

**INDIAN AND NORTHERN AFFAIRS  
CANADA, BC REGION**

**ASSESSMENT STUDY OF  
WATER AND WASTEWATER SYSTEMS  
AND ASSOCIATED  
WATER MANAGEMENT PRACTICES  
AT SCOWLITZ**

 ***NovaTec Consultants Inc.***  
***Environmental Engineers and Scientists***

## **Appendix C**

### **Water Testing Results**



# CHEMICAL ANALYSIS REPORT

SOURCE: "COMPLETION REPORT CONSTRUCTION AND TESTING OF PRODUCTION WELL 1-95 AT THE WEST END OF SCOWLITZ I.R. NO. 1 EAST OF HARRISON MILLS, B.C."

PACIFIC HYDROLOGY CONSULTANTS LTD VANCOUVER, BC, PROJECT NO. ST16101, April 18, 1995 (INAC REPORT 5187)

Date: March 21, 1995  
ASL File No. E7841  
Report On: Scowolitz Indian Band Water Analysis 5038-008-00-02

Report To: UMA Engineering Ltd. 3030 Gilmore Diversion Burnaby, BC V5G 3B4

Attention: Mr. Kelvin Carey

Received: March 6, 1995

ASL ANALYTICAL SERVICE LABORATORIES LTD.  
per:

Joyce Chow, B.Sc.  
Project Chemist

RECEIVED
UMA ENGINEERING LTD.
BURNABY, B.C.
MAR 24 1995
KRC
SIU Specialist in Environmental Chemistry

Katherine Thomas, B.Sc.  
Project Chemist

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**REMARKS**

File No. E7841

The water as represented by the samples submitted as "Sample 1" and "Sample 3", can be characterized as moderate with respect to dissolved mineralization. The samples met the Canadian Drinking Water Guidelines for all parameters analyzed with the exceptions of Turbidity, Iron and Manganese. These parameters are limited for aesthetic objectives rather than health considerations. See the guidelines attached or contact ASL if you require any additional information.



RESULTS OF ANALYSIS - Water

File No. E7841

SAMPLE COLLECTION  
TIME AFTER ~~BE~~ START  
OF PUMP TEST

217 min

10 min  
Sample 3

Sample 1	Sample 2
95 03 03 13:07	95 03 03 13:07

95 03 03  
09:40

Physical Tests

Colour	CU	<5.0	-	<5.0
Conductivity	umhos/cm	229	-	229
Total Dissolved Solids		146	-	148
Hardness	CaCO3	111	-	116
pH		7.00	-	7.07
Total Suspended Solids		17	-	89
Turbidity	NTU	89.3	-	75.0

Dissolved Anions

Alkalinity - Total	CaCO3	117	-	116
Chloride	Cl	2.0	-	1.9
Fluoride	F	0.06	-	0.06
Silicate	SiO2	39.9	-	41.3
Sulphate	SO4	<1.0	-	1.2

Nutrients

Nitrate Nitrogen	N	<0.005	-	<0.005
Nitrite Nitrogen	N	0.002	-	0.003

Bacteriological Tests

Coliform Bacteria - Fecal	-	<2	-
Coliform Bacteria - Total	-	<2	-

Total Metals

Aluminum	T-Al	<0.20	-	<0.20
Arsenic	T-As	0.0007	-	0.0024
Barium	T-Ba	0.046	-	0.056
Boron	T-B	<0.10	-	<0.10
Cadmium	T-Cd	<0.0002	-	<0.0002
Calcium	T-Ca	29.5	-	30.4
Chromium	T-Cr	<0.015	-	<0.015
Copper	T-Cu	<0.010	-	0.062
Iron	T-Fe	6.83	-	6.40
Lead	T-Pb	<0.001	-	0.002
Magnesium	T-Mg	9.10	-	9.75
Manganese	T-Mn	0.526	-	0.535
Mercury	T-Hg	<0.00005	-	<0.00005
Potassium	T-K	0.93	-	0.97
Selenium	T-Se	<0.0005	-	<0.0005
Sodium	T-Na	2.57	-	2.66
Zinc	T-Zn	0.005	-	0.012

Remarks regarding the analyses appear at the beginning of this report.  
 Coliform results are expressed as Most Probable Number (MPN) per 100 mL.  
 A coliform result of <2 will be interpreted by the B.C. Ministry of Health  
 as a value of 0 (zero).  
 Results are expressed as milligrams per litre except for pH,  
 Conductivity (umhos/cm), Turbidity (NTU), and Colour (CU).  
 < = Less than the detection limit indicated.

