

**ASSESSMENT STUDY OF
WATER AND WASTEWATER SYSTEMS
AND ASSOCIATED
WATER MANAGEMENT PRACTICES
AT SUMAS FIRST NATION**

**A
REPORT
TO
INDIAN AND NORTHERN AFFAIRS CANADA
BC REGION**

 NovaTec Consultants Inc.
Environmental Engineers and Scientists

Appendix C

Water Testing Results

Page(s) 006403 to\à 006406

Is(are) under consultation



ANALYTICAL SERVICES

22-Oct-01
Page 1 of 9

Certificate of Analysis

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

HEALTH CANADA

Client Code CE

45860 CHEAM AVENUE
CHILLIWACK, BC
V2P 1N6Phone : (604) 792-6258
FAX : (604) 792-8273Project Information :Project ID : SUMAS FIRST NATTON
Submitted By: DANA SWARENRequisition Forms :

Form 08090307 logged on 12-Oct-01 completed on 20-Oct-01

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



RESULTS OF ANALYSIS

File No. 8978C

Sumas
Band

Matsqui

93 02 25

Physical Tests

Colour	CU		<5.0
Conductivity	umhos/cm		135
Total Dissolved Solids			88
Hardness	CaCO3		55.2
pH			6.36
Total Solids			89
Turbidity	NTU		0.26

Dissolved Anions

Alkalinity - Total	CaCO3		45.2
Chloride	Cl		3.7
Fluoride	F		0.10
Sulphate	SO4		17.9

Nutrients

Ammonia Nitrogen	N		0.005
Nitrate Nitrogen	N		2.55
Nitrite Nitrogen	N		0.002
Nitrite/Nitrate Nitrogen	N		2.55

Cyanides

Total Cyanide	CN		<0.001
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Remarks regarding the analyses appear at the beginning of this report.
 < = Less than the detection limit indicated.
 Results are expressed as milligrams per litre except where noted.



RESULTS OF ANALYSIS

File No. 8978C

Sumas
Band
93 02 25

Total Metals

Aluminum	T-Al	
Antimony	T-Sb	<0.005
Arsenic	T-As	<0.0001
Barium	T-Ba	<0.0001
Boron	T-B	<0.010
		<0.10
Cadmium	T-Cd	
Calcium	T-Ca	<0.0002
Chromium	T-Cr	16.1
Cobalt	T-Co	<0.001
Copper	T-Cu	<0.001
		0.136
Iron	T-Fe	
Lead	T-Pb	0.049
Magnesium	T-Mg	0.002
Manganese	T-Mn	3.67
Mercury	T-Hg	<0.005
		<0.00005
Potassium	T-K	
Selenium	T-Se	<2.0
Sodium	T-Na	<0.0005
Uranium	T-U	5.40
Zinc	T-Zn	<0.00005
		0.007

Inorganic Parameters

Sulphide S <0.02

Halogenated Volatiles

Bromodichloromethane	<0.001
Bromoform	<0.001
Carbon Tetrachloride	<0.001
Chlorobenzene	<0.001
Chloroform	<0.001
	<0.001
Dibromochloromethane	<0.001
1,2-Dichlorobenzene	<0.001
1,4-Dichlorobenzene	<0.001
1,2-Dichloroethane	<0.001
1,1-Dichloroethylene	<0.001
	<0.001
Tetrachloroethylene	<0.001
Trichloroethylene	<0.001
Trichlorofluoromethane	<0.001
Vinyl Chloride	<0.001

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< = Less than the detection limit indicated.
Results are expressed as milligrams per litre except where noted.



RESULTS OF ANALYSIS

File No. 8978C

Sumas
Band
93 02 25

Non-halogenated Volatiles

Benzene	<0.0005
Ethylbenzene	<0.0005
Toluene	<0.0005
meta- & para-Xylene	0.0018
ortho-Xylene	<0.0005

Polyaromatic Hydrocarbons

Benzo(a)pyrene	<0.00001
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Chlorinated Phenols

2,4-Dichlorophenol	<0.001
2,4,6-Trichlorophenol	<0.001
2,3,4,6-Tetrachlorophenol	<0.001
Pentachlorophenol	<0.001

Organic Parameters

Total Organic Carbon C	1.18
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Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
Results are expressed as milligrams per litre except where noted.

