

Rhonda Miller - MVLWB

From: Kathleen Graham [kgraham@mvlwb.com]
Sent: June-06-11 3:40 PM
To: permits@mvlwb.com
Subject: FW: Ft smith water licence review
Attachments: Bio sampling slave river.pdf; natural water spring discharge.pdf; landfill drainage stream.pdf; natrual spring data.pdf

Please post under MV2011L3-0001

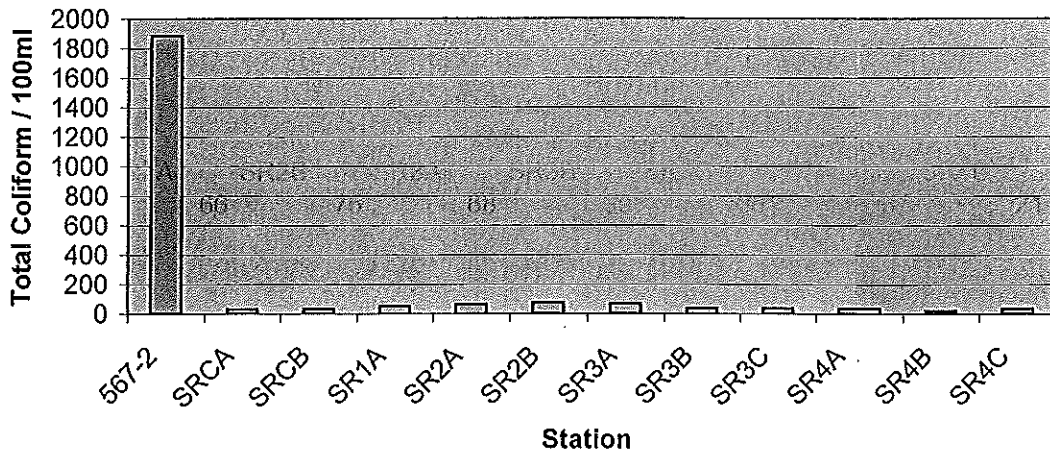
From: Jean Soucy [mailto:jsoucy@fortsmith.ca]
Sent: Monday, June 06, 2011 3:36 PM
To: racherk@wlwb.ca
Cc: michel.lanteigne@aecom.com; Kathleen Graham
Subject: Ft smith water licence review

Here are copies of various reports that will support our comments from the TOFS review Q/A as well provide some data and reporting on the discharge mixing zone (Bio sampling). The natural spring report clarifies IEG's misinterpretation of the landfill stream as well sampling data collected around station 567-4 and numerous springs located along the river bank. The Slave River monitoring program was conducted in the mid 90's and summarised in 1998 is a multimedia sampling program characterize baseline conditions of the aquatic ecosystem. Although these reports are older, they are valuable as most of our landfill and wastewater treatment infrastructure hasn't changed in any significant extent.

Regards
Jean Soucy
A/Director of Municipal Services
Town of Fort Smith
867-872-8412
867-872-0494 cell
867-872-8401 fax

SR1A	SR2A	SR2B	SR3A	SR3B	SR3C		SR4B	SR4C	
53		66	75	68	39	36	37	21	36

Bio Sampling - Slaver River Winter 1988



Biological Sampling Project
Slave River At Fort Smith

Purpose: The project is initiated to assess the mid winter effect of coliform concentrations in the Slave River resulting from sewage discharge from the Town of Fort Smith.

Rational: The Town of Fort Smith discharges sewage effluent from a three celled facultative pond system via an underground pipeline directly and continuously to the Slave River. Biological treatment is poor during the winter months causing coliform bacteria and B.O.D. to rise dramatically from summer conditions, the effects of which on the receiving waters are not fully understood.

Procedure: Duplicate water samples will be collected from the Slave River at two control stations above the sewage outfall, from six stations below the outfall, and from the lagoon discharge line at water licence station 567-2. The river samples will be obtained by drilling a hole through the ice cover and sampling just under the surface (as per Smith, 1983).

Station descriptions are as follows:

SRCA

200 m. immediately upstream from the sewage outfall point.

SRCB

100 m. toward the right bank from SRCA.

SR1A

100 m. immediately downstream from the sewage outfall point.

SR2A

300 m. immediately downstream from the sewage outfall point.

SR2B

100 m. toward the right bank from SR2A.

SR3A

500 m. immediately downstream from the sewage outfall point.

SR3B

100 m. toward the right bank from SR3A.

SR3C

200 m. toward the right bank from SR3A.

567-2

Water Licence station - sewage lagoon effluent to the Slave River.

