

**Assessment Study of
Water and Wastewater Systems
and Associated Water Management Practices
at the Stelat'en First Nation Community**

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



December, 2001

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: Oct 17/01 URGENT _____ CONFIDENTIAL _____

TO: Lawrence Benjamin - CH2M Hill

FAX NUMBER: 604 684 3292

Pages to follow: 8

Original Mailed: Yes _____ No

FROM: Paul Brode

SUBJECT: Water Data

COMMENTS: _____

here is the information requested for Stellapus
& Nakerdli

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

PE
 signed

Community : :

STELLAT'EN No. 1

Sampling Year : : 2001

s.19(1)

DATE	LOCATION	GB	TC	FC
02/01/01	Health Centre	0	0	0
03/13/01		2	0	0
03/13/01	Stellaquo Store	0	0	0
03/13/01	Pumphouse	750	0	0
03/13/01	Alberta Ward KT	6	0	0
03/13/01	Health Centre	6	0	0
03/13/01		0	0	0
03/13/01		0	0	0
03/13/01		28	0	0
04/04/01	Pumphouse	0	0	0
04/04/01	Health Centre	2	0	0
05/15/01		0	0	0
05/15/01		8	0	0
05/15/01	Alberta Ward BT	0	0	0
05/15/01	Health Centre	0	0	0

STELLAT'EN No. 1

Sampling Year : : 2000

DATE	LOCATION	GB	TC	FC
02/17/00		40	0	0
02/17/00		10	2	0
04/14/00	Health Centre	0	0	0
06/12/00	Health Centre	0	0	0
06/12/00		0	0	0
06/12/00		22	0	0
09/21/00	Health Centre	26	0	0
09/21/00	Daycare KT	0	0	0
11/15/00		0	0	0
11/15/00		0	0	0
11/15/00	Store & Gas Bar	0	0	0
11/15/00		0	0	0
11/15/00	Health Centre	0	0	0

s.19(1)



ANALYTICAL SERVICES

12-Apr-01
Page 2 of 8

ANALYTICAL REPORT

Client : HEALTH CANADA
Project :
Sampling site :
Submitted by : PAUL BRODA

Philip ID : 11018784
Client ID : STELLAQUE
WELL

Sparcode	Parameter	Unit	MDL	CDWG	
PHYSICAL					
00041220	pH	pH units	0.1	6.5-8.5	8.2
00021300	Color True	Col. Unit	5	15	< 5
00111160	Specific Conductance	uS/cm	1	---	224
SCCACALC	Computed Conductance	uS/cm		---	232
CCPDCALC	Conductance % Diff.	%		---	3.6
007H1035	Residue Filterable 1.0u (TDS)	mg/L	10	500	136
CTDSCALC	Computed TDS	mg/L		---	121
TDSRCALC	TDS % Diff.	%		---	-11.3
00151140	Turbidity	NTU	0.10	1.0	< 0.10
0107CALC	Hardness Total -T	mg/L		500	100
GENERAL INORGANICS					
01011211	Alkalinity Phen. 8.3 as CaCO3	mg/L	1	---	< 1
01021210	Alkalinity Total as CaCO3	mg/L	1	---	111
CO3-CALC	Carbonate as CO3 =	mg/L		---	< 0.5
HCO3CALC	Bicarbonate as HCO3-	mg/L		---	135
OH--CALC	Hydroxide as OH-	mg/L		---	< 0.5
ANIONS					
11041334	Chloride Dissolved	mg/L	1.0	< 250	< 1.0
11061341	Fluoride Dissolved	mg/L	0.10	1.5	0.29
IonBCALC	Ion Balance	%		---	1.1
AnnsCALC	Total Anions	meq/L		---	2.39
CtnsCALC	Total Cations	meq/L		---	2.45
LangCALC	Langelier Index	pH units		---	0.3
pHSACALC	Saturation pH	pH units		---	7.9
NITROGEN					
1110CALC	Nitrate Nitrogen Dissolved (N)	mg/L		10.0	< 0.02
11091350	Nitrate + Nitrite (N)	mg/L	0.02	10.0	< 0.02
11111354	Nitrite Nitrogen (N)	mg/L	0.005	1.0	< 0.005

