

**ASSESSMENT STUDY OF WATER AND WASTEWATER SYSTEMS
AND ASSOCIATED WATER MANAGEMENT PRACTICES
HALALT FIRST NATION, HALALT IR NO. 2**

For

**Indian and Northern Affairs Canada
British Columbia Region**

By

**UMA Engineering Ltd.
3030 Gilmore Diversion
Burnaby, British Columbia
V5G 3B4**

April 2002

Assessment Study of Water and Wastewater Systems
Halalt First Nation, Halalt IR No. 2

Appendix D

WATER TESTING RESULTS
(CHEMICAL/PHYSICAL/BACTERIOLOGICAL)
WITH COMPARISONS TO THE
GUIDELINES FOR CANADIAN DRINKING WATER QUALITY (GCDWQ)



ANALYTICAL SERVICES

15-Mar-02
 Page 2 of 13

ANALYTICAL REPORT
 Form 08098835

Client : HEALTH CANADA
 Project : CHEMAMNUS IR#11, HALALT FN
 Sampling site :
 Submitted by : MELISSA DANIELS

Philip ID : 12012502 12012503
 Client ID : CHEMAMNUS HALALT FIR
 IR #11 ST NATION

Spaccode	Parameter	Unit	MDL	CDWG		
PHYSICAL						
00041220	pH	pH units	0.1	6.5-8.5	6.2	6.5
00021300	Color True	Col. Unit	5	15	< 5	< 5
00111160	Specific Conductance	uS/cm	1	---	31	71
SCC/CALC	Computed Conductance	uS/cm	---	---	31	77
CCP/CALC	Conductance % Diff.	%	---	---	0.6	8.5
00081071	Residue Nonfilterable (TSS)	mg/L	4	---	< 4	< 4
007H1035	Residue Filterable 1.0u (TDS)	mg/L	10	500	< 10	38
CTD/CALC	Computed TDS	mg/L	---	---	15	41
TDSR/CALC	TDS % Diff.	%	---	---	200	8.4
00151140	Turbidity	NTU	0.10	1.0	0.38	0.11
0107/CALC	Hardness Total -T	mg/L	---	500	10.6	30.1
GENERAL INORGANICS						
01011211	Alkalinity Phan. 8.3 as CaCO3	mg/L	1	---	< 1	< 1
01021210	Alkalinity Total as CaCO3	mg/L	1	---	6	27
CO3-CALC	Carbonate as CO3=	mg/L	---	---	< 0.5	< 0.5
HCO3/CALC	Bicarbonate as HCO3-	mg/L	---	---	7.3	32.9
OH-CALC	Hydroxide as OH-	mg/L	---	---	< 0.5	< 0.5
2105AA04	Cyanide(SAD) + Thiocyanate	mg/L	0.0005	0.2	0.0008	0.0007
0125LLM9	Sulfide Total	mg/L	0.005	0.05	< 0.005	< 0.005
ANIONS						
11041334	Chloride Dissolved	mg/L	0.5	< 250	4.1	3.5
11061341	Fluoride Dissolved	mg/L	0.01	1.5	0.02	0.02
IonB/CALC	Ion Balance	%	---	---	-2.1	-3.5
ANM/CALC	Total Anions	meq/L	---	---	0.28	0.77
Cnm/CALC	Total Cations	meq/L	---	---	0.27	0.72
Lang/CALC	Langlier Index	pH units	---	---	-3.8	-2.5
pHS/CALC	Saturation pH	pH units	---	---	10.0	9.0
CARBON						
01030912	Organic Carbon - Total	mg/L	0.5	---	2.0	1.1

Matrix : Water
 Sampled on: 02/03/05 10:45 Water 02/03/05 10:00

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ANALYTICAL SERVICES

15-Mar-02
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Form 08098835Client : HEALTH CANADA
Project : CHEMAINUS IR#11, HALALT FN
Sampling site :
Submitted by : MELISSA DANIELSPhilip ID : 12012502 12012503
Client ID : CHEMAINUS HALALT FIR
IR #11 ST NATION