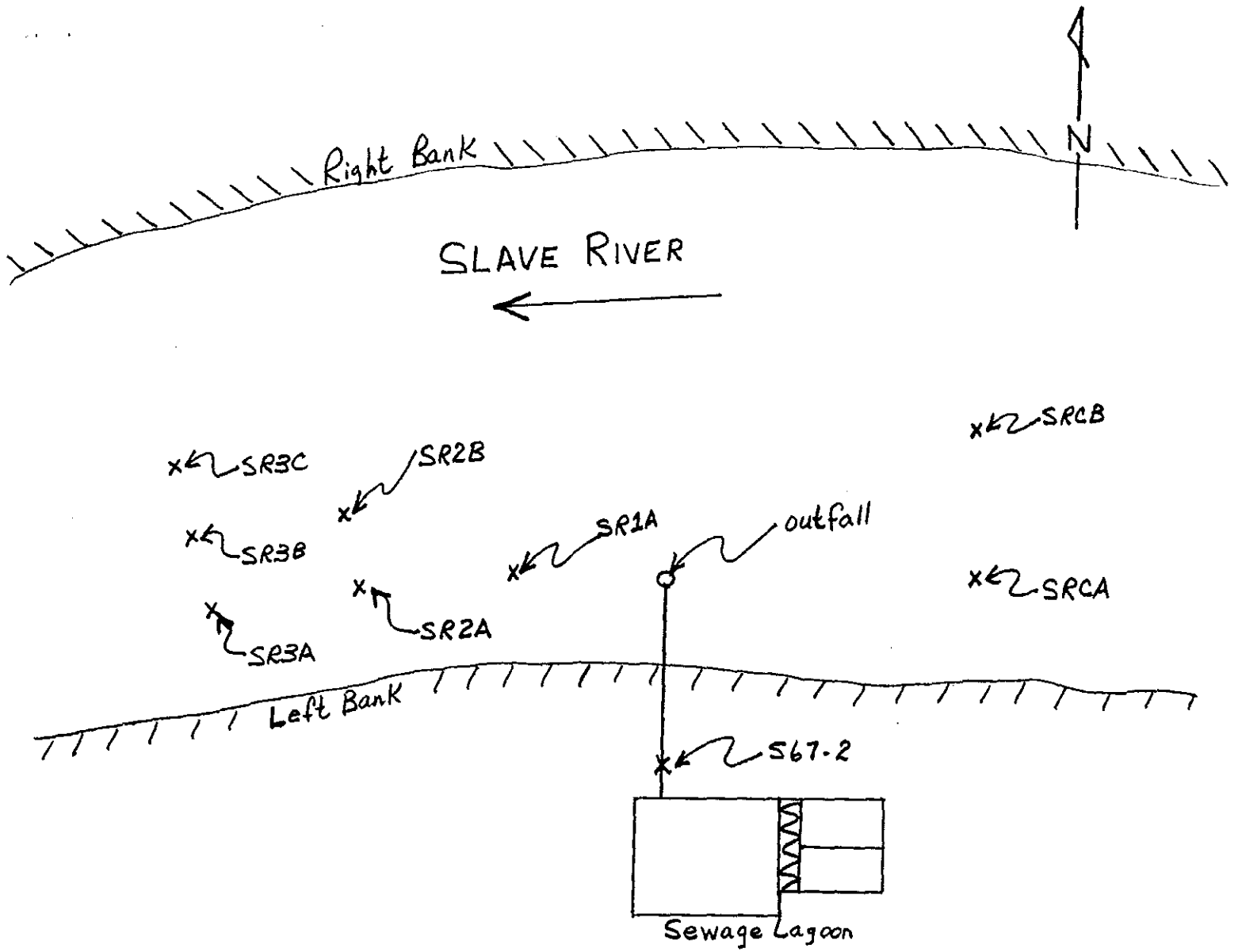
* See diagram for station locations directly below outfall.

Samples will be collected on alternating Tuesdays with shipment to the laboratory on Wednesdays beginning on February 2, 1988. This schedule will be held through to the end of March as closely as possible considering other operational requirements.

Total and Fecal Coliform concentrations will be analyzed from all stations, while suspended solids, B.O.D., and nutrients will be analyzed from the two control stations (SRCA & SRCB), the first station immediately downstream from the outfall (SR1A), and the sewage lagoon effluent (567-2).

Upon receiving input from the regional office three additional stations were established at the quarter and mid points of the Slave River immediately upstream from the confluence of Salt River. These stations were designated SR4A (approx. 250m toward centre of the river from left bank), SR4B (approx. mid point of river), and SR4C (approx. 250 m. toward centre of the river from right bank).

Following analysis of the samples the results will be summarized in tabular form.



NOTE: Sketch not to scale.

Diagram showing sample station locations for Slave River Biological Sampling project.

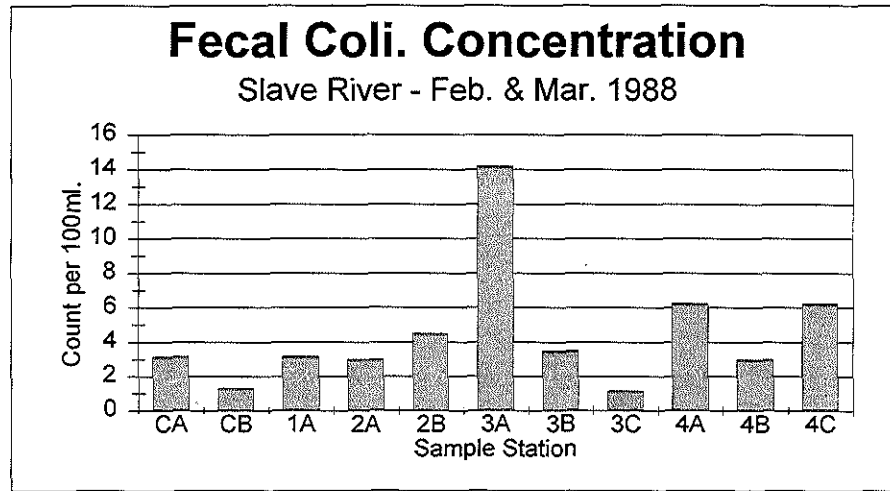
<u>Station</u>	<u>Date</u>	<u>Total Coli</u>	<u>Fecal Coli</u>	<u>BOD</u>	<u>SS</u>
SRCA	Feb. 2/88	14	10	<5	1700
		17	L1	<5	1600
	Feb. 23/88	18	3	<5	1200
		12	2	<5	1300
	March 22/88	68	2	<5	135
		48	1	<5	88
SRCB	Feb. 2/88	4	2	<5	1900
		8	2	<5	1800
	Feb. 23/88	38	<1	<5	43
		35	<1	<5	42
	March 22/88	58	1	<5	28
		56	1	<5	19
SR1A	Feb. 2/88	80	8	<5	78
		75	2	<5	104
	Feb. 23/88	53	1	<5	41
		52	2	<5	38
	March 22/88	26	3	<5	53
		29	3	<5	60
SR2A	Feb. 2/88	70	6		
		200	3		
	Feb. 23/88	31	<1		
		35	1		
	March 22/88	37	4		
		23	24		
SR2B	Feb. 2/88	20	<1		
		12	1		
	Feb. 23/88	200	4		
		140	2		
	March 22/88	40	12		
		38	7		

<u>Station</u>	<u>Date</u>	<u>Total Coli</u>	<u>Fecal Coli</u>	<u>BOD</u>	<u>SS</u>
SR3A	Feb. 2/88	75	40	<5	
		50	61	<5	
	Feb. 23/88	68	16		
		97	11		
	March 22/88	64	2		
53		2			
SR3B	Feb. 2/88	11	3		
		40	3		
	Feb. 23/88	68	1		
		35	1		
	March 22/88	35	10		
43		3			
SR3C	Feb. 2/88	60	<1		
		25	<1		
	Feb. 23/88	29	<1		
		24	2		
	March 22/88	30	<1		
46		<1			
SR4A	Feb. 24/88	54	8		
		27	5		
	March 23/88	37	5		
		29	7		
SR4B	Feb. 24/88	24	1		
		14	4		
	March 23/88	18	3		
		28	4		
SR4C	Feb. 24/88	24	1		
		20	8		
	March 23/88	43	12		
		56	4		

