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**Project #** 60547247 (Old 60120148) Vol 2017

Dear Sirs:

Subject: Town of Inuvik - Water Licence No. G17L3-001

Year End Summary Report, 2017

On behalf of Inuvik, we are pleased to provide the Annual Report for 2017.

#### WATER DEMANDS, STATION 0036-1

The total volume of water used from the East Channel is listed in Table G17L3-001-1 attached. Water use remained well within the License limit throughout the year. It was also at ordinary levels relative to recent times: about 8% more than consumption in 2016, possibly due to changes arising from the new water treatment plant. Overall, Inuvik's water use is now running at 55 to 60% of the levels reached in the late 1980's, in the time before metering and consumption billing.

#### **WASTEWATER VOLUMES**

Annually, about 97 percent of the wastewater reaching Inuvik's lagoon is distributed and re-collected by the Town's above ground utilidor system. About three percent is distributed from Inuvik's truck fill point and is then re-collected by wastewater trucks.

There is no extraneous inflow, and rarely much loss to leakage. Inuvik will accept in its lagoon wastewater from a source other than the Town's water supply on a fee for service basis, but volumes being received are negligible. There are a few water uses that do not contribute to sewage (such as firefighting, and, in summer, gardening and vehicle washing) but these are so small a portion of total water use that they too can be neglected. For practical purposes, inflow into the lagoon is essentially equal to the Town's metered production of water, reported in Table G17L3-001-1.

It is Inuvik's practice to obtain assurance from waste hauling contractors and waste generators that discharges to the lagoon from trucks will be restricted to wastewater of domestic origin and character, not contaminated by solvents, petroleum products, glycol, drilling fluids, or any other industrial waste of any sort in concentrations exceeding what would ordinarily be expected from domestic activities such as washing of clothes and hands. Inuvik did not accept wastewater from sources outside the Town's boundaries during the year.

#### **SEWAGE EFFLUENT QUANTITIES**

Inuvik's lagoon is normally operated at a constant level, with a dyke freeboard of 1.0 m or slightly more. Therefore, in normal operation, monthly quantities of effluent are about equal to monthly water use. Lagoon level was normal and constant throughout 2017.



#### **SOLID WASTE SITE OPERATIONS AND MAINTENANCE**

In 2017 Inuvik's solid waste site was operated routinely. Based on rates from the Municipal Solid Waste Facility O&M Manual, Appendix A, the estimated municipal solid waste generated in 2017 was approximately 5,800 tonnes of Municipal Solid Waste, which used approximately 19,400 m³ of space at the Municipal Solid Waste Facility. Detailed estimates are presented in Table G17L3-001-2, attached.

No other projects were undertaken, beyond routine covering and compaction of completed cells. Typically Inuvik will accept Municipal Solid Waste from outside sources, though the quantities tend to be very low (i.e., between 3 and 20 loads) and this was the case in 2017.

Household hazardous waste is collected at the Fire Department during an annual collection event, stored in an appropriate storage container, and then hauled out of Town for disposal. No quantity information for hazardous waste was recorded for 2017; quantities are expected to be recorded in 2018.

#### **SEWAGE EFFLUENT QUALITY MONITORING, STATION G17L3-0036-3**

Lagoon effluent is sampled monthly at Station 0036-3; the secondary cell outlet. Laboratory test results are listed in Table G17L3-001-3, attached. Generally, results are within typical ranges for the time of year. Running averages of parameters measured in routine monthly samples, and pH measurements (which are not averaged), remained within license limits during the year. An exception is the pH measurement for August, which appears to be an error, since a pH of 1.5 would be slightly more acidic than vinegar, and this value is well below the other pH readings for the year (and previous years), which are all above 7 (no recorded pH has been lower than 6.5 in readily available records dating back to 1996).

It has been observed that effluent pH rises sharply in summer; in some years to levels above the Licence limit of 9.0. The summer spike in pH is believed to be due to "extensive algae growth. Algae consume alkalinity (inorganic carbon) for growth and the pH increases as algae consume the alkalinity species in the order carbon dioxide, bicarbonate and carbonate." (Quotation from a paper entitled Microbiological and Chemical Testing for Troubleshooting Lagoons, by Michael Richard, PhD, of the Sear-Brown Group, Fort Collins, CO: found in lagoonsonline.com.)

BOD<sub>5</sub> monitoring was changed to CBOD monitoring in the licence renewal; the limit for CBOD was set at 135 mg/L, compared to 150 mg/L for BOD<sub>5</sub>. There were no concerns with either parameter during the year. It is relevant that the full effluent CBOD load in East Channel is not exerted at or close to Inuvik, in a concentrated way. Rather, it is distributed quite thinly far downstream, due to the slow BOD exertion rate in a northern river environment, especially at winter temperatures.

There were no concerns with Suspended Solids of Fecal Coliforms, as both parameters were within normal ranges and well below the licence limits.

The Town does not have a standard for ammonia, but is required to monitor for it. The ammonia levels all appeared to be within normal ranges.

The treatment performance seen in 2017 was typical for a primary-secondary lagoon system operating normally in a high-latitude setting. In summer a good standard of secondary treatment is achieved; in winter there is just primary treatment. To achieve a secondary-level effluent in winter Inuvik would need a mechanical plant or at minimum lagoon aeration, in either case involving major capital investment and significantly increased operating cost.



Prior to the licence renewal in July, there was no quantitative criterion for oil and grease, with testing for the parameter requiring initiation upon discovery of an oil sheen during the monthly sample collection. Testing for oil and grease was not completed in the third or fourth quarters of 2017, but did commence with the February 2018 sample.

#### SOLID WASTE SITE RUN-OFF QUALITY MONITORING, STATIONS G06L3-001-4,-5 AND -9

Runoff from the Mt. Baldy solid waste site is sampled monthly during periods of flow. Station 0036-4 monitors flow westward; Station 0036-5 monitors near-shore water quality in a pond to the east; and SNP 0036-9 was added in the latest licence renewal to monitor potential impacts of the Solid Waste Disposal Facilities on surface water at Boot Creek. Sample results are shown in Tables G17L3-001-4, -5, and -9 respectively.

There are no known concerns arising from test results. As described in earlier reports, very little runoff leaves the site owing to topographic advantages.

#### PONDS AT LAGOON, STATIONS G17L3-001-6 AND -7; CONTROL STATION G17L3-001-8

Sampling of ponds adjacent to the lagoon is done once a year, in September; starting in 2007. The purpose is to monitor for possible evidence of leakage from the lagoon. Samples are tested for the same parameters as lagoon effluent.

