

APPENDIX I

Stream Card Survey Information, Fish Collection Data Form and Lake Biophysical Data Form



**DFO / MOE
STREAM SURVEY FORM**

Stream Name (gaz)		(local) <u>Cober L. outlet</u>			Access	<u>L</u>	Method	
Watershed Code				Reach No.	Length (km)			
Location <u>Outlet of Cober L.</u>				Map # <u>95L13</u>	Site No.	Lithsurv (m)		<u>100</u> T
Date YMD <u>17/09/10</u>				Time <u>9:45</u>	Agency	<u>KC</u>	Crew	<u>GS / JS /</u>
UTM <u>58791-6072703</u>				Photos	<u>#2/21-26</u>	Air Photos	<u>30 BCB</u>	<u>92084 #179</u>
PARAMETER		VALUE	METH.	SPECIFIC DATA				OBSTRUCTIONS
Ave. Chan. Width (m)		<u>1.3</u>	<u>T</u>	<u>0.77</u>	<u>0.96</u>	<u>0.8</u>	<u>1.07</u>	<u>3.0</u>
Ave. Wet. Width (m)		<u>1.2</u>	<u>T</u>	<u>0.77</u>	<u>0.96</u>	<u>0.8</u>	<u>1.07</u>	<u>2.3</u>
Ave. Max. Riffle Depth (cm)		<u>6.5</u>	<u>ms</u>	<u>6</u>	<u>3</u>	<u>10</u>	<u>7</u>	
Ave. Max. Pool Depth (cm)		<u>18</u>	<u>ms</u>	<u>14</u>	<u>10</u>	<u>30</u>		
Gradient % <u>35-10</u>		<u>24</u>	<u>CL</u>					
COVER: Total %		<u>20</u>	<u>GE</u>	BED MATERIAL				BANKS
Comp sum 100%		<u>15</u>	<u>25</u>	Fines: clay, silt, sand (< 2mm)				Height (m)
Dp Pool		<u>0</u>	<u>0</u>	Gravels: small (2-16mm)				% Unstable
L.O.D.		<u>0</u>	<u>0</u>	large (16-64mm)				Texture (F) G L R
Boulder		<u>0</u>	<u>0</u>	sm. cobble (64-128mm)				Valley: Channel Ratio
In Veg		<u>0</u>	<u>0</u>	Large: lg. cobble (128-256mm)				0-2 2-5 (5-10) 10+ N/A
Over Veg		<u>25</u>	<u>35</u>	boulder (> 256mm)				Stage
Cutbank		<u>35</u>	<u>35</u>	Bedrock (R)				Dry L (M) H Flood
Crown Closure %		<u>50</u>	<u>C</u>	D ₉₀ (cm) <u>24</u>				Flood Signs H (m)
Aspect		<u>30</u>	<u>C</u>	Compaction				0
				L (M) B				Bars (%)
								pH
								Water Temp (°C)
								Turb. (cm)
								Cond (25°C)
								(4)
DISCHARGE				REACH SYMBOL (Fish)				
Parameter	Value	Method	Specific Data					
Wetted Width (m)			0					
Mean Depth (m)			1, C, 24					
Mean Velocity (m/s)			0, 5, 5, 0					
Discharge (m ³ /s)			(Width, Valley Channel, Slope)					
			(Bed Material)					

QP #18241

REVISED DEC 87

SS187

FISH SUMMARY							STREAM/VALLEY CROSS-SECTION (Looking Downstream)	
C	Species	No.	Size Range (mm)	Life Phase	Use	Method/Ref.	L	R
			<u>NO 1-15H</u>					
COMMENTS							PLANIMETRIC VIEW	
Channel Stability <input type="checkbox"/> Debris <input checked="" type="checkbox"/> Management Concerns <input type="checkbox"/> Obstructions <input checked="" type="checkbox"/> Riparian Zone <input type="checkbox"/> Valley Wall Processes <input type="checkbox"/> Etc.								
series of chutes & falls from 50-100 m from confluence with Lake Considered to be a lake in position fish barrier as only waded from 0-100m and site was located from 35-55m								
average gradient 7.20% and river did not present immediate suitable resing habitat and was full of fast water Electroshocking - 124s @ 600V/5S								
Weather - sunny but cool, air temp = 3.5°C								
1 Conductivity measured in situ in 50cmers, rest done								
General obs - creek covered with tree fall & was very slug & confined								
2 Cutbanks amount to 20% of cover depth + 17, 22, 24, 9, 13 cm								
3 Chute represents other hydraulic unit								
							Edited by: <u>GS</u>	
							Date YMD: <u>9/10/11/25</u>	

