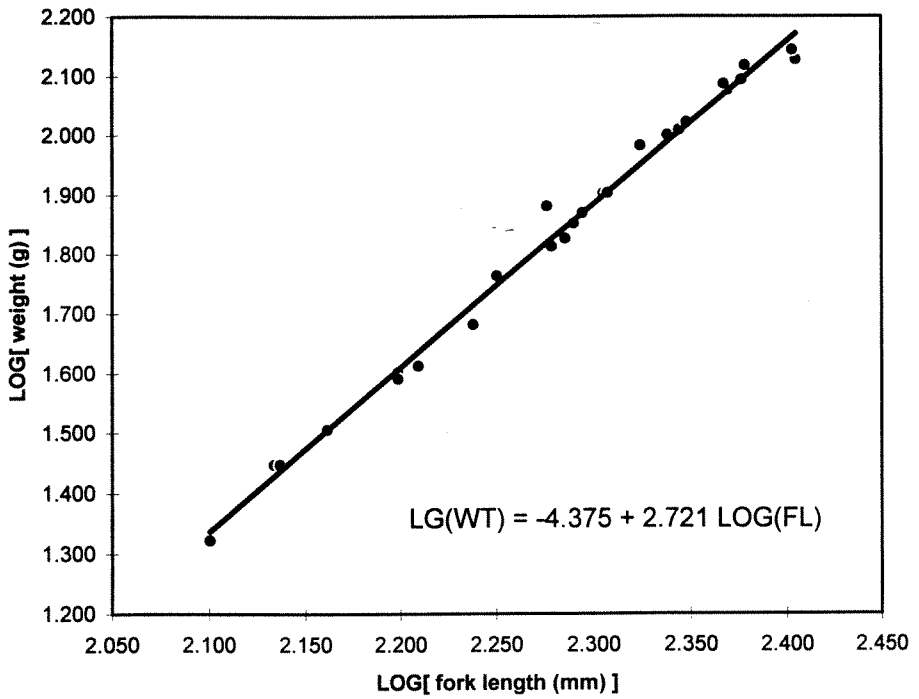


Figure 9. Estimated length - weight relationship for Chisholm Lake cutthroat. Both length and weight are $\log_{10}$ transformed. The GM regression equation is shown; the resulting estimate of Fulton's condition factor is thus $10^{-4.375} \cdot 10^5 = 4.22$.

7. LIMNOLOGICAL SAMPLING

Limnological sampling was conducted at midday on September 28, 1996 at the Chisholm Lake limnology station labelled on Figure 2. Weather during the survey was partly cloudy with up to 25 km/h westerly winds creating choppy surface conditions. Raw data and associated information were recorded on the RIC standard "Lake Biophysical Data Form" reproduced in Appendix D. Water samples were collected at 0.0 m, 10.0 m and 22.0 m depths, apportioned into aliquots for general chemistry and metals analysis, and shipped to Zenon Laboratories on ice for processing. Zenon's records show that the Chisholm Lake samples were received on Sept. 30, 1996 within the 72 hour RIC standard time frame for water sample transport.

7.1 Stratification

The oxygen - temperature profile of Chisholm Lake on September 28, 1996 is shown in Figure 10. The lake was thermally stratified at time of survey. Dissolved oxygen in the hypolimnion was moderately depleted.

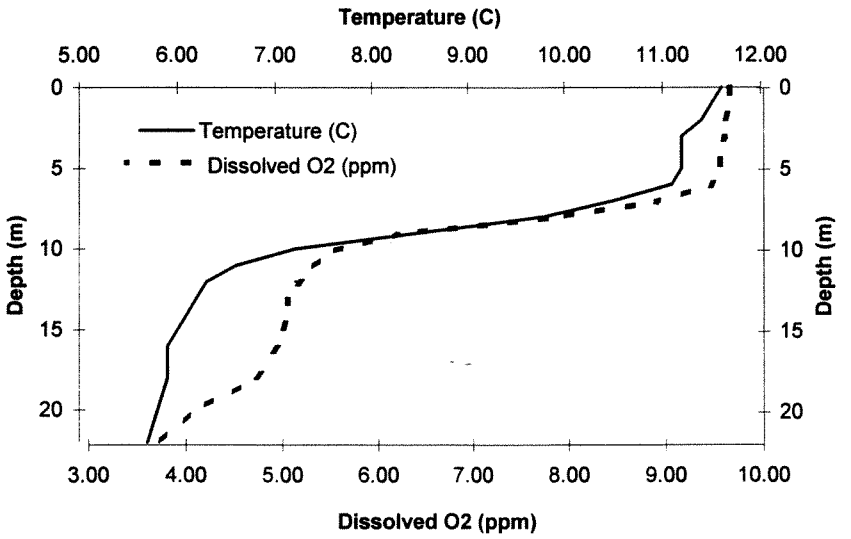


Figure 10. Temperature and dissolved O_2 profiles for Chisholm Lake on September 28, 1996. The sampling device was a YSI 57 temperature/oxygen meter. Sample interval was 1.0 m from the surface to 14.0 m depth and 2.0 m below this point.

Table 4. 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 September 28, 1996 and received by Zenon on September 30, 1996. MDC = minimum detectable concentration for the analytic method.

Parameter	Shallow	Thermocline	Deep	Unit	MDC	Method
Time of Day	13:30	13:25	13:20	h	-	-
Depth	0.0	10.0	22.0	m	-	-
pH	7.4	7	6.9	pH	0.1	Automated pH Meter
Specific Conductance	38	39	41	uS/cm	1	Cond.Meter Siebold
Residue Filterable 1.0u (TDS)	46	46	50	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	17.8	18.3	18.6	mg/L	0.5	Automated Electrometer
Carbonate	< 0.5	< 0.5	< 0.5	mg/L		Calculated Result
Bicarbonate	21.7	22.3	22.7	mg/L		Calculated Result
Hydroxide	< 0.5	< 0.5	< 0.5	mg/L		Calculated Result
Organic Nitrogen - Total	< 0.04	< 0.04	0.12	mg/L		Calculated Result
Total Kjeldahl Nitrogen	< 0.04	< 0.04	0.12	mg/L	0.04	HgSO4 Dig.Auto.Colour.
Total Nitrogen	< 0.06	< 0.06	0.14	mg/L		Calculated Result
Ammonia Nitrogen	0.006	0.009	< 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	0.005	0.005	0.013	mg/L	0.003	Dig.Auto.Ascorbic Acid
Phosphorus - Total	0.007	0.01	0.022	mg/L	0.003	Pres.Dig.Auto.Ascorbic A

7.2 Water Chemistry

Results of the general chemistry and metals analyses are given in Table 4 and Table 6. Lake water was moderately turbid at time of survey. Chisholm Lake is neutral with very low specific conductance and filterable residue. Phosphorus and nitrogen concentrations imply oligotrophy and the estimated N : P ratio (Table 5) was less than 9 : 1, indicating either phosphorus or nitrogen could be limiting primary productivity. Chlorophyll *a* concentration in the surface water suggested low phytoplankton standing crop at time of survey.

Table 5. Estimated nitrogen : phosphorus ratio, and chlorophyll *a* concentration for surface water samples from Chisholm 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 *a*	1.6	ug/L	0.5	Spectrophotometer
Nitrogen - Total	< 0.06	mg/L		Calculated result
Phosphorus - Total	0.007	mg/L	0.003	Pres. Dig. Auto Ascorbic Acid
N : P RATIO	< 9 : 1			Calculated result (total N / total P)

Table 6. Metals concentrations estimated by Zenon Laboratories. Sample collection is described in the caption to Table 4. All metals aliquots were fixed immediately after collection with 1 ml HNO_3 and subjected to HNO_3 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	13:30	13:25	13:20	h	-	-
Depth	0.5	10.0	22.0	m	-	-
Silver	< 0.03	< 0.03	< 0.03	mg/L	0.03	ICAP 61E
Aluminum	0.07	0.09	0.15	mg/L	0.06	ICAP 61E
Arsenic	< 0.04	< 0.04	< 0.04	mg/L	0.04	ICAP 61E
Boron	< 0.04	< 0.04	< 0.04	mg/L	0.04	ICAP 61E
Barium	0.004	0.005	0.006	mg/L	0.001	ICAP 61E
Beryllium	< 0.001	< 0.001	< 0.001	mg/L	0.001	ICAP 61E
Bismuth	< 0.02	< 0.02	< 0.02	mg/L	0.02	ICAP 61E
Calcium	4.39	4.54	4.84	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	< 0.002	< 0.002	mg/L	0.002	ICAP 61E
Copper	< 0.002	< 0.002	< 0.002	mg/L	0.002	ICAP 61E
Iron	0.07	0.18	0.54	mg/L	0.05	ICAP 61E
Potassium	< 0.4	< 0.4	< 0.4	mg/L	0.4	ICAP 61E
Magnesium	1.07	1.09	1.18	mg/L	0.02	ICAP 61E
Manganese	0.006	0.016	0.079	mg/L	0.002	ICAP 61E
Molybdenum	< 0.004	< 0.004	< 0.004	mg/L	0.004	ICAP 61E
Sodium	1.7	1.7	1.9	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	0.4	0.4	0.4	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	2.7	3	3.3	mg/L	0.8	ICAP 61E
Tin	< 0.02	< 0.02	< 0.02	mg/L	0.02	ICAP 61E
Strontium	0.022	0.023	0.025	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	0.04	0.03	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 99 % of the lake surface is open water. *Nuphar polysepalum, Potamogeton epihydrus, P. gramineus, Hippuris vulgaris, Utricularia vulgaris Equisetum fluviatile, Carex* sp., and *Sparganium* sp. are present along the shoreline. Identification references used for aquatic plants are listed in Appendix A.

8.2 Zooplankton

The Chisholm Lake zooplankton community was numerically dominated by small cyclopoid copepods. *Holopedium* sp. were also present in the plankton. The zooplankton taxonomic composition and size structure was suggestive of intense planktivory by the lake's cutthroat trout.

Table 7. Zooplankton collected by horizontal tow of a 150 µ mesh conical plankton net, Chisholm Lake offshore, 1400 h on September 28, 1996. Net mouth diameter was 30 cm and net length was 1 m. Tow duration was 2.0 minutes, at velocity of 0.4 m/sec and depth between 0 m and 2 m.

Taxa	No. / L	Max (mm)	Mode (mm)
***Holopedium* sp.**	2.4	1.2	1.0
Cyclopoida	21.4	0.7	0.4
Nauplii	1.8	-	-

8.3 Waterfowl and Other Fauna

Mollusc shells were moderately abundant, and one live mollusc was collected and preserved. Evidence of moose activity was seen around the lake.

8.4 Summary of Rare and Endangered Species

No bull trout, tailed frogs or harlequin ducks were seen during the survey.

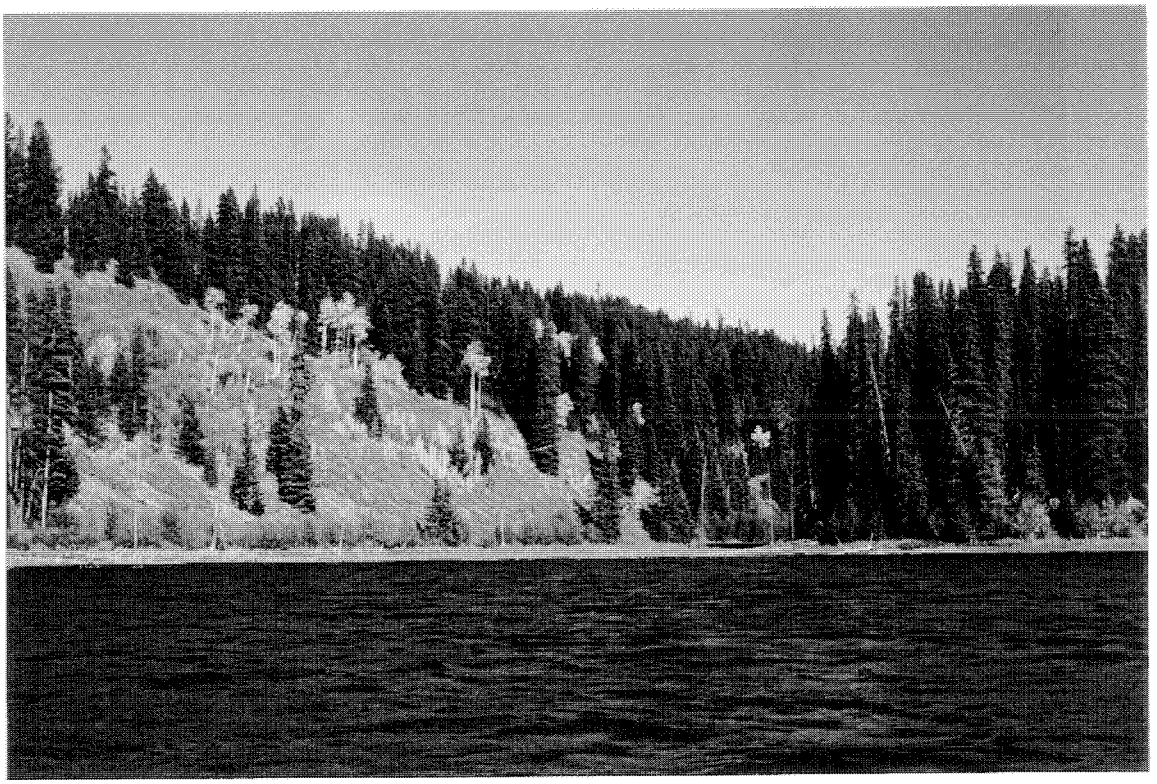
9. MANAGEMENT COMMENTS

Lack of far views, unremarkable surroundings and extensive nearby timber harvest create low to moderate aesthetic value for Chisholm Lake. The Chisholm Forest Service Road passes along the south shore of the lake and several cutblocks are visible from the lake surface. A campsite with a fire pit is located at the west end of the lake near where the road reaches the lakeshore.