Spurcode	Parameter	Unit	MDL	CDWG		
CHLORINATED PHENOLS						
EX9946Z7	Water Prep for CPs	date			02/03/11	02/03/11
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
CPW1CPWA	2,4+3,4-DiClPhenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CPW2CPWA	2,5-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP09CPWA	2,6-Dichlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
CP83CPWA	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
P022CPWA	Pentachlorophenol	mg/L	0.0001	---	< 0.0001	< 0.0001
SURROGATE RECOVERY						
DC01SURR	CL2 Phenylacetic acid	%		---	102	98
BR3-CPWA	Tribromophenol	%	40	---	117	124
HYDROCARBONS						
H099PT11	VH C6-C10	mg/L	0.1	---	< 0.1	< 0.1
EX995172	Volat. Wax. Pro-Scr.	date			02/03/08	02/03/08
H097CALC	VPHw	mg/L		---	< 0.1	< 0.1
POLYCYCLIC AROMATIC HYDROCARBONS						
EX9946Z4	PAH Extraction-Water	date			02/03/08	02/03/08
PA05MW02	Benzo(a)pyrene	mg/L	0.00001	0.00001	< 0.00001	< 0.00001

Matrix : Water Water
Sampled on: 02/03/05 10:45 02/03/05 10:00

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ANALYTICAL SERVICES

15-Mar-02
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Form 08098835

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 Client ID : CHEMAINUS IR #11 HALALT FIR
 ST NATION

Spurcode	Parameter	Unit	MDL	CDWG		
T029MS11	Trichlorobene	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	1.5	< 0.5
B013MS11	Bromoform	ug/L	0.4	100.0	< 0.4	< 0.4
C032MS11	Chloroform	ug/L	0.6	100.0	75	< 0.6
C033MS11	Dibromochloromethane	ug/L	0.4	100.0	< 0.4	< 0.4
VOC SURROGATE RECOVERY						
VS01VSUR	Bromofluorobenzene	%	0	---	82	79
VS02VSUR	1,1,2-trichloroethane	%	0	---	117	127
VS03VSUR	m-Toluene	%	0	---	99	104

Matrix : Water Water
 Sampled on: 02/03/05 10:45 02/03/05 10:00

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ltd.



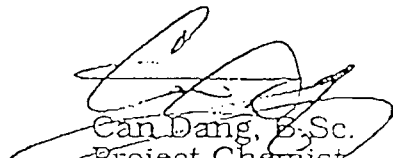
CHEMICAL ANALYSIS REPORT

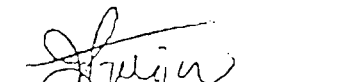
Hadat Robinson

Date: February 24, 1998
ASL File No. J2424
Report On: Water Analysis
For Don MacVicar, EHO
Report To: Health Canada - EHS (Pacific)
1230 Government Street
Victoria, BC
V8W 3G7
Attention: Mr. Peter Mazey, Sr. Environmental Health Officer
Received: February 13, 1998

ASL ANALYTICAL SERVICE LABORATORIES LTD.

per:


Can Dang, B.Sc.
Project Chemist


Joanne Patrick, B.Sc.
Project Chemist

004815





RESULTS OF ANALYSIS - Water

File No. J2424

		Halalt Reserve	W. Saanich	East Saanich
		98 02 11 01:00	98 02 12 09:00	98 02 12 09:45
<hr/>				
Physical Tests				
Colour	(CU)	<5	<5	<5
Conductivity	(umhos/cm)	65	47	48
Total Dissolved Solids		35	32	27
Hardness	CaCO3	22.8	16.6	16.5
pH		6.84	6.68	6.78
Turbidity	(NTU)	0.1	0.2	0.2
Dissolved Anions				
Alkalinity-Total	CaCO3	22	14	14
Chloride	Cl	1.7	3.1	3.1
Fluoride	F	<0.02	<0.02	<0.02
Sulphate	SO4	2	1	1
Nutrients				
Nitrate Nitrogen	N	0.228	0.093	0.081
Nitrite Nitrogen	N	<0.001	0.068	0.054
Total Metals				
Aluminum	T-Al	<0.2	<0.2	<0.2
Arsenic	T-As	<0.0001	0.0001	0.0001
Barium	T-Ba	<0.01	<0.01	<0.01
Boron	T-B	<0.1	<0.1	<0.1
Cadmium	T-Cd	<0.0002	<0.0002	<0.0002
Calcium	T-Ca	7.96	4.88	4.93
Chromium	T-Cr	<0.01	<0.01	<0.01
Copper	T-Cu	0.02	0.01	0.01
Iron	T-Fe	<0.03	<0.03	0.04
Lead	T-Pb	<0.001	<0.001	<0.001
Magnesium	T-Mg	0.72	1.07	1.02
Manganese	T-Mn	<0.005	<0.005	<0.005
Mercury	T-Hg	<0.00005	<0.00005	<0.00005
Potassium	T-K	<2	<2	<2
Selenium	T-Se	<0.0005	<0.0005	<0.0005
Sodium	T-Na	2	<2	<2
Zinc	T-Zn	<0.005	<0.005	0.009