<u>Station</u>	<u>Date</u>	<u>Total Coli</u>	<u>Fecal Coli</u>	<u>BOD</u>	<u>SS</u>
567-2	Feb. 2/88	1.6X10 ⁶	8.7X10 ⁵	118	23
		2.2X10 ⁶	5.7X10 ⁵	121	23
	Feb. 23/88	1.79X10 ⁶	4.78X10 ⁵	124	22
		1.82X10 ⁶	5.8X10 ⁵	127	25
	March 22/88	2.0X10 ⁶	5.7X10 ⁵	219	16
		1.9X10 ⁶	4.4X10 ⁵	221	13

Average Fecal Coliform Data - Feb./Mar. 1988

	CA	CB	1A	2A	2B	3A	3B	3C	4A	4B	4C
Conc. / 100ml	3.16	1.33	3.16	3	4.5	14.2	3.5	1.16	6.25	3	6.25





TO
A

File Note

FROM
DE

Wayne Starling
Water Resource Officer
Fort Smith Sub-District

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE - N / RÉFÉRENCE MV2003L3-0006
YOUR FILE - V / RÉFÉRENCE
DATE May 27, 2005

SUBJECT
OBJET

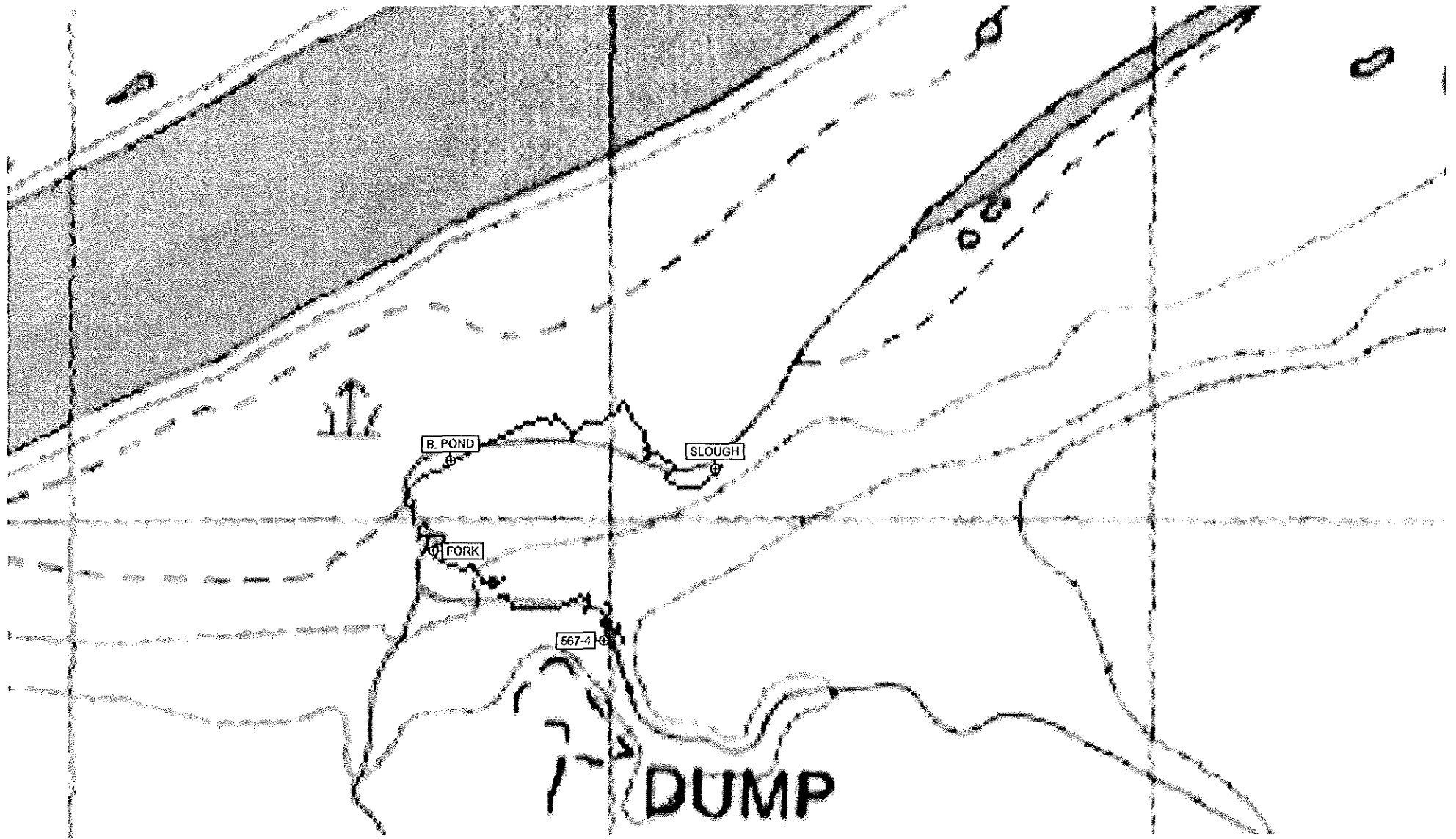
Town of Ft. Smith Landfill Drainage Stream

In the fall of 2004 the Town of Fort Smith commissioned a Wetlands Characterization Study to provide information and physical data on the existing soil, water, and vegetation conditions down slope of the active landfill. While exploring the drainage pattern of a small stream flowing adjacent to the waste disposal area, the authors determined that the majority of flow was in a Northwesterly direction instead of Northeast as it appeared on topographical and aerial photography mapping.