Date sent: Wed, 16 Jan 2002 13:42:33 -0500
From: "Rick Fernandes" <fernandesr@inac.gc.ca>
To: <oturk@novatec.ca>
Copies to: "Nathalie Lapierre" <LapierreN@inac.gc.ca>
Subject: Fwd: More Sumas Water Results (Bacteriology)

Sam,

I have forwarded data from the EHO for Sumas. Please be advised that the band has a new EHO. Her name is Kerrilyn Street. Some of the data will list Dana Swaren as being the EHO.

Regards,

Rick Fernandes
Real Property Services for INAC
Ph.604.666.5163
Fx.604.666.5159

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Is(are) under consultation



ANALYTICAL SERVICES

22-Oct-01
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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : SUMAS FIRST NATION
Sampling site :
Submitted by : DANA SWAREN

Philip ID : 11066444
Client ID : BAND OFFICE

Sparcode	Parameter	Unit	MDL	CDWG	
PHYSICAL					
00041220	pH	pH units	0.1	6.5-8.5	6.7 ✓
00021300	Color True	Col. Unit	5	15	5 ✓
00111160	Specific Conductance	uS/cm	1	--	236 -
SCCACALC	Computed Conductance	uS/cm		--	247 -
CCPDCALC	Conductance % Diff.	%		--	4.6 -
007H1035	Residue Filterable 1.0u (TDS)	mg/L	10	500	138 ✓
CTDSCALC	Computed TDS	mg/L		--	130 -
TDSRCALC	TDS % Diff.	%		--	-6.2 -
00151140	Turbidity	NTU	0.10	1.0	0.19 ✓
0107CALC	Hardness Total -T	mg/L		500	96.1 ✓
GENERAL INORGANICS					
01011211	Alkalinity Phen. 8.3 as CaCO3	mg/L	1	--	< 1 -
01021210	Alkalinity Total as CaCO3	mg/L	1	--	66 -
CO3-CALC	Carbonate as CO3 =	mg/L		--	< 0.5 -
HCO3CALC	Bicarbonate as HCO3-	mg/L		--	80.5 -
OH-CALC	Hydroxide as OH-	mg/L		--	< 0.5 -
ANIONS					
11041334	Chloride Dissolved	mg/L	1.0	< 250	7.4 ✓
11061341	Fluoride Dissolved	mg/L	0.10	1.5	< 0.10 ✓
IonBCALC	Ion Balance	%		--	0.4 -
AnnscALC	Total Anions	meq/L		--	2.30 -
CtncALC	Total Cations	meq/L		--	2.32 -
LangCALC	Langlier Index	pH units		--	-1.5 -
pHSACALC	Saturation pH	pH units		--	8.2 -
NITROGEN					
1110CALC	Nitrate Nitrogen Dissolved (N)	mg/L		10.0	1.82 ✓
11091350	Nitrate + Nitrite (N)	mg/L	0.02	10.0	1.82 ✓
11111354	Nitrite Nitrogen (N)	mg/L	0.005	1.0	< 0.005 ✓

Matrix : Water
Sampled on: 01/10/11 10:10

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ANALYTICAL SERVICES

22-Oct-01
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ANALYTICAL REPORT

Client : HEALTH CANADA
Project : SUMAS FIRST NATION
Sampling site :
Submitted by : DANA SWAREN