Matrix : Water
Sampled on: 01/04/04 16:00

CONTINUED on page 3



ANALYTICAL SERVICES

12-Apr-01
Page 3 of 8

ANALYTICAL REPORT

Client : HEALTH CANADA
Project :
Sampling site :
Submitted by : PAUL BRODA

Philip ID : 11018784
Client ID : STELLAQUE
WELL

Sparcode	Parameter	Unit	MDL	CDWG	
SULFATE					
11211405	Sulfate	mg/L	1.0	< 500	6.9
METALS TOTAL					
Al-T0031	Aluminum	mg/L	0.02	---	< 0.02
As-TMS31	Arsenic	mg/L	0.001	0.025	0.015
Ba-T0031	Barium	mg/L	0.001	1.0	0.082
B--T0031	Boron	mg/L	0.008	5.0	< 0.008
Cd-TMS31	Cadmium	mg/L	0.0001	0.005	< 0.0001
Ca-T0031	Calcium	mg/L	0.05	---	31.0
Cr-T0031	Chromium	mg/L	0.002	0.05	< 0.002
Cu-T0031	Copper	mg/L	0.001	1.0	0.002
Fe-T0031	Iron	mg/L	0.005	0.3	0.008
Pb-TMS31	Lead	mg/L	0.001	0.01	< 0.001
Mg-T0031	Magnesium	mg/L	0.05	---	5.55
Mn-T0031	Manganese	mg/L	0.001	0.05	0.127
Hg-T0310	Mercury	mg/L	0.00005	0.001	< 0.00005
K_T0031	Potassium	mg/L	0.4	---	2.2
Se-TMS31	Selenium	mg/L	0.001	0.01	< 0.001
Na-T0031	Sodium	mg/L	0.010	200	8.92
U--TLLMS	Uranium	mg/L	0.00001	0.1	0.00133
Zn-T0031	Zinc	mg/L	0.002	5.0	< 0.002

Matrix : Water
Sampled on: 01/04/04 16:00

Appendix D

Wastewater Quality Test Results

STELLA&JO LAGOON

SAMPLING DATE	INFLUENT				EFFLUENT				COMMENTS
	pH	AMMONIA (mg/L)	BOD5 (mg/L)	TSS (mg/L)	pH	AMMONIA (mg/L)	BOD5 (mg/L)	TSS (mg/L)	
2-Apr-92	7.4		162	60		77	10		
4-Nov-92		30.0	80	48				Influent sample taken @ 1345 hrs	
6-Oct-93		5.00	45	44					
22-Mar-94		19.1	126	50					
28-Jun-94		19.2	181	50	7.2	0.08	15	56	
07-Sep-94		33.2	320	164					
17-Jan-95		21.4	117	78					
27-Mar-95	7.4	26.9	183	192				Second cell still not discharging	
29-Aug-95		36	290	284					
15-Nov-95	7.4	20.4	150	396	7.1	20.8	140	20	
12-Mar-96	7.0	24.8	182	62	7.7	6.42	18	8	
24-Jun-96	*	*	*	*	7.4	10.3	*	10	
25-Sep-96	7.4	20.2	176	136	7.4	19.1	73	21	
11-Dec-96	7.2	1.76	23	24	7.3	5.82	26	29	
30-Apr-97	7.2	40.1	660	1310	7.6	18.5	135	54	
2-Sep-97	7.4	36.9	165	110	7.6	16.7	100	44	
27-Oct-97	9.3				7.3	14.9	185	66	
03-June-98		12.7	44	22					
06-July-98	7.5	40	400	410	7.5	18.5	90	18	
28-Oct-98		30.3	150	66					
22-Feb-99	7.41	9.19	74	74	7.14	30.7	150	15	
7-Jul-99	7.27	20.6	126	300					
4-Oct-99		63.3	1020	1300	6.76	11.6	41	44	
3-Nov-99		22.1	180	192					
26-Jan-00		0.66	<10	17					
26-Jul-00	7.6	27.4	230	74					
11-Oct-00		12.1	250	132	7.31	19.7	75	26	
16-Nov-00									