On May 26, 2005 I followed the stream on foot from SNP station 567-4 through dense willows and swampy terrain recording the route using a Garmin Map 76S GPS. The stream was very difficult to follow at times due to glaciation of winter overflow discharges, occasional disappearances under ground, thick vegetation, and boggy / marsh type conditions. The path eventually led me to the entrance of a large marsh followed by a long slough located Northeast of the landfill facility. In order to get around some of the boggy areas I had to skirt to either side and then return to the channel, however, the GPS track recording is very consistent with the stream routing indicated on the 1:50,000 topographical map (copy attached). It is therefore my conclusion that the majority of the water in the stream adjacent to the Fort Smith landfill does in fact flow to the wetland located Northeast of this site.

Water samples were collected at surveillance station 567-4 and immediately upstream of the bog preceding the long slough, and sent to the Taiga Environmental Lab for heavy metals analyses.


Wayne B. Starling





Aerial May 31/05



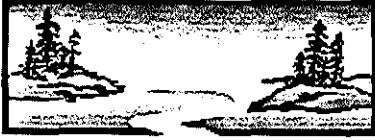
Stream Channel May 26/05



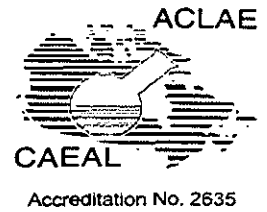
Beaver Pond May 26/05



Discharge to slough May 26/05



Taiga Environmental Laboratory
 4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
 Tel: (867)-669-2788 Fax: (867)-669-2718

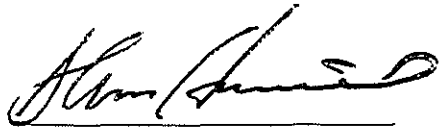


- CERTIFICATE OF ANALYSIS -

Client Sample ID: 567-4

Taiga Sample ID: 250940

Client Project: Town of FtSmith
 Sample Type: Freshwater
 Received Date: 27-May-05
 Sampling Date: 26-May-05
 Location: Landfill area


 Approved By R. Shane Harnish
 Quality Assurance Officer

Report Status: FINAL

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Metals, Total</u>						
Aluminum	79	30	µg/L	01-Jun-05	EPA200.8	
Antimony	0.3	0.1	µg/L	01-Jun-05	EPA200.8	
Barium	358	0.1	µg/L	01-Jun-05	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Cesium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Chromium	0.4	0.3	µg/L	01-Jun-05	EPA200.8	
Cobalt	0.3	0.1	µg/L	01-Jun-05	EPA200.8	
Copper	1.1	0.3	µg/L	01-Jun-05	EPA200.8	
Lead	0.3	0.1	µg/L	01-Jun-05	EPA200.8	
Lithium	3.9	0.3	µg/L	01-Jun-05	EPA200.8	
Manganese	288	0.1	µg/L	01-Jun-05	EPA200.8	
Molybdenum	0.9	0.1	µg/L	01-Jun-05	EPA200.8	

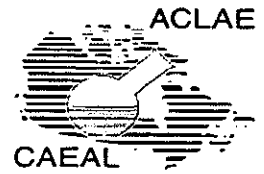
ReportDate: Monday, June 06, 2005
 Print Date: Monday, June 06, 2005



Taiga Environmental Laboratory

4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3

Tel: (867)-669-2788 Fax: (867)-669-2718



Accreditation No. 2535

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 567-4

Taiga Sample ID: 250940

Nickel	1.5	0.1	µg/L	01-Jun-05	EPA200.8
Rubidium	0.8	0.1	µg/L	01-Jun-05	EPA200.8
Selenium	< 1	1	µg/L	01-Jun-05	EPA200.8
Silver	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8
Strontium	188	0.1	µg/L	01-Jun-05	EPA200.8
Thallium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8
Titanium	2.3	0.1	µg/L	01-Jun-05	EPA200.8
Uranium	0.2	0.1	µg/L	01-Jun-05	EPA200.8
Vanadium	0.4	0.1	µg/L	01-Jun-05	EPA200.8
Zinc	< 10	10	µg/L	01-Jun-05	EPA200.8
Iron	2340	50	µg/L	01-Jun-05	EPA200.8
Arsenic	1.9	0.2	µg/L	01-Jun-05	EPA200.8

* Taiga analytical methods are based on the following standard analytical methods

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

CCME - Canadian Council of Ministers of the Environment

ReportDate: Monday, June 06, 2005

Page 5 of 5

Print Date: Monday, June 06, 2005



Taiga Environmental Laboratory
 4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
 Tel: (867)-669-2788 Fax: (867)-669-2718



- CERTIFICATE OF ANALYSIS -

Client Sample ID: Pond Entrance

Taiga Sample ID: 250939

Client Project: Town of FtSmith
Sample Type: Freshwater
Received Date: 27-May-05
Sampling Date: 26-May-05
Location: Landfill area

R. Shane Harnish
 Approved By **R. Shane Harnish**
 Quality Assurance Officer

Report Status: FINAL

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Metals, Total</u>						
Aluminum	< 30	30	µg/L	01-Jun-05	EPA200.8	
Antimony	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Barium	241	0.1	µg/L	01-Jun-05	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Cesium	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Chromium	0.5	0.3	µg/L	01-Jun-05	EPA200.8	
Cobalt	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Copper	0.8	0.3	µg/L	01-Jun-05	EPA200.8	
Lead	< 0.1	0.1	µg/L	01-Jun-05	EPA200.8	
Lithium	4.9	0.3	µg/L	01-Jun-05	EPA200.8	
Manganese	10.4	0.1	µg/L	01-Jun-05	EPA200.8	

Report Date: Monday, June 06, 2005
Print Date: Monday, June 06, 2005



Taiga Environmental Laboratory
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Tel: (867)-669-2788 Fax: (867)-669-2718



- CERTIFICATE OF ANALYSIS -

Client Sample ID: Pond Entrance

Taiga Sample ID: 250939

Molybdenum	1.5	0.1	µg/L	01-Jun-05	EPA200.8
Nickel	0.8	0.1	µg/L	01-Jun-05	EPA200.8
Rubidium	0.6	0.1	µg/L	01-Jun-05	EPA200.8
Selenium	<1	1	µg/L	01-Jun-05	EPA200.8
Silver	<0.1	0.1	µg/L	01-Jun-05	EPA200.8
Strontium	182	0.1	µg/L	01-Jun-05	EPA200.8
Thallium	<0.1	0.1	µg/L	01-Jun-05	EPA200.8
Titanium	0.1	0.1	µg/L	01-Jun-05	EPA200.8
Uranium	0.6	0.1	µg/L	01-Jun-05	EPA200.8
Vanadium	0.1	0.1	µg/L	01-Jun-05	EPA200.8
Zinc	<10	10	µg/L	01-Jun-05	EPA200.8
Iron	71	50	µg/L	01-Jun-05	EPA200.8
Arsenic	0.6	0.2	µg/L	01-Jun-05	EPA200.8