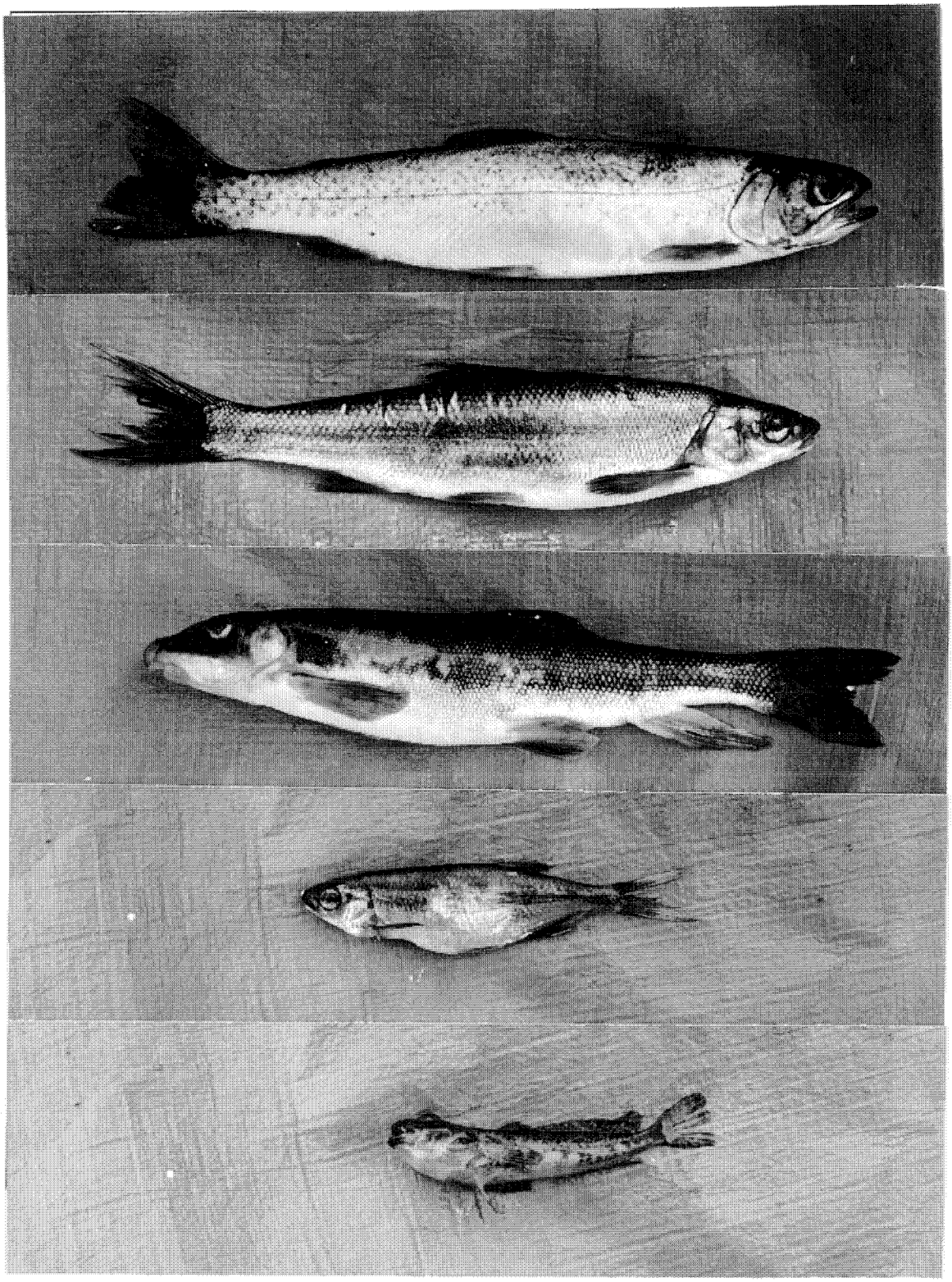
Chisholm Lake supports a relatively diverse fish community. High quality salmonid spawning and rearing habitat is available in Tagit Creek. Cutthroat trout are moderately abundant and in good condition, though not particularly large. Chisholm Lake is readily accessible via 2WD logging roads though the cutthroat trout would not attract many anglers as fish size is unremarkable. The presence of cutthroat trout in Chisholm Lake requires that its outlet and low gradient inlets be classified as fish bearing under the Forest Practices Code. Access management or special angling restrictions are not recommended for Chisholm Lake at this time.

10. PHOTOGRAPHS

Photograph 1. View west from east end of Chisholm Lake.



Photograph 2. View northeast, from north of large island in Chisholm Lake.

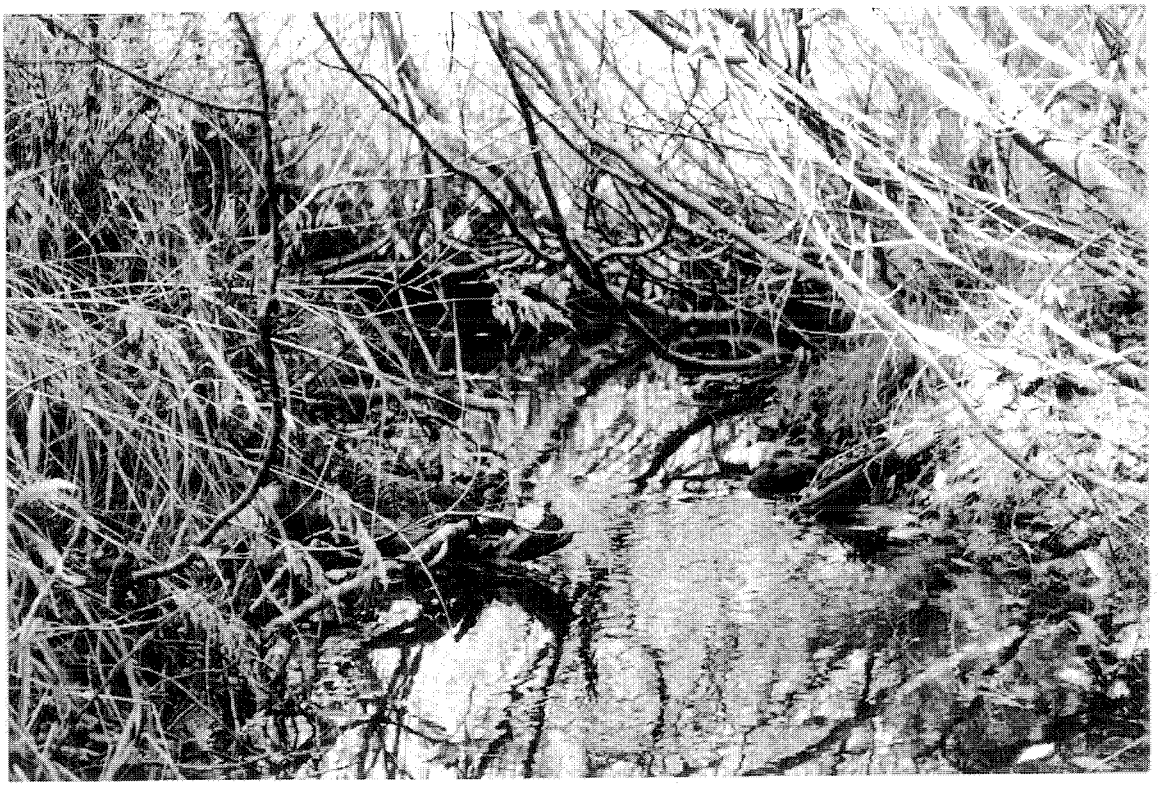


Photographs 3, 4, 5, 6 and 7. (cropped) Cutthroat trout, peamouth chub, longnose sucker, redside shiner, and prickly sculpin. Gillnet catch.

Photograph 8. Downstream view of Tagit Creek, C1, WC 460-6006-445, outlet of Chisholm Lake.

Photograph 9. Downstream view of Tagit Creek, C2, WC 460-6006-445, inlet to west shore of Chisholm Lake.

Photograph 10. Upstream view of C3, (WC pending) inlet to north shore of Chisholm Lake.



Photograph 11. Upstream view of C4, WC 460-6006-445-214, inlet to northeast shore of Chisholm 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

Fish growth rate and condition factor were estimated by methods detailed in:

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Canadian Bulletin of Fisheries and Aquatic Sciences No. 191.

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 9632 to Chisholm Lake 460-6006-445-01. This number appears in field notes and other contractor records associated with this survey.

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Tagit Creek **Watershed Code:** 460-6006-445-000-000-000-000-000-000-000-000-000

Stream Survey Report

Header Information

Stream Name: Tagit Creek
Stream "Local": Contractor Reference Number = 9632-C1/R1
Access: FT
Watershed Code: 460-6006-445-000-000-000-000-000-000-000-000-000
Reach No.: 1 **Reach Length (km):** **Method:**
Location: Outlet of Chisholm Lake
Map #: 93/L3 **Site No.:** 1 **Length surveyed (m):** 630.0 **Method:** HC
U.T.M. : 09.615950.6008017 **Fish Card:** N **Field:** Yes **Historical:** No
Date: 27/09/96 **Time:** 17:14 **Agency:** C58 **Survey Crew:** JD \ JL \ \ \ \ \ \ **Photos:** **Air Photos:**

Channel Characteristics

Av. Chan. Width (m):	11.2	**Method Av. Chan. Width (m):**	T
Av. Wet. Width (m):	9.6	**Method Av. Wet. Width (m):**	T
Av. Max. Rif. Depth (cm):		**Av. Max. Riffle Depth (cm):**	MS
Av. Max. Pool Depth (cm):	1	**Av. Max. Pool Depth (cm):**	
Gradient (%):	0.1	**Method Gradient:**	CL
% Pool: 100	**% Riffle:** 0	**% Run:** 0 **% Other:** 0	**Method:** GE
% Side Channel:	0-10	**Method Side Channel:**	GE
% Debris Area:	0-10	**Method Debris Area:**	GE

Specific Data

12.6	12.6	12.0	9.7	10.3	10.1
11.2	11.1	10.8	7.9	8.7	8.1

Cover

Cover Total % :	30	**Method Cover Total %:**	GE				
Dp Pool : 0	**L.O.D.:** 0	**Boulder:** 0	**In Veg.:** 100	**Over Veg:** 0	**Cutbank:**	0	
Crown Closure % :	0	**Method Crown Closure:**	GE	**Aspect :** SW	**Method Aspect:**		GE

Discharge

Wetted Width (m) :	3.8	**Method Wetted Width (m) :**	T
Mean Depth (m) :	0.3	**Method Mean Depth (m) :**	MS
Mean Velocity (m/s) :	0.18	**Method Mean Velocity (m/s)**	F
Discharge (m3/s) :	0.21	**Method Discharge (m3/s) :**	F

Specific Data

0.0	0.3	0.3	0.5	0.5

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | (Bed Material)

Bed Material

% Fines (<2mm):	100	**% Fines (<2mm):**	100
% Gravels:	0	**Small (2-16mm):**	0
		Large (16-64mm):	0
% Larges:	0	**Small cobble (64-128mm):**	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	**% Bedrock:**	0
D90 (cm):		**Compaction:**	High

Banks

Height (m):		**% Unstable:**	0
Textures Fines:	Yes	**Gravel:** No **Larges:** No **Bedrock:**	No
Confinement:	5		
Valley: Chan. Ratio:	4		
Stage:	M		
Flood Signs Ht(m):		**Method Flood Signs:**	
Braided:	N	**Method Braided:**	
Bars (%):	10	**Method Bars:**	
pH:	7.5	**Method pH:**	
02 (ppm):		**Method Dissolved Oxygen:**	
Water Temp. (°C):	13.0	**Method Temperature:**	
Turb. (cm):		**Method Turbidity:**	
Cond. (µmhos):	36	**Method Conductivity:**	

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Tagit Creek **Watershed Code:**

Stream Survey Report

460-6006-445-000-000-000-000-000-000-000-000-000

Stream/Valley Cross-Section

Fish Summary

RSC	2	65 - 80	J	R			MT
WSU	1	70.0	J	R			MT

Obstructions

Comments

1 Discharge was estimated at the reach break (approx. 630 m d/s of the lake); d/s of the reach break (a very old, breached beaver dam), the channel contains some riffles with salmonid spawning habitat (gravel/cobble substrate, good flow) but the channel may be impounded again downstream (see air photo).

2 The channel showed very low but discernible flow throughout.

3 There are many species of lentic macrophytes growing in the channel : Nuphar polysepalum, Potemageton epihydrus, burr-reeds, Hippuris vulgaris.

4 The entire reach consists of one long continuous pool.

5 The minnow traps (3) were fished overnight (set: 1750, hauled the next day at 0915). Only one minnow trap (#3) yielded any fish: 2 RSC, and 1 WSU. Hundreds of RSC, between 50 - 90 cm, were visually observed in the channel.

6 All distances estimated by hip chain.

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Tagit Creek **Watershed Code:** 460-6006-445-000-000-000-000-000-000-000-000-000

Stream Survey Report

Header Information

Stream Name:	Tagit Creek	**Stream "Local":**	Contractor Reference Number = 9632-C2			**Access:**	FT
Watershed Code:	460-6006-445-000-000-000-000-000-000-000-000-000			**Reach No.:**	1	**Reach Length (km):**	**Method:**
Location:	Inlet to W shore of Chisholm Lake	**Map #:**	93/L3	**Site No.:**	1	**Length surveyed (m):** 500.0	**Method:** HC
		U.T.M. :	09.615875.6008234	**Fish Card:**	N	**Field:** Yes	**Historical:** No
Date: 28/09/96	**Time:** 10:07	**Agency:** C58	**Survey Crew:** JD \ JL\ \ \ \ \ \ \	**Photos:**		**Air Photos:**	

Channel Characteristics

				Specific Data					
Av. Chan. Width (m):	5.0	**Method Av. Chan. Width (m):**	MS	6.0	5.0	4.5	5.5	5.0	4.2
Av. Wet. Width (m):	3.0	**Method Av. Wet. Width (m):**	MS	2.9	3.5	2.8	2.2	3.3	3.1
Av. Max. Rif. Depth (cm):	11	**Av. Max. Riffle Depth (cm):**	MS	7	9	13	14	12	13
Av. Max. Pool Depth (cm):	58	**Av. Max. Pool Depth (cm):**	11	65	57	44	74	58	52
Gradient (%):	2.0	**Method Gradient:**	CL						
% Pool: 15	**% Riffle:** 40	**% Run:** 45	**% Other:** 0	**Method:** GE					
% Side Channel:	0-10	**Method Side Channel:**	GE						
% Debris Area:	0-10	**Method Debris Area:**	GE						

Cover

Cover Total % :	15	**Method Cover Total %:**	GE						
Dp Pool : 40	**L.O.D.:** 35	**Boulder:** 5	**In Veg.:** 0	**Over Veg:**	10	**Cutbank:**		10	
Crown Closure % :	45	**Method Crown Closure:**	GE	**Aspect :**	SE	**Method Aspect:**		GE	

Discharge

				Specific Data			
Wetted Width (m) :	2.4	**Method Wetted Width (m) :**	MS				
Mean Depth (m) :	0.2	**Method Mean Depth (m) :**	MS	0.2	0.2	0.2	0.2
Mean Velocity (m/s) :	0.25	**Method Mean Velocity (m/s)**	F				
Discharge (m3/s) :	0.12	**Method Discharge (m3/s) :**	F				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | (Bed Material)

Bed Material

% Fines (<2mm):	10	**% Fines (<2mm):**	10
% Gravels:	45	**Small (2-16mm):**	15
		Large (16-64mm):	30
% Larges:	45	**Small cobble (64-128mm):**	25
		Large cobble (128-256mm):	15
		Boulder cobble (>256mm):	5
% Bedrock:	0	**% Bedrock:**	0
D90 (cm):		**Compaction:**	Medium

Banks

Height (m):	0.7	**% Unstable:**	30
Textures Fines:	Yes	**Gravel:** Yes **Larges:** Yes	**Bedrock:** No
Confinement:	4		
Valley: Chan. Ratio:	3		
Stage:	M		
Flood Signs Ht(m):	1.3	**Method Flood Signs:**	
Braided:	N	**Method Braided:**	
Bars (%):	45	**Method Bars:**	
pH:	7.1	**Method pH:**	
02 (ppm):		**Method Dissolved Oxygen:**	
Water Temp. (°C):	7.7	**Method Temperature:**	
Turb. (cm):		**Method Turbidity:**	
Cond. (µmhos):	50	**Method Conductivity:**	

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Tagit Creek **Watershed Code:** 460-6006-445-000-000-000-000-000-000-000-000-000

Stream Survey Report

Stream/Valley Cross-Section

Fish Summary

CT	2	70 - 110	J	R			MT
CT	20	35.0	E	R			VO

Obstructions

Comments

1 All minnow traps (3) set @ 1900, hauled @ 1005 the next day; traps yielded two (2) CT, ranging from 70 - 110 mm.

2 The channel offers very good salmonid spawning potential, and fair to good rearing potential.

3 In many places, bank height on both sides of the channel is greater than 1.5 m. Site location: 200 m u/s of Chisholm Lake.