DFO/MoELP Stream Survey Form

30-Dec-96

Stream: UNNAMED

Watershed Code:

Stream Survey Report

460-0000-000-000-000-000-000-000-000-000-000

Header Information									
Stream Name:	UNNAMED	Stream "Local":	CEBER LAKE OUTLET	Access:	11				
Watershed Code:	460-0000-000-000-000-000-000-000-000-000-000	Reach No.:	1	Reach Length (km):	Method:				
Location:	CEBER LAKE OUTLET	Map #:	93L.13	Site No.:	1	Length surveyed (m):	100.0	Method:	T
		U.T.M.:	09.589191.6077763	Fish Card:	N	Field:	Yes	Historical:	No
Date:	9/16/96	Time:	9:45	Agency:	KC	Survey Crew:	GSJS \ \ \ \ \ \ \ \	Photos:	#2/21-26
						Air Photos:	BCB3092084.179		

Channel Characteristics					<i>Specific Data</i>				
Av. Chan. Width (m):	1.3	Method Av. Chan. Width (m):	T		0.8	1.0	0.8	1.1	3.0
Av. Wet. Width (m):	1.2	Method Av. Wet. Width (m):	T		0.8	1.0	0.8	1.1	2.3
Av. Max. Rif. Depth (cm):	6	Av. Max. Riffle Depth (cm):	MS		6	3	10	7	
Av. Max. Pool Depth (cm):	18	Av. Max. Pool Depth (cm):	6		14	10	30		
Gradient (%):	24.0	Method Gradient:	CL						
% Pool:	50	% Riffle:	40	% Ran:	0	% Other:	10	Method:	GE
% Side Channel:	0-10	Method Side Channel:	GE						
% Debris Area:	25	Method Debris Area:	GE						

Bed Material				
% Fines (<2mm):	0	% Fines (<2mm):	0	
% Gravels:	50	Small (2-16mm):	10	
		Large (16-64mm):	40	
% Larges:	50	Small cobble (64-128mm):	40	
		Large cobble (128-256mm):	10	
		Boulder cobble (>256mm):	0	
% Bedrock:	0	% Bedrock:	0	
D90 (cm):	24	Compaction:	Medium	

Cover											
Cover Total %:	20	Method Cover Total %:	GE								
Dp Pool:	15	L.O.D.:	25	Boulder:	0	In Veg.:	0	Over Veg.:	25	Cutbank:	35
Crown Closure %:	50	Method Crown Closure:	Aspect:		Method Aspect:						

Discharge				
Wetted Width (m):	Method Wetted Width (m):	<i>Specific Data</i>		
Mean Depth (m):	Method Mean Depth (m):			
Mean Velocity (m/s):	Method Mean Velocity (m/s):			
Discharge (m3/s):	Method Discharge (m3/s):			

Reach Symbol								
(Fish)								
0								
<table style="margin: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 0 10px;">1 C 24.0</td> <td style="padding: 0 10px;">0550</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 10px;">(Width, Valley: Channel, Slope)</td> <td style="padding: 0 10px;">(Bed Material)</td> </tr> </table>					1 C 24.0	0550	(Width, Valley: Channel, Slope)	(Bed Material)
1 C 24.0	0550							
(Width, Valley: Channel, Slope)	(Bed Material)							

Banks							
Height (m):	3.5	% Unstable:	0				
Textures Fines:	Yes	Gravel:	No	Larges:	No	Bedrock:	No
Confinement:	1						
Valley: Chan. Ratio:	3						
Stage:	M						
Flood Signs Ht(m):	0	Method Flood Signs:					
Braided:	N	Method Braided:					
Bars (%):	0	Method Bars:					
pH:	8.0	Method pH:					
O2 (ppm):		Method Dissolved Oxygen:					
Water Temp. (°C):	7.5	Method Temperature:					
Turb. (cm):		Method Turbidity:					
Cond. (µmhos):	40	Method Conductivity:	AAA				

