

**Assessment Study of
Water and Wastewater Systems and
Associated Water Management Practices
at the Takla Lake First Nation Community**

**for the
Indian and Northern Affairs Canada
BC Region**



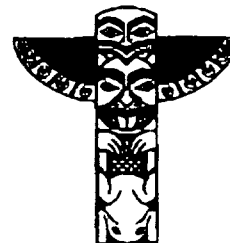
August, 2002

Appendix C

Water Quality Test Results



Environmental Health Services
Northern District
Health Canada
First Nations & Inuit Health Branch
#220 - 177 Victoria Street
Prince George, B.C. V2L 5R8



DATE: June 24/02 URGENT _____ CONFIDENTIAL _____

TO: Kim Stephens - CH2M Hill

FAX NUMBER: 604 684-3292 Pages to follow: 8 9

Original Mailed: Yes _____ No

FROM: Paul Broda

SUBJECT: Takla Water Results

COMMENTS: as requested

- if you have any questions, please call

If there are any troubles receiving this fax please call us at the number below:

OUR FAX NUMBER: (250) 564-3272

OUR PHONE NUMBER: (250) 561-5384

PB

L:\COMMON\EHO\SPSS-WAT\2002\takla.02.sav

	takla	location	date	gen.bact	t.colif	fecal.c
1	Health Centre		02/28/02	0	0	0

L:\COMMON\EHO\SPSS-WAT2001\takla2001.sav

	takla	location	date	gen.bact	t.colif	fecal.c		
	1	Band Office	Washroom Tap	09/20/01	0	0	0	
	2	Health Clinic	KT	09/20/01	4	0	0	
	3	School	Classroom tap	09/20/01	0	0	0	
	4	Trading Post KT		09/20/01	334	0	0	private
	5			09/20/01	0	0	0	
s.19(1)	6		KT	09/20/01	2	0	0	
	7	Stream next to		10/09/01	250	10	0	Creek samples
	8	Creek Mouth at	TaklaPost "Cut"	10/09/01	2590	0	0	
	9	Homebrew Creek	next to	10/09/01	1300	50	0	
	10	Hudson Bay Crk		10/09/01	260	30	0	
	11		Aerator	10/25/01	0	2	0	
	12		KT	10/25/01	22	0	0	
	13	Nursing Station	KT	10/25/01	2	0	0	
	14	Trading Post KT		10/25/01	34	0	0	private



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Certificate of Analysis

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

Reported To :

HEALTH CANADA

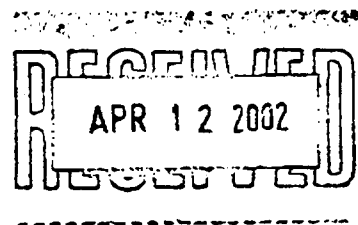
Client Code FC

220 - 177 VICTORIA STREET
PRINCE GEORGE, BC
V2L 5R8

Phone : (250) 561-5384
FAX : (250) 564-3272

Project Information :

Project ID : TAKLA HEALTH CENTRE
Submitted By: P.BRODA



Requisition Forms :

Form 08099063 logged on 4-Mar-02 completed on 14-Mar-02
Form 08099064 logged on 4-Mar-02 completed on 14-Mar-02

Remarks :

- + All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- + 'MDL' = Method Detection Limit, '<' = Less than MDL, '---' = Not analyzed
- + 'CDWG' = Canadian Drinking Water Guidelines
- + 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 except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- + This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th 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. Liability for 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 Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: James Teshima

James Teshima



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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : TAKLA HEALTH CENTRE
Sampling site :
Submitted by : P.BRODA