4 All distances estimated by hip chain.

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed

Stream Survey Report

Header Information

Stream Name: Unnamed **Stream "Local":** Contractor Reference Number = 9632-C3/R1 **Access:** FT

Watershed Code: Pending **Reach No.:** 1 **Reach Length (km):** **Method:**

Location: Inflow to N shore of Chisholm Lake **Map #:** 93/L3 **Site No.:** 1 **Length surveyed (m):** 45.0 **Method:** HC

U.T.M. : 09.616350.6008775 **Fish Card:** N **Field:** Yes **Historical:** No

Date: 28/09/96 **Time:** 15:10 **Agency:** C58 **Survey Crew:** JD \ JL\ \ \ \ \ \ \ **Photos:** **Air Photos:**

Channel Characteristics

				Specific Data					
Av. Chan. Width (m):	1.0	**Method Av. Chan. Width (m):**	MS	0.8	0.9	1.2	1.2	1.1	1.0
Av. Wet. Width (m):	1.0	**Method Av. Wet. Width (m):**	MS	0.7	0.9	1.1	1.2	1.0	1.0
Av. Max. Rif. Depth (cm):	4	**Av. Max. Riffle Depth (cm):**	MS	6	2	3	5	2	
Av. Max. Pool Depth (cm):	17	**Av. Max. Pool Depth (cm):**	4	20	17	17	20	13	
Gradient (%):	2.5	**Method Gradient:**	CL						
% Pool: 5	**% Riffle:** 15	**% Run:** 80	**% Other:** 0	**Method:** GE					
% Side Channel:	0	**Method Side Channel:**	GE						
% Debris Area:	0-10	**Method Debris Area:**	GE						

Cover

Cover Total % : 10 **Method Cover Total %:** GE

Dp Pool : 50 **L.O.D.:** 40 **Boulder:** 0 **In Veg.:** 10 **Over Veg:** 0 **Cutbank:** 0

Crown Closure % : 0 **Method Crown Closure:** GE **Aspect :** S **Method Aspect:** GE

Discharge

				Specific Data			
Wetted Width (m) :	0.3	**Method Wetted Width (m) :**	MS				
Mean Depth (m) :	0.1	**Method Mean Depth (m) :**	MS	0.1	0.1	0.1	0.0
Mean Velocity (m/s) :	0.25	**Method Mean Velocity (m/s)**	F				
Discharge (m3/s) :	0.01	**Method Discharge (m3/s) :**	F				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | **(Bed Material)**

Bed Material

% Fines (<2mm):	100	**% Fines (<2mm):**	100
% Gravels:	0	**Small (2-16mm):**	0
		Large (16-64mm):	0
% Larges:	0	**Small cobble (64-128mm):**	0
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	**% Bedrock:**	0
D90 (cm):		**Compaction:**	High

Banks

Height (m):	0.1	**% Unstable:**	0				
Textures Fines:	Yes	**Gravel:**	No	**Larges:**	No	**Bedrock:**	No
Confinement:	5						
Valley: Chan. Ratio:	4						
Stage:	M						
Flood Signs Ht(m):	0.08	**Method Flood Signs:**					
Braided:	N	**Method Braided:**					
Bars (%):	5	**Method Bars:**					
pH:	7.3	**Method pH:**					
02 (ppm):		**Method Dissolved Oxygen:**					
Water Temp. (°C):	10.8	**Method Temperature:**					
Turb. (cm):		**Method Turbidity:**					
Cond. (µmhos):	75	**Method Conductivity:**					

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed

Stream Survey Report

Stream/Valley Cross-Section

Fish Summary

CT	1	25.0	F				DN

Obstructions

Comments

1 The channel traverses a muddy wetland which was formerly flooded by Chisholm Lake; the reach break is at 45 m u/s of the lake; the site location was at 30 m u/s of the lake.

2 The total length of the channel surveyed (R1 and R2) was 113 m. At 62 m u/s of the lake, the channel descends a 15 m section with a gradient of 42%, which would not be passable to fish. At 113 m u/s of the lake, a 1.5 m high beaver dam impounds a pond, with flow that goes over and then through the dam; this would not likely be passable to fish.

3 All distances estimated by hip chain.

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed

Stream Survey Report

Header Information

Stream Name:	Unnamed	**Stream "Local":**	Contractor Reference Number = 9632-C3/R2			**Access:**	FT
Watershed Code:	Pending			**Reach No.:**	1	**Reach Length (km):**	**Method:**
Location:	Inflow to N shore of Chisholm Lake	**Map #:**	93/L3	**Site No.:**	1	**Length surveyed (m):**	68.0 **Method:** HC
		U.T.M. :	09.616350.6008775	**Fish Card:**	N	**Field:** Yes	**Historical:** No
Date: 28/09/96	**Time:** 15:26	**Agency:** C58	**Survey Crew:** JD \ JL\ \ \ \ \ \ \	**Photos:**		**Air Photos:**	

Channel Characteristics

				Specific Data					
Av. Chan. Width (m):	0.8	**Method Av. Chan. Width (m):**	MS	1.0	0.9	0.7	0.8	0.5	1.2
Av. Wet. Width (m):	0.7	**Method Av. Wet. Width (m):**	MS	1.0	0.9	0.2	0.5	0.3	1.1
Av. Max. Rif. Depth (cm):	4	**Av. Max. Riffle Depth (cm):**	MS	3	5	3	4		
Av. Max. Pool Depth (cm):	14	**Av. Max. Pool Depth (cm):**	4	13	16	15	11		
Gradient (%):	7.0	**Method Gradient:**	CL						
% Pool: 40	**% Riffle:** 10	**% Run:** 50	**% Other:** 0	**Method:** GE					
% Side Channel:	0-10	**Method Side Channel:**	GE						
% Debris Area:	10-40	**Method Debris Area:**	GE						

Cover

Cover Total % :	15	**Method Cover Total %:**	GE				
Dp Pool : 100	**L.O.D.:** 0	**Boulder:** 0	**In Veg.:** 0	**Over Veg:** 0	**Cutbank:**	0	
Crown Closure % :	60	**Method Crown Closure:**	GE	**Aspect :** S	**Method Aspect:**	GE	

Discharge

				Specific Data			
Wetted Width (m) :	0.3	**Method Wetted Width (m) :**	MS				
Mean Depth (m) :	0.1	**Method Mean Depth (m) :**	MS	0.1	0.1	0.1	0.0
Mean Velocity (m/s) :	0.25	**Method Mean Velocity (m/s)**	F				
Discharge (m3/s) :	0.01	**Method Discharge (m3/s) :**	F				

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | (Bed Material)

Bed Material

% Fines (<2mm):	5	**% Fines (<2mm):**	5
% Gravels:	20	**Small (2-16mm):**	10
		Large (16-64mm):	10
% Larges:	70	**Small cobble (64-128mm):**	20
		Large cobble (128-256mm):	40
		Boulder cobble (>256mm):	10
% Bedrock:	5	**% Bedrock:**	5
D90 (cm):		**Compaction:**	Medium

Banks

Height (m):	0.1	**% Unstable:**					0
Textures Fines:	Yes	**Gravel:** No	**Larges:** No	**Bedrock:**	No		
Confinement:	3						
Valley: Chan. Ratio:	3						
Stage:	M						
Flood Signs Ht(m):		**Method Flood Signs:**					
Braided:	N	**Method Braided:**					
Bars (%):	35	**Method Bars:**					
pH:	7.3	**Method pH:**					
02 (ppm):		**Method Dissolved Oxygen:**					
Water Temp. (°C):	10.8	**Method Temperature:**					
Turb. (cm):		**Method Turbidity:**					
Cond. (µmhos):	75	**Method Conductivity:**					

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed

Stream Survey Report

Stream/Valley Cross-Section

Fish Summary

Species	Number	Size Range (mm)					
CT	2	25 - 30	F				VO

Obstructions

Comments

1 The reach starts at 45 m u/s from the lake; the site location was at 55 m u/s of the lake.

2 The total length of the channel surveyed (R1 and R2) was 113 m.

3 This reach consists of a series of stepped pools.

4 All distances estimated by hip chain.

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed **Watershed Code:** 460-6006-445-214-000-000-000-000-000-000-000

Stream Survey Report

Header Information

Stream Name:	Unnamed	**Stream "Local":**	Contractor Reference Number = 9632-C4			**Access:**	FT
Watershed Code:	460-6006-445-214-000-000-000-000-000-000-000			**Reach No.:**	1	**Reach Length (km):**	**Method:**
Location:	Inflow of Chisholm Lake	**Map #:**	93/L3	**Site No.:**	1	**Length surveyed (m):** 350.0	**Method:** HC
		U.T.M.:	09.617300.6008325	**Fish Card:**	N	**Field:** Yes	**Historical:** No
Date: 28/09/96	**Time:** 16:27	**Agency:** C58	**Survey Crew:** JD \ JL\ \ \ \ \ \ \	**Photos:**		**Air Photos:**	

Channel Characteristics

				Specific Data					
Av. Chan. Width (m):	1.9	**Method Av. Chan. Width (m):**	MS	1.3	1.2	1.4	2.0	3.1	2.2
Av. Wet. Width (m):	1.2	**Method Av. Wet. Width (m):**	MS	1.2	1.2	1.4	1.1	1.2	1.3
Av. Max. Rif. Depth (cm):	5	**Av. Max. Riffle Depth (cm):**	MS	4	6	4			
Av. Max. Pool Depth (cm):	38	**Av. Max. Pool Depth (cm):**	5	15	28	37	47	41	60
Gradient (%):	0.5	**Method Gradient:**	CL						
% Pool: 85	**% Riffle:** 5	**% Run:** 10	**% Other:** 0	**Method:** GE					
% Side Channel:	0-10	**Method Side Channel:**	GE						
% Debris Area:	>40	**Method Debris Area:**	GE						

Cover

Cover Total % :		**Method Cover Total %:**					
Dp Pool :	**L.O.D.:**	**Boulder:**	**In Veg.:**	**Over Veg:**		**Cutbank:**	
Crown Closure % :	35	**Method Crown Closure:**	GE	**Aspect :**	E	**Method Aspect:**	GE

Discharge

				Specific Data		
Wetted Width (m) :	0.5	**Method Wetted Width (m) :**	MS			
Mean Depth (m) :	0.1	**Method Mean Depth (m) :**	MS	0.1	0.1	0.1
Mean Velocity (m/s) :	0.25	**Method Mean Velocity (m/s)**	F			
Discharge (m3/s) :	0.01	**Method Discharge (m3/s) :**	F			

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope) | **(Bed Material)**

Bed Material

% Fines (<2mm):	85	**% Fines (<2mm):**	85
% Gravels:	10	**Small (2-16mm):**	5
		Large (16-64mm):	5
% Larges:	5	**Small cobble (64-128mm):**	5
		Large cobble (128-256mm):	0
		Boulder cobble (>256mm):	0
% Bedrock:	0	**% Bedrock:**	0
D90 (cm):		**Compaction:**	Medium

Banks

Height (m):	0.3	**% Unstable:**	0
Textures Fines:	Yes	**Gravel:** No **Larges:** No **Bedrock:**	No
Confinement:	6		
Valley: Chan. Ratio:	5		
Stage:	M		
Flood Signs Ht(m):	0.26	**Method Flood Signs:**	
Braided:	N	**Method Braided:**	
Bars (%):	45	**Method Bars:**	
pH:	7.1	**Method pH:**	
02 (ppm):		**Method Dissolved Oxygen:**	
Water Temp. (°C):	7.7	**Method Temperature:**	
Turb. (cm):		**Method Turbidity:**	
Cond. (µmhos):	47	**Method Conductivity:**	

DFO/MoELP Stream Survey Form

05-Apr-97 **Stream:** Unnamed **Watershed Code:** 460-6006-445-214-000-000-000-000-000-000-000-000

Stream Survey Report

Stream/Valley Cross-Section

Fish Summary

CT	2	25 - 30	F				VO

Obstructions

1	BD	105.0

Comments

1 Much of the channel is stagnant, or has very little discernible flow, as well as being somewhat impounded.

2 Site location: 220 m u/s of Chisholm Lake.

3 All distances estimated by hip chain.

APPENDIX C. FISH SAMPLING FORMS

FISH COLLECTION METHOD INFORMATION

Card 1 of 1

Date (yy/mm/dd):	96/09/26	Agency:	C58	Crew:	JD / JL
Gazetted Name:	Chisholm	Alias:	N/A	UTM:	09.615950.6008017
Lake/Stream/Wetland	Lake	Location:		Source:	NAD 27
Sequence No.	01	Weather:			
Watershed code:	460-6006-445	Reach #:			

Date (yy/mm/dd)	Sample Site No.	Pass # or trap/net #	Capture Method	Time In (24 hr clock)	Time Out (24 hr clock)	Sampling time (min)	Depth (m)
96/09/26		1	MT	1835	1805	1410	1.5
96/09/26		2	MT	1842	1801	1399	1.0
96/09/26		3	MT	1902	1810	1388	0.3
96/09/26		1	GN (S)	1925	0715	710	0 -12
96/09/26		1	GN (F)	1940	0730	710	0-2.4
96/09/26		4	MT	1944	1637	1253	1.5
96/09/26		5	MT	1947	1630	1243	0.5

Comments : All gear fished over one night. Date recorded is date of set. Both gillnets set with small mesh inshore.