"Gate Pond", Station 6, occupies a former small gravel quarry just outside the lagoon system's west dike, adjacent to the west sludge cell. "Far Pond", Station 7, is located just outside the lagoon system's west dike, opposite the middle-north part of the secondary cell, about 800 m northwest of Gate Pond and 250 m direct distance south of the outlet structure. Twin Lake is used as a background benchmark, and its Station 8 is located at the south end of north Twin Lake.

The changes in sampling requirements when the licence renewed in July were not correctly adjusted for when sampling of these cells. As such, CBOD was not sampled, but BOD<sub>5</sub> was. Sampling for Ammonia was overlooked at all three sites, but a number of additional parameters, including metals and oil and grease were completed for the three sites.

The 2017 sample results for these stations' traditional parameters are shown in Table G17L3-001-6, 7 & 8. They are in line with the patterns of preceding years. Complete data for the stations is presented in the results appendix. Current licence parameters have been reviewed with Exova and the Town's operations personnel.

#### SOLID WASTE DISPOSAL FACILITY FENCING PLAN

The Solid Waste Fencing Plan requirement (Part D, Item 15) was added to the licence renewal. There was no documented progress made on the plan in 2017; the plan is expected to be advanced in 2018 and submitted before the due date in 2019.



#### SURVEILLANCE NETWORK PROGRAM (SNP) LOCATIONS

A map of the SNP Locations is attached. Active SNP location data is presented in the following table.

SNP#	Description	Purpose	Coordinates
0036-1	Raw Water Intake at the Mackenzie River Water Supply Facilities	To monitor monthly and annual quantity of water withdrawn for municipal purposes.	68°21'10.36"N, 133°43'35.53" W
0036-3	Decant Structure at Sewage Disposal Facilities	Site of Compliance. To monitor final effluent quality prior to discharge to the receiving environment and in case of an emergency decant.	68°22'20.58"N, 133°45'38.85" W
0036-4	Run-off below the Solid Waste Disposal Facilities	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°21'7"N, 133°41'1.3" W
0036-5	Run-off to two (2) tundra ponds southwest of Solid Waste Disposal Facilities	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°20'36.22"N, 133°40'32.41" W
0036-6	"Gate Pond" – near SW corner of Sewage Disposal Facility	To monitor potential impacts of the Sewage Lagoon on Surface Water	68°21'51.45"N, 133°44'1.00" W
0036-7	"Far Pond" – near the NW corner of Sewage Disposal Facility	To monitor potential impacts of the Sewage Lagoon on Surface Water	68°22'15.73"N, 133°45'41.60" W
0036-8	Twin Lakes at Happy Valley	Control for Sewage Lagoon Sampling	68°21'239.14"N, 133°44'28.10" W
0036-9	Boot Creek upstream of Boot Lake	To monitor potential impacts of the Solid Waste Disposal Facilities on Surface water.	68°21'13.35"N, 133°41'51.48" W

#### SOLIDS REMOVED FROM SEWAGE TREATMENT FACILITY

Sludge that had accumulated in the lagoon's primary cells since their commissioning in 1980 was transferred to the adjacent sludge holding cells in July 1993. A survey done in the fall of 2006 found that that subsequent sludge accumulations were still well below levels requiring the next transfer by dredging. The apparently reduced accumulation rate (relative to 1981-1993) may be due to a lagoon conditioner that Inuvik has been adding to the primary cells since the mid 1990's.

In many years, small amounts of settled and floating solids need to be removed from around ends of pipes passing through primary cell dikes. This is done with a backhoe, the solids being deposited in the sludge holding cells. Routine solids removal as described was done again in 2017.

No sludge measurement was undertaken in 2017; however, Operators have noted that sludge levels in the primary cells have been increasing, and are expecting that sludge removal from the primary cells will be completed in 2018.

#### **INSPECTION OF LAGOON EARTHEN CONTAINMENT STRUCTURES**

The 2017 inspection of lagoon dikes (Water Licence Condition D8) report is attached. There are no immediate concerns arising from the 2017 lagoon dike inspection. Routine maintenance work was done on the lagoon's earthwork dikes, and all dikes appear to be at or very near to design shapes and levels. Continued longitudinal cracking does indicate that at some point in the future, a major restoration project will be required.



#### CONSTRUCTION, MODIFICATIONS AND MAJOR MAINTENANCE WORK

No modifications affecting existing processes or existing process facilities were undertaken in 2017, except as described below. Naturally, routine maintenance work was done as needed.

Inuvik has upgraded the East Channel water supply and treatment system so as to be able to use East Channel as its water source throughout the year. The water plant improvements are also mandated to bring Inuvik's water quality in line with current and foreseen standards for protection of public health and for aesthetics. The upgraded plant started in operation 3 November 2016, though work on the new, year-round intake structure was ultimately completed in March of 2017.

#### **UNAUTHORIZED DISCHARGES**

There were no unauthorized discharges in 2017.

#### SPILL TRAINING AND COMMUNICATIONS EXERCISES

No additional training was completed. Spill kits and spill containment equipment was purchased in 2017 for implementation of actions identified in the Spill Containment Plan (2017), which was updated and submitted with the 2017 Water Licence renewal application.

#### ABANDONMENT, CLOSURE, AND RECLAMATION

No such projects were undertaken in 2017. The future of the Lake B – Hidden Lake water supply infrastructure needs to be confirmed, but is expected to be abandoned at a future date.

#### **STUDIES**

No additional studies were completed nor requested by the Board.

#### SPILL CONTINGENCY, OPERATIONS AND MAINTENANCE PLANS

The Spill Contingency Plan was updated and submitted February 6, 2017.

An updated Solid Waste Disposal Facility O&M Manual was submitted December 20, 2017 to the Board for Review. Additionally, three of the Town's Operators undertook Solid Waste Management training through MACA in 2017.

Work on Water Supply Facilities and Sewage Disposal Facilities O&M plan updates is underway.

#### **OTHER**

The Town had acquired a 1 year renewal on their previous water licence in 2016 to allow the completion of the Water Plant. The current licence became effective July 1, 2017 and expires June 30, 2027.



#### **CLOSURE**

We trust that this submission fulfills the reporting requirements for the period referred to.

Sincerely,

**AECOM Canada Ltd.** 

Jordan Hoffart, P.Eng

Project Manager

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/jh Encl

cc: GLWB – AlecSandra MacDonald, Regulatory Officer Inuvik: Grant Hood, S.A.O.; Rick Campbell; Utilidor Shop Inuvik Public Works Committee



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# Appendix A

**Summary Tables and SNP Map** 



# Appendix A

**Summary Tables and SNP Map** 

Station 0036-1, Mackenzie River pumphouse.