Philip ID : 12012057
Client ID : TAKLA
12012058
~~MIDDLE RIVER~~

Sparcode	Parameter	Unit	MDL	CDWG		
PHYSICAL						
00041220	pH	pH units	0.1	6.5-8.5	7.2	7.2
00021300	Color True	Col.Unit	5	15	5	< 5
00111160	Specific Conductance	uS/cm	1	---	77	70
SCCACALC	Computed Conductance	uS/cm		---	83	73
CCPDCALC	Conductance % Diff.	%		---	7.9	9.9
00081071	Residue Nonfilterable (TSS)	mg/L	4	---	< 4	4
007H1035	Residue Filterable 1.0u (TDS)	mg/L	10	500	50	40
CTDSCALC	Computed TDS	mg/L		---	43	38
TDSRCALC	TDS % Diff.	%		---	-15.3	4.6
00151140	Turbidity	NTU	0.10	1.0	0.24	< 0.10
0107CALC	Hardness Total -T	mg/L		500	37.0	35.0
GENERAL INORGANICS						
01011211	Alkalinity Phen. 8.3 as CaCO3	mg/L	1	---	< 1	1
01021210	Alkalinity Total as CaCO3	mg/L	1	---	34	36
CO3-CALC	Carbonate as CO3=	mg/L		---	< 0.5	< 0.5
HCO3CALC	Bicarbonate as HCO3-	mg/L		---	41.4	43.9
OH--CALC	Hydroxide as OH-	mg/L		---	< 0.5	< 0.5
2105AA04	Cyanide(SAD) + Thiocyanate	mg/L	0.0005	0.2	< 0.0005	< 0.0005
0125LLHS	Sulfide Total	mg/L	0.005	0.05	< 0.005	0.005
ANIONS						
11041334	Chloride Dissolved	mg/L	0.5	< 250	1.5	< 0.5
11061341	Fluoride Dissolved	mg/L	0.01	1.5	0.06	0.07
IonBCALC	Ion Balance	%		---	3.0	0.6
AnnsCALC	Total Anions	meq/L		---	0.82	0.78
CtnsCALC	Total Cations	meq/L		---	0.87	0.77
LangCALC	Langelier Index	pH units		---	-1.6	-1.6
pHSACALC	Saturation pH	pH units		---	8.8	8.8
CARBON						
01030912	Organic Carbon - Total	mg/L	0.5	---	3.2	< 0.5

Matrix : Water
Sampled on: 02/02/28 10:00
Water
02/02/27 03:00

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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : TAKLA HEALTH CENTRE
Sampling site :
Submitted by : P.BRODA

Philip ID : 12012057
Client ID : TAKLA
12012058
MIDDLE
RIVER

Sparcode	Parameter	Unit	MDL	CDWG		
NITROGEN						
11081351	Ammonia Nitrogen (N)	mg/L	0.005	---	0.008	< 0.005
1110CALC	Nitrate Nitrogen Dissolved (N)	mg/L		10.0	0.07	0.08
11091350	Nitrate + Nitrite (N)	mg/L	0.02	10.0	0.07	0.08
11111354	Nitrite Nitrogen (N)	mg/L	0.005	1.0	< 0.005	< 0.005
SULFATE						
11211405	Sulfate	mg/L	0.5	< 500	4.1	2.0
METALS TOTAL						
Al-T0031	Aluminum	mg/L	0.02	---	< 0.02	< 0.02
Sb-TMS31	Antimony	mg/L	0.001	---	< 0.001	< 0.001
As-TMS31	Arsenic	mg/L	0.001	0.025	< 0.001	< 0.001
Ba-T0031	Barium	mg/L	0.001	1.0	0.017	0.018
B--T0031	Boron	mg/L	0.008	5.0	< 0.008	< 0.008
Cd-T0031	Cadmium	mg/L	0.002	0.005	< 0.002	< 0.002
Ca-T0031	Calcium	mg/L	0.05	---	12.1	10.1
Cr-T0031	Chromium	mg/L	0.005	0.05	< 0.005	< 0.005
Co-T0031	Cobalt	mg/L	0.005	---	< 0.005	< 0.005
Cu-T0031	Copper	mg/L	0.005	1.0	0.034	0.012
Fe-T0031	Iron	mg/L	0.005	0.3	0.043	0.006
Pb-TMS31	Lead	mg/L	0.0005	0.01	0.0025	< 0.0005
Mg-T0031	Magnesium	mg/L	0.05	---	1.65	2.02
Mn-T0031	Manganese	mg/L	0.001	0.05	< 0.001	0.003
Hg-T0310	Mercury	mg/L	0.00005	0.001	< 0.00005	< 0.00005
Mo-T0031	Molybdenum	mg/L	0.005	---	< 0.005	< 0.005
Ni-T0031	Nickel	mg/L	0.008	---	< 0.008	< 0.008
K_T0031	Potassium	mg/L	1	---	< 1	< 1
Se-TMS31	Selenium	mg/L	0.001	0.01	< 0.001	< 0.001
Ag-T0031	Silver	mg/L	0.01	---	< 0.01	< 0.01
Na_T0031	Sodium	mg/L	0.05	200	2.76	1.46
U--TLLMS	Uranium	mg/L	0.00001	0.1	0.00004	0.00002
V--T0031	Vanadium	mg/L	0.005	---	< 0.005	< 0.005
Zn-T0031	Zinc	mg/L	0.005	5.0	0.007	< 0.005