FISH COLLECTION DATA FORM
VERSION : LENGTH-ONLY

Card 1 of 1

Date (yy/mm/dd):	96/09/27	Agency:	CS8	Crew:	JD / JL
Gazetted Name:	Chisholm	Alias:	N/A	UTM:	09.615950.6008017
Lake/Stream/Wetland	Lake	Location:		Source:	NAD 27
Sequence No.	01	Weather:	cloudy/rain		
Watershed code:	460-6006-445	Reach #:			

Area sampled: (m2)				Air tmp : (C)			Wtr tmp : (C)			EC : (ms/cm)			
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)
	GN (F)	1	PMC	173	186	177	202	201	180	196	182	183	199
	GN (F)	1	PMC	165	165	166	182	164	195	194	168	202	141
	GN (F)	1	PMC	187	189	176	189	194	188	180	159	193	185
	GN (F)	1	PMC	185	204	193	182	196	189	192	195	196	160
	GN (F)	1	PMC	168	181	207	180	170					
	GN (S)	1	LSU	164	159	213	235	210	115	124	236	155	159
	GN (S)	1	LSU	163									
	GN (S)	1	PMC	129	180	184	132	130	145	143	181	195	136
	GN (S)	1	LSU	124	147	129	169	160					
	GN (S)	1	CAS	96	87								
	GN (S)	1	RSC	103	105	95							
	GN (S)	1	CT	221	251	260	230	232	252	251	139	132	137
	GN (S)	1	CT	188	197	135	143	123	136				
	GN (F)	1	CT	205	199	187	203	187	206	155	232	205	152
	GN (F)	1	CT	234	235	216	250	220	218	234	193	212	238
	GN (F)	1	CT	210	215	226	205	227	202	217	217	205	193
	GN (F)	1	CT	201	202	186	192	190	204	193	200	203	185
	GN (F)	1	CT	147	149	155	146	138					
	MT	2	CAS	50	70	80							
	MT	3	RSC	30	50								
	MT	4	RSC	50									
	MT	4	CT	100									
	MT	5	RSC	30									
	MT	5	CAS	55									

FISH COLLECTION DATA FORM

Card 1 of 1

Date (yy/mm/dd):	96/09/27	Agency:	C58	Crew:	JD / JL
Gazetted Name:	Chisholm	Alias:	N/A	UTM:	09.615950.6008017
Lake/Stream/Wetland	Lake	Location:		Source:	NAD 27
Sequence No.	01	Weather:	cloudy/rain		
Watershed code:	460-6006-445	Reach #:			

Area sampled: (m2)			Air tmp: (C)				Wtr tmp : (C)		EC : (ms/cm)		
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex (code)	Maturity (code)	Activity (code)	Comments
	GN (S)	1	CT	N/A	279	173	1	R	M	MT	Age 5+
	GN (S)	1	CT	N/A	234	119	2	R	F	MT	Age 4+
	GN (S)	1	CT	N/A	254	134	3	R	F	MT	Age 3+
	GN (S)	1	CT	N/A	238	124	4	R	M	M	Age 2+
	GN (S)	1	CT	N/A	197	74	5	R	F	IM	Age 2+
	GN (S)	1	CT	N/A	136	28	6	R	M	IM	Age 2+
	GN (S)	1	CT	N/A	145	32	7	R	M	IM	Age 2+
	GN (S)	1	CT	N/A	126	21	8	R	M	IM	Age 2+
	GN (F)	1	CT	N/A	158	40	9	R	F	IM	Age 2+
	GN (F)	1	CT	N/A	137	28	10	R	M	IM	Age 2+
	GN (F)	1	CT	N/A	162	41	11	R	F	IM	Age 2+
	GN (F)	1	CT	N/A	158	39	12	R	M	IM	Age 3+
	GN (F)	1	CT	N/A	178	58	13	R	M	IM	Age 3+
	GN (F)	1	CT	N/A	195	71	14	R	F	IM	Age 3+
	GN (F)	1	CT	N/A	189	76	15	R	M	IM	Age 4+
	GN (F)	1	CT	N/A	190	65	16	R	M	IM	
	GN (F)	1	CT	N/A	173	48	17	R	F	IM	Age 2+
	GN (F)	1	CT	N/A	193	67	18	R	F	IM	Age 3+
	GN (F)	1	CT	N/A	202	80	19	R	F	IM	Age 2+
	GN (F)	1	CT	N/A	211	96	20	R	F	MT	Age 5+
	GN (F)	1	CT	N/A	253	139	21	R	F	MT	Age 4+
	GN (F)	1	CT	N/A	233	122	22	R	F	MT	Age 3+
	GN (F)	1	CT	N/A	218	100	23	R	M	MT	Age 2+
	GN (F)	1	CT	N/A	239	131	24	R	M	MT	Age 4+
	GN (F)	1	CT	N/A	221	102	25	R	F	MT	Age 3+
	GN (F)	1	CT	N/A	223	105	26	R	F	MT	Age 3+
	GN (F)	1	CT	N/A	203	80	27	R	M	IM	Age 4+
	GN (F)	1	CT	N/A	223	105	28	R	M	IM	Age 3+
	GN (F)	1	CT	N/A	216	101	29	R	F	MT	Age 3+
	GN (F)	1	CT	N/A	206	82	30	R	M	MT	Age 3+
	GN (F)	1	CT	N/A	222	111	31	R	M	MT	Age 3+

FISH CAPTURE RESULTS

Card 1 of 1

Date (yy/mm/dd):	96/09/27	Agency:	C58	Crew:	JD / JL
Gazetted Name:	Chisholm	Alias:	N/A	UTM:	09.615950.6008017
Watershed code:	460-6006-445	Seq. No.	01	Source:	NAD 27

Date (yy/mm/dd)	Capture Method	Trap or Net #	Species code	Number captured	Number sampled	Comments
96/09/27	GN (F)	1	PMC	45	45	
96/09/27	GN (F)	1	CT	68	23	
96/09/27	GN (S)	1	CT	24	8	
96/09/27	GN (S)	1	LSU	11	11	
96/09/27	GN (S)	1	PMC	15	15	
96/09/27	GN (S)	1	CAS	2	2	
96/09/27	GN (S)	1	RSC	3	3	
96/09/27	MT	1	-	0		
96/09/27	MT	2	CAS	3		
96/09/27	MT	3	RSC	2		
96/09/27	MT	4	RSC	1		
96/09/27	MT	4	CT	1		
96/09/27	MT	5	RSC	1		
96/09/27	MT	5	CAS	1		

Comments Date recorded is date of retrieval. Both gillnets set with small mesh inshore.

APPENDIX D. LIMNOLOGICAL SAMPLING FORMS

Lake Biophysical Data Form

Date (yy/mm/dd):	96/09/28		Crew:	JD / JL	
Site ID					
Watershed code:	460-6006-445		Sequence No.:		01
Gazetted name:	Chisholm		Alias:		N/A
FW Region:	06		UTM : Zone		09
Management Unit:	09		Easting		615950
NTS Map No.:	93L/3		Northing		6008017
			Source		Watershed Atlas
Biophysical					
Biogeo Zone	SBS-mc2				
Benchmark (Y/N)	Y				
Benchmark details:	see report				
Nutrient Status					
SEAM No.:	E223805	Limno Station No:	01		
Secchi depth (m)	3.8	H2S (mg/l)	0		
Other samples taken:	Zooplankton	H2S comments	no odour		
		TDS method	lab		
		DO method	YSI 57		
		TEMP method	YSI 57		
		Alkalinity	lab		
Field Conditions					
wind velocity (km/h)	20 -25	wind direction:	W	air temp. (c):	10.5
cloud cover (/10 O.C.)	3.5	surface condition:	choppy	water colour:	v. light yellow
Development					
MOF rec sites (Y/N)	N	Resort cmpsts (Y/N)	N	Residences (Y/N)	N
MOF campsites (Y/N)	N	Resorts (Y/N)	N	Co. Rec facilities	N
Parks campgrds (Y/N)	N	Resort cabins (Y/N)	N		
Recreation					
ROS	3	Biophys features:		Biophys sub-feat.:	
Inlets/Outlets	see Stream Survey Card for mandatory fields				
Biological					
Fish Card attached (Y/N)	Y		Fish. Man. Com.	See report	
Wildlife:	See report		Reptiles:	See report	
Aquatic birds:	See report		Invertebrates:	See report	
Amphibians:	See report		Aquatic Plants:	See report	
Comments:					
Water samples:	22.0 m @ 1320		Chlorophyll-a: 1 L. filtered		
	10.0 m @ 1325				
	0.0 m @ 1330				
Zooplankton: horizontal tow for 2 min @ 0.4 m/s @ 1400; 150 um mesh, 30 cm diameter mesh					

Lake Survey Profile Data

Sequence number: 01 Date : 96/09/28 (yy/mm/dd) Time: 13:15 (hhmm)

Limnology station: 01

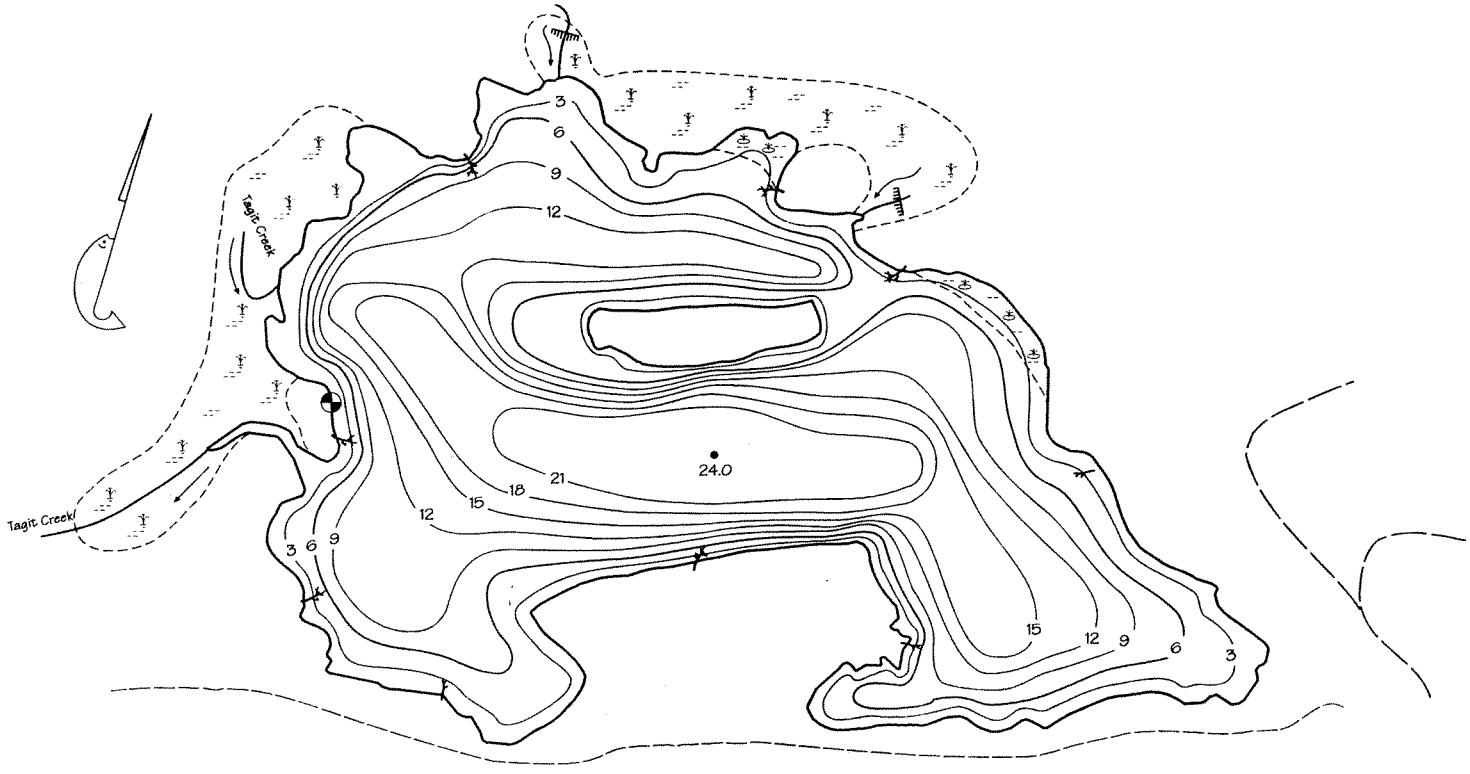
Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
surface	9.65	11.6		
0.5				
1.0	9.65	11.5		
1.5				
2.0	9.60	11.4		
2.5				
3.0	9.60	11.2		
3.5				
4.0	9.55	11.2		
4.5				
5.0	9.55	11.2		
5.5				
6.0	9.45	11.1		
6.5				
7.0	8.90	10.5		
7.5				
8.0	7.80	9.8		
8.5				
9.0	6.20	8.5		
9.5				
10.0	5.55	7.2		
10.5				
11.0	5.30	6.6		
11.5				
12.0	5.15	6.3		
12.5				
13.0	5.05	6.2		
13.5				
14.0	5.05	6.1		
14.5				
15.0				
15.5				
16.0	4.95	5.9		
16.5				
17.0				
17.5				
18.0	4.70	5.9		
18.5				
19.0				
19.5				
20.0	4.05	5.8		

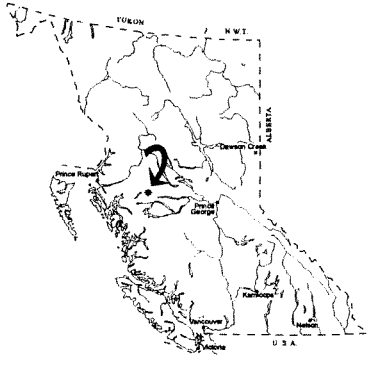
Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
20.5				
21.0				
21.5				
22.0	3.70	5.7		
22.5				
23.0				
23.5				
24.0				
24.5				
25.0				
25.5				
26.0				
26.5				
27.0				
27.5				
28.0				
28.5				
29.0				
29.5				
30.0				
30.5				
31.0				
31.5				
32.0				
32.5				
33.0				
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
9632 - 1	3	cutthroat trout, gillnet catch
9632 - 2	4	peamouth chub, gillnet catch
9632 - 3	5	longnose sucker, gillnet catch
9632 - 4	6	redside shiner, gillnet catch
9632 - 5	7	prickly sculpin, gillnet catch
9632 - 6	8	Tagit Creek (C1), WC 460-6006-445 outlet of Chisholm Lake; downstream view, 200 m downstream of the lake
9632 - 7		start of a 180° clockwise panorama of the E end of Chisholm Lake, taken from the far E bay, view to the S
9632 - 8	1	panorama continued, view to the W
9632 - 9		panorama continued, view to the N
9632 - 10		start of a 180° clockwise panorama of the W end of Chisholm Lake, taken from just S of the W end of the large island, view to the SSW
9632 - 11		panorama continued, view to the SW
9632 - 12		panorama continued, view to the W
9632 - 13		panorama continued, view to the NW
9632 - 14		panorama continued, view to the N
9632 - 15		panorama continued, view to the NNE
9632 - 16		Tagit Creek (C2), WC 460-6006-445 inlet to Chisholm Lake; upstream view, 250 m upstream of the lake
9632 - 17		Tagit Creek (C2), WC 460-6006-445 inlet to Chisholm Lake; upstream view, 250 m upstream of the lake
9632 - 18	9	Tagit Creek (C2), WC 460-6006-445 inlet to Chisholm Lake; downstream view, 250 m upstream of the lake
9632 - 19		start of a 180° clockwise panorama, taken from the mouth of Tagit Creek (C2), WC 460-6006-445 view to the N
9632 - 20		panorama continued, view to the NE
9632 - 21		panorama continued, view to the SE
9632 - 22		panorama continued, view to the S
9632 - 23		unnamed channel C3, (WC pending), inlet to the N shore of Chisholm Lake; view of barrier, 65 m upstream of the lake
9632 - 24	10	unnamed channel C3/R1, WC, inlet to the N shore of Chisholm Lake; 35 m upstream of the lake
9632 - 25		unnamed channel C3/R2, WC, inlet to the N shore of Chisholm Lake; 50 m upstream of the lake
9632 - 26		start of a 90° clockwise panorama of the NE shore of Chisholm Lake, taken from the lake's surface between the N shore and the large island, view to the N
9632 - 27	2	panorama continued, view to the NNE
9632 - 28		panorama continued, view to the NE
9632 - 29		panorama continued, view to the ENE
9632 - 30		panorama continued, view to the E
9632 - 31	11	unnamed channel C4, WC 460-6006-445-214, inlet to the NE shore of Chisholm Lake

APPENDIX F. BATHYMETRIC MAP





Reduced to

33%

of Original Size

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

SURVEYED BY: J. DEGISI / J. LEOPKEY DATE: AUG 26-28, 1996
OUTLINE SOURCE: Air Photo 30BCC94067:180,181 (JULY 1994)

PREPARED FOR: Fisheries Branch, Ministry of Environment, Lands and Parks BY Joseph S. DeGisi, Smithers, British Columbia

Elevation	757	m. ±
Surface Area	1 217 839	sq.m.
Area above 6m. contour	445 672	sq.m.
Volume	10 662 410	cu.m.
Mean Depth	9.2	m.
Maximum Depth	24.0	m.
Perimeter, Main Shore	7 213	m.
Perimeter, Islands	935	m.
Bench Mark	2.4	m.

