

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

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



July, 2002

Appendix C

Water Quality Test Results

Page(s) 003497 to\à 003497

Is(are) under consultation

Sample 239

LABORATORY REQUISITION - CYST DETECTION TEST
PACIFIC REGION GIARDIA/CRYPTOSPORIDIUM PROGRAM

220 - 177 Victoria Street
Prince George, B.C.
V2L 5R8
Phone (250) 561-5379
Fax (250) 564-3272

1. **GENERAL**

District Central District
Address **s.19(1)** [REDACTED]
Box 295, Boston Bar, B.C. V0K 1C0
EHO Contact Rita Manuel Phone 250-378-5764
Band Contact Boothroyd Indian Band Phone 604-867-9211

2. **DRINKING WATER SAMPLE** **s.19(1)**

Name of Community Tested [REDACTED]
Name of Water Source _____
Date of Sample (M/D/Y) November 22nd 1999
Exact Sampling site Kitchen Tap
Water at Site Sampled Raw Treated
Start Filtration (time) 9:30am Stop (time) 1:30pm
Water Meter at Start Time 41.601 m³ or _____ litres
Water Meter at Stop Time 42.106 m³ or _____ litres
Total Volume of Filtered Water _____
Flow Rate Through Filter (start) 2 L/min, (stop) 1.6 L/m
Ambient Temperature _____ °C Water Temperature 10 °C
pH 7.69 Turbidity 0.7 NTU Cl₂ _____ ppm
Flow Rate of Water Source:
 Very Noticeable Movement Little Movement
 Noticeable Movement No Noticeable Movement
Estimated Rate of Flow 4 litres/Min
Water Treatment at Consumer Tap: None (Raw) Chlorination
 Ozone Filtration (specify type) _____
Other Type of Treatment _____
Water System Tested: Municipal Band Operated
 Small System (<3 connections)
 Private Utility
Other Type of Water System _____

FAXED

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: 239

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: 11/22/99

s.19(1) Sample Source: [REDACTED] (Boothroyd Indian Band, Boston Bar, BC)

Sample Site: from kitchen tap [REDACTED] s.19(1)

Sample sent by: Boothroyd Indian Band Volume Filtered: 505 litres

Date & Time Received: 11/24/99 Date Processed / Preserved: 11/24/99

Condition of Filter: Good. It was contained in 350 ml 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: 0.5 ml of dark grey residue was extracted from the filter.
- Algae present: Algae were not found on the filter membrane.
- Other: Recognizable remains of plant cells, nematodes and pollen grains were found.

Giardia Result: Positive Presumptive Negative

Cryptosporidium Result: Positive Presumptive Negative

Summary and Conclusion: No presumptive or confirmed *Giardia* cysts or confirmed *Cryptosporidium* oocysts were found. Four round objects ranging in diameter from 3 to 4 um reacted with immun-fluorescent stain and these are reported as presumptive *Cryptosporidium* oocysts. Photographs of two of these presumptive oocysts are attached as Figures 1 and 2.