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Appendix 1 - REGULATORY CRITERIA

File No. E7841

Health Canada

Guidelines for Canadian Drinking Water Quality. Fifth Ed., 1993.  
(Revised December 1993 for Trihalomethanes)

All limits are Maximum Acceptable Concentration (MAC) unless otherwise indicated.

Limits expressed as milligrams per litre except pH, Turbidity, Colour, and Coliform Bacteria.

		Lower Limit	Upper Limit		Notes
<b>Physical Tests</b>					
Colour	CU	-	15	CU	1
Total Dissolved Solids		-	500	mg/L	1
Hardness	CaCO <sub>3</sub>	-	-		2
pH		6.5	8.5		1
Turbidity	NTU	-	5	NTU	3, 4
<b>Dissolved Anions</b>					
Chloride	Cl	-	250	mg/L	1
Fluoride	F	-	1.5	mg/L	
Sulphate	SO <sub>4</sub>	-	500	mg/L	1, 5
<b>Nutrients</b>					
Nitrate Nitrogen		N	-	10.0	mg/L
Nitrite Nitrogen		N	-	1.0	mg/L
<b>Bacteriological Tests</b>					
Coliform Bacteria - Fecal		-	0		
Coliform Bacteria - Total		-	-		6
<b>Total Metals</b>					
Arsenic	T-As	-	0.025	mg/L	7
Barium	T-Ba	-	1.0	mg/L	
Boron	T-B	-	5.0	mg/L	7
Cadmium	T-Cd	-	0.005	mg/L	
Chromium	T-Cr	-	0.05	mg/L	
Copper	T-Cu	-	1.0	mg/L	1, 3
Iron	T-Fe	-	0.3	mg/L	1
Lead	T-Pb	-	0.01	mg/L	3, 8
Manganese	T-Mn	-	0.05	mg/L	1
Mercury	T-Hg	-	0.001	mg/L	
Selenium	T-Se	-	0.01	mg/L	
Sodium	T-Na	-	200	mg/L	1
Zinc	T-Zn	-	5.0	mg/L	1, 3

- 1 Aesthetic Objective (AO) (taste, odour, appearance, etc.)
- 2 Maximum not established, levels > 200 mg/L are considered poor but may be tolerated (AO).
- 3 At point of consumption (AO).
- 4 1 NTU maximum allowed for water entering distribution systems.
- 5 There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
- 6 No sample should contain more than 10 organisms per 100mL and no consecutive samples should be positive (MAC).
- 7 Interim Maximum Acceptable Concentration (IMAC)
- 8 First drawn water may be high, flush system before sampling (MAC)

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## Appendix 2 - METHODOLOGY

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Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

### **Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

### **Metals in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Edition published by the American Public Health Association, 1992. The procedures involve a variety of instrumental analyses including atomic emission spectrophotometry (ICP) and atomic absorption spectrophotometry (AA) to obtain the required detection limit for each element. Specific details are available on request.

**End of Report**



# can test ltd.

SUITE 200 1523 WEST 3rd AVENUE, VANCOUVER, B.C. V6J 1J8 • TELEPHONE (604) 734-7276 • TELEX 04-54210

Report On Analysis of Water Sample File No. 11889F, 11946F

Reported To Golder Associates Report No. \_\_\_\_\_

224 W. 8th Avenue P.O. # \_\_\_\_\_

Vancouver, B.C. V5Y 1N5 Date May 21/86

Attention: Mr. R. Guiton/Mr. L. Hansen

We have tested the samples submitted by you and report as follows:

PROJECT NAME: Water Quality  
 PROJECT NUMBER: 862-1052

**SUMMARY:**

For the chemical parameters tested, the samples met all the limits set by "British Columbia Drinking Water Quality Standards, 1982", Province of B.C., Ministry of Health and "Guidelines for Canadian Drinking Water Quality, 1978", published by authority of Health and Welfare Canada, as indicated in the "Results of Testing".

Parameters are limited for health or aesthetic reasons.

In regards to bacterial parameters, the sample met the limits (i.e. no coliform was detected).

In summary, the water represented by the sample submitted may be characterized as low in dissolved mineralization and soft with respect to hardness.

**SAMPLE IDENTIFICATION:**

The samples were identified as:

DATE SAMPLED: As Indicated  
 DATE SUBMITTED: May 1 and 6, 1986  
 TYPE OF CONTAINER: 1L Plastic, 250ml acid washed, 250 ml sterilized

For further identification, see "Results of Testing".

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can test it.