CHISOHLM LAKE

DEPTHS IN METRES

WATERSHED CODE 460-60000-44E-01		UTM COORDINATE 09 615950 6008017
MU 08-09	PLOT DATE MARCH 31, 1997	SCALE 1:4500
DIGITIZED CompuGrid	REVISION DATE	
CONTOURS J J J	APPROVED	NTS NO 93 L/03
TECH. CHECK		

APPENDIX G. WATER CHEMISTRY ANALYSIS BY ZENON LABORATORIES

ZENON LABORATORIES
A division of PHILIP Analytical Services Corp.

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

12-Oct-96
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ZENON LABORATORIES
Certificate of Analysis

Reported To :

JOSEPH S. DEGISI Client Code DJ

R.R.#1, SITE 27, C2
SMITHERS, B.C.
V0J 2N0

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

Project Information :

Project ID : CHISHOLM LAKE
Submitted By : JOE DEGISI

Requisition Forms :

Form 06111173 logged on 30-Sep-96 completed on 12-Oct-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

ZENON LABORATORIES
A division of PHILIP Analytical Services Corp.

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ANALYTICAL REPORT
Form 06111173

Client : JOSEPH S. DEGISI
Project : CHISHOLM LAKE

Sparcode	Parameter	Unit	MDC	Zenon ID : / Client ID : METHOD BLANK	96027737 CHISHOLM LAKE 22.0m	96027738 CHISHOLM LAKE 10.0m	96027738 Duplicate
PHYSICAL							
00041220	pH	pH units	0.1	n/a	6.9	7.0	---
00111160	Specific Conductance	uS/cm	1	< 1	41	39	---
007H1033	Residue Filterable 1.0u (TDS)	mg/L	4	6	50	46	---
GENERAL INORGANICS							
01011211	Alkalinity Phen. 8.3	mg/L	0.5	< 0.5	< 0.5	< 0.5	---
01021210	Alkalinity Total 4.5	mg/L	0.5	1.9	18.6	18.3	---
CO3-CALC	Carbonate	mg/L			< 0.5	< 0.5	
HCO3CALC	Bicarbonate	mg/L			22.7	22.3	
OH--CALC	Hydroxide	mg/L			< 0.5	< 0.5	
NITROGEN							
0112CALC	Organic Nitrogen - Total	mg/L			0.12	< 0.04	
0113136A	Total Kjeldahl Nitrogen	mg/L	0.04	< 0.04	0.12	< 0.04	---
0114CALC	Total Nitrogen	mg/L			0.14	< 0.06	
11081351	Ammonia Nitrogen	mg/L	0.005	< 0.005	< 0.005	0.009	0.009
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	
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	< 0.003	0.013	0.005	---
P--T139A	Phosphorus - Total	mg/L	0.003	< 0.003	0.022	0.010	---
METALS TOTAL							
Ag-T0042	Silver	mg/L	0.03	< 0.03	< 0.03	< 0.03	---
Al-T0042	Aluminum	mg/L	0.06	< 0.06	0.15	0.09	---
As-T0042	Arsenic	mg/L	0.04	< 0.04	< 0.04	< 0.04	---
B--T0042	Boron	mg/L	0.04	< 0.04	< 0.04	< 0.04	---
Ba-T0042	Barium	mg/L	0.001	< 0.001	0.006	0.005	---
Be-T0042	Beryllium	mg/L	0.001	< 0.001	< 0.001	< 0.001	---
Bi-T0042	Bismuth	mg/L	0.02	< 0.02	< 0.02	< 0.02	---
Ca-T0042	Calcium	mg/L	0.05	< 0.05	4.84	4.54	---
Cd-T0042	Cadmium	mg/L	0.002	< 0.002	< 0.002	< 0.002	---
Co-T0042	Cobalt	mg/L	0.004	< 0.004	< 0.004	< 0.004	---
Cr-T0042	Chromium	mg/L	0.002	0.003	< 0.002	< 0.002	---
Cu-T0042	Copper	mg/L	0.002	< 0.002	< 0.002	< 0.002	---
Fe-T0042	Iron	mg/L	0.05	< 0.05	0.54	0.18	---
				Matrix :	Fresh Water	Fresh Water	
				Sampled on:	96/09/28 13:20	96/09/28 13:25	

ZENON LABORATORIES
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ANALYTICAL REPORT
Form 06111173

Client : JOSEPH S. DEGISI
Project : CHISHOLM LAKE

		Zenon ID :	METHOD	96027737	96027738	96027738
		Client ID :	BLANK	CHISHOLM LAKE 22.0m	CHISHOLM LAKE 10.0m	Duplicate
Sparcode	**Parameter**	**Unit**	**MDC**			
K_T0042	Potassium	mg/L	0.4	< 0.4	< 0.4	< 0.4	---
Mg-T0042	Magnesium	mg/L	0.02	< 0.02	1.18	1.09	---
Mn-T0042	Manganese	mg/L	0.002	< 0.002	0.079	0.016	---
Mo-T0042	Molybdenum	mg/L	0.004	< 0.004	< 0.004	< 0.004	---
Na_T0042	Sodium	mg/L	0.4	< 0.4	1.9	1.7	---
Ni-T0042	Nickel	mg/L	0.01	< 0.01	< 0.01	< 0.01	---
P_T0042	Phosphorus	mg/L	0.04	< 0.04	< 0.04	< 0.04	---
Pb-T0042	Lead	mg/L	0.03	< 0.03	< 0.03	< 0.03	---
S_T0042	Sulphur	mg/L	0.1	< 0.1	0.4	0.4	---
Sb-T0042	Antimony	mg/L	0.02	< 0.02	< 0.02	< 0.02	---
Se-T0042	Selenium	mg/L	0.03	< 0.03	< 0.03	< 0.03	---
Si-T0042	Silicon	mg/L	0.8	< 0.8	3.3	3.0	---
Sn-T0042	Tin	mg/L	0.02	< 0.02	< 0.02	< 0.02	---
Sr-T0042	Strontium	mg/L	0.001	< 0.001	0.025	0.023	---
Te-T0042	Tellurium	mg/L	0.02	< 0.02	< 0.02	< 0.02	---
Ti-T0042	Titanium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---
Tl-T0042	Thallium	mg/L	0.03	< 0.03	< 0.03	< 0.03	---
V-T0042	Vanadium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---
Zn-T0042	Zinc	mg/L	0.01	< 0.01	0.01	0.03	---
Zr-T0042	Zirconium	mg/L	0.003	< 0.003	< 0.003	< 0.003	---
		Matrix :		Fresh Water	Fresh Water	
		Sampled on:		96/09/28 13:20	96/09/28 13:25	

ZENON LABORATORIES
A division of PHILIP Analytical Services Corp.

12-Oct-96
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ANALYTICAL REPORT
Form 06111173

Client : JOSEPH S. DEGISI
Project : CHISHOLM LAKE

			Zenon ID :		METHOD	96027739	96027739
			Client ID :		BLANK	CHISHOLM LAKE 0.0m	Duplicate
Sparcode	**Parameter**	**Unit**	**MDC**				
PHYSICAL							
00041220	pH	pH units	0.1	=		7.4	---
00111160	Specific Conductance	uS/cm	1	=		38	---
007H1033	Residue Filterable 1.0u (TDS)	mg/L	4	=		46	---
GENERAL INORGANICS							
01011211	Alkalinity Phen. 8.3	mg/L	0.5	=		< 0.5	---
01021210	Alkalinity Total 4.5	mg/L	0.5	=		17.8	---
CO3-CALC	Carbonate	mg/L				< 0.5	
HCO3CALC	Bicarbonate	mg/L				21.7	
OH--CALC	Hydroxide	mg/L				< 0.5	
NITROGEN							
0112CALC	Organic Nitrogen - Total	mg/L				< 0.04	
0113136A	Total Kjeldahl Nitrogen	mg/L	0.04	=		< 0.04	< 0.04
0114CALC	Total Nitrogen	mg/L				< 0.06	
11081351	Ammonia Nitrogen	mg/L	0.005	=		0.006	---
11091350	Nitrate+Nitrite (N)	mg/L	0.02	=		< 0.02	---
1110CALC	Nitrate Nitrogen Dissolved	mg/L				< 0.02	
11111354	Nitrite Nitrogen	mg/L	0.005	=		< 0.005	---
PHOSPHORUS							
P--D1390	Phosphorus Total Dissolved	mg/L	0.003	=		0.005	---
P--T139A	Phosphorus - Total	mg/L	0.003	=		0.007	---
METALS TOTAL							
Ag-T0042	Silver	mg/L	0.03	=		< 0.03	---
Al-T0042	Aluminum	mg/L	0.06	=		0.07	---
As-T0042	Arsenic	mg/L	0.04	=		< 0.04	---
B--T0042	Boron	mg/L	0.04	=		< 0.04	---
Ba-T0042	Barium	mg/L	0.001	=		0.004	---
Be-T0042	Beryllium	mg/L	0.001	=		< 0.001	---
Bi-T0042	Bismuth	mg/L	0.02	=		< 0.02	---
Ca-T0042	Calcium	mg/L	0.05	=		4.39	---
Cd-T0042	Cadmium	mg/L	0.002	=		< 0.002	---
Co-T0042	Cobalt	mg/L	0.004	=		< 0.004	---
Cr-T0042	Chromium	mg/L	0.002	=		< 0.002	---
Cu-T0042	Copper	mg/L	0.002	=		< 0.002	---
Fe-T0042	Iron	mg/L	0.05	=		0.07	---

Matrix : Fresh Water
Sampled on: 96/09/28 13:30

ZENON LABORATORIES
A division of PHILIP Analytical Services Corp.

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ANALYTICAL REPORT
Form 06111173

Client : JOSEPH S. DEGISI
Project : CHISHOLM LAKE

			Zenon ID :	METHOD	96027739	96027739
			Client ID :	BLANK	CHISHOLM LAKE 0.0m	Duplicate
Sparcode	**Parameter**	**Unit**	**MDC**			
K_T0042	Potassium	mg/L	0.4	=	< 0.4	---
Mg-T0042	Magnesium	mg/L	0.02	=	1.07	---
Mn-T0042	Manganese	mg/L	0.002	=	0.006	---
Mo-T0042	Molybdenum	mg/L	0.004	=	< 0.004	---
Na_T0042	Sodium	mg/L	0.4	=	1.7	---
Ni-T0042	Nickel	mg/L	0.01	=	< 0.01	---
P_T0042	Phosphorus	mg/L	0.04	=	< 0.04	---
Pb-T0042	Lead	mg/L	0.03	=	< 0.03	---
S_T0042	Sulphur	mg/L	0.1	=	0.4	---
Sb-T0042	Antimony	mg/L	0.02	=	< 0.02	---
Se-T0042	Selenium	mg/L	0.03	=	< 0.03	---
Si-T0042	Silicon	mg/L	0.8	=	2.7	---
Sn-T0042	Tin	mg/L	0.02	=	< 0.02	---
Sr-T0042	Strontium	mg/L	0.001	=	0.022	---
Te-T0042	Tellurium	mg/L	0.02	=	< 0.02	---
Ti-T0042	Titanium	mg/L	0.003	=	< 0.003	---
Tl-T0042	Thallium	mg/L	0.03	=	< 0.03	---
V--T0042	Vanadium	mg/L	0.003	=	< 0.003	---
Zn-T0042	Zinc	mg/L	0.01	=	0.04	---
Zr-T0042	Zirconium	mg/L	0.003	=	< 0.003	---
GENERAL BIOLOGY						
01431810	Chlorophyll A	ug/L	0.5	n/a	1.6	---

Matrix : Fresh Water
Sampled on: 96/09/28 13:30

ZENON LABORATORIES
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SPIKE SUMMARY
Form 06111173

Parameter	Client ID	Zenon ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Residue Filterable 1.0u (TDS)	Blank Spike. Batch :	64403096	6	118	100	mg/L	112
Nitrite Nitrogen	Blank Spike. Batch :	64101075	< 0.005	0.107	.1	mg/L	105
Nitrate+Nitrite (N)	Blank Spike. Batch :	64101075	< 0.02	0.41	.4	mg/L	104
Ammonia Nitrogen	Blank Spike. Batch :	64101075	< 0.005	0.097	.1	mg/L	94
Nitrite Nitrogen	CHISHOLM LAKE 10.0m	96027738	< 0.005	0.098	.1	mg/L	96
Nitrate+Nitrite (N)	CHISHOLM LAKE 10.0m	96027738	< 0.02	0.38	.4	mg/L	95
Ammonia Nitrogen	CHISHOLM LAKE 10.0m	96027738	0.009	0.105	.1	mg/L	96

ZENON LABORATORIES
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12-Oct-96
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ANALYSIS DATES
Form 06111173