Results Certified by: C.H. Jarosch
C.H. Jarosch
Prince George Water Assay

Date: December 10, 1999

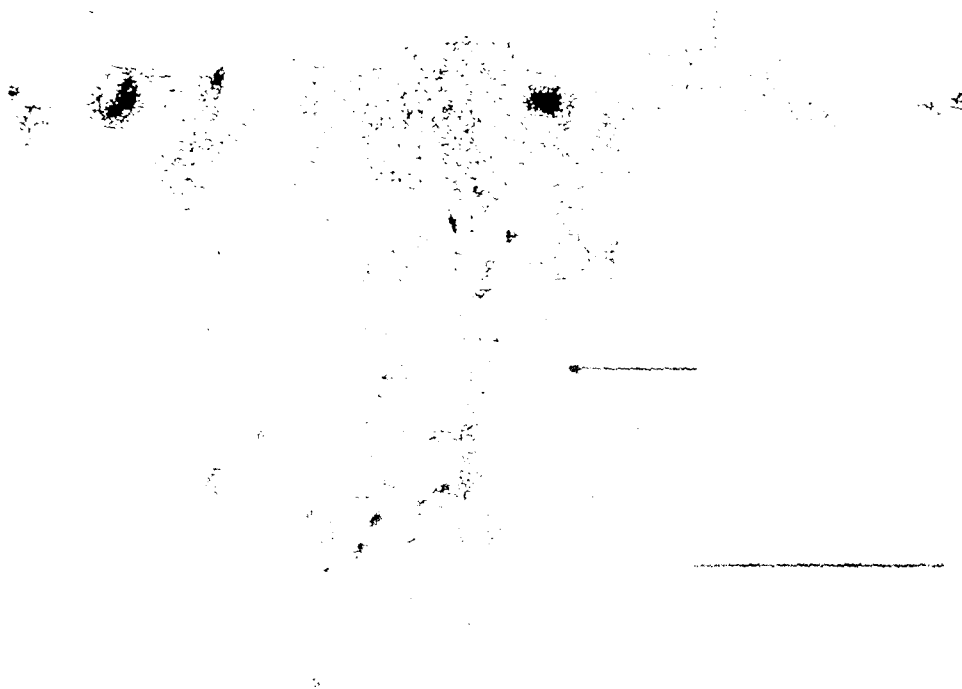
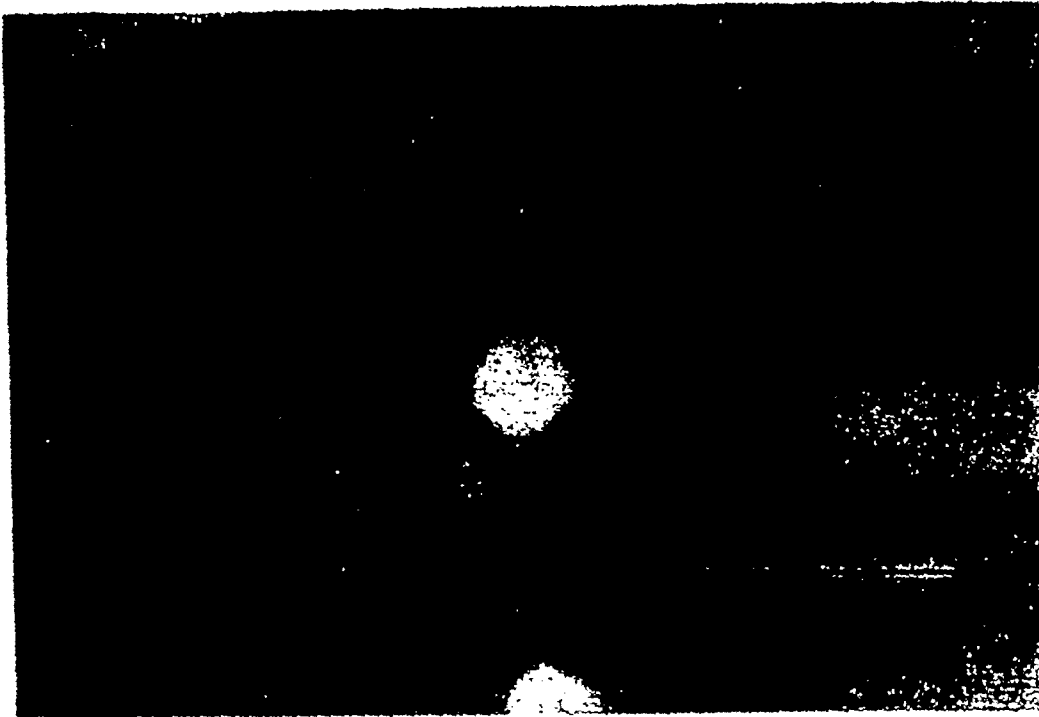


Figure 2 (Upper photograph) This is another example of an object which is considered to be a presumptive *Cryptosporidium* oocyst in sample 239. The specimen is viewed with UV epifluorescent illumination. (Lower photograph) The same presumptive oocyst (arrow) observed with transmitted white light. (Bar indicates 10 μ m.)

from
the

Health files

Ministry of Health and
Ministry Responsible for Seniors

Number 48
September 1995

Cryptosporidiosis

What is Cryptosporidiosis?

Cryptosporidiosis is an infection of the intestines caused by a very small parasite.

The disease is usually contracted by drinking contaminated water. In B.C., drinking water systems supplied from surface water sources (rain, creeks, rivers, lakes, etc.) are vulnerable to contamination by the feces of infected animals.

What are the symptoms of Cryptosporidiosis?

Symptoms usually start anywhere from two to ten days after exposure to the parasite, although not everyone who is infected with it will feel sick. If symptoms do occur, they may include watery diarrhea, stomach cramps, nausea, vomiting, and mild fever.

Symptoms may come and go, and usually last fewer than 30 days in people who are otherwise healthy.