Measure quantities daily. Report by month.

The total volumes of water used from SNP 0036-1 are listed below.

Month	East
2017	Channel
	m <sup>3</sup>
January	46,972
February	45,698
March	53,005
April	48,030
May	43,617
June	32,775
July	39,520
August	36,526
September	34,820
October	37,901
November	41,745
December	39,264
Total	499,873

#### Notes:

1. Quantities are well within Licence limits. No known concerns.

#### Solid Waste Generation

Table G17L3-001-2

The total estimated solid waste generated is listed below.

Month	Solid Waste	Solid Waste
2017	Generated	Deposited
	tonnes	$m^3$
January	495	1,649
February	447	1,490
March	495	1,649
April	479	1,596
May	495	1,649
June	479	1,596
July	495	1,649
August	495	1,649
September	479	1,596
October	495	1,649
November	479	1,596
December	495	1,649
Total	5,825	19,418

Station 0036-3, Sewage Discharge to Receiving Water.

SNP requirements. Sample monthly. Report parameters tabulated below. Reports previously due quarterly within thirty days, now only for the calendar year by March 31.

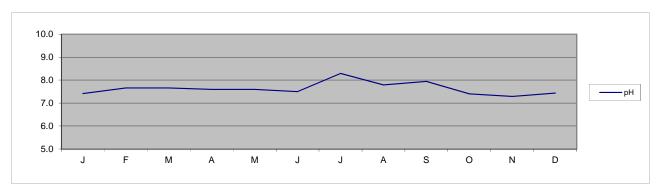
				SAMPLE	RESULTS				AMBIENT CONDITIONS		
Date		рН	BOD/ CBOD mg/L	SS NH3-N mg/L mg/L		Un- ionized Ammonia mg/L	Fecal Coli CFU/dL	Temp ° C	• 1	OC/ Prcp	
2017	01	17	7.4	50	5	21	0.15	144000	-31	N 5	Snow
2017	02	15	7.7	55	4	22	0.28	120000	-26	W 5	Clear
2017	03	15	7.7	72	6	22	0.27	520000	-32	NE 8	Cloudy
2017	04	11	7.6	80	7	23	0.24	200000	-10	E 11	Snow
2017	05	17	7.6	49	5	15	0.16	103000	11	E 14	Clear
2017	06	14	7.5	18	16	13	0.11	400	1	NNE 4	Clear
2017	07	12	8.3	13	71	03	0.15	20	13	NNE 13	Clear
2017	08	16	1.5	7	28	04	0.00	500	14	N 3	Clear
2017	09	13	8.0	5	38	01	0.02	300	8	E 8	Cloudy
2017	10	19	7.4	06	18	26	0.18	1000	-8	N 3	FrzRain
2017	11	16	7.3	04	4	04	0.02	10000	-20	SSE 9	Snow
2017	12	13	7.4	26	9	11	0.08	60000	-14	<b>ENE 10</b>	Snow

Note: pH for August 16 reported as 1.5, which is an obvious error - used average of August pH reading from 2013 to 2016 in subsequent calculations.

		F	RUNNING	AVERAGES	OF SAMPL	E RESULT	S	
Item Unit Limit, a	vg. 4	consec.	pH 6-9	BOD/ CBOD mg/L 150	SS mg/L 70	NH3-N mg/L none	Un- ionized Ammonia mg/L none	Fecal Coli CFU/dL 1,000,000
2017	01	17	7.4	26	8	16.4	0.23	26,135
2017	02	15	7.7	38	8	19.3	0.25	88,810
2017	03	15	7.7	51	6	20.9	0.22	152,379
2017	04	11	7.6	64	6	22.1	0.24	65,109
2017	05	17	7.6	64	6	20.5	0.24	59,877
2017	06	14	7.5	55	9	18.2	0.20	14,387
2017	07	12	8.3	40	25	13.4	0.17	26,355
2017	80	16	7.8	22	30	8.5	0.12	25,980
2017	09	13	8.0	11	38	5.2	0.09	305
2017	10	19	7.4	8	39	8.4	0.10	455
2017	11	16	7.3	6	22	8.5	0.07	2,950
2017	12	13	7.4	10	17	10.3	0.08	17,825

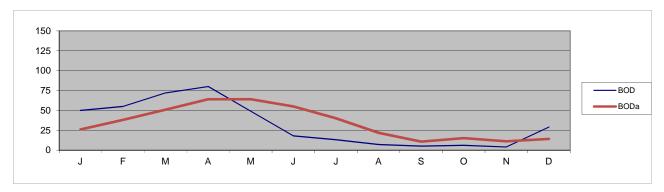
- In the table header above, "avg. 4 con" is shorthand for "average of four consecutive samples". There is no average requirement for pH, only an upper and lower limt. Values presented for pH are monthly sample results.
- In the graphs below, the heavier line (coded with suffix "a" in the key) shows the average of four consecutive samples. The thinner line shows individual monthly readings.
- 3 NT is not tested in this sample. NR is not reported.
- 4 Requirements in the new licence took affect July 1, 2017. Average reported for Fecal Coliforms changed from geometric to arithmetic averages at that time. Averages for CBOD were calculated using BOD where CBOD values were unavailable.

pH, BY MONTH 2017



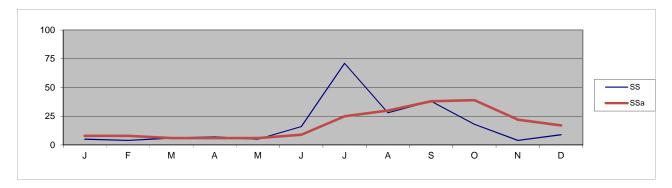
#### BOD5 / CBOD (mg/L), BY MONTH

2017



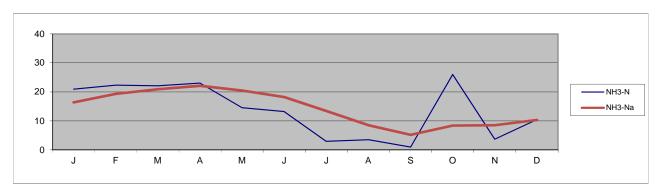
#### SUSPENDED SOLIDS (mg/L) BY MONTH

2017



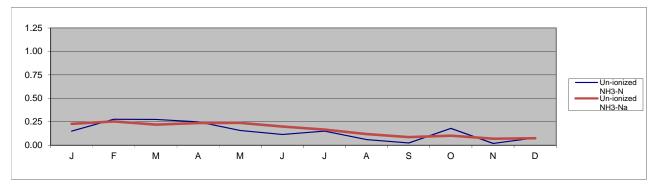
NH3-N (mg/L) BY MONTH

2017



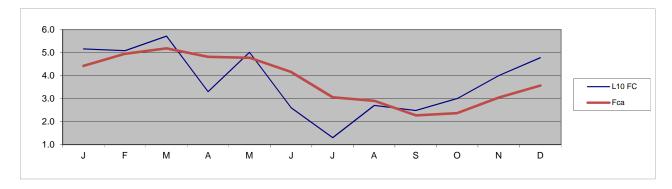
Un-ionized NH3-N (mg/L) BY MONTH

2017



FECAL COLIFORMS (LOG10 CFU/100 mL) BY MONTH

2017



Note: the chart for Fecal Colifirms, above, shows the Log(10) of the measured value.