	Zenon ID:	96027737	96027738	96027739
	Client ID:	CHISHOLM LAKE 22.0m	CHISHOLM LAKE 10.0m	CHISHOLM LAKE 0.0m
00041220	pH	03-OCT-1996	03-OCT-1996	03-OCT-1996
00111160	Specific Conductance	03-OCT-1996	03-OCT-1996	03-OCT-1996
007H1033	Residue Filterable 1.0u (TDS)	11-OCT-1996	11-OCT-1996	11-OCT-1996
01011211	Alkalinity Phen. 8.3	03-OCT-1996	03-OCT-1996	03-OCT-1996
01021210	Alkalinity Total 4.5	03-OCT-1996	03-OCT-1996	03-OCT-1996
0113136A	Total Kjeldahl Nitrogen	08-OCT-1996	08-OCT-1996	08-OCT-1996
11081351	Ammonia Nitrogen	03-OCT-1996	03-OCT-1996	03-OCT-1996
11091350	Nitrate+Nitrite (N)	03-OCT-1996	03-OCT-1996	03-OCT-1996
11111354	Nitrite Nitrogen	03-OCT-1996	03-OCT-1996	03-OCT-1996
P--D1390	Phosphorus Total Dissolved	09-OCT-1996	09-OCT-1996	09-OCT-1996
P--T139A	Phosphorus - Total	09-OCT-1996	09-OCT-1996	09-OCT-1996
MET-F	Metals ICP Water Total	03-OCT-1996	03-OCT-1996	03-OCT-1996
01431810	Chlorophyll A	---	---	04-OCT-1996
	Matrix:	Fresh Water	Fresh Water	Fresh Water
	Sampled on:	28-SEP-1996	28-SEP-1996	28-SEP-1996

Zenon Environmental Laboratories Inc.
8577 Commerce Court
Burnaby, B.C. V5A 4N5
Phone: (604) 444-4808
Fax: (604) 444-4511

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

6111173

PAGE 1 OF 1

COMPANY NAME: JOSEPH S. DEGISI
PH. #: 604. 847. 3575
FAX #: 604. 847. 2957
COMPANY ADDRESS: RR#1 SITE 27 C2 SMITHERS, BC V0J 2N0
SITE LOCATION AND/OR NUMBER: Chisholm Lake
CLIENT PROJECT ID: (#)
(NAME)
SAMPLER NAME (PRINT): JOE DE GISI
PROJECT MANAGER:

FIELD SAMPLE ID	ZENON LAB # (Lab Use Only)	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	# CONTAINERS	SAMPLING: DATE	SAMPLING: TIME	HEADSPACE VAPOUR
Chisholm Lake 22m	27737	X			3	28 Sept 96	1320	
Chisholm Lake 10m	27738	X			3	28 Sept 96	1325	
Chisholm Lake 0.0m	27739	X			3	28 Sept 96	1330	
Chisholm Lake 0.0m				X	1	28 Sept 96	1330	

ANALYSIS REQUEST

FIELD SAMPLE ID	PCDD/PCDF LOW RES MS__ HIGH RES MS__	PULP & PAPER CHLOROPHENOLICS	RESIN ACIDS	CHLOROPHENOLS (TRI, TETRA & PENTA)	POLYCHLORINATED BIPHENYLS (PCB's)	DIAGNOSTIC PESTICIDE SCAN	PHENOXY ACID HERBICIDES	SEMI-VOLATILE ORGANICS (BNA's)	VOLATILE ORGANICS (VOC's)	PAH'S LEVEL A__ LEVEL B__ LEVEL C__	BTEX LEVEL A__ LEVEL B__ LEVEL C__	BTEX / LH LEVEL A__ LEVEL B__ LEVEL C__	TEH LEVEL A__ LEVEL B__ LEVEL C__	MINERAL OIL & GREASE GRAV__ IR__	TOTAL METALS LEVEL A__ LEVEL B__ LEVEL C__	DISSOLVED METALS LEVEL A__ LEVEL B__	ICAP METALS TOTAL X DISSOLVED__	LOW LEVEL As & Se TOTAL__ DISSOLVED__	MERCURY TOTAL__ DISSOLVED__	pH / CONDUCTIVITY / ALKALINITY	TSS (NFR)__ TDS (FR) X TS__	TOTAL KJELDAHL NITROGEN (TKN)	NITRATE / NITRITE / AMMONIA	PHOSPHORUS TOTAL X ORTHO__	CHLORIDE__ FLUORIDE__ SULPHATE__	BOD__ COD__	CYANIDE SAD__ WAD__	PHENOLICS - 4-AAP	COLIFORM FECAL__ TOTAL__	TOTAL DISSOLVED PHOSPHORUS	Chlorophyll-a Volumetric 1.0 L
Chisholm Lake 22m																	X			X	X	X	X	X						X	
Chisholm Lake 10m																	X			X	X	X	X	X						X	
Chisholm Lake 0.0m																	X			X	X	X	X	X						X	
Chisholm Lake 0.0m																															X

TAT
Urgent (72 hr)* ____
Rush (1 week)* ____
Regular (2 weeks) X
Other ____
* Surcharge May Apply

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE

SPECIAL REPORTING OR BILLING INSTRUCTIONS
EDT ☐

LAB USE ONLY
CLIENT CODE DJ
ADDRESS CODE
PROJECT MANAGER
QUOTE NUMBER
ADDITIONAL SPARCODES
LAB INFORMATION
OCT 15 COB

CUSTODY RECORD

RELINQUISHED BY SAMPLER: JOE DE GISI	DATE 29 - Sept -96	TIME 1300	RECEIVED BY: Greyhound
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE Sept 30/96	TIME 3:48	RECEIVED BY LABORATORY:

55

Chisholm Lake 460-6006-445-01

APPENDIX H. ORIGINAL FIELD NOTES

Reconnaissance Lake Inventory Field Notes

Gazetted Name : Chisholm

Alias : N/A

Location and Access

Watershed code (including sequence no.) :

UTM (with source) :

N.T.S. map no. : 93 L/03

SEAM site no. : E 223805

Forest District : Morice

Drainage : Tagit C → Morice R →

Accessed by 2WD road from Houston (town)

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

@ 0Km turned onto Morice River FSR from highway 16
@ 27.5 Km turned right (W) onto Morice West FSR
@ 29.5 Km turned right (N) onto Chisholm FSR
@ 56.7 Km - turnoff on left (N) side into pullout (gravel pit) short road leads to lakeshore

Lake pullout is just past km marker 30 on the Chisholm Main - these km markers apply to the "new" Chisholm main and not the old chisholm main - (above distances follow the "old" (southern) Chisholm rn.

Physical Data and Sources

Elevation _____ m

Elevation Source _____

Sounding Device Lowrance X15A

Contractor lake reference number: 9632

Lake name Chisholm

Benchmark

The benchmark was established in a 53 cm dbh lodgepole pine located 8 m from shore, on the point of land between where Taart C enters the lake and exits the lake (see line drawing)

An iron spike was placed in an orange circle painted on the tree trunk, 2.4 m above the current lake level. The high water mark was located 0.10 m above the current lake level.

benchmark : 50 cm above ground.

Terrain and Vegetation

Immediate shore

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

- shoreline substrates are generally cobble, some gravels
- immediate shoreline vegetated by grasses in a 5-10 m band, followed by a one-plant layer of alders, then mature forest
- sweepers abundant but not a shoreline access problem in most places

Surrounding country

(terrain; forest cover; cliffs / rock outcrops / meadows; mountains or other visible features)

- terrain near the lake is composed of short steep ridges, hills - hence, complex shore and islands
- forest cover: mostly fir/spruce to S, mostly lodgepole pine to N
- mid distant views to N, E and W of moderately steep larger hills, generally forested, but with occasional rock outcrops and glades

- distant views of Nadina Mtn to the E from some vantage points, also of Howson Range to the WNW (from the E end of the lake)

Aquatic macrophytes

(types, relative abundance, location of beds)

N. polysepalum, P. epihydrus, P. gramineus

Hippuris vulgaris, Utricularia sp.

Equisetum, Carex (burr reeds - collected for I.D.)

Contractor lake reference number: 9632

Lake name Chisholm

Development and Land Use

Campsites or cabins

No cabins were found at the lake. Only at the west end of the lake, where road access reaches the lakeshore, was any evidence of prior camping (camp fire pits) seen.

Timber harvest

(*locations visible from lake; along inlets or outlet*)

The Chisholm Forest Service Road passes along the south shore of the lake, at 50-100 m from the lake in many places. The road cut, and vehicles travelling on the road, are visible from most vantage points on the lake surface.

- cutblock (new, at time of survey) visible to E of E end of lake, (visible from W end of lake)
- cutblock to SW of W end of lake (greening up) visible @ 1-2 km distant, from W end of lake

Mining claims, trapping or other human activity

No mining claims or other evidence of mining or trapping were seen by the survey crew.

Obstructions and pollutions

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

The outlet of Chisholm Lake (Tagit Creek) was highly impounded by beavers in the recent past, though the dams near the lake have been breached. All of the channels entering Chisholm Lake showed evidence of having been impounded, and several large lodges (abandoned) exist around the lakeshore. No sign of current beaver activity was seen; the area appears to have been free of beavers for at least several years and most dams near the lake have breached.

Comments, including fish population / angling quality

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

Mollusc shells moderately abundant; one live adult collected and preserved. Much evidence of moose activity.

The lake level appears to have risen ~1.5 m and then dropped to the current level, over the last several decades, judging by the shoreline which displays a wide grassy area which has not yet been colonized by alders but which contains some dead rooted alder remains and dead standing timber. Lake level changes certainly due to beaver activity followed by dam breaching on the outlet channel.

Contractor lake reference number: 96-2

Lake Biophysical Data Form

Date (yy/mm/dd): 96/09/28 Crew: JD/JL

Site ID

Watershed code: Sequence No.: 01

Gazetted name: Chisholm Alias:

FW Region: 06 UTM (Zone, Easting, Northing):

Management Unit: NTS Map No.:

Biophysical

Biogeo Zone

Benchmark (Y/N): Y

Benchmark details:

Nutrient Status

SEAM No.: E 223805

Secchi depth (m): 3.75

Other samples taken: Zooplankton

Limno Station No:	01		
H2S (mg/l)	0		
H2S comments	no odor		
TDS method	— (lab)		
DO method	YSI 57		
TEMP method	YSI 57		
Alkalinity	(lab)		

Field Conditions

wind velocity (km/h): 20-25 wind direction: W air temp. (c): 10.5

cloud cover (/10 O.C.): 3.5 surface condition: choppy water colour: V. light yellow

Development

MOF rec sites (Y/N): N Resort cmpsts (Y/N): N Residences (Y/N): 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: Invertebrates:

Amphibians: Aquatic Plants:

Comments:

Water samples: 22.0 m @ 1320 Chlorophyll-a: 1.0 L filtered

10.0 m @ 1325

0.0 m @ 1330

Zooplankton: horizontal trawl for 2 min @ 0.4 m/s; 150 µm mesh, 30 cm net diameter

↳ @ 1400

Zenon Reg. # 6111173

10.30 11.20 11.20

.92 .92 .92

2060 2240 2240

92700 100800 102600

0.40

7.15 | 30.0

286

7.4

10.2

7.15

9632

Lake Survey Profile Data

Sequence number: 01

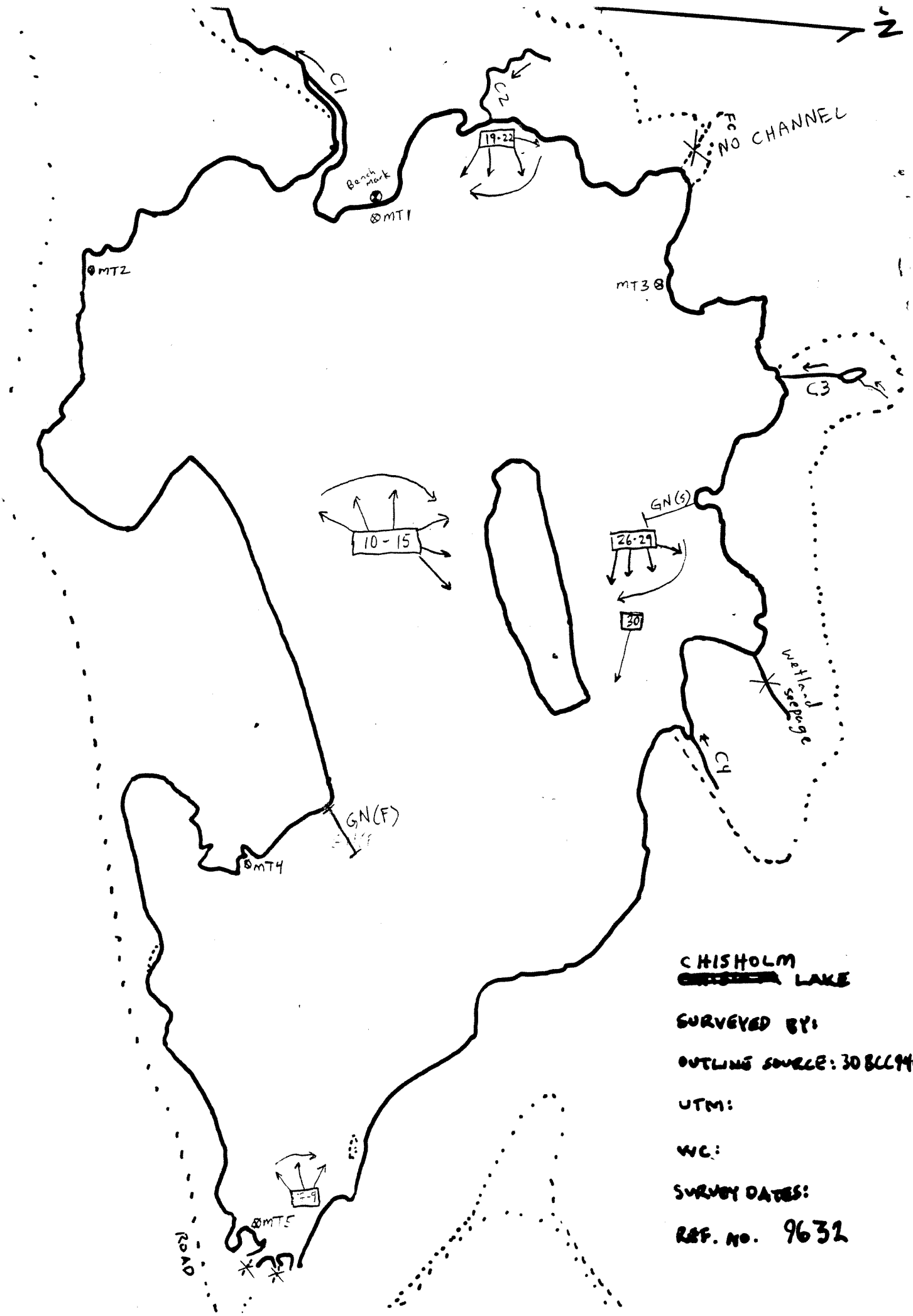
Date : 96/09/28 Q1253 (yy/mm/dd)

Limnology station: 01

Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
surface	9.65	11.6		
0.5				
1.0	9.65	11.5		
1.5				
2.0	9.6	11.4		
2.5				
3.0	9.6	11.2		
3.5				
4.0	9.55	11.2		
4.5				
5.0	9.55	11.2		
5.5				
6.0	9.45	11.1		
6.5				
7.0	8.9	10.5		
7.5				
8.0	7.8	9.8		
8.5				
9.0	6.2	8.5		
9.5				
10.0	5.55	7.2		
10.5				
11.0	5.3	6.6		
11.5				
12.0	5.15	6.3		
12.5				
13.0	5.05	6.2		
13.5				
14.0	5.05	6.1		
14.5				
15.0				
15.5				
16.0	4.95	5.9		
16.5				
17.0				
17.5				
18.0	4.7	5.9		
18.5				
19.0				
19.5				
20.0	4.05	5.8		