Philip ID : 11066444
Client ID : BAND OFFICE

Sparcode	Parameter	Unit	MDL	CDWG
SULFATE				
11211405	Sulfate	mg/L	1.0	< 500 30.7
METALS TOTAL				
Al-T0031	Aluminum	mg/L	0.02	< 0.02 -
As-TMS31	Arsenic	mg/L	0.001	0.025 < 0.001 ✓
Ba-T0031	Barium	mg/L	0.001	1.0 0.013 ✓
B-T0031	Boron	mg/L	0.008	5.0 0.030 ✓
Cd-TMS31	Cadmium	mg/L	0.0001	0.005 < 0.0001 -
Ca-T0031	Calcium	mg/L	0.05	--- 28.5 -
Cr-T0031	Chromium	mg/L	0.002	0.05 0.002 ✓
Cu-T0031	Copper	mg/L	0.001	1.0 0.102 ✓
Fe-T0031	Iron	mg/L	0.005	0.3 0.056 ✓
Pb-TMS31	Lead	mg/L	0.001	0.01 0.004 ✓
Mg-T0031	Magnesium	mg/L	0.05	--- 6.05 -
Mn-T0031	Manganese	mg/L	0.001	0.05 0.003 ✓
Hg-T0310	Mercury	mg/L	0.00005	0.001 < 0.00005 ✓
K-T0031	Potassium	mg/L	0.4	--- 1.2 -
Se-TMS31	Selenium	mg/L	0.001	0.01 < 0.001 ✓
Na-T0031	Sodium	mg/L	0.010	200 8.26 ✓
U-TLLMS	Uranium	mg/L	0.00001	0.1 < 0.00001 ✓
Zn-T0031	Zinc	mg/L	0.002	5.0 0.010 ✓
HYDROCARBONS				
EX995141	TEH Extraction-Water	date		01/10/12
H099PT11	VH C6-C10	mg/L	0.1	--- < 0.1 -
EPH1P112	EPHw C10-19	mg/L	0.1	--- < 0.1 -
WLEPCALC	LEPHw	mg/L		--- < 0.1 -
EPH2P112	EPHw C19-32	mg/L	0.1	--- < 0.1 -
WHEPCALC	HEPHw	mg/L		--- < 0.1 -
H097CALC	VPHw	mg/L		--- < 0.1 -
POLYCYCLIC AROMATIC HYDROCARBONS				
EX9946Z4	PAH Extraction-Water	date		01/10/16
PA01MW02	Acenaphthene	mg/L	0.00001	--- < 0.00001

Matrix : Water
Sampled on: 01/10/11 10:10

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Centre for
Disease Control
October /

BCCDC LABORATORY SERVICES
655 12th Avenue West
Vancouver, B.C. V5Z 4R4

Fax: (604)660-6073

ENVIRONMENTAL
BACTERIOLOGY

Phone Number :

Printed :2001 NOV 6

Requisition :A1WW042309

Submitter Ref :

HEALTH CANADA (CHILLIWACK) - 995
45860 CHEAM AVE
CHILLIWACK BC V2P 1N6

Specimen Submitter

:995-HEALTH CANADA (CHILLIWACK) *

s.19(1)

Site Information

Code/Name :02R2860 - 02R2860
Site Desc :SUMAS F.N. - [REDACTED] (LAUNDRY TUB), ABBT
City/Area :
Source :Well
Type :COM.W.S.

Specimen

Treatment:TREATED
Nature :WATER
Ph Level:
Exams Req :Total Coliform
Free Chlorine Level: ppm
WHO :D. SWAREN
:Fecal Coliform

Collected:2001 OCT 31

Received :2001 NOV 1

RESULTS

Reported on 2001 NOV 6

<u>Test</u>	<u>Result</u>	<u>Units</u>
1. Total Coliform (Membrane Filtration) EST:ESTIMATED COUNT	EST 2	TC Count/100ml
2. Fecal Coliform (Membrane Filtration) L:LESS THAN	L1	FC Count/100ml
3. EST RESULT INDICATES HIGH COLONY DENSITY ON MEMBRANE PREVENTING ACCURATE COLIFORM COUNTING.		

For inquiries from medical personnel regarding laboratory results,
please contact the Central Inquiry Line at 604-660-5100.

Specimen was 24 hours in transit

BCCDC LABORATORY SERVICES

The Province's centre of expertise in communicable disease control and provider of specialty health support services.

006426

MEDINET

C. Centre for
Epidemiology and
Disease Control

BCCDC LABORATORY SERVICES
655 12th Avenue West
Vancouver, B.C. V5Z 4R4

Fax: (604)660-6073

ENVIRONMENTAL
BACTERIOLOGY

Phone Number :

Printed :2001 NOV 6

Requisition :A1WW042310
Submitter Ref :

HEALTH CANADA (CHILLIWACK) - 995
45860 CHEAM AVE
CHILLIWACK BC V2P 1N6

Specimen Submitter

:995-HEALTH CANADA (CHILLIWACK)*

s.19(1)