* Error with type of sampling bottles used

Lagoon discharging to wetland
 Continuous discharge to wetland; LC50=83
 FC = 690000
 LC50=75
 LC50=33
 FC=500000
 LC50=71
 FC=230000
 LC50=66; FC=290000
 FC=41000
 LC50=44
 FC=480000
 flushing lines, so infl. values low, LC50 =71
 FC=98,000
 FC=140,000, LC50=57

STELLAQUO GROUND WATER MONITORING

SAMPLE DATE	CONDUCT (umhos/cm)	pH	CHLORIDE (mg/L)	TOT P (mg/L)	TDP (mg/L)	ORTHO P (mg/L)	NITRITE (mg/L)	NITRATE (mg/L)	FEC COLI (CFU/100ml)
NORTHEAST WELL									
22-Nov-88	710		20	0.061	0.014	0.011	0.002	0.008	1
15-May-89	810	6.9	4	0.035	0.004	0.004	0.002	0.163	1
15-Jul-89	265	7.6	4	0.204	0.075	0.070	0.004	0.052	1
6-Dec-89	700	7.1	31	0.148	0.003	0.007	0.002	0.014	1
18-Jun-90	87	7.3	1	0.042	0.025	0.018	< 0.002	0.036	< 1
7-Nov-90									< 1
23-Jan-91	440	7.3	3	0.018	0.013	0.017	0.002	0.017	< 1
3-Oct-91	343	7.1	4	0.063	0.040	0.035	0.004	0.096	< 1
24-Mar-92									< 1
2-Apr-92	297	7.3	1	0.138	0.022	0.008	0.003	0.057	< 1
16-Jul-92	371	7.6	1	0.064	0.034	0.023	< 0.002	0.170	< 1
4-Nov-92	686	7.2	2	0.036	0.005	< 0.005	< 0.002	0.007	< 1
18-Feb-93	581	7.1	1	0.040	0.015	0.004	< 0.002	0.022	< 1
28-Apr-93	165	7.0	2	0.119	0.073	0.066	0.004	0.391	< 2
6-Oct-93									< 2
13-Dec-93	399	6.9	3	0.1	0.073	0.037	< 0.002	0.140	< 2
22-Mar-94	Well frozen								< 2
14-Jul-94	393	6.9	4	0.065	0.045	0.036	0.003	0.025	< 2
07-Sep-94	538	6.9	4	0.073	0.042	0.025	0.002	0.107	4
17-Jan-95	777	7.2	3	0.054	0.012	0.007	< 0.002	0.076	< 1
27-Mar-95	931	6.9	4	0.019	0.009	0.005	< 0.002	0.050	< 2
29-Aug-95	1010	7.2	4	0.084	0.012	0.008	0.003	0.035	< 2
15-Nov-95	850	7.1	5	0.091	0.012	< 0.002	< 0.002	0.048	< 2
12-Mar-96	not sampled	well	frozen						
24-Jun-96	401	6.8	7	0.025	0.004		0.002	0.047	< 1
25-Sep-96	710	7.1	10	0.103	0.012		0.003	0.040	< 1
11-Dec-96	1140	7.2	29	0.09	0.014		< 0.002	0.033	< 1
30-Apr-97	558	7.2	21	0.04	< 0.003		< 0.002	0.050	4
2-Sep-97	900	7.0	24	0.195	0.026		< 0.002	0.046	< 1
28-Oct-97	950	7.4	21	0.112	0.008		< 0.002	0.052	< 1
02-June-98	680	7.1	44	0.034	0.021		< 0.002	0.007	
06-July-98									< 1
28-Oct-98	1010	6.9	19	0.022	0.005		0.012	0.038	
22-Feb-99	1060	6.7	20	0.229	0.010		< 0.002	0.041	< 1
07-July-99	812	7.2	27	0.033	0.021		< 0.002	< 0.001	< 1

Stelwell.xls

STELLAQUO GROUND WATER MONITORING .