Depth (m)	D.O. (mg/l)	Temp (c)	TDS (ppm)	Conduct. (umhos/cm)
20.5				
21.0				
21.5				
22.0	3.7	5.7		
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				

9632



CHISHOLM
[redacted] LAKE

SURVEYED BY:

OUTLINE SOURCE: 30BCC94OLW 1:[illegible]

UTM:

WC:

SURVEY DATES:

REF. NO. 9632

DFO / MOE

STREAM SURVEY FORM

Stream Name (gaz)	Tagit C	(local)						Access		Method	
Watershed Code					Reach No.	1		Lngth(km)			
Location	outlet of Chisholm Lake				Site	1		Elev(m)	630		
				U.T.M.				Legal	Y (N)	C	
Date YMD	960927	Time	1714	Crew	CS8	Camera	JD/JL	Photos	yes	AirPhotos	

C	PARAMETER	VALUE	METH	SPECIFIC DATA
	Ave. Chan. Width (m)		T	12.6, 12.6, 12, 9.7, 10.3, 10.1
	Ave. Wet Width (m)		T	11.2, 11.1, 10.8, 7.9, 8.7, 8.1
	Ave.Max.Riffle Depth (cm)	N/A		
4	Ave.Max.Pool Depth (cm)	1.0	MS	
2	Gradient %	<0.1	GE	
	Class 100			
	Side Chan.%			
	Debris Area%			
	Debris Stable%	100		
	COVER: Total%	30		

3	Comp.	Dp.Pool	L.O.D.	Boulder	InVeg	OverVeg	Cutbank
	sum 100%	0	0	0	100	0	0

Crown Closure %	0	C	Aspect	SW	

C	BED MATERIAL	%
	clay,silt,sand (<2mm)	100
	small (2-16mm)	0
	large (16-64mm)	0
	sm. cobble (64-128mm)	0
	lge. cobble (128-256mm)	0
	boulder(>256mm)	0

D90(cm) | C | Compaction (L) M H

C	BANKS				
	Height(m)		%Unstable	0	
	Texture	(F) G L R			
	Confinement	EN CO FC OC (CC) N/A			
	Valley:Channel Ratio	0-2 2-5 5-10 (10+) N/A			
	Stage	Dry L (M) H Flood			
	Flood Signs Ht(m)	—	Braided	Y (N)	
	Bars (%)	10	pH	7.5	O_2 (ppm) —
	WaterTemp(C)	13	Turb(cm)	—	Cond(25C) 36

C	OBSERVATIONS			
	C	Elem	Type	Loc'n
		N/A	—	—

DISCHARGE

1	Parameter	Value	Method	Specific Data
	Wetted Width (m)	3.75	T	
	Mean Depth (m)		MS	0, 0.02, 0.33, 0.34, 0.45, 0.46, 0.33, 0.20
	Mean Velocity (m/s)	0.10	F	
	Discharge (m3/s)			

REACH SYMBOL (Fish)

(Width:Valley/Channel.Slope) | BedMaterial

FISH SUMMARY

C	Species	No.	Size Range(mm)	Life Stage	Use	Method
5	RSC	100s	50 - 90	JUV	R	VO
	RSC	2	65 - 80	JUV	R	MT
	WSU	1	70	JUV	R	MT

STREAM/VALLEY CROSS-SECTION ☐ (Looking Downstream) L R

PLANIMETRIC VIEW ☐

COMMENTS

Channel Stability ☐ Debris ☐ Management Concerns ☐ Obstructions ☐ Riparian Zone ☐ Valley Wall Processes ☐ Etc.

MT (3) set: 1750, hauled 0915

site locn: 200 m d/s of Chisholm Lake

MT1: Ø MT2: Ø MT3: 2 RSC, 1 WSU

1 discharge estimated at reach break

2 channel/stream showed very low but discernible current throughout

3 many species of lentic macrophytes growing in channel: Nuphar polysepalum, Potamogeton epihydrus, burr-reeds, Hippuris vulgaris

4 entire reach consists of one long continuous pool ☹

distances: hipchain estimated

Edited by:

Date YMD

Reach break @ 630 m d/s of Chisholm Lake – breached BD (very old)

Downstream of the reach break, channel contains some riffles with salmonid spawning habitat (gravel/cobble, good flow) but the channel may be impounded again further downstream (see air photo)

9632-C1/R1

DFO / MOE

STREAM SURVEY FORM

Stream Name (gaz): Tag it Creek (local):

Watershed Code:

Location: inlet to Chisholm Lake, west shore

Date Y M D: 96 09 28 Time: 1007 Observer: CSB / JD/JL Photos: AirPhotos:

Access: Method:

UTM No.: 1 Length(km):

UTM Sq.: 1 Distance: 500

U.T.M.: Y (N) E Fish: X Bird:

C	PARAMETER	VALUE	METH	SPECIFIC DATA
	Ave.Channel Width (m)		MS	6, 5, 4.5, 5.5, 5, 4.2, 4.4
	Ave. Wet Width (m)		MS	2.9, 3.5, 2.8, 2.2, 3.3, 3.1, 2.9
	Ave.Max.Riffle Depth (cm)		MS	7, 9, 13, 14, 12, 13, 9
	Ave.Max.Pool Depth (cm)		MS	65, 57, 44, 74, 58, 52
	Gradient %	2.0	C	
	% Pool: 15 Rif: 40 Rap: 45 Cascade: 0		GE	
	Side Chan.%		GE	
	Debris Area%		GE	
	Debris Stable%	65		
	COVER: Total%	15		

Comp.	Dp.Pool	L.O.D.	Boulder	InVeg	OverVeg	Cutbank
sum 100%	40	35	5	0	10	10

Crown Closure %: 45 Aspect: SE

BED MATERIAL

	%
clay,silt,sand (<2mm)	10
small (2-16mm)	15
large (16-64mm)	30
sm. cobble (64-128mm)	25
lge. cobble (128-256mm)	15
boulder(>256mm)	5
Bedrock	0

D90(cm): — Compaction: L (M) H

BANKS

Height(m): 0.7 %Unstable: 30

Texture: (F) G L R

Confinement: EN CO FC (GC) UC N/A

Valley:Channel Ratio: 0-2 2-5 (5-10) 10+ N/A

Dry L (M) H Flood

Flood Signs Ht(m): 1.3 Braided: Y (N)

Bars (%): 45 pH: 7.1 O_2 (ppm): —

WaterTemp(C): 7.7 Turb(cm): — Cond(25C): 50

Channel Cross-Sections: C | Form | Type | Loc'n — N/A —

DISCHARGE

Parameter	Value	Method	Specific Data
Wetted Width (m)	2.4	MS	
Mean Depth (m)		MS	0, 0.18, 0.23, 0.23, 0.20, 0
Mean Velocity (m/s)	0.25	F	
Discharge (m3/s)			

REACH SYMBOL

(Fish)

(Width:Valley/Channel.Slope) BedMaterial

FISH SUMMARY

C	Species	No.	Size Range(mm)	Life Stage	Use	Method
	CT	2	70-110	JUV	R	MT
	CT	20	35	ALE	R	VO

STREAM/VALLEY CROSS-SECTION ☐ (Looking Downstream) L R

PLANIMETRIC VIEW ☐

COMMENTS

Channel Stability ☐ Debris ☐ Management Concerns ☐ Obstructions ☐ Riparian Zone ☐ Valley Wall Processes ☐ Etc.

MT1: Set 1900 hauled 1005 : CTT 70 mm FL

MT2 Set 1900 hauled 1005 : CTT 110 mm FL

MT3 Set 1900 hauled 1005 : ∅

In many places, bank height on both sides of the channel is greater than 1.5 m

Site loc'n: 220 m u/s of Chisholm Lake

very good salmonid spawning, fair to good rearing

Edited by:

Date Y M D

All distances: hipchain estimate

9632-C2

DFO / MOE

STREAM SURVEY FORM

Stream Name (gaz)	C3/R1	(local)						Access		Method	
Watershed Code								Lngth(km)			
Location								Sketch		Transect	113
				U.T.M.				Specific	Y N	C	UTM Misc
Date Y M D	960920	Time	1510	Zone	CSS	Easting	JD/JL	Photos		AirPhotos	

C	PARAMETER	VALUE	METH
	Ave.Chan. Width(m)		MS
	Av. Wet Width (m)		MS
	Ave.Max.Riffle Depth (cm)		MS
	Ave.Max.Pool Depth (cm)		MS
	Gradient %	2.5	CL
	Aspect 5 Area% 15 Stable% 80 Debris 0		GE
	Side Chan.%		GE
	Area%		GE
	Debris Stable%	90	GE
	COVER: Total%	10	GE
	Comp. 50 Dp.Pool 40 L.O.D. Boulder InVeg 10 OverVeg Cutbank		GE
	Crown Closure % 0	C Aspect S	

C	SPECIFIC DATA
MS	0.75, 0.80, 1.2, 1.2, 1.1, 1.0, 0.85
MS	0.70, 0.90, 1.1, 1.3, 1.0, 1.0, 0.80
MS	6, 2, 3, 5, 2
MS	20, 17, 17, 20, 13

C	BED MATERIAL	%
	clay,silt,sand (<2mm)	100
	small (2-16mm)	0
	large (16-64mm)	0
	sm. cobble (64-128mm)	0
	lge. cobble (128-256mm)	0
	boulder(>256mm)	0
		0
	D90(cm) C Compaction L M H	

C	BANKS
	Height(m) .08 %Unstable 0
	Texture (F) G L R
	Confinement EN CO FC OC (UC) N/A
	Valley:Channel Ratio 0-2 2-5 5-10 (10+) N/A
	Flood Dry L (M) H Flood
	Flood Signs Ht(m) .08 Braided Y (N)
	Bars (%) 5 pH 7.3 O_2 (ppm)
	WaterTemp(C) 10.8 Turb(cm) Cond(25C) 74.5

DISCHARGE

Parameter	Value	Method	Specific Data
Wetted Width (m)	0.3	MS	0.30
Mean Depth (m)		MS	0.08, 0.08, 0.06, 0.03
Mean Velocity (m/s)	0.25	F	
Discharge (m3/s)			

REACH SYMBOL
(Fish)

(Width:Valley/Channel.Slope) BedMaterial

FISH SUMMARY

C	Species	No.	Size Range(mm)	Data Type	Use	Method
	CT	1	25	FRY		DN

STREAM/VALLEY CROSS-SECTION ☐
(Looking Downstream) L R

PLANIMETRIC VIEW ☐

COMMENTS

Channel Stability ☐ Debris ☐ Management Concerns ☐ Obstructions ☐ Riparian Zone ☐ Valley Wall Processes ☐ Etc.

This channel (reach) traverses a muddy wetland which was formerly flooded by Chisholm Lake

@ 62 m u/s of Chisholm Lake, the channel descends a section of gradient 42%, (length 15 m) which would not be passable to fish

@ 113 m u/s of Chisholm Lake, a beaver dam of height ~1.5 m impounds a pond; flow is over then through the dam; this would not likely be passable to fish

site loc'n: 30 m u/s from lake 9632 (Chisholm Lake)

Reach break @ 45 m u/s " " " " " "

Edited by:

Date Y M D

distances: hipchain

9632 C3/R1

DFO / MOE

STREAM SURVEY FORM

Stream Name (gaz) 9632 C3/R2 (local)

Watershed Code

Location inlet to Chisholm Lake

Date Y M D 96 09 28 Time 1526 C58 JD/JL Photos

Access Method 68

Lngth(km) Tributary of

U.T.M. Y N Large Small

AirPhotos

C	PARAMETER	VALUE	METH	SPECIFIC DATA
	Ave.Chan.Width(m)		MS	1, 0.9, 0.7, 0.8, 0.5, 1.2, 1.3,
	Ave.Wet Width(m)		MS	1, 0.9, 0.2, 0.5, 0.3, 1.1, 1.2,
	Ave.Max.Riffle Depth (cm)		MS	3, 5, 3, 4
	Ave.Max.Pool Depth (cm)		MS	13, 16, 15, 11
	Gradient%	7	CL	
	Map 40 Bkfl 10 Dis 50	0	GE	
	Side Chan.%		GE	
	Debris Area%		GE	
	Debris Stable%	90	GE	
	COVER: Total%	15	GE	

Comp.	Dp.Pool	L.O.D.	Boulder	InVeg	OverVeg	Cutbank
sum 100%	100	0	0	0	0	0

Crown Closure % 60 Aspect S

C	BED MATERIAL	%
	clay,silt,sand (<2mm)	5
	small (2-16mm)	10
	large (16-64mm)	10
	sm. cobble (64-128mm)	20
	lge. cobble (128-256mm)	40
	boulder(>256mm)	10
	Bedrock	5

D90(cm) Compaction L M H

C	BANKS			
	Height(m) 0.1	%Unstable 0		
	Texture F G L R			
	Confinement	EN CO FC OC UC N/A		
	Valley:Channel Ratio	0-2 2-4 4-10 10+ N/A		
	Shape	Dry L M H Flood		
	Flood Signs Ht(m)	Braided	Y N	
	Bars (%) 35	pH 7.3	O_2 (ppm)	
	WaterTemp(C) 10.6	Turb(cm)	Cond(25C) 74.5	

DISCHARGE

Parameter	Value	Method	Specific Data
Wetted Width (m)			
Mean Depth (m)			
Mean Velocity (m/s)			
Discharge (m3/s)			

REACH SYMBOL

(Fish)

(Width:Valley/Channel,Slope) BedMaterial

FISH SUMMARY

C	Species	No.	Size Range(mm)	Life Phase	Use	Method
	CT	2	25-30	FRY		VO

STREAM/VALLEY CROSS-SECTION ☐

(Looking Downstream) L R

PLANIMETRIC VIEW ☐

COMMENTS

Channel Stability ☐ Debris ☐ Management Concerns ☐ Obstructions ☐ Riparian Zone ☐ Valley Wall Processes ☐ Etc.