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DFO/MoELP Stream Survey Form

30-Dec-96

Stream: UNNAMED

Watershed Code:

Stream Survey Report

460-0000-000-000-000-000-000-000-000-000-000

Stream/Valley Cross-Section

Fish Summary

Obstructions

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Obstruction	Ht(m)	Type	Location
1		F	60.0
2		F	100.0
1		C	80.0

Comments

- CX1 Series of chutes and falls from 60-100 m from confluence with lake. Considered these to be impassable fish barriers therefore only walked from 0-100 m and site was located from 35-55 m.
- CX2 Average gradient >20% and river did not provide abundant suitable rearing habitat and was full of fast water.
- CX3 Electroshocking - 124 s @ 600V.
- CX4 Weather: sunny but cool, air temp = 3.5 degrees C.
- C1 Conductivity measured in situ in microSeimens, not ohms. General also - creek covered with deadfall and was very steep and confined.
- C2 Cutbanks amount to 20% of cover, depths - 17, 22, 24, 9, 13 cm
- C3 Chute represents other hydraulic unit.



Fish Collection Data Form

Card 1 of 1

Date (yy/mm/dd): 96/9/15-16
 Gazetted Name: n/a
 Lake/Stream/Wetland: Lake
 Sequence No.: n/a
 Watershed Code: n/a

Agency: Kohn-Crippen
 Alias: Cerber Lake
 Location: 21.9 km northwest of Smithers
 Weather: calm and sunny
 Reach #: n/a

Crew: GS/JS
 UTM: 9.589/91.6077763

Area Sampled: <u>n/a</u>		Air Temp (C): <u>8</u>		Water Temp (C): <u>12.2-11.7</u>		EC ms/cm: <u>30-40</u>					
Site No.	Capture Method	Pass # or trap/net #	Species (code)	Mark or Tag No.	Length FL (mm)	Weight (g)	Fish #	Sex (code)	Maturity (code)	Activity (code)	Scale and DNA vial No.
<u>1</u>	<u>GL</u>	<u>1</u>	<u>RB</u>		<u>511</u>	<u>1620</u>	<u>1</u>	<u>F</u>	<u>n/a</u>	<u>n/a</u>	<u>e223692-1</u>
<u>1</u>	<u>GL</u>	<u>1</u>	<u>RB</u>		<u>570</u>	<u>2584</u>	<u>2</u>	<u>M</u>	<u>n/a</u>	<u>n/a</u>	<u>e223692-2</u>

- 1 Capture method: angler report (AR), angling (AG), creel census (CR), dead capture (DC), dip netting (DN), electroshocking (EL), gill netting (GN), minnow trapping (MT), seining (SN), swimming (SW), visual observation above water (VO), method unknown (UN).
- 2 Activity: migration (MI), spawning (S), incubation (I), rearing (feeding or resting) (R).
- 3a Level of life phase, Method 1: egg/alevin (E), fry (F), juvenile (J), adult (A) - or use Method 2.
- 3b Level of maturity, Method 2: egg/alevin (E), fry (F), immature (IM), maturing (MT), mature (M), spawning (SP), spent (ST).
- 4 Species codes: see manual.

Kohn-Crippen



Lake Biophysical Data Form

Date (yy/mm/dd): 96/9/15-16

Crew: GS/JS

Site ID

Watershed Code: n/a

Sequence No.: n/a

Gazetted Name: n/a

Alias: Cerber Lake

FW Region: Prince Rupert

UTM (Zone, Easting, Northing): 9.589191.6077763

Management Unit: 6-9

NTS Map No.: 93L.13

Biophysical

Biogeo Zone: Engelmann Spruce-Subalpine Fir

Biogeo Zone No.: PR-133

Benchmark (Y/N) Y

Elevation (m): 1017.1

Benchmark details: iron spike

Nutrient Status

SEAM No.: e223692

Secchi depth (m): 2.8

Other samples taken: water quality (0.5 m and 4 m)