Note: Data charted are monthly measured values and running averages. Averages are identified by the suffix "a".

Note: in the first three quarters, charts extend to year end at a chosen "typical" value.

Station 0036-4. Sample monthly when there is flow. Report parameters tabulated below.

SAMPLE DATES	S & OBS	ERVATIONS	Temp	Wind	Sky	Prcp		
			° C	km/h				
April		2017	Frozen - No Sample Taken					
May	29	2017	15	E 25	Clear	0		
June	28	2017	15	E 16	Clear	0		
July		2017	Int	ermittent Flow -	No Sample Tak	en		
August	16	2017	14	N 3	Clear	0		
September	13	2017	11 SE Cloudy 0					
October		2017		Frozen - No S	Sample Taken			

			SAMPLE ANA	LYSIS RESULT	rs		
Item				Da	ate		
		May 29	Jun 28	July	August	September	October
рН	NA	7.72	7.41		7.97	7.97	
Conductivity	uS/cm	1760	2400		2070	2140	
Sodium	mg/L	71.8	102.0		144.0	151.0	
Potassium	mg/L	4.0	2.5		28.0	30.8	
Magnesium	mg/L	97.6	127.0		91.9	108.0	
Calcium	mg/L	224	324		210	232	
Cadmium	mg/L	0.00004	0.00005		0.00004	0.00001	
Chromium	mg/L	< 0.0005	< 0.001		0.0019	0.0200	
Copper	mg/L	0.004	0.002		0.003	0.010	
Iron	mg/L	0.027	0.2		3.8	10.8	
Lead	mg/L	< 0.0001	< 0.0002		0.0010	0.0041	
Mercury	mg/L	0.000066	< 0.000005		< 0.000005	< 0.000005	
Nickel	mg/L	0.0039	0.0035		0.0089	0.0170	
Zinc	mg/L	0.016	0.037		0.010	0.038	
Sulphate	mg/L	935	1310		670	656	
Phosphate	mg/L	0.07	< 0.05		0.11	0.30	
Phenols	mg/L	0.001	< 0.001		0.011	0.003	
BOD5	mg/L	<4	<4		<4	<4	
Oil & Grease	mg/L	<5	5		<5	<5	
Suspend. Solid	mg/L	2	<5		30	13	
TPH	mg/L				NR	NR	

- 1. Prior to Q3, Oil & Grease is measured only if there is a visible sheen; otherwise reported "ND"; "NR" is Not Reported.
- 2. "Phosphate" is reported as total P.
- 3. Requirements for testing TPH became effective July 1, 2017, but were not sampled for in 2017 as Oil & Grease samples, which are no longer required, were continued.
- 4. Intermittent flow was observed on one or more occasions. However, flow had dried up at times when attempts were made to gather samples.

Station 0036-5. Sample monthly when there is flow. Report parameters tabulated below.

SAMPLE DAT	ES & OB	SERVATIONS	Temp	Wind	Sky	Prcp
			° C	km/h		
April		2017				
May	29	2017	15	E 25	Clear	0
June	28	2017	15	E 16	Clear	0
July	13	2017	16	E 4	Cloudy	0
August	16	2017	14	N 3	Clear	0
September	13	2017	11	SE 12	Cloudy	0
October		2017				

	SAMPLE ANALYSIS RESULTS											
ltem	Unit			Dat	e							
		May 30	Jun 28	July	August	September	October					
рН	NA	7.74	7.64	7.60	7.21	7.34						
Conductivity	uS/cm	292	378	410	407	464						
Sodium	mg/L	12.3	16.5	18.9	18.6	20.2						
Potassium	mg/L	3.4	3.5	2.9	2.4	2.0						
Magnesium	mg/L	11.3	15.0	17.1	16.4	19.6						
Calcium	mg/L	31.8	41.2	46.3	41.8	49.3						
Cadmium	mg/L	0.00006	<0.00001	<0.00001	<0.00001	<0.00001						
Chromium	mg/L	<0.0005	<0.0005	<0.0005	0.0008	0.0029						
Copper	mg/L	0.002	0.001	0.001	<0.001	0.002						
Iron	mg/L	1.23	0.80	0.60	0.73	0.73						
Lead	mg/L	0.0002	0.0001	0.0001	0.0001	0.0002						
Mercury	mg/L	0.000006	<0.000005	0.000006	<0.000005	<0.00005						
Nickel	mg/L	0.0023	0.0027	0.0026	0.0022	0.0026						
Zinc	mg/L	0.017	0.003	0.002	0.002	0.010						
Sulphate	mg/L	68.6	94.9	113.0	108.0	143.0						
Phosphate	mg/L	0.21	0.13	0.10	0.11	<0.3						
Phenols	mg/L	0.001	<0.001	<0.001	0.001	0.001						
BOD5	mg/L	5	<4	NR	<4	<4						
Oil & Grease	mg/L	<5	5	5	<5	5						
Suspend. Solid	mg/L	9	7	8	2	6						
TPH	mg/L			NR	NR	NR						

- 1. Prior to Q3, Oil & Grease is measured only if there is a visible sheen; otherwise reported "ND"; "NR" is Not Reported.
- 2. "Phosphate" is reported as total P.
- 3. Requirements for testing TPH became effective July 1, 2017, but were not sampled for in 2017 as Oil & Grease samples, which are no longer required, were continued.
- 4. No flow or frozen conditions were present for April and October.

### INUVIK SURVEILLANCE NETWORK PROGRAM MONITORING OF PONDS NEAR LAGOON

2017

Station 0036-6, "Gate Pond", W dike, SW, near gate. La Station 0036-7, "Far Pond", W dike, mid-north. La Station 0036-8, control, Twin Lakes at Happy Valley. La

La N 68 d 21.861 m, Lo W 133 d 44.994 m La N 68 d 22.230 m, Lo W 133 d 45.599 m La N 68 d 21.644 m, Lo W 133 d 44.439 m

SNP requirements. Sample annually. Report parameters tabulated below. Reports are due annually for the calendar year by March 31.