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except for pH, Colour (CU),
Conductivity (umhos/cm), and Turbidity (NTU).
< = Less than the detection limit indicated.

-----REPORT AUDIT-----
 J2424-1
 Halalt Reserve

	Results		Cations eq wt			Anions			TDS calt'd cond factor Conduct calt'd		
	Sodium	2	mg/L	0.09	23	xxxx	2.10	0.469	4.48		
Potassium	0	mg/L	0.00	39	xxxx	0.00	0.543	0.00			
Calcium	7.96	mg/L	0.40	20	xxxx	7.96	0.385	20.7			
Magnesium	0.72	mg/L	0.06	12	xxxx	0.72	0.262	2.76			
Hardness	22.8	mg/L (CaCO3)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			
Alkalinity	22	mg/L (CaCO3)	xxxx	50	0.45	13.4	0.689	19.5			
Sulfate	2	mg/L	xxxx	48	0.05	2.26	0.649	3.49			
Chloride	1.7	mg/L	xxxx	35.5	0.05	1.67	0.467	3.58			
Silicate	xxxx	mg/L	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			
Fluoride	0.00	mg/L	xxxx	19	0.00	0.00	xxxx	xxxx			
Nitrate+Nitrite:N	0.23	mg/L	xxxx	14	0.02	1.01	0.870	1.16			
Ammonia:N	xxxx	mg/L	xxxx	14	xxxx	xxxx	0.245	xxxx			
Iron	0.00	mg/L	0.00	27.9	xxxx	0.00	0.517	0.00			
Manganese	0.00	mg/L	0.00	27.5	xxxx	0.00	0.514	0.00			
Copper	0.02	mg/L	0.00	31.8	xxxx	0.02	0.578	0.03			
Zinc	0.00	mg/L	0.00	32.7	xxxx	0.00	0.619	0.00			
Aluminum	0.0	mg/L	0.00	9	xxxx	0.00	0.146	0.00			
Barium	0.00	mg/L	0.00	68.7	xxxx	0.00	xxxx	xxxx			
pH	6.84	units	0.00	1	xxxx	0.00	0.003	0.05			
Conductivity	65	µmho/cm									
TDS	35	mg/L									
TOC	xxxx	mg/L									

	Cation	Anion	TDS	Conduct.
Σ	0.55	0.56	29.2	55.7

VALIDATION SUMMARY		Ion Balance % Diff	
		-0.76%	
	TDS	Conductivity	
det'd	35.0	Cond/TDS % Diff	65.0
calt'd	29.2		55.7 cal'd
% Diff	18.1%		15.4% % Diff

HEALTH ASSESSMENT: Pass

Assessment based on the Guidelines for Canadian Drinking Water Quality for all parameters analysed. 004817

Assessment Study of Water and Wastewater Systems
Halalt First Nation, Halalt IR No. 2

Appendix E

WASTEWATER TESTING RESULTS

(CHEMICAL/PHYSICAL/BACTERIOLOGICAL)

WITH COMPARISONS TO THE
GUIDELINES FOR EFFLUENT QUALITY AND WASTEWATER
TREATMENT AT FEDERAL ESTABLISHMENTS

Nil