Limno Station No.:	1(0.5 m)	1(4 m)	
H2S (mg/l)	n/a	n/a	
H2S comments	n/a	n/a	
TDS method	n/a	n/a	
TEMP method	n/a	n/a	
Alkalinity	68.43	63.05	

Field Conditions

Wind velocity (km/h): 0

Wind direction: n/a

Air temp. (c): 8

Cloud cover (/10 O.C.): 10

Surface conditions: calm

Water colour: brown/green

Development

MOF rec sites (Y/N) N

Resort cmpsts (Y/N) N

Residences (Y/N) N

MOF campsites (Y/N) N

Resots (Y/N) N

Co. Rec facilities N

Parks cmpgrds (Y/N) N

Resort cabins (Y/N) N

Recreation

ROS N

Biophys features: N

Biophys subfeat.: N

Inlets/Outlets

see Stream Survey Card for mandatory fields

Biological

Fish Card attached (Y/N) Y

Fish Man. Com. Y

Wildlife: Y

Reptiles: N

Aquatic Birds: Y

Invertebrates: Y

Amphibians: N

Aquatic Plants: Y

Comments:



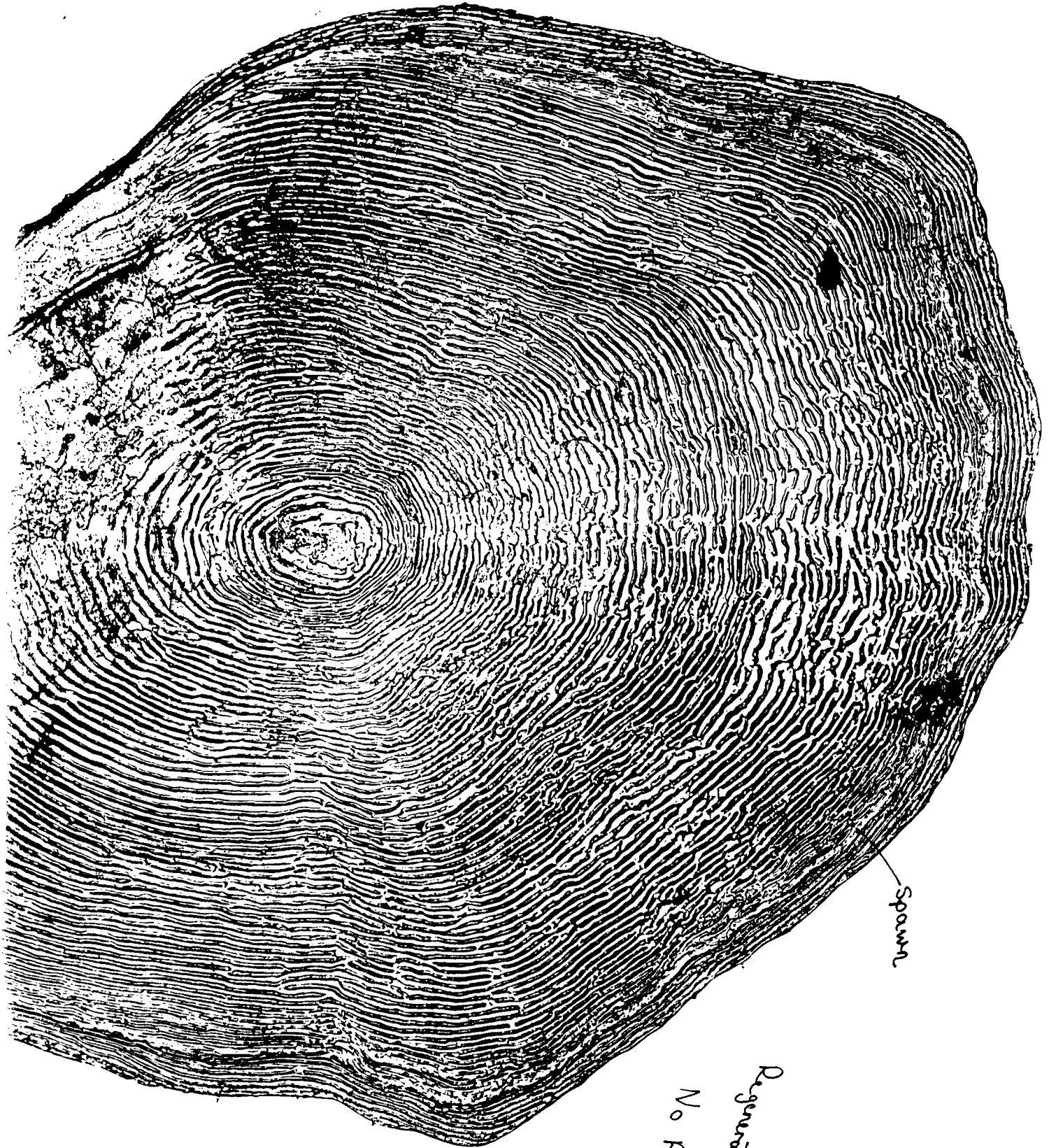
APPENDIX II
Fish Scale Microfiche Prints