However, the infection may last longer and be more serious in people whose immune system is not working properly. Persons with AIDS, those who have had an organ or bone marrow transplant, and those who have had cancer treatment are examples of people who may get serious infections.

How is it spread?

The parasite that causes Cryptosporidiosis is often found in the bowel movements (feces) of infected animals, including pets, livestock, poultry, or wild animals. These animals may have a bowel movement in or near rivers, creeks or lakes that are used as a source of drinking water.

Current methods used to treat drinking water do not always remove this very hardy parasite.

The infection can also be spread from hand to mouth (for example, by touching an infected animal with your hands and not washing your hands prior to eating). A person can also become infected by hand to mouth transfer of the parasite from contaminated surfaces or items. This is possible because the parasite can live outside of the body for several months under moist conditions.

Outbreaks of Cryptosporidiosis have occurred in daycare centres and in locations where drinking water (or beverages made from drinking water) or swimming pools have been contaminated. In many cases however, the source of infection is difficult to determine.

Some people are more likely than others to become infected. They include health care workers, child care providers, children in daycare, those exposed to feces through sexual contact, and those caring for a person infected with the parasite.

How can I prevent Cryptosporidiosis?

Wash your hands well after going to the toilet or changing diapers, and after touching farm animals, pets, or wild animals. This is especially important before eating or preparing food.

You should also avoid drinking water directly from rivers, creeks or lakes, or when you are uncertain whether the water has been properly treated (such as during foreign travel).



BC Ministry of Health and
Ministry Responsible for Seniors

Page(s) 003503 to\à 003513

Is(are) under consultation

F A C S I M I L E

Environmental Health Services
Health Canada
202-2090 Coutlee Avenue
Box 188, Merritt, BC V1K 1B8



Name: Ken Stevens
Fax: 604-684-3292
Phone:
From: Rita Manuel, EHO, Health Canada
Phone: 250-378-5764
Fax: 250-378-9119
Date: May 6/02

Pages including the cover: 13
Subject: Boothroyd Indian Band - Colilest Water Sample Results for INAC Water System Assessment.

Comments:
As per discussion with you earlier, and permission from the Boothroyd Indian Band, I am giving you copies of Colilest Water Sampling results from Nov. 1/99 - May 2/00

cc cc Boothroyd Band Fax

Colibert Water Sampling Results
 Boothroyd Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
Reservoir	Tap	Nov 1	1:30pm	1:30pm	clear ✓			
	Tap	Nov 1	1:30pm	1:30pm	clear ✓			
	Tap	Nov 1	1:30pm	1:30pm	clear ✓			
	Tap	Nov 1	1:30pm	1:30pm	clear ✓			
	holding tank	Nov 1	1:30pm	1:30pm	clear ✓			
	Tap	Nov 1	1:30pm	2:30pm	clear ✓			
	TAP-Private Supply	Nov 22	3:30pm	3:30pm	clear ✓	light yellow ✓	fluorescent ✓	

fax copy of water sample results to Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.



Colilert Water Sampling Results
Boothroyd Reservoir Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
s.19(1)	5 well system							
	tap Reservoir	Nov 30	10:30 am	DEC 1 10:36 am	✓ clear			
	tap Reservoir	Nov 30	10:30 am	DEC 1 12:30 am	✓ clear			
	Reservoir	Nov 30	10:30 am	DEC 1 10:30 am	✓ clear			
	tap Reservoir	Nov 30	10:30 am	DEC 1 10:40 am	✓ clear			
	tap Reservoir	Nov 30	10:30 am	DEC 1 10:40 am	✓ clear			
	tap Intake at Private houses	Nov 30	10:30 am	DEC 1 10:30 am	✓ clear			24hr incubation turned ✓ yellow
	gard Sample	Nov 30	10:30 am		✓ clear	light yellow	24hr incubation turned yellow	from week -
	tap. Kitchen	Dec 2	3:00 pm	DEC 3 3:00 pm	✓ clear		24 hr incubation clear	

For copy of water sample results to: Rita Marnel, EHO Fax: 250-378-9119 Indicate if sample required **L**. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.



MAY 6 2002 3:57 PM RICH KELLOWNA

Colilert Water Sampling Results
Beathroyd Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
				NEXT DAY				
s.19	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	first day started clear	24 hr incubation yellow ✓		
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
3 well	above ground	Dec 7 99	3 pm	Dec 8 / 3 pm		24 hr incubation yellow		
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
tap	SURFACE WATER							green surface water.
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	clear ✓			
tap	3 well	Dec 6 99	3 pm	Dec 7 / 3 pm	first day was clear	after 24 hr incubation yellow ✓		wasn't home received water SID TAP

No. 2789 P. 4

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.