ReportDate: Monday, June 06, 2005
Print Date: Monday, June 06, 2005

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT
 WATER RESOURCES DIVISION, YELLOWKNIFE, NORTHWEST TERRITORIES

FIELD SAMPLING AND DATA

AGENCY/PROJECT <i>Even of Fort Smith</i>	LICENCE NO. <i>NILA-0567</i>	LOCATION <i>Ft. Smith Dump, Lagoon, + Groundwater Springs.</i>
DATE SAMPLED <i>June 21 & 22/94</i>	SAMPLED BY <i>W. Sterling</i>	

ANALYSIS	SAMPLE VOLUME	PRESERVATIVE	STATION NUMBER							
			Spring #1	Spring #2	567-4	567-4 B	567-4 c	567-2		
			BOTTLE NUMBER							
MISC. & ARSENIC	1 LITRE	NONE								
HEAVY METALS	500 ML	2 ML 1:1 HNO ₃	2174	2175	2176	2180	2179	2181		
CYANIDE	500 ML	About 6 pellets NaOH to pH 12								
MERCURY	250 ML	2 ML 1:1 HNO ₃ + 2 ML 5% K ₂ Cr ₂ O ₇								
NUTRIENTS	250 ML	NONE			2177					2182
BACTERIA	500 ML	NONE			2178					2183
OIL AND GREASE	1 LITRE (GLASS)	4 ML 1:1 H ₂ SO ₄								
Time of Sampling			<i>June 21 1440</i>	<i>June 21 1455</i>	<i>June 22 0935</i>	<i>June 22 0945</i>	<i>June 22 1000</i>	<i>June 22 1040</i>		
Air Temperature			<i>+23°C</i>	<i>+23°C</i>	<i>+18°C</i>	<i>+18°C</i>	<i>+18°C</i>	<i>+19°C</i>		
Water Temperature					<i>4.5°C</i>	<i>6°C</i>	<i>4°C</i>			
Rate of Flow			<i>~75 l/m.</i>	<i>~75 l/m.</i>	<i>~125 l/m.</i>	<i>125 l/m.</i>	<i>125 l/m.</i>	<i>125 l/m.</i>	<i>3.5"</i>	
Ice Thickness										
Depth of Sampling			<i>Surface</i>	<i>Surface</i>	<i>Surface</i>	<i>Surface</i>	<i>0.1m</i>	<i>Surface</i>		
pH			<i>8.50</i>	<i>7.62</i>	<i>8.0</i>	<i>8.42</i>	<i>8.21</i>			
Conductivity			<i>725</i>	<i>830</i>	<i>650</i>	<i>630</i>	<i>614</i>			
Dissolved Oxygen										

Sample 567-4B collected about 150 metres downstream from 567-4

Sample 567-4C collected about 300 metres downstream from 567-4

Spring #1 - Sample collected from groundwater spring at downstream end of culvert beneath access road immediately adjacent to sewage lagoon discharge point into Slave River.

Spring #2 - Sample collected from groundwater spring directly below Breynat street at a point where the spring intersects the access trail below the slide zone area.

SAMPLER: RETAIN FOR YOUR RECORDS

FIELD SAMPLE NOTES:

Aug. 3/99
(1)

PROJECT: Town of Ft. Smith

(2)

(3)

(4)

STATION NO.	Spring 1	Spring 2	Spring 3	Spring 4
WATER TEMP (°C)				
SAMPLING DEPTH (m)				
FLOW, ICE, etc.				
pH				
COND.				
DO				
TURB				
OTHER				

SITE LOCATION/DESCRIPTION

- 1) Groundwater spring below Bryemat Street in Ft. Smith
- 2) Stream ≈ 20 m East from Sewage Lagoon Disc. entering Slave R.
- 3) Stream entering Slave R. ≈ 100 m East from winter road access below
- 4) Stream entering Slave R. ≈ 50 m West from Harry Sudan's Irrigation access road.

Upper Air Stn.

COMMENTS:

PRESERVATION CODE GUIDE

BOTTLE TYPE	DESCRIPTION	PRESERVATIVE	COLOUR
ROUTINE (R)	1 litre plastic (HDPE)	4 degrees C	green
NUTRIENTS (NUT)	500 mL plastic (HDPE)	4 degrees C	black
PRES. NUTRIENTS (p-nut)	125 mL plastic (HDPE)	1 mL 1:1 sulphuric acid	pink
BACTI	250 or 500 or 1 litre plastic (HDPE)	autoclave (time) tape	white
SULPHIDE (S)	250 mL plastic (HDPE)	1 mL 6N zinc acetate	purple
PHENOL (P-OH)	1 litre glass	4 mL 1:1 sulphuric acid	yellow
OIL + GREASE (O+G)	1 litre glass	4 mL 1:1 sulphuric acid	yellow
CYANIDE (CN)	500 mL brown plastic	5 mL 10% sodium hydroxide	blue
MERCURY (Hg)	150 mL glass	2 mL 1:1 sulphuric acid + 1 mL 5% potassium dichromate	orange
METAL (M)	500 mL clear plastic	5 ml 1:1 nitric acid	red

Natural Water Quality Discharges to Slave River (ug/l) - June 94/August 1999						
		Cd	Co	Cr	Cu	Fe
Spring 1		-0.3	-1	-3	-2	260
June/94		0.1	0.9	0.2	0.4	258
Spring 2		-0.3	-1	-3	2	490
June/94		0.6	9.8	34.5	19.9	21600
Spring 3		0.7	8.3	22	22.6	2010
Spring 4		4.2	38.2	86.1	91.4	105000
567-4		-0.3	-1	11	-2	330
150m d/s 567-4		-0.3	-1	-3	-2	900
300m d/s 567-4		-0.3	-1	-3	-2	60
Slave R. @ Ft. Smith		0.26	1.65	7.98	6.35	4565