Site Information

Code/Name :02R2861 - 02R2861
Site Desc :SUMAS F.N. - (KITCHEN), ABBT
City/Area : Type :COM.W.S.
Source :Well

Specimen

Treatment:TREATED Ph Level: Free Chlorine Level: ppm
Nature :WATER Exams Req :Total Coliform
HO :D. SWAREN :Fecal Coliform

Collected:2001 OCT 31
Received :2001 NOV 1

RESULTS

Reported on 2001 NOV 6

<u>Test</u>	<u>Result</u>	<u>Units</u>
1. Total Coliform (Membrane Filtration)	3	TC Count/100ml
2. Fecal Coliform (Membrane Filtration)	L1	FC Count/100ml
L:LESS THAN		

For inquiries from medical personnel regarding laboratory results,
please contact the Central Inquiry Line at 604-660-5100.

Specimen was 24 hours in transit

BCCDC LABORATORY SERVICES

The Province's centre of expertise in communicable disease control and provider of specialty health support services.

006427

MBDINRT

C. Centre for
Disease Control
Society

BCCDC LABORATORY SERVICES
655 12th Avenue West
Vancouver, B.C. V5Z 4R4

Fax: (604)660-6073

ENVIRONMENTAL
BACTERIOLOGY

Phone Number :

Printed :2001 NOV 2

Requisition :A1WW042306

Submitter Ref :

HEALTH CANADA (CHILLIWACK) - 995
45860 CHEAM AVE
CHILLIWACK BC V2P 1N6

Specimen Submitter

:995-HEALTH CANADA (CHILLIWACK)*

Site Information

Code/Name :02R2857 - 02R2857
Site Desc :SUMAS F.N. - BAND OFFICE (STAFF ROOM), ABBT.
City/Area : Type :COM.W.S.
Source :Well

Specimen

Treatment:TREATED Ph Level: Free Chlorine Level: ppm
Nature :WATER Exams Req :Total Coliform

EHO :D. SWAREN :Fecal Coliform

Collected:2001 OCT 31

Received :2001 NOV 1

RESULTS

Reported on 2001 NOV 2

<u>Test</u>	<u>Result</u>	<u>Units</u>
1. Total Coliform (Membrane Filtration)	L1	TC Count/100ml
2. Fecal Coliform (Membrane Filtration)	L1	FC Count/100ml
L:LESS THAN		

For inquiries from medical personnel regarding laboratory results,
please contact the Central Inquiry Line at 604-660-5100.

Specimen was 24 hours in transit

BCCDC LABORATORY SERVICES

The Province's centre of expertise in communicable disease control and provider of specialty health support services.

006428

MDINET

C. Centre for
Disease Control
Vancouver

BCCDC LABORATORY SERVICES
655 12th Avenue West
Vancouver, B.C. V5Z 4R4

Fax: (604)660-6073

ENVIRONMENTAL
BACTERIOLOGY

Phone Number :

Printed :2001 NOV 6

Requisition :A1WW042308

Submitter Ref :

HEALTH CANADA (CHILLIWACK) - 995
45860 CHEAM AVE
CHILLIWACK BC V2P 1N6

Specimen Submitter

:995-HEALTH CANADA (CHILLIWACK)*

Site Information

s.19(1)

Code/Name :02R2859 - 02R2859
Site Desc :SUMAS F.N. - (KITCHEN), ABBT
City/Area : Type :COM.W.S.
Source :Well

Specimen

Treatment:TREATED Ph Level: Free Chlorine Level: ppm
Nature :WATER Exams Req :Total Coliform
LHO :D. SWAREN :Fecal Coliform

Collected:2001 OCT 31
Received :2001 NOV 1

RESULTS

Reported on 2001 NOV 6

<u>Test</u>	<u>Result</u>	<u>Units</u>
1. Total Coliform (Membrane Filtration)	L1	TC Count/100ml
2. Fecal Coliform (Membrane Filtration)	L1	FC Count/100ml
L:LESS THAN		
3. MORE THAN 200 BACKGROUND COLONIES NOTED ON TOTAL COLIFORM MEMBRANE FILTER PER 100 ML		

For inquiries from medical personnel regarding laboratory results,
please contact the Central Inquiry Line at 604-660-5100.

Specimen was 24 hours in transit

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006429

MEDINBT

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