Reach starts @ 45m u/s from Chisholm Lake

Site loc'n @ 55m u/s from Chisholm

Reach is stepped pool scenario

Edited by:

Date Y M D

9632 - C3/R2

DFO / MOE

STREAM SURVEY FORM

Stream Name: (gaz) 9632 C4 (local) | Access | Method

Watershed Code | Reach # 1 | Length(km)

Location: Inlet to Chisholm Lake | Segment | Photos 1 | Distance 350

U.T.M. | Fish Y (N) C | Fish X | Habitat

Date (YMD): 960928 | Time: 1627 | Crew: CSS | Observer: JD/JL | Photos | AirPhotos

C	PARAMETER	VALUE	METH	SPECIFIC DATA
	Ave.Chan.Width(m)		MS	1.3, 1.2, 1.4, 2, 3.1, 2.2, 2.5
	Ave.Wet.Width(m)		MS	1.2, 1.2, 1.4, 1.1, 1.2, 1.3, 1.2
	Ave.Max.Riffle Depth (cm)		MS	4, 6, 4
	Ave.Max.Pool Depth (cm)		MS	15, 28, 32, 47, 41, 60
	Gradient%	<0.5	GE	
1	% RS	5 / 10 / 0	GE	
	Side Chan.%	X	GE	
	Debris Area%	X	GE	
	Debris Stable%	80	GE	
	COVER: Total%		GE	

Comp.	Dp.Pool	L.O.D.	Boulder	InVeg	OverVeg	Cutbank
sum 100%						

Crown Closure %	35	C	Aspect	EL	

C	BEDMATERIAL	%
	clay,silt,sand (<2mm)	85
	small (2-16mm)	5
	large (16-64mm)	5
	sm. cobble (64-128mm)	5
	lge. cobble (128-256mm)	0
	boulder(>256mm)	0
		0

D90(cm) | C | Compaction L (M) H

C	BANKS					
	Height(m)	0.76	%Unstable	0		
	Texture	(F) G L R				
	Confinement	EN	CO	FC	DC	UC (N/A)
	Valley:Channel Ratio	0-2	2-5	5-10	10+	(N/A)
	Shore	Dry	L	(M)	H	Flood
	Flood Signs Ht(m)	0.76	Braided		Y	(N)
	Bars (%)	45	pH	7.1	O_2 (ppm)	
	WaterTemp(C)	7.7	Turb(cm)		Cond(25C)	47.2

DISCHARGE

Parameter	Value	Method	Specific Data
Wetted Width (m)	0.50	MS	
Mean Depth (m)		MS	0, 0.08, 0.10, 0.08, 0
Mean Velocity (m/s)	0.25	F	
Discharge (m3/s)			

REACH SYMBOL

(Fish)

(Width:Valley/Channel.Slope) BedMaterial

FISH SUMMARY

C	Species	No.	Size Range(mm)	Life Stage	Use	Method
	CT	2	25-30	FRY	R	VO

STREAM/VALLEY CROSS-SECTION ☐ (Looking Downstream) L R

PLANIMETRIC VIEW ☐

COMMENTS

Channel Stability ☐ Debris ☐ Management Concerns ☐ Obstructions ☐ Riparian Zone ☐ Valley Wall Processes ☐ Etc.

1. Much of the channel is stagnant or has very little discernible flow - somewhat impounded site loc'n: 220 m u/s of Chisholm Lake

Edited by:

Date Y M D

9632 C4

FISH COLLECTION METHOD INFORMATION

Card 1 of 1

Date (yy/mm/dd):	96/09/26	Agency:	CS8	Crew:	JD/JL
Gazetted Name:	Chisholm	Alias:	N/A	UTM:	
Lake/Stream/Wetland		Location:		Datum:	
Sequence No.		Weather:			
Watershed code:		Reach #:			

Date (yy/mm/dd)	Sample Site No.	Pass # or trap/net #	Capture Method	Time In (24 hr clock)	Time Out (24 hr clock)	Sampling time (min)	Depth (m)	
		1	MT	1835	1805		1.5	macrophytes over fi
		2	MT	1842	1801		1.0	" " "
		3	MT	1902	1810		0.3	cobbles
		1	GN(S)	1925	0715		0-12	
		1	GN(F)	1940	0730		N/A	
		4	MT	1944	1637		1.5	macrophytes, fine
		5	MT	1947	1630		0.5	" "

Comments :

MT 5: RSC 30, CAS 55
MT 4: RSC 50, CT 100
MT 2: CAS 50, 70, 80
MT 1: Ø
MT 3: RSC 30, 50

9632

FISH COLLECTION DATA FORM
VERSION : LENGTH-ONLY

Card 1 of 1

Date (yy/mm/dd):	96/09/27	Agency:	CSS	Crew:	JD/JL
Gazetted Name:	Christholm	Alias:	N/A	UTM:	
Lake/Stream/Wetland	Lake	Location:	N/A	Datum:	
Sequence No.	01	Weather:	cloudy/Rain		
Watershed code:		Reach #:	N/A		

Area sampled: (m2) | Air tmp: (C) | Wtr tmp: (C) | EC: (ms/cm)

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)	Length FL (mm)
	GN(F)	1	PMC	173	186	177	202	201	180	191	192	153	149
				165	165	166	182	164	195	194	158	202	141
				187	189	176	189	194	188	180	159	193	185
			↓	185	204	193	182	196	189	192	195	196	160
	↓		PMC	168	181	202	180	170					
	GN(S)		LSU	164	159	213	235	210	115	124	236	155	159 163
			PMC	129	180	184	132	130	145	143	181	145	136
			PMC	124	147	129	169	160					
			CAS	96	87								
			RSC	103	105	95							
			CT	221	251	260	230	232	252	251	139	132	137
	↓			188	197	135	143	123	136				
	GN(F)			205	199	187	203	187	206	155	232	205	152
				234	235	216	250	220	218	234	193	212	238
				210	215	226	205	227	202	217	217	205	193
	↓	↓	↓	201	202	186	192	190	204	193	200	203	185
	GN(F)	1	CT	147	149	155	146	138					
	MT	2	CAS	50	70	80							
	MT	3	RSC	30	50								
	MT	4	RSC	50				—					
	MT	4	CT	100									
	MT	5	RSC	30									
	MT	5	CAS	55									

9632

FISH COLLECTION DATA FORM

Card 1 of 1

Date (yy/mm/dd): 96/09/27
Gazetted Name: Chisholm
Lake/Stream/Wetland: Lake
Sequence No.:
Watershed code:

Agency: C58
Alias: N/A
Location: Cloudy / Rain
Weather:
Reach #:

Crew: JD / JL
UTM:
Datum:

Area sampled: (m2)
Air tmp: (C)
Wtr tmp: (C)
EC: (ms/cm)

Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Scale sample #	Sex (code)	Maturity (code)	Activity (code)	Comments
	GN(S)	1	CT	N/A	279	173	1	M	MT	R	
					234	119	2	F	MT		
					254	134	3	F	MT		
					238	124	4	M	M		
					197	74	5	F	IM		
					136	28	6	M	IM		
	↓	↓			145	32	7	M	IM		
	GN(S)	1			126	21	8	M	IM		
	GN(F)	1			158	40	9	F	IM		
					137	28	10	M	IM		
					162	41	11	F	IM		
					158	39	12	M	IM		
					178	58	13	M	IM		
					195	71	14	F	IM		
					189	76	15	M	IM		
					190	65	16	M	IM		
					173	48	17	F	IM		
					193	67	18	F	IM		
					208	80	19	F	IM		
					211	96	20	F	MT		
					253	139	21	F	MT		
					233	122	22	F	MT		
					218	100	23	M	MT		
					239	131	24	M	MT		
					221	102	25	F	MT		
					223	105	26	F	MT		
					203	80	27	M	IM		
					223	105	28	M	IM		
					216	101	29	F	MT		
	↓	↓	↓	↓	206	82	30	M	MT		
	GN(F)	1	CT	N/A	222	111	31	M	MT	R	

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FISH CAPTURE RESULTS

Card 1 of 1

Date (yy/mm/dd): 96/09/27 Agency: CS8 Crew: JD/JL

Gazetted Name: Chisholm Alias: N/A UTM:

Watershed code: Seq. No.

Date (yy/mm/dd)	Capture Method	Trap or Net #	Species code	Number captured	Number sampled	Comments
96/09/27	GN(F)	1	PMC	45		
	GN(F)	1	CT	68		
	GN(S)	1	CT	24		
	GN(S)	1	LSU	11		
		1	PMC	15		
		1	CAS	2		
	GN(S)	1	RSC	3		
	MT	1	—	0		
	MT	2	CAS	3		
	MT	3	RSC	2		
	MT	4	RSC	1		
96/09/27	MT	4	CT	1		
	MT	5	RSC	1		
96/09/27	MT	5	CAS	1		

Comments: Date recorded is date of gear retrieval.

CT:

class \ net →	catch F	catch S	scale sample (≈ 1/3) F	scale sample (≈ 1/3) S
Small	11	10	4	3
Med	20	3	7	1
Large	37	11	12	4

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PHOTO SURVEY FORM - PHOTO DETAILS

Card 1 of 1

Date (yy/mm/dd): 96/09/27 Agency: C58 Crew: JD/JL

Gazetted Name: Chisholm Alias: N/A UTM:

	Date (yy/mm/dd)	Roll No. Counter No.	Direction (N, S, E, W)	Subject description / location taken from
R	96/09/27	1/1	N/A	CT, gillnet catch
R		1/2		PMC, gillnet catch
R		1/3		LSU, gillnet catch
R		1/4		RSC, gillnet catch
R	96/09/27	1/5	N/A	CAS gillnet catch
R	96/09/27	1/6	SW	Tagit C (C1), d/s view, @ 200 m d/s of Chisholm Lk.
7, 8 R	96/09/28	1/7-1/9	~NW	clockwise panorama (~180°) from east end of lake
12-15 R		1/10-1/15	var	clockwise panorama (~180) S to W to N to NE
				from South of west end of large island
		1/16, 1/17		u/s view of Tagit C (C2) 250 m u/s of Chisholm Lk.
R		1/18		d/s view of Tagit C (C2) 250 m u/s of Chisholm Lake
19-21		1/19-1/22		clockwise panorama (~180°) from mouth of Tagit C
				(west shore of Chisholm Lake)
(R)		1/23		barrier on C3 @ 65 m u/s of Chisholm L.
R		1/24		C3/R1 @ 35 m u/s of Chisholm L.
R		1/25		C3/R2 @ 50 m u/s of Chisholm L.
30 R		1/26-1/30		clockwise panorama towards E, from North
				of large midlake island
	96/09/28	1/~~30~~ 31		~~view E from Nose of middle island~~
R				~~wrong way~~ C4

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BATHYMETRIC SURVEY DATA

Card 1 of 1

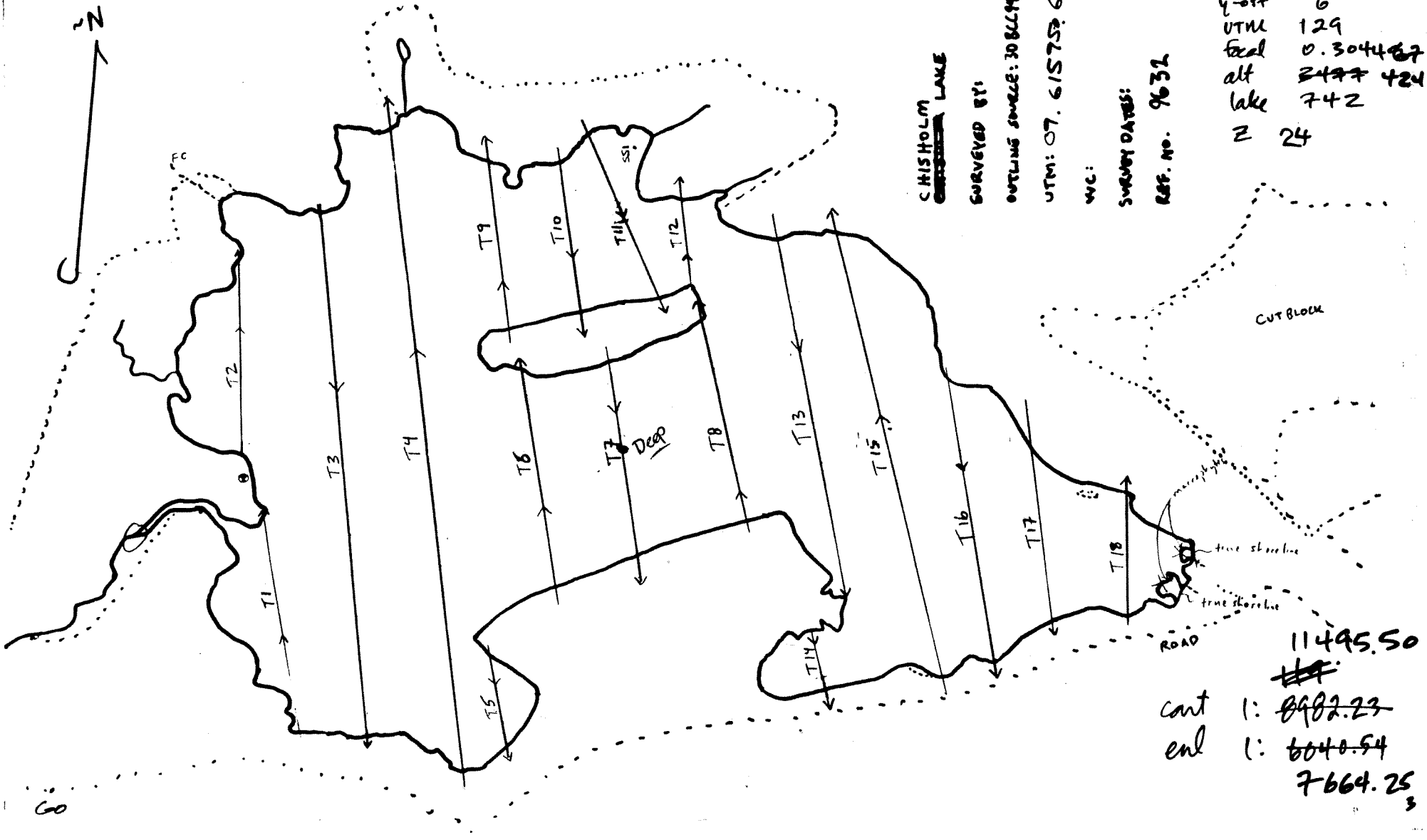
Date (yy/mm/dd):	96/09/26	Agency:	C58	Crew:	JD/JL
Gazetted Name:	Chicholm	Alias:	N/A	UTM:	
Watershed code:		Seq. No.	01	Datum:	

Transect number	Distance from shore		Maximum depth (m)	Comments
	start (m)	end (m)		
1	2	2	10.8	
2	2	2	16.8	
3	2	2	21.0	
4	3	2	22.3	
5	2	2	4.5	
6	2	2	23.8	
7	2	2	24.0	
8	2	4	23.0	
9	3	3	13.5	
10	3	3	13.5	
11	4	3	13.7	
12	2	2	13.0	
13	2	2	23.5	
14	2	2	5.5	
15	2	2	16.0	
16	2	3	14.5	
17	2	2	10.0	
18	3	8	4.5	

Comments : Deep point: trench crossed by T7

Sounder: Lowrance X15A

9632



CHISHOLM LAKE

SURVEYED BY:

OUTLINE SCALE: 30 BLOCKS x 19

UTM: 07. 615753 6005[illegible]

WC:

SURVEY DATES:

REF. NO. 9632

width 32
height 19
x-off 2
y-off 6
UTM 129
focal 0.304467
alt 2477 424
lake 742
Z 24

11495.50
~~11495.50~~
cont 1: ~~8982.23~~
enl 1: ~~6040.54~~
7664.25