Coliport Water Sampling Results
Boothroyd Indian Band

MP 1 . 0 . 2007 3:00PM RILUHT NELUMINA

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Flourescent)	Comments
	Well from tap	JAN 10/00	JAN 10/00 10:AM	Jan 11/00 10 AM	✓			
	Well from tap	Jan 10/00	JAN 10/00 10:AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			
	Well / tap	Jan 10/00	JAN 10/00 10 AM	Jan 11/00 10 AM	✓			24 hr incubation Bat Not fluorescent
	Well / tank	Jan 10/00	Jan 11/00 10 AM	Jan 11/00 10 AM				
	No sample available				Due to transportation			
	No sample available				No vehicle to get there			

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.

Received Jan. 11/2000

Rita Manuel, EHO

003518

No. 2/89 P. 5

Plattin Andrew

(5)

MAY 6 2002 3:58PM
RICOH KELOWNA

Colibert Water Sampling Results
Boothroyd Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
	3 well	Jan 24	9am	Jan 25 9am	✓			We have
	3 well	Jan 24	9am	Jan 25 9am	✓			been u
	3 well	Jan 24	9am	Jan 25 9am	✓			1 well
	3 well	Jan 24	9am	Jan 25 9am	✓			For the
	3 well	Jan 24	9am	Jan 25 9am	✓			Past
	3 well	Jan 24	9am	Jan 25 9am	✓			week
	3 well	Jan 24	9am	Jan 25 9am	✓			Due to
	3 well	Jan 24	9am	Jan 25 9am	✓			2 pumps
	3 well	Jan 24	9am	Jan 25 9am	✓			are
								being
								repaired

BOOTHROYD BAND 1

s.19(1)

604-967-9747

11:37

01/25/2000

No. 2789 P. 6

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.



Martin & New Boothroyd Band

Coliform Water Sampling Results Boothroyd Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
			24hr	Next Day				
s. 19 Boothroyd Band Holding tank	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			
	Surface	Feb 8	11:00	11:00	✓			
	3well	Feb 8	11:00	11:00	✓			

all clear after 24 hr
INCUBATION
except 3 wells
his well
yellow

turned yellow but was not fluorescent.

Due to pump failure we have been using one well as of Jan 3

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.

Martin ANDREW

Coliform Water Sampling Results
Boothroyd Indian Band

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
	above Ground	Mar 29/00	8:30am	Mar 30 8:30am		✓ orange.		the water was. Dark/murky/muddy.
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	Swell	Mar 29/00	8:30AM	Mar 30 8:30am	✓			
	above Ground	Mar 29/00	8:30am	Mar 30 8:30am		✓ yellow.		

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1, Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.

#1 4-867-42
 Mart. ANDREW

Collect Water Sampling Results
Boothroyd Indian Band

PAGE 01

BOOTHROYD BAND

504-867-9747

04/27/2000 12:34

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
s.19(1)	3 well	April 26	9am	April 27 9am	clear			we are still using well due to 2 of 3 pump failure
					clear			
					clear			
					clear			
					clear			
					clear			
No transportation for Angie Isaac's							We are still using a well system due to 2 of 3 pump failure	

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1. Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.



003525 4:00PM RIVN NLUWNA NO. 1189 P. 12

Martin ANDREW

Coliform Water Sampling Results
Boothroyd Indian Band

MAY 6 2002 4:00PM RICOH KELOWNA

Sample Site	Water System	Date	Time Start	Time Stop	Negative for Total Coliforms & E.Coli (Clear)	Positive for Total Coliforms (Yellow)	Positive for E.Coli (Fluorescent)	Comments
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			d u n d e r o g u i s m MAY 9 K S 11:45
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			
Reservoir	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			
	Swell	MAY 2	MAY 2 10AM	MAY 3 10AM	clear			

Fax copy of water sample results to: Rita Manuel, EHO Fax: 250-378-9119 Indicate if sample required 1: Additional Incubation or was Fluorescent Presence of E.Coli indicates a boil Advisory may be necessary.

No. 2789 P. 13

PAGE 01
BOOTHROYD BAND I.S.
S.19
584-867-9747
11:32
05/03/2000

Appendix D
Wastewater Quality Test Results

No wastewater information was seen