	SAMPLE RESULTS										DITIONS
Item			SNP	рН	BOD <sub>5</sub>	SS	NH3-N	Fecal Coli	Temp	Wind	Prcp
Unit					mg/L	mg/L	mg/L	CFU/dL	° C	km/h	
2017	09	13	6	7.8	<4	19	nd	2	11	SE 12	Clear
2017	09	13	7	8.0	<4	<1	nd	2	11	SE 12	Clear
2017	09	13	8	8.0	<4	10	nd	<1	11	SE 12	Clear

- 1. 'nd' is no data
- 2. Results from recent earlier years are included below for comparison.

Item	1		SNP	рН	BOD	SS	NH3-N	Fecal Coli	Temp	Wind	Prcp
Unit				•	mg/L	mg/L	mg/L	CFU/dL	° C	km/h	_
2016	09	13	6	8.1	<4	2	14.1	<1	0	E 18	Cloudy
2016	09	13	7	8.1	<4	<1	<0.025	<1	0	E 18	Cloudy
2016	09	13	8	8.1	<4	2	3.1	2	0	E 18	Cloudy
0045	00	00		<b>-</b> -	,		40.0	0	_	N 13 A / A	<b>O</b> L 1
2015 2015	09 09	08 08	6 7	7.7 8.4	<4 <4	3 <7	12.8 <0.025	2 <1	1 1	NW 4 NW 4	Cloudy Cloudy
2015	09	08	8	8.2	<4 <4	8	1.6	1	1	NW 4	Cloudy
2013	UĐ	00	0	0.2	<b>\4</b>	O	1.0	'	'	1444 4	Cloudy
2014	10	07	6	7.7	<4	4	12.4	81	-3	NW 30	Snow
2014	10	07	7	8.0	<4	4	< 0.05	<1	-3	NW 30	Snow
2014	10	07	8	8.1	<4	47	1.9	1	-3	NW 30	Snow
2013	09	24	6	7.8	<4	<1	14.4	2	0	NE 5	Cloudy
2013	09	24	7	8.1	<4	15	< 0.05	24	0	NE 5	Cloudy
2013	09	24	8	8.1	<4	<2	1.9	<1	0	NE 5	Cloudy
2012	09	18	6	8.1	<4	3	10.4	4	7	S 10	Clear
2012	09	18	7	8.3	<4	<1	< 0.05	1	7	S 10	Clear
2012	09	18	8	8.2	<4	<2	3.4	2	7	S 10	Clear
2012	00	10		0.2	~ ~	~~	0.4	_	,	0 10	Oloui
2011	09	19	6	8.0	<4	<2	13.6	<1	0	NE 15	Cloudy
2011	09	19	7	8.3	<4	<2	< 0.05	<1	0	NE 15	Cloudy
2011	09	19	8	8.1	<4	6	1.6	<1	0	NE 15	Cloudy
			_		_						
2010	09	21	6	7.8	<4	<1	14.3	1	1	NW 15	Cloudy
2010	09	21	7	8.1	<4	<1	<0.05	<1	1	NW 15	Cloudy
2010	09	21	8	8.1	<4	50	2.6	<1	1	NW 15	Cloudy
2009	09	28	6	7.1	<4	3	11.2	<1	-3	NW 4	Snow
2009	09	28	7	8.2	5	6	<0.05	<1	-3	NW 4	Snow
2009	09	28	8	7.8	<4	6	2.8	<1	-3	NW 4	Snow
2008	09	15	6	7.7	<4	5	10.0	1	-3	E 12	Clear
2008	09	15	7	8.6	<4	3	< 0.05	<1	-3	E 12	Clear
2008	09	15	8	8.3	<4	6	1.3	<1	-3	E 12	Clear
				7.0		40			4.0	05.0-	
2007	11	14	6	7.2	<4	13	8.9	<1	-12	SE 07	Snow
2007	11	14	7	7.3	14	303	0.3	1	-12	SE 07	Snow
2007	11	14	8	7.4	5	6	4.3	<1	-12	SE 07	Snow

Station 0036-9. Sample monthly when there is flow. Report parameters tabulated below.

SAMPLE DAT	ES & OB	SERVATIONS	Temp	Wind	Sky	Prcp	
			° C	km/h			
April		2017		Not Ap	Not Applicable		
May	29	2017	15	E 25	Clear	0	
June	28	2017	15	E 16	Clear	0	
July	13	2017	16	E 4	Cloudy	0	
August	16	2017	14	N 3	Clear	0	
September	13	2017	11	SE 12	0		
October		2017					

	SAMPLE ANALYSIS RESULTS								
Item	Unit			Da	te				
		Мау	June	Jul 13	Aug 16	Sep 13	October		
pН	NA	7.21	7.41	7.86	7.28	7.44			
Conductivity	uS/cm	159	569	1900	645	570			
Sodium	mg/L	4.7	18.5	93.6	25.3	21.2			
Potassium	mg/L	1.7	1.6	4.6	1.5	1.6			
Magnesium	mg/L	6.2	26.8	85.8	34.4	25.9			
Calcium	mg/L	15.5	56.7	245.0	64.7	60.8			
Cadmium	mg/L	0.00003	0.00006	0.00001	0.00003	0.00002			
Chromium	mg/L	0.0008	0.0008	< 0.0005	0.0010	0.0009			
Copper	mg/L	0.003	0.003	<0.001	0.003	0.002			
Iron	mg/L	1.72	1.13	1.11	1.11	0.52			
Lead	mg/L	0.0004	0.0003	<0.0001	0.0001	<0.0001			
Mercury	mg/L	0.000009	<0.000005	<0.000005	<0.00005	<0.000005			
Nickel	mg/L	0.0076	0.0124	0.0037	0.0097	0.0082			
Zinc	mg/L	0.011	0.026	0.009	0.013	0.011			
Sulphate	mg/L	49	233	927	259	224			
Phosphate	mg/L	0.11	0.06	0.05	0.15	0.06			
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	0.001			
BOD / CBOD	mg/L	<4	<4	NR	<4	<4			
Oil & Grease	mg/L	<5	8	<5	<5	<5			
Suspend. Solid	mg/L	19	22	<5	<2	2			
TPH	mg/L	NR	NR	NR	NR	NR			

- 1. "NR" is not recorded.
- 2. "Phosphate" is reported as total P.
- 3. SNP Station 9 became active effective July 1, 2017, with the same criteria for SNP Stations 4&5. Like Stations 4&5, sampling for TPH and CBOD was not completed correctly.