Mn	Ni	Pb	Zn			
261	3.9	-1	-10			
170	4.6	0.3	5			
9	4	2	-10			
409	28.8	14.6	77			
505	27.9	12.8	76.4			
3370	112	59.7	321			
55.8	1.8	-1	-10			
93	2.1	1.7	-10			
8.8	1.8	-1	10.4			
74.43	7.81	3.32	22.17			

TAIGA ENVIRONMENTAL LABORATORY

Dept. Indian Affairs & Northern Development

4601-52 nd Ave., Box 1500

Yellowknife, NT. X1A 2R3

Tel. (867) 669-2788

Fax: (867) 669-2718

To: NAP-FTSMITH

WATER RESOURCES, NAP, DIAND

BOX 658

FT. SMITH

NT

XOE 0P0

Att'n: WAYNE STARLING

LAB# 991543

SAMPLE INFORMATION

Our Lab#: 991543

PROJECT: Spring 0567

Your Sample ID: SPRING 1; 9:30 am

Sample Matrix: water -grab

Collection:

Location: Town of Ft. Smith

Date: 8/03/99

By: W.Starling

Received Date: 8/4/99

Report Date: 16-Aug-99

Approved By: **- SAMPLE ANALYSIS REPORT -**

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
991543	Tot-Cadmium(ICP-MS)	L0.3	ug/L	0.3	8/06/99	ICP-MS
	Tot-Cobalt(ICP-MS)	L1	ug/L	1.0	8/06/99	ICP-MS
	Tot-Chromium(ICP-MS)	L3	ug/L	3.0	8/06/99	ICP-MS
	Tot-Copper(ICP/MS)	L2	ug/L	2.0	8/06/99	ICP-MS
	Tot-Iron(AA)	0.26	mg/L	0.03	8/11/99	ICP-MS
	Tot-Manganese(ICP-MS)	261	ug/L	1.0	8/06/99	ICP-MS
	Tot-Nickel(ICP-MS)	3.9	ug/L	1.0	8/06/99	ICP-MS
	Tot-Lead(ICP-MS)	L1	ug/L	1.0	8/06/99	ICP-MS
	Tot-Zinc(ICP-MS)	L10	ug/L	10.0	8/06/99	ICP-MS

TAIGA ENVIRONMENTAL LABORATORY

Dept. Indian Affairs & Northern Development

4601-52 nd Ave., Box 1500

Yellowknife, NT. X1A 2R3

Tel. (867) 669-2788

Fax: (867) 669-2718

To: NAP-FTSMITH

WATER RESOURCES, NAP, DIAND

BOX 658

FT. SMITH

NT XOE OPO

Att'n: WAYNE STARLING

LAB# 991544

SAMPLE INFORMATION

Our Lab#: 991544

PROJECT: Spring

Your Sample ID: SPRING 2; 9:45 am

Sample Matrix: water -grab

Collection:

Location: Town of Ft. Smith

Date: 8/03/99

By: W.Starling

Received Date: 8/4/99

Report Date: 19-Aug-99

Approved By: W. Starling**- SAMPLE ANALYSIS REPORT -**

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
991544	Tot-Cadmium(ICP-MS)	L0.3	ug/L	0.3	8/13/99	ICP-MS
	Tot-Cobalt(ICP-MS)	L1	ug/L	1.0	8/13/99	ICP-MS
	Tot-Chromium(ICP-MS)	L3	ug/L	3	8/13/99	ICP-MS
	Tot-Copper(ICP/MS)	2.0	ug/L	2.0	8/13/99	ICP-MS
	Tot-Iron(AA)	0.49	mg/L	0.03	8/11/99	ICP-MS
	Tot-Manganese(ICP-MS)	9.0	ug/L	1.0	8/13/99	ICP-MS
	Tot-Nickel(ICP-MS)	4.0	ug/L	1.0	8/13/99	ICP-MS
	Tot-Lead(ICP-MS)	2.0	ug/L	1.0	8/13/99	ICP-MS
	Tot-Zinc(ICP-MS)	L10	ug/L	10	8/13/99	ICP-MS

TAIGA ENVIRONMENTAL LABORATORY

Dept. Indian Affairs & Northern Development

4601-52 nd Ave., Box 1500

Yellowknife, NT. X1A 2R3

Tel. (867) 669-2788

Fax: (867) 669-2718

To: NAP-FTSMITH

WATER RESOURCES, NAP, DIAND

BOX 658

FT. SMITH

NT

XOE OPO

Att'n: WAYNE STARLING

LAB# 991545

SAMPLE INFORMATION

Our Lab#: 991545

PROJECT: Spring

Your Sample ID: SPRING 3; 10:30 am

Sample Matrix: water -grab

Collection:

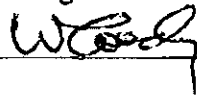
Location: Town of Ft. Smith

Date: 8/03/99

By: W.Starling

Received Date: 8/4/99

Report Date: 16-Aug-99

Approved By: 

- SAMPLE ANALYSIS REPORT -

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
991545	Tot-Cadmium(ICP-MS)	0.7	ug/L	0.3	8/06/99	ICP-MS
	Tot-Cobalt(ICP-MS)	8.3	ug/L	1.0	8/06/99	ICP-MS
	Tot-Chromium(ICP-MS)	22.0	ug/L	3.0	8/06/99	ICP-MS
	Tot-Copper(ICP/MS)	22.6	ug/L	2.0	8/06/99	ICP-MS
	Tot-Iron(AA)	20.1	mg/L	0.03	8/11/99	ICP-MS
	Tot-Manganese(ICP-MS)	505	ug/L	1.0	8/06/99	ICP-MS
	Tot-Nickel(ICP-MS)	27.9	ug/L	1.0	8/06/99	ICP-MS
	Tot-Lead(ICP-MS)	12.8	ug/L	1.0	8/06/99	ICP-MS
	Tot-Zinc(ICP-MS)	76.4	ug/L	10.0	8/06/99	ICP-MS

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To: NAP-FTSMITH

WATER RESOURCES, NAP, DIAND

BOX 658

FT. SMITH

NT

XOE OPO

Att'n: WAYNE STARLING

LAB# 991546

SAMPLE INFORMATION

Our Lab#: 991546

PROJECT: Spring

Your Sample ID: SPRING 4; 11:15 am

Sample Matrix: water -grab

Collection:

Location: Town of Ft. Smith

Date: 8/03/99

By: W.Starling

Received Date: 8/4/99

Report Date: 16-Aug-99

Approved By: **- SAMPLE ANALYSIS REPORT -**

Lab#	Test	Result	Units	Detection Limit	Analysis Date	Analytical Method
991546	Tot-Cadmium(ICP-MS)	4.2	ug/L	0.3	8/06/99	ICP-MS
	Tot-Cobalt(ICP-MS)	38.2	ug/L	1.0	8/06/99	ICP-MS
	Tot-Chromium(ICP-MS)	86.1	ug/L	3.0	8/06/99	ICP-MS
	Tot-Copper(ICP/MS)	91.4	ug/L	2.0	8/06/99	ICP-MS
	Tot-Iron(AA)	105	mg/L	0.03	8/11/99	ICP-MS
	Tot-Manganese(ICP-MS)	3370	ug/L	1.0	8/06/99	ICP-MS
	Tot-Nickel(ICP-MS)	112	ug/L	1.0	8/06/99	ICP-MS
	Tot-Lead(ICP-MS)	59.7	ug/L	1.0	8/06/99	ICP-MS
	Tot-Zinc(ICP-MS)	321.0	ug/L	10.0	8/06/99	ICP-MS

INDIAN & NORTHERN AFFAIRS
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Fax. (403) 873-9300

To: Municipal (Ft. Smith)
Town of Ft. Smith
c/o DIAND
Ft. Smith District
==> Ft. Smith NT XOE OPO
Wayne Starling

SAMPLE INFORMATION

Our Lab # : 940955
Your Sample ID: 567-2
Sample Matrix : sewage

Account No.: N1L40567

Collection:
Location: Stn #567-2
Date: 06/22/94
By: WS

Report Date: 10/15/94

Approved by: *J. G.*

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940955	Bio.Oxy.Demand	26 mg/L	2.000	08202
	T.Cadmium ICP-MS	0.2 ug/L	0.100	100133
	Conductivity	568.0 uS/cm	0.100	02041
	T.Cobalt ICP-MS	0.3 ug/L	0.100	27009
	T.Chromium ICP-MS	2.3 ug/L	0.200	24009
	T.Copper ICP-MS	11.3 ug/L	0.100	100119
	Faecal_Coli	L2 CFU/dL	1.000	36014
	T.Manganese ICP-MS	44.6 ug/L	0.100	100113
	Non-Filt Res.	33 mg/L	3.000	10406
	Ammonia-N	10.100 mg/L	0.002	07555
	T.Nickel ICP-MS	3.1 ug/L	0.100	100117
	NO3-N+NO2-N	0.372 mg/L	0.008	07110
	T.Lead ICP-MS	1.5 ug/L	0.200	100145
	pH	8.81 pH	0.050	10301
	T.Arsenic-Hyd.	0.6 ug/L	0.300	33011
	Tot.Coliforms	4000 CFU/dL	1.000	36002
	T. Iron	224 ug/L	20.000	26004
	T-Phosphorous	3.360 mg/L	0.002	15403
	T.Zinc ICP-MS	12.0 ug/L	5.000	100121

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Ft. Smith District
==> Ft. Smith NT XOE OPO
Wayne Starling

SAMPLE INFORMATION

Our Lab # : 940951
Your Sample ID: Spring#2
Sample Matrix : effluent

Account No.: N1L40567

Collection:
Location: groundwater spring
Date: 06/21/94
By: WS

Report Date: 10/15/94

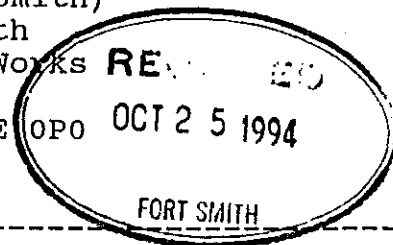
Approved by:

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940951	T.Cadmium ICP-MS	L0.1 ug/L	0.100	100133
	T.Cobalt ICP-MS	0.9 ug/L	0.100	27009
	T.Chromium ICP-MS	L0.2 ug/L	0.200	24009
	T.Copper ICP-MS	0.4 ug/L	0.100	100119
	T.Manganese ICP-MS	170.0 ug/L	0.100	100113
	T.Nickel ICP-MS	4.6 ug/L	0.100	100117
	T.Lead ICP-MS	0.3 ug/L	0.200	100145
	T.Arsenic-Hyd.	0.5 ug/L	0.300	33011
	T. Iron	253 ug/L	20.000	26004
	T.Zinc ICP-MS	L5 ug/L	5.000	100121

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To: Municipal (Ft. Smith)
 Town of Ft. Smith
 Dept of Public Works
 Box 147
 ==> Ft. Smith NT XOE
 Edmund Dube



SAMPLE INFORMATION

Our Lab # : 940950
 Your Sample ID: Spring#1
 Sample Matrix : effluent

Account No.: N1L40567

Collection:
 Location: groundwater spring
 Date: 06/21/94
 By: WS

Report Date: 10/15/94

Approved by: J. G.

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940950	T.Cadmium ICP-MS	0.6 ug/L	0.100	100133
	T.Cobalt ICP-MS	9.8 ug/L	0.100	27009
	T.Chromium ICP-MS	34.6 ug/L	0.200	24009
	T.Copper ICP-MS	19.9 ug/L	0.100	100119
	T.Manganese ICP-MS	409.0 ug/L	0.100	100113
	T.Nickel ICP-MS	28.8 ug/L	0.100	100117
	T.Lead ICP-MS	14.6 ug/L	0.200	100145
	T.Arsenic-Hyd.	6.7 ug/L	0.300	33011
	T. Iron	21600 ug/L	20.000	26004
	T.Zinc ICP-MS	77.0 ug/L	5 0.500 7c	100121

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c/o DIAND
Ft. Smith District
==> Ft. Smith NT XOE OPO
Wayne Starling