SAMPLE DATE	CONDUCT (umhos/cm)	pH	CHLORIDE (mg/L)	TOT P (mg/L)	TDP (mg/L)	ORTHO P (mg/L)	NITRITE (mg/L)	NITRATE (mg/L)	FEC COLI (CFU/100ml)
4-Oct-99	785	6.6	24	0.392	0.026		0.011	0.076	<1
3-Nov-99	811	6.5	25	0.016	0.007		0.005	0.05	<1
26-Jan-00	well not sampled - frozen								
26-Jul-00	860	6.9	34	0.073	0.007		0.021	0.037	<10
11-Oct-00	851	7.2	30	0.098	0.005		0.009	0.01	
16-Nov-00	900	6.8	35	0.125	<0.003		<0.002	<0.002	<1
SOUTHEAST WELL									
22-Nov-88	980		8	0.097	0.014	0.007	0.003	0.013	14
15-May-89	190	7.0	22	0.084	0.047	0.005	0.027	0.011	1
15-Jul-89	750	6.8	2	0.091	0.032	0.002	0.002	0.008	2
6-Dec-89	570	7.2	2	0.083	0.003	0.004	0.002	0.002	1
18-Jun-90	760	6.9	2	0.051	0.011	0.006	0.005	0.023	<1
7-Nov-90									<1
23-Jan-91	590	6.9	2	0.060	0.010	0.027	0.004	0.067	<1
3-Oct-91	705	6.8	<1	0.131	0.027	0.015	0.003	0.029	<2
24-Mar-92									<1
2-Apr-92	509	6.7	2	0.049	0.018	0.007	<0.002	0.071	<1
16-Jul-92	542	7.0	1	0.214	0.026	0.009	<0.002	0.021	<1
4-Nov-92	623	7.0	1	0.144	<0.005	<0.005	0.008	0.057	<2
18-Feb-93	615	7.0	1	0.160	0.019	0.007	0.002	0.046	<1
28-Apr-93	721	6.8	1	0.096	0.015	0.920	0.002	2.90	<2
6-Oct-93	524	6.9	1	0.096	0.012	0.003	0.009	0.140	<2
13-Dec-93	642	6.7	1	0.119	0.041	0.043	<0.002	0.020	<2
22-Mar-94	Well frozen								
14-Jul-94	1190	7.1	24	0.116	0.030	0.028	0.002	0.062	<2
07-Sep-94	1150	7.1	22	0.103	0.039	0.026	<0.002	0.009	<1
17-Jan-95	622	7.0	<1	0.074	0.015	0.007	0.007	0.008	<1
27-Mar-95	582	6.8	2	0.053	0.029	0.007	<0.002	0.011	<2
29-Aug-95	615	6.8	<1	0.074	0.019	0.007	0.004	0.018	<2
15-Nov-95	is not analyzed for these parameters.								
12-Mar-96	564	7.0	<1	0.064	0.045		<0.002	0.017	<1
24-Jun-96	564	6.8	2	0.136	<0.003		0.002	0.047	<1
25-Sep-96	566	6.8	3	0.095	0.006		0.01	0.019	<1
11-Dec-96	590	6.8	2	0.112	<0.002		<0.002	0.054	<1
30-Apr-97	303	6.7	6	0.044	<0.003		<0.002	0.459	<2
2-Sep-97	400	6.8	10	0.098	0.015		0.008	0.256	<1
28-Oct-97	580	7.0	5	0.157	0.008		0.004	0.006	<1