# Appendix B

**SNP Station Sampling Data** 

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#### **Report Transmission Cover Page**

Bill To: Town of Inuvik

Report To: Town of Inuvik ID:

Box 1160 Name:

2 Firth Street Location:

Inuvik, NT, Canada LSD:

P.O.:

Acct code:

Attn: Rick Campbell

X0E 0T0

Sampled By: Justin Simms Company: Town of Inuvik

Project: Lot ID: 1183291

Control Number:

Date Received: Jan 26, 2017 Date Reported: Feb 3, 2017

Report Number: 2164336

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden Aecom - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Single Report  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

SNP 0036-1

E.C.W.T.P.

100104

#### **Notes To Clients:**

- Sample 1183291-1; 5628438 Total organic carbon was less than dissolved organic carbon for sample 1183291-1. The results were verified and are within expected measurement uncertainty.
- Sample 1183291-1; 5628438 Some total metal results were less than dissolved metal results for sample 1183291-1. The results were verified and are within expected measurement uncertainty.

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Feb 3, 2017

2164336

Date Reported:

Report Number:

#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1183291

Report To: Town of Inuvik ID: SNP 0036-1 Control Number:

Box 1160 Name: Date Received: Jan 26, 2017
2 Firth Street Location: E.C.W.T.P.

Inuvik, NT, Canada LSD:

Acct code:

X0E 0T0 P.O.: 100104

Sampled By: Justin Simms
Company: Town of Inuvik

Attn: Rick Campbell

Reference Number 1183291-1 Sample Date Jan 25, 2017 Sample Time NA

Sample Location

Sample Description SNP-0036-1 / 1.5°C

Matrix Water Nominal Detection Analyte Units Results Results Results Limit **Inorganic Nonmetallic Parameters** Sulfide mg/L < 0.002 0.002 Organic Carbon Total Nonpurgeable mg/L 2.9 0.5 Organic Carbon 0.5 Dissolved Nonpurgeable mg/L 3.1 Chlorine Total 1.2 mg/L 0.1 < 0.002 Cyanide Dissolved mg/L 0.002 < 0.002 Hydrogen Sulfide Calculated mg/L **Metals Dissolved** Lab Filtered Subsample Field Filtered **Metals Total** Aluminum Total mg/L 0.04 0.02 Calcium Total 46.7 0.2 mg/L Total < 0.05 0.05 Iron mg/L Magnesium Total mg/L 11.8 0.2 Manganese Total mg/L 0.006 0.005 Total Potassium mg/L 1.1 0.4 Silicon Total 1.86 0.05 mg/L Sodium Total mg/L 13.8 0.4 Sulfur Total mg/L 18.1 0.3 Mercury Total mg/L < 0.000005 0.000005 0.0002 Antimony Total < 0.0002 mg/L Arsenic Total < 0.0002 0.0002 mg/L Barium Total 0.056 mg/L 0.001 Beryllium Total mg/L < 0.0001 0.0001 **Bismuth** Total < 0.0005 0.0005 mg/L Boron Total mg/L 0.016 0.002 Cadmium Total mg/L < 0.00001 0.00001 Chromium Total mg/L < 0.0005 0.0005 Cobalt Total mg/L < 0.0001 0.0001 Total 0.025 0.001 Copper mg/L Lead Total mg/L < 0.0001 0.0001 Lithium Total 0.006 0.001 mg/L Molybdenum Total 0.001 0.001 mg/L Nickel Total 0.0005 mg/L 0.0028 Selenium Total 0.0003 0.0002 mg/L Silver Total < 0.00001 0.00001 mg/L Strontium Total mg/L 0.308 0.001

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#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1183291

ID: SNP 0036-1 Report To: Town of Inuvik Control Number:

Acct code:

Box 1160 Name:

Date Received: Jan 26, 2017 2 Firth Street Location: E.C.W.T.P. Date Reported: Feb 3, 2017 LSD: Inuvik, NT, Canada Report Number: 2164336

X0E 0T0 P.O.: 100104

Sampled By: Justin Simms Company: Town of Inuvik

Attn: Rick Campbell

**Reference Number** 1183291-1 Sample Date Jan 25, 2017 Sample Time NA **Sample Location** 

Sample Description SNP-0036-1 / 1.5°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Thallium	Total	mg/L	<0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	< 0.0005			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0002			0.0001
Zinc	Total	mg/L	0.020			0.001
Microbiological Analysis						
Total Coliforms	Membrane Filtration	CFU/100 mL	<1			1
Escherichia coli	Membrane Filtration	CFU/100 mL	<1			1
Physical and Aggregate	Properties					
Solids	Total Dissolved	mg/L dried at 180 °C	234			7
Colour	Apparent, Potable	Colour units	<5			5
Turbidity		NTU	0.3			0.1
Solids	Total Suspended	mg/L	<1			2
Routine Water						
рН			7.49			
Temperature of observed pH		°C	20.1			
Electrical Conductivity	at 25 °C	uS/cm	389			1
Calcium	Dissolved	mg/L	48.5			0.2
Magnesium	Dissolved	mg/L	12.2			0.2
Sodium	Dissolved	mg/L	14.1			0.4
Potassium	Dissolved	mg/L	1.2			0.4
Iron	Dissolved	mg/L	<0.01			0.01
Manganese	Dissolved	mg/L	< 0.005			0.005
Chloride	Dissolved	mg/L	23.7			0.4
Fluoride		mg/L	0.10			0.05
Nitrate - N		mg/L	0.12			0.01
Nitrite - N		mg/L	<0.005			0.005
Nitrate and Nitrite - N		mg/L	0.12			0.01
Sulfate (SO4)	Dissolved	mg/L	55.3			0.9
Hydroxide		mg/L	<5			
Carbonate		mg/L	<6			
Bicarbonate		mg/L	135			
P-Alkalinity	as CaCO3	mg/L	<5			5
T-Alkalinity	as CaCO3	mg/L	110			5



#### **Analytical Report**

Bill To: Town of Inuvik

Project: ID:

Lot ID: 1183291

Report To: Town of Inuvik

Control Number:

Box 1160

Name: Location:

E.C.W.T.P.