Spawm

Regenerated - No. A
(Probably 5+)
Klohn-Crippen





No Age
Regenerated

Spawm

APPENDIX III
Water Chemistry Analysis

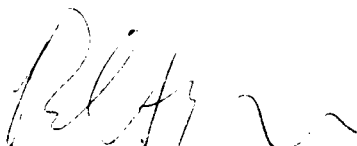
KLOHN CRIPPEN ENVIRONMENTAL LABORATORY
Analytical Test Report

Project Name: Reconnaissance Level Inventory of Bulkley District Lakes
 Project Number: PW 7507 0103
 Date of Report: Oct. 17, 1996

Lake	Sample ID	Depth	Date Sampled	Date Received and Analyzed	Alkalinity* (mg/l)	TDS* (mg/l)	NH3** (mg/l)	Nitrate** (mg/l)	Total P** (mg/L)	Total dissolved P** (mg/l)
Cerber	e223692	top	14-Sep	17-Sep	68.43	43.75	0.18	0.26	0.08	0.00
		bottom	14-Sep	17-Sep	63.05	35.71	0.09	0.18	0.16	0.00
		bottom	14-Sep	17-Sep				0.22		
		bottom	14-Sep	17-Sep				0.26		

Notes:

- 1 * = Analytical methods employed are described in the "Standard Methods for the Examination of Water and Wastewater, 19th ed., 1995.
- 2 ** = Analytical methods employed are described in the "DR/2000 Spectrophotometer Procedure Manual" which has adapted the procedures from the Standard Methods for the Examination of Water and Wastewater and the procedures are USEPA approved.
- 3 The Laboratory QA/QC included running standards and analytical triplicates for each set of samples received.
- 4 The division manager and laboratory personnel oversee and review the test regularly.



Rob Stephenson, Ph.D.
 Manager, EnviroChemical Engineering



Vita Yan, B.Sc., B.A.Sc.
 Environmental Engineer





Elemental Research Inc.

Greg Scarborough
Klohn Krippen
10200 Shellbridge Way
Richmond B.C.
V6X 2W7

29th November 1996

Your Ref: Ceber Lake

ERI Ref: 9757

Cerber Lake	Cerber Lake
e223692	e223692
Sep.16/96	Sep.16/96
Surface	Bottom

DISSOLVED METALS

Sodium	ppb	2010	2090
Magnesium	ppb	4330	4540
Calcium	ppb	7440	7880

PARAMETERS

Filterable Residue	mg/L	<1	<1
Total Nitrogen	mg N/L	0.326	0.307
Chlorophyll	mg/m3	0.61	0.77

9757.xls

Analyst *N. J. Jones*



APPENDIX IV

Photograph Directory



Photo Survey Form 1 - Equipment Details

Survey Start Date: 1996/09/13
Survey End Date: 1996/09/27

Agency: Kohn_Crippen Consultants Ltd.
Crew: GS/JS

Camera #1

Make and Model: Ricoh LX-33W date	Lenses: A
Format: 35 mm film	

Camera #2

Make and Model: Fuji Disposable	Lenses: A
Format: 35 mm film	

Lenses

Focal length (mm)
A - Fixed

Roll and/or Batch Details

Roll #	Camera #	Output Medium	Film Type	ISO
1	1	neg, print	color	400
2	1	neg, print	color	400
3	2	neg, print	color	400
4	1	neg, print	color	400
5	1	neg, print	color	400
6	1	neg, print	color	400
7	1	neg, print	color	400
8	1	neg, print	color	400