Matrix : Water
Sampled on: 02/02/28 10:00 Water 02/02/27 03:00



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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : TAKLA HEALTH CENTRE
Sampling site :
Submitted by : P.BRODA

Philip ID : 12012057
Client ID : TAKLA
12012058
MIDDLE
RIVER

Sparcode	Parameter	Unit	MDL	CDWG		
CHLORINATED PHENOLS						
EX9946Z7	Water Prep for CPs	date			02/03/06	02/03/06
MCP2CPWA	2-chlorophenol	mg/L	0.001	---	< 0.001	< 0.001
MCP3CPWA	3-chlorophenol	mg/L	0.001	---	< 0.001	< 0.001
MCP4CPWA	4-chlorophenol	mg/L	0.001	---	< 0.001	< 0.001
CPE1CPWA	2,3-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CPH1CPWA	2,4+3,4-DiClPhenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CPH2CPWA	2,5-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP09CPWA	2,6-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CPE3CPWA	3,5-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP03CPWA	2,3,4-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP04CPWA	2,3,5-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP05CPWA	2,3,6-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP06CPWA	2,4,5-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP07CPWA	2,4,6-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP44CPWA	3,4,5-Trichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP02CPWA	2,3,4,5-Tetrachlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP01CPWA	2346+2356-TeClPhenol	mg/L	0.0001	---	< 0.0001	< 0.0001
PO22CPWA	Pentachlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
SURROGATE RECOVERY						
DC01SURR	Cl2 Phenylaceticacid	%		---	90	97
BR3-CPWA	Tribromophenol	%	40	---	110	110
HERBICIDES						
EX995351	Prep for Glyphosate	date			02/03/12	---
A001P012	AMPA	mg/L	0.05	---	< 0.05	---
HYDROCARBONS						
H099PT11	VH C6-C10	mg/L	0.1	---	< 0.1	< 0.1
EX995172	Volat. Wat. Pre-Scr.	date			02/03/05	02/03/05
H097CALC	VPHw	mg/L		---	< 0.1	< 0.1

Matrix : Water
Sampled on: 02/02/28 10:00 Water
02/02/27 03:00

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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : TAKLA HEALTH CENTRE
Sampling site :
Submitted by : P.BRODA

Philip ID : 12012057
Client ID : TAKLA
12012058
MIDDLE
BEVER

Sparcode	Parameter	Unit	MDL	CDWG		
POLYCYCLIC AROMATIC HYDROCARBONS						
EX9946Z4	PAH Extraction-Water	date			02/03/06	02/03/04
PA05MW02	Benzo(a)pyrene	mg/L	0.00001	0.00001	< 0.00001	< 0.00001
VOLATILE ORGANICS-MAH						
B020MS11	Benzene	ug/L	0.5	5.0	< 0.5	< 0.5
V919MS11	Chlorobenzene	ug/L	0.5	80.0	< 0.5	< 0.5
V924MS11	1,2-Dichlorobenzene	ug/L	0.5	200.0	< 0.5	< 0.5
V925MS11	1,3-Dichlorobenzene	ug/L	0.3	---	< 0.3	< 0.3
V926MS11	1,4-Dichlorobenzene	ug/L	0.4	5.0	< 0.4	< 0.4
B021MS11	Ethylbenzene	ug/L	0.5	---	< 0.5	< 0.5
V921MS11	Styrene	ug/L	0.4	---	< 0.4	< 0.4
T001MS11	Toluene	ug/L	0.5	24.0	< 0.5	< 0.5
X_8842_5	Xylenes	ug/L	0.5	300.0	< 0.5	< 0.5
X003MS11	m,p - Xylene	ug/L	0.5	---	< 0.5	< 0.5
X002MS11	o - Xylene	ug/L	0.5	---	< 0.5	< 0.5
VOLATILE ORGANICS-CHLORINATED ALIPHATIC						
V903MS11	Bromomethane	ug/L	3	---	< 3	< 3
C034MS11	Carbon tetrachloride	ug/L	1	---	< 1	< 1
V904MS11	Chloroethane	ug/L	4	---	< 4	< 4
V914MS11	2-chloroethylvinylether	ug/L	2	---	< 2	< 2
V901MS11	Chloromethane	ug/L	1	---	< 1	< 1
V909MS11	1,1-Dichloroethane	ug/L	0.7	---	< 0.7	< 0.7
V912MS11	1,2-Dichloroethane	ug/L	0.5	---	< 0.5	< 0.5
V906MS11	1,1-Dichloroethene	ug/L	0.4	---	< 0.4	< 0.4
V910MS11	cis-1,2-Dichloroethene	ug/L	0.4	---	< 0.4	< 0.4
V908MS11	trans-1,2-Dichloroethene	ug/L	0.7	---	< 0.7	< 0.7
V907MS11	Dichloromethane	ug/L	0.9	---	< 0.9	< 0.9
V913MS11	1,2-Dichloropropane	ug/L	0.5	---	< 0.5	< 0.5
V915MS11	cis-1,3-Dichloropropene	ug/L	0.4	---	< 0.4	< 0.4
V916MS11	trans-1,3-Dichloropropene	ug/L	0.3	---	< 0.3	< 0.3
V918MS11	1,2-Dibromoethane	ug/L	1	---	< 1	< 1
V923MS11	1,1,2,2-Tetrachloroethane	ug/L	0.5	---	< 0.5	< 0.5