Date Received: Jan 26, 2017 Date Reported: Feb 3, 2017

Inuvik, NT, Canada

2 Firth Street

LSD:

X0E 0T0

P.O.: Acct code: Report Number: 2164336

Attn: Rick Campbell

Sampled By: Justin Simms Company: Town of Inuvik

**Reference Number** 

1183291-1

Sample Date Sample Time Jan 25, 2017 NA

**Sample Location** 

Sample Description SNP-0036-1 / 1.5°C

Matrix \/\/ater

SNP 0036-1

100104

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Routine Water - Continue	ed					
Total Dissolved Solids	Calculated	mg/L	221			1
Hardness	Dissolved as CaCO3	mg/L	171			
Ionic Balance	Dissolved	%	101			
Trihalomethanes Screen	- Water					
Chloroform		mg/L	0.005			0.001
Bromodichloromethane		mg/L	0.001			0.001
Dibromochloromethane		mg/L	<0.001			0.001
Bromoform		mg/L	<0.001			0.001
Total Trihalomethanes		mg/L	0.006			0.001
Trihalomethanes - Surro	gate Recovery					
Dibromofluoromethane	EPA Surrogate	%	90			86-118
Toluene-d8	EPA Surrogate	%	95			85-115
Bromofluorobenzene	EPA Surrogate	%	93			86-115

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman



#### **Methodology and Notes**

Bill To: Town of Inuvik

Project: ID:

Lot ID: 1183291

Report To: Town of Inuvik

Name:

Control Number:

Box 1160 2 Firth Street

Location: E.C.W.T.P. Date Received: Jan 26, 2017 Date Reported: Feb 3, 2017

Inuvik, NT, Canada

LSD:

X0E 0T0

100104

SNP 0036-1

Report Number: 2164336

Attn: Rick Campbell

P.O.: Acct code:

Sampled By: Justin Simms

Company: Town of Inuvik

Method of Analysis					
Method Name	Reference		Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	*	Alkalinity - Titration Method, 2320 B	27-Jan-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	Conductivity, 2510 B	27-Jan-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	pH - Electrometric Method, 4500-H+ B	27-Jan-17	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	*	lon Chromatography with Chemical Suppression of Eluent Cond., 4110 B	27-Jan-17	Exova Edmonton
Approval-Edmonton	APHA		Checking Correctness of Analyses, 1030 E	27-Jan-17	Exova Edmonton
Carbon Organic (Dissolved) in water DOC)	APHA		High-Temperature Combustion Method, 5310 B	27-Jan-17	Exova Edmonton
Carbon Organic (Total) in water (TOC)	APHA		High-Temperature Combustion Method, 5310 B	26-Jan-17	Exova Edmonton
Chloride in Water	APHA	*	Automated Ferricyanide Method, 4500-CI-E	27-Jan-17	Exova Edmonton
Chlorine (Total) in water	APHA	*	DPD Colorimetric Method, 4500-Cl G	26-Jan-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA		E. Coli - MF Partition Procedures, 9222 G	27-Jan-17	Exova Calgary
Coliforms - Membrane Filtration	APHA		Standard Total Coliform Membrane Filter Procedure, 9222 B	27-Jan-17	Exova Calgary
Colour (Apparent) in water	APHA	*	Visual Comparison Method, 2120 B	27-Jan-17	Exova Edmonton
Syanide (Dissolved) in water	Alta. Env. Method	*	Cyanide, Simple Extractable (Automated Pyridine-Barbituric Acid Colorimetric Method), 06608L	30-Jan-17	Exova Edmonton
Mercury (Total) in water	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	30-Jan-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	27-Jan-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA		Hardness by Calculation, 2340 B	27-Jan-17	Exova Edmonton
Metals Trace (Dissolved) in water	АРНА	*	Inductively Coupled Plasma (ICP) Method, 3120 B	27-Jan-17	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	27-Jan-17	Exova Edmonton
Solids Dissolved (Total, Fixed and /olatile)	АРНА	*	Total Dissolved Solids Dried at 180 C, 2540 C	27-Jan-17	Exova Edmonton
Solids Suspended (Total, Fixed and /olatile)	АРНА	*	Total Suspended Solids Dried at 103- 105'C, 2540 D	01-Feb-17	Exova Edmonton
Sulfide in water	APHA	*	Gas Dialysis, Automated Methylene Blue Method, 4500-S2- E	03-Feb-17	Exova Edmonton
THM - Water	US EPA	*	US EPA method, 8260B/5035	30-Jan-17	Exova Calgary
Furbidity in Water	APHA	*	Turbidity - Nephelometric Method, 2130 B	27-Jan-17	Exova Edmonton
			× 1 loto vomo o A Anthonal A Analitical		

<sup>\*</sup> Reference Method Modified

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Report Number: 2164336

#### **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1183291

Report To: Town of Inuvik ID: SNP 0036-1 Control Number:

Box 1160 Name: Control Number:

2 Firth Street Location: E.C.W.T.P. Date Received: Jan 26, 2017
Date Reported: Feb 3, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104

Acct code:

Attn: Rick Campbell
Sampled By: Justin Simms
Company: Town of Inuvik

#### References

APHA Standard Methods for the Examination of Water and Wastewater
APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### **Comments:**

- Sample 1183291-1; 5628438 Total organic carbon was less than dissolved organic carbon for sample 1183291-1. The results were verified and are within expected measurement uncertainty.
- Sample 1183291-1; 5628438 Some total metal results were less than dissolved metal results for sample 1183291-1. The results were verified and are within expected measurement uncertainty.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

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#### **Report Transmission Cover Page**

Bill To: Town of Inuvik

Project: ID:

Lot ID: 1183301

Report To: Town of Inuvik

Control Number:

Box 1160

Name:

Date Received: Jan 26, 2017

2 Firth Street

Location: E.C.W.T.P.

SNP 0036-1

100104

Date Reported: Feb 1, 2017

Inuvik, NT, Canada X0E 0T0

LSD:

Attn: Rick Campbell

P.O.: Acct code: Report Number: 2164348

Sampled By: Justin Simms

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden Aecom - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Single Report  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

#### **Notes To Clients:**

• Sample 1183301-1; 5628474 Some total metal results were less than dissolved metal results for sample 1183301-1. The results were verified and are within expected measurement uncertainty.