Photo Survey Form 2 - Photo Details

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Date	Roll	Negative	Counter	NTS Map Sheet	Watershed Code	Description	Photo Direction	Reach	Site	Picture Type	UTM Zone	Easting (field)	Northing (field)	Easting (correct)	Northing (correct)	Crew	Focal Length	Scale
9/15/96	2	8	9	n/a	n/a	Access (helicopter) to Ceber L from Smithers along Toboggan Creek	W			O	9					GS/JS	St	n/a
9/15/96	2	9	10	n/a	n/a	Toboggan Glacier from helicopter	S			O	9					GS/JS	St	n/a
9/15/96	2	10	11	93L13	n/a	Shoreline area where gee trap #2 was placed in Ceber L	NW			L	9					GS/JS	St	n/a
9/15/96	2	11	12	93L13	n/a	Shoreline area where gee trap #3 was placed in Ceber L	NE			L	9					GS/JS	St	n/a
9/15/96	2	13	13	93L13	n/a	Tree fall to which gee trap #4 was attached in Ceber L	E			L	9					GS/JS	St	n/a
9/15/96	2	15	15	93L13	n/a	Shoreline area where gee trap #1 was placed in Ceber L. Note the aquatic vegetation	E			L	9					GS/JS	St	n/a
9/16/96	2	17	17	93L13	n/a	Ceber L from helicopter (south end)	W			WS	9					GS/JS	St	n/a
9/16/96	2	16	16	93L13	n/a	Ceber L from helicopter (north end)	NW			WS	9					GS/JS	St	n/a
9/15/96	2	18	18	93L10	n/a	Rainbow trout mortality from gillnet in Ceber L	n/a			Fi	9					GS/JS	St	10 L pail near fish's head
9/16/96	2	19	19	93L13	n/a	Greg releasing rainbow that remained alive in gillnet in Ceber L	n/a			Fi	9					GS/JS	St	Person
9/16/96	2	20	20	93L10	n/a	Example of invertebrate (copepods) size found in Ceber L (also in North L and Coppermine L)	n/a			O	9					GS/JS	St	persons hand
9/16/96	2	21	21	93L13	n/a	Ceber L outlet taken from lakeshore	S			L, Ch	9			589191	6077763	GS/JS	St	person and boat
9/16/96	2	22	22	93L13	n/a	80 cm falls in Ceber L outlet, 60 m from lake	Up	1		Ch	9					GS/JS	St	folding ruler
9/16/96	2	23	23	93L13	n/a	Habitat and vegetation at Ceber outlet sample site. Note the abundant tree fall	Up	1	1	Ch	9					GS/JS	St	n/a
9/16/96	2	24	24	93L13	n/a	1.8 m chute in Ceber outflow 100 m from outlet	Up	1		Ch	9					GS/JS	St	field book with scale in inches
9/16/96	2	25	25	93L10	n/a	Downstream limit of Ceber L outlet site	Up	1	1	Ch	9					GS/JS	St	n/a



Date	Roll	Negative	Counter	NTS Map Sheet	Watershed Code	Description	Photo Direction	Reach	Site	Picture Type	UTM Zone	Easting (field)	Northing (field)	Easting (correct)	Northing (correct)	Crew	Focal Length	Scale
9/16/96	2	26	26	93L13	n/a	Upstream limit of Ceber L outlet site. Note the extensive cover	Dn	1	1	Ch	9					GS/JS	St	n/a
9/16/96	2	27	27	93L13	n/a	Ceber L inlet from the shoreline	E, Up	1		L, Ch	9			582282	6078000	GS/JS	St	n/a
9/16/96	2	28	28	93L13	n/a	Benchmark in tree near Ceber L (note flagging tape)	N			L	9	588883	6077755			GS/JS	St	n/a

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