AFTER WELL DEVELOPMENT PUMPING

Name: Golder Associates
File No: 11889F, 11946F
Page No: 2

AFTER PUMP TESTING

RESULTS OF TESTING:

Table with 4 columns: SAMPLE #, CLIENT SAMPLE I.D., 11889 SCOWLITZ APRIL 30/86, 11946 SCOWLITZ MAY 6/86, MAXIMUM ACCEPTABLE CONC.\*\*\*

PHYSICAL TESTS

Table with 4 columns: Parameter, 11889, 11946, Maximum Acceptable Conc.\*\*\*. Includes pH, Conductivity, True Color, Turbidity, Hardness, Total Suspended Solids, Total Dissolved Solids.

DISSOLVED ANIONS (mg/L)

Table with 4 columns: Anion Name, 11889, 11946, Maximum Acceptable Conc.\*\*\*. Includes Alkalinity (Bicarbonate, Carbonate, Hydroxide), Chlorides, Sulfates, Nitrates and Nitrites, Fluorides.

DISSOLVED METALS (mg/L)

Table with 4 columns: Metal Name, 11889, 11946, Maximum Acceptable Conc.\*\*\*. Includes Calcium, Magnesium, Sodium, Potassium, Iron, Manganese, Silica.

TOTAL METALS (mg/L)

Table with 4 columns: Metal Name, 11889, 11946, Maximum Acceptable Conc.\*\*\*. Includes Magnesium, Iron, Manganese.

COLIFORM BACTERIA (MPN/100ml)\*R

Table with 4 columns: Category, 11889, 11946, Maximum Acceptable Conc.\*\*\*. Includes Total (Confirmed), Fecal.

mg/L = milligrams per liter

L = Less than = not detected

\* = filtered on a 0.45 micron membrane

\*\* = total nitrate and nitrite nitrogen

\*\*\* = Maximum Acceptable concentration as set by "B.C. Drinking Water Quality Standards, 1982" and "Guidelines for Canadian Drinking Water Quality, 1978"

x = Exceeded the "Guidelines"

SOURCE: REPORT TO UTA ENGINEERING LTD. ON THE DESIGN, CONSTRUCTION AND TESTING OF A NEW WATER SUPPLY WELL. SCOWLITZ BAND, SQUAWKUM CREEK INDIAN RESERVE NO. 3. GOLDER ASSOCIATES REPORT NO. 862-1052, June 1986. INAC REPORT 4184

Name: Golder Assoc.  
File No: 11889F, 11946F  
Page No: 3

REMARKS:

When evaluating coliform results, the following excerpts from the "Guidelines for Canadian Drinking Water Quality, 1978", published by the authority of Health and Welfare, Canada should be noted:

Page 24-25 "It should be emphasized that no bacteriological analysis of water can take the place of a complete knowledge of the conditions at the sources of supply and throughout the distribution system. Contamination is often intermittent and may not be revealed by the examination of a single sample. The most a bacteriological report can prove is that, at the time of examination, bacteria indicating fecal pollution did or did not grow under laboratory conditions from a sample of water."

Page 26 "Since the presence of any type of coliform organism in treated water suggest either inadequate treatment or contamination, the objective level for total coliforms should be no organisms detectable per 100ml; however, in practice this level is not always attainable."

Page 27 "If any coliform organisms are detected, the site should be resampled, and if the presence of coliforms is confirmed, action taken to determine the cause. If the maximum acceptable level is exceeded, the local control agency or Medical Officer of Health should be contacted for the appropriate corrective action. The most common immediate actions include increasing the chlorine dosage, flushing the water mains, using an alternative source of water and advising consumers to boil drinking water."

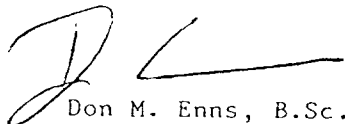
The "B.C. Drinking Water Quality Standards, 1982" published by Province of British Columbia, Ministry of Health further state that:

Page 3 "If any raw water sample contains fecal coliforms or if more than five percent of the samples in any consecutive 30-day period have a total coliform density greater than 10 per 100 ml, disinfection is required."

METHOD OF TESTING: The analyses were carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 15th Edition, 1980, published by the American Public Health Association.

The metals were determined using Inductively Coupled Plasma Spectrographic analysis, direct or graphite furnace atomic absorption spectrophotometry.

CAN TEST LTD.



Don M. Enns, B.Sc.,  
Supervisor

Water Analysis Laboratory

DME/cs

**Page(s) 005976 to\à 006013**

**Is(are) under consultation**