SAMPLE INFORMATION

Our Lab # : 940954
Your Sample ID: 567-4C
Sample Matrix : water

Account No.: N1L40567

Collection:
Location: Stn #567-4 (*~300m Ns From 567-4*)
Date: 06/22/94
By: WS

Report Date: 10/15/94

Approved by: *J. G.*

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940954	T.Cadmium ICP-MS	0.1 ug/L	0.100	100133
	T.Cobalt ICP-MS	0.2 ug/L	0.100	27009
	T.Chromium ICP-MS	1.1 ug/L	0.200	24009
	T.Copper ICP-MS	0.6 ug/L	0.100	100119
	T.Manganese ICP-MS	43.3 ug/L	0.100	100113
	T.Nickel ICP-MS	1.9 ug/L	0.100	100117
	T.Lead ICP-MS	2.1 ug/L	0.200	100145
	T.Arsenic-Hyd.	0.6 ug/L	0.300	33011
	T. Iron	419 ug/L	20.000	26004
	T.Zinc ICP-MS	L5 ug/L	5.000	100121

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Ft. Smith District
==> Ft. Smith NT XOE OPO
Wayne Starling

SAMPLE INFORMATION

Our Lab # : 940953
Your Sample ID: 567-4B
Sample Matrix : sewage

Account No.: N1L40567

Collection:
Location: Stn #567-4 (*~150m d/s from 567-4*)
Date: 06/22/94
By: WS

Report Date: 10/15/94

Approved by: *f. Q.*

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940953	T.Cadmium ICP-MS	0.2 ug/L	0.100	100133
	T.Cobalt ICP-MS	2.1 ug/L	0.100	27009
	T.Chromium ICP-MS	4.2 ug/L	0.200	24009
	T.Copper ICP-MS	2.8 ug/L	0.100	100119
	T.Manganese ICP-MS	248.0 ug/L	0.100	100113
	T.Nickel ICP-MS	7.3 ug/L	0.100	100117
	T.Lead ICP-MS	3.9 ug/L	0.200	100145
	T.Arsenic-Hyd.	4.8 ug/L	0.300	33011
	T. Iron	6670 ug/L	20.000	26004
	T.Zinc ICP-MS	15.0 ug/L	5.000	100121

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Wayne Starling

SAMPLE INFORMATION

Our Lab # : 940952
Your Sample ID: 567-4
Sample Matrix : sewage

Account No.: N1L40567

Collection:
Location: Stn #567-4
Date: 06/22/94
By: WS

Report Date: 10/15/94

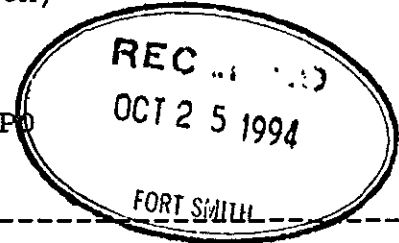
Approved by: *W.S.*

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940952	Bio.Oxy.Demand	26 mg/L	2.000	08202
	T.Cadmium ICP-MS	0.1 ug/L	0.100	100133
	Conductivity	665.0 uS/cm	0.100	02041
	T.Cobalt ICP-MS	1.1 ug/L	0.100	27009
	T.Chromium ICP-MS	2.7 ug/L	0.200	24009
	T.Copper ICP-MS	1.9 ug/L	0.100	100119
	Faecal_Coli	L2 CFU/dL	1.000	36014
	T.Manganese ICP-MS	149.0 ug/L	0.100	100113
	Non-Filt Res.	49 mg/L	3.000	10406
	Ammonia-N	0.021 mg/L	0.002	07555
	T.Nickel ICP-MS	4.2 ug/L	0.100	100117
	NO3-N+NO2-N	0.089 mg/L	0.008	07110
	T.Lead ICP-MS	1.7 ug/L	0.200	100145
	pH	7.89 pH	0.050	10301
	T.Arsenic-Hyd.	3.0 ug/L	0.300	33011
	Tot.Coliforms	L2 CFU/dL	1.000	36002
	T. Iron	2490 ug/L	20.000	26004
	T-Phosphorous	0.043 mg/L	0.002	15403
	T.Zinc ICP-MS	5.0 ug/L	5.000	100121

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Town of Ft. Smith
c/o DIAND
Ft. Smith District
==> Ft. Smith NT XOE OPD
Wayne Starling



SAMPLE INFORMATION

Our Lab # : 940956
Your Sample ID: 567-1
Sample Matrix : water

Account No.: N1L40567

Collection:
Location: Stn #567-1
Date: 06/22/94
By: WS

Report Date: 10/15/94
Approved by: f. G.

- SAMPLE ANALYSIS REPORT -

Lab#	Parameter	Result Units	Detect Limit	Method Code
940956	Alkalinity	92.4 mg/L	0.300	10101
	Calcium	31.50 mg/L	0.040	20103
	T.Cadmium ICP-MS	0.4 ug/L	0.100	100133
	Chloride	2.36 mg/L	0.080	17206
	Colour	60 Colour	5.000	02021
	Conductivity	221.0 uS/cm	0.100	02041
	T.Cobalt ICP-MS	3.1 ug/L	0.100	27009
	T.Chromium ICP-MS	19.5 ug/L	0.200	24009
	T.Copper ICP-MS	22.2 ug/L	0.100	100119
	Filt.Residue	152 mg/L	10.000	10451
	Tot.Hardness	113.0 mg/L	0.100	10602
	Potassium	1.09 mg/L	0.050	19106
	Magnesium	8.30 mg/L	0.010	12102
	T.Manganese ICP-MS	124.0 ug/L	0.100	100113
	Sodium	4.70 mg/L	0.040	11102
	Non-Filt Res.	208 mg/L	3.000	10406
	Ammonia-N	0.044 mg/L	0.002	07555
	T.Nickel ICP-MS	11.6 ug/L	0.100	100117
	NO3-N+NO2-N	0.042 mg/L	0.008	07110
	T.Lead ICP-MS	8.0 ug/L	0.200	100145
	pH	8.07 pH	0.050	10301
	Sulphate	18.2 mg/L	3.000	16306
	T.Arsenic-Hyd.	3.1 ug/L	0.300	33011
	T. Iron	9150 ug/L	20.000	26004
	T-Phosphorous	0.243 mg/L	0.002	15403
	Turbidity	189.9 NTU	0.100	02081
	T.Zinc ICP-MS	57.0 ug/L	5.000	100121