Stelwell.xls

STELLAQUO GROUND WATER MONITORING

SAMPLE DATE	CONDUCT (umhos/cm)	pH	CHLORIDE (mg/L)	TOT P (mg/L)	TDP (mg/L)	ORTHO P (mg/L)	NITRITE (mg/L)	NITRATE (mg/L)	FEC COLI (CFU/100ml)
02-June-98	488	6.9	13	0.083	0.033		<.002	0.016	
06-July-98									
23-Oct-98	603	6.9	14	0.234	0.004		0.023	<.002	<1
22-Feb-99	634	6.5	20	0.078	0.005		<0.002	0.018	<1
07-July-99	570	6.8	27	0.035	0.014		<0.002	<0.002	<1
4-Oct-99	490	6.3	22	0.01	0.009		0.003	0.113	<1
3-Nov-99	581	6.4	25	0.119	<0.003		<0.002	0.004	<1
26-Jan-00	606	6.2	18	0.190	0.010		0.008	0.170	<1
26-Jul-00	725	6.5	34	0.293	0.004		0.005	<0.002	<10
11-Oct-00	646	6.8	27	0.073	0.007		<0.002	0.015	<1
16-Nov-00	642	6.5	30	0.344	0.003		<0.002	<0.002	<1
NORTHWEST WELL									
15-May-89	1020	7.8	2	0.047	0.028	0.024	0.022	0.031	1
15-Jul-89	1000	6.7	38	0.073	0.029	0.004	0.002	0.028	1
6-Dec-89	410	7.6	5	0.020	0.007	0.007	0.002	0.007	1
18-Jun-90	1010	6.8	23	0.105	0.010	0.007	0.008	0.029	<1
7-Nov-90									<1
23-Jan-91	780	7.0	13	0.040	0.008	0.062	0.002	0.075	<1
3-Oct-91	991	6.9	16	0.061	0.027	0.022	0.004	0.094	<2
24-Mar-92									<1
2-Apr-92	902	6.9	2	0.138	0.020	0.005	<0.002	0.052	<1
16-Jul-92	1140	7.1	12	0.172	0.060	0.054	0.003	0.149	<1
4-Nov-92	Y - NO SAMPLE								
18-Feb-93	732	7.2	7	0.127	0.011	0.005	0.006	0.095	<1
28-Apr-93	1070	7.0	8	0.164	0.022	0.016	<0.002	0.033	<2
6-Oct-93	1340	7.1	13	0.179	0.033	0.027	0.002	0.020	<2
13-Dec-93	1320	6.9	13	0.169	0.043	0.043	<0.002	0.010	<2
22-Mar-94	1120	7.1	13	0.112	0.013	0.006	<0.002	0.010	<2
14-Jul-94	638	6.8	1	0.053	0.006	0.002	<0.002	0.010	<2
07-Sep-94	540	6.7	1	0.09	0.017	0.005	<0.002	0.016	4
17-Jan-95	1020	7.4	19	0.077	0.012	0.012	<0.002	0.008	1
27-Mar-95	1060	7.0	20	0.019	0.009	0.003	<0.002	0.009	<2
29-Aug-95	1150	7.1	24	0.16	0.014	0.007	0.003	0.052	<2
15-Nov-95	1000	7.2	24	0.061	0.053	<0.002	0.003	0.024	<2
12-Mar-96	1040	7.3	22	0.097	0.045		<0.002	0.001	<1
24-Jun-96	1190	7.1	26	0.072	0.019		0.002	0.005	<1

Stelwell.xls

STELLAQUO GROUND WATER MONITORING

SAMPLE DATE	CONDUCT (umhos/cm)	pH	CHLORIDE (mg/L)	TOT P (mg/L)	TDP (mg/L)	ORTHO P (mg/L)	NITRITE (mg/L)	NITRATE (mg/L)	FEC COLI (CFU/100ml)
25-Sep-96	1200	7.1	29	0.062	0.031		0.002	0.051	<1
11-Dec-96									
30-Apr-97	1070	7.2	29	0.112	0.006		<0.002	0.005	<2
2-Sep-97	1200	7.1	27	0.188	0.037		0.004	0.082	<1
28-Oct-97	1210	7.3	26	0.115	0.018		0.002	0.009	<1
02-June-98	1070	7	15	0.259	0.022		<.002	0.017	
06-July-98									<1
28-Oct-98	1060	7.1	28	0.03	0.006		0.012	0.05	
22-Feb-99	1130	7	27	0.059	0.014		<0.002	0.028	1
07-July-99	1030	7.3	38	0.204	0.029		<0.002	<0.002	<1
4-Oct-99	1130	6.7	26	0.122	0.026		<0.002	0.069	<1
3-Nov-99	1140	6.7	35	0.036	0.022		<0.002	0.010	<1
26-Jan-00	1090	6.8	28	0.109	0.037		<0.002	0.029	<1
26-Jul-00	1210	6.9	29	0.012	0.003		0.003	<0.002	<10
11-Oct-00	1045	7.3	28	0.13	0.005		<0.002	0.016	
16-Nov-00	1062	6.9	31	0.16	0.005		<0.002	0.007	<10

Stelwell.xls