Matrix : Water
Sampled on: 02/02/28 10:00 Water
02/02/27 03:00

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006511



ANALYTICAL SERVICES

18-Mar-02
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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : TAKLA HEALTH CENTRE
Sampling site :
Submitted by : P.BRODA

Philip ID : 12012057
Client ID : TAKLA
12012058
MIDDLE
RIVER

Sparcode	Parameter	Unit	MDL	CDWG		
T030MS11	Tetrachloroethene	ug/L	0.5	30.0	< 0.5	< 0.5
V911MS11	1,1,1-Trichloroethane	ug/L	0.7	---	< 0.7	< 0.7
V917MS11	1,1,2-Trichloroethane	ug/L	0.5	---	< 0.5	< 0.5
T029MS11	Trichloroethene	ug/L	0.6	50.0	< 0.6	< 0.6
V905MS11	Trichlorofluoromethane	ug/L	4	---	< 4	< 4
V902MS11	Vinyl Chloride	ug/L	1	2.0	< 1	< 1
VOLATILE ORGANICS-TRIHALOMETHANES						
B012MS11	Bromodichloromethane	ug/L	0.5	100.0	< 0.5	< 0.5
B013MS11	Bromoform	ug/L	0.4	100.0	< 0.4	< 0.4
C032MS11	Chloroform	ug/L	0.6	100.0	42	< 0.6
C033MS11	Dibromochloromethane	ug/L	0.4	100.0	< 0.4	< 0.4
VOC SURROGATE RECOVERY						
VS01VSUR	Bromofluorobenzene	%	0	---	80	77
VS02VSUR	d4-1,2-dichloroethane	%	0	---	102	101
VS03VSUR	d8-Toluene	%	0	---	85	85

Matrix : Water
Sampled on: 02/02/28 10:00
Water
02/02/27 03:00

LABORATORY REPORT OF WATER FILTER ANALYSIS
 PRINCE GEORGE WATER ASSAY
 PO Box 2832 Station B
 Prince George, BC V2N 4T6

CONFIDENTIAL

To: Environmental Services
 Health Canada, Medical Services Branch
 220 - 177 Victoria Street
 Prince George, BC V2S 5R8

Sample Number: 252

Examination for *Giardia* cysts and *Cryptosporidium* oocysts using the procedures which are described in section 9711B of Standard Methods 19th Ed., 1995.

Date of Sample: 06/14/2000

Sample Source: Treated Water, Takla Lake

Sample Site: (not available)

Sample sent by: K. Street

Volume Filtered: 354 litres

Date & Time Received: 06/15/2000

Date Processed / Preserved: 06/15/2000

Condition of Filter: Good. It was shipped in 1 L of residual water.

Filter Type: Filterite Cotton

Slides Analysed: 1 = 100 litres

Temperature on Receipt: < 5 °C, 5 - 10 °C, 10 - 20 °C, > 20 °C

Observations:

- debris present: 0.25 ml of dark brown sediment was extracted from the filter.
- algae present: Several species of algae were found on the filter membrane.
- other: Some pollen grains and plant cells were found.

Giardia Result: Positive Presumptive Negative

Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion:

No confirmed or presumptive *Giardia* cysts, or presumptive or confirmed *Cryptosporidium* oocysts, were found.

Results Certified by: C.H. Jarosch

Date: July 3, 2000

C.H. Jarosch
 Prince George Water Assay

Page(s) 006514 to\à 006515

Is(are) under consultation

Appendix D

Wastewater Quality Test Results

No wastewater information was seen