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#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1183301

Report To: Town of Inuvik ID: SNP 0036-1 Control Number:

Box 1160 Name: Date Received:

Jan 26, 2017 2 Firth Street Location: E.C.W.T.P. Date Reported: Feb 1, 2017 Inuvik, NT, Canada LSD: Report Number: 2164348

X0E 0T0 P.O.: 100104

Acct code:

Sampled By: Justin Simms Company: Town of Inuvik

Attn: Rick Campbell

1183301-1 **Reference Number** Sample Date Jan 25, 2017 Sample Time NA

**Sample Location** 

Sample Description SNP-0036-1 / 1.5°C

Matrix Water Nominal Detection Analyte Units Results Results Results Limit **Inorganic Nonmetallic Parameters** Organic Carbon Total Nonpurgeable mg/L 4.9 0.5 4.7 Organic Carbon Dissolved Nonpurgeable mg/L 0.5 < 0.002 0.002 Cyanide Total mg/L **Metals Dissolved** Field Filtered Lab Filtered Subsample **Metals Total** Aluminum Total 0.08 0.02 mg/L Calcium Total mg/L 48.2 0.2 Total 0.13 0.05 Iron mg/L Magnesium Total 12.1 0.2 mg/L 0.008 0.005 Manganese Total mg/L Potassium Total 0.4 mg/L 1.2 Silicon Total mg/L 2.16 0.05 Sodium Total mg/L 12.3 0.4 Sulfur Total 18.0 0.3 mg/L Mercury Total < 0.000005 0.000005 mg/L Antimony Total mg/L < 0.0002 0.0002 Arsenic Total mg/L 0.0004 0.0002 Barium Total mg/L 0.063 0.001 Beryllium Total < 0.0001 0.0001 mg/L **Bismuth** Total < 0.0005 0.0005 mg/L Total 0.017 Boron mg/L 0.002 Cadmium Total mg/L 0.00001 0.00001 Chromium Total < 0.0005 0.0005 mg/L < 0.0001 Cobalt Total mg/L 0.0001 0.009 Copper Total mg/L 0.001 Lead Total mg/L < 0.0001 0.0001 Lithium Total mg/L 0.006 0.001 Molybdenum Total 0.001 0.001 mg/L Nickel Total mg/L 0.0088 0.0005 Selenium Total 0.0004 0.0002 mg/L Silver Total < 0.00001 0.00001 mg/L Strontium Total mg/L 0.326 0.001 Thallium Total < 0.00005 0.00005 mg/L Tin Total < 0.001 0.001 mg/L 0.0005 Titanium Total mg/L 0.0023

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### Page 2 of 5 **EXOVO**

#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1183301

Acct code:

Report To: Town of Inuvik ID: SNP 0036-1

Town of Inuvik ID: SNP 0036-1 Control Number:

Post 1160 Name: Date Received: Jan 26, 2017
2 Firth Street Location: E.C.W.T.P. Date Reported: Feb 1, 2017
Inuvik, NT, Canada LSD: Report Number: 2164348

X0E 0T0 P.O.: 100104

Attn: Rick Campbell
Sampled By: Justin Simms
Company: Town of Inuvik

Reference Number 1183301-1
Sample Date Jan 25, 2017
Sample Time NA

Sample Description SNP-0036-1 / 1.5°C

**Sample Location** 

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	0.0009			0.0005
Vanadium	Total	mg/L	0.0004			0.0001
Zinc	Total	mg/L	0.004			0.001
Physical and Aggregate F	Properties					
Solids	Total Dissolved	mg/L dried at 180 °C	266			7
Colour	Apparent, Potable	Colour units	18			5
Turbidity		NTU	2.8			0.1
Solids	Total Suspended	mg/L	<1			2
Routine Water						
рН			7.77			
Temperature of observed pH		°C	19.8			
Electrical Conductivity	at 25 °C	uS/cm	679			1
Calcium	Dissolved	mg/L	47.8			0.2
Magnesium	Dissolved	mg/L	12.2			0.2
Sodium	Dissolved	mg/L	12.3			0.4
Potassium	Dissolved	mg/L	1.2			0.4
Iron	Dissolved	mg/L	<0.01			0.01
Manganese	Dissolved	mg/L	0.005			0.005
Chloride	Dissolved	mg/L	12.8			0.4
Fluoride		mg/L	0.14			0.05
Nitrate - N		mg/L	0.11			0.01
Nitrite - N		mg/L	< 0.005			0.005
Nitrate and Nitrite - N		mg/L	0.11			0.01
Sulfate (SO4)	Dissolved	mg/L	54.8			0.9
Hydroxide		mg/L	<5			
Carbonate		mg/L	<6			
Bicarbonate		mg/L	149			
P-Alkalinity	as CaCO3	mg/L	<5			5
T-Alkalinity	as CaCO3	mg/L	122			5
Total Dissolved Solids	Calculated	mg/L	214			1
Hardness	Dissolved as CaCO3	mg/L	170			
Ionic Balance	Dissolved	%	100			

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### Page 3 of 5 Exovo

#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1183301

Report To: Town of Inuvik ID: SNP 0036-1 Control Number:

Box 1160 Name: Date Received: Jan 26, 2017

2 Firth Street Location: E.C.W.T.P. Date Reported: Feb 1, 2017 LSD: Inuvik, NT, Canada Report Number: 2164348

X0E 0T0 P.O.: 100104 Acct code:

Sampled By: Justin Simms Company: Town of Inuvik

Attn: Rick Campbell

Approved by:

Darlene Lintott, MSc Consulting Scientist

7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

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#### **Methodology and Notes**

Bill To: Town of Inuvik

Project: ID:

SNP 0036-1

E.C.W.T.P.

100104

Lot ID: 1183301

Report To: Town of Inuvik

Name:

Control Number:

Box 1160 2 Firth Street

Location:

Date Received: Jan 26, 2017

Inuvik, NT, Canada

LSD:

Date Reported: Feb 1, 2017

X0E 0T0

P.O.:

Report Number: 2164348

Attn: Rick Campbell

Acct code:

Sampled By: Justin Simms Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Alkalinity - Titration Method, 2320 B	27-Jan-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	27-Jan-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	27-Jan-17	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	* Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	30-Jan-17	Exova Edmonton
Approval-Edmonton	APHA	Checking Correctness of Analyses, 1030 E	27-Jan-17	Exova Edmonton
Carbon Organic (Dissolved) in water (DOC)	APHA	High-Temperature Combustion Method, 5310 B	27-Jan-17	Exova Edmonton
Carbon Organic (Total) in water (TOC)	APHA	High-Temperature Combustion Method, 5310 B	26-Jan-17	Exova Edmonton
Chloride in Water	APHA	* Automated Ferricyanide Method, 4500-CI-E	27-Jan-17	Exova Edmonton
Colour (Apparent) in water	APHA	* Visual Comparison Method, 2120 B	27-Jan-17	Exova Edmonton
Cyanide (Total) in water	US EPA	* US EPA method, 335.3	30-Jan-17	Exova Edmonton
Filtration of water for dissolved analysis	APHA	* Filtration for Dissolved and Suspended Metals / Total Organic Carbon, 3030 B / 5310 A	27-Jan-17	Exova Edmonton
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	30-Jan-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	27-Jan-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	Hardness by Calculation, 2340 B	27-Jan-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	27-Jan-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	27-Jan-17	Exova Edmonton
Solids Dissolved (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Dissolved Solids Dried at 180 C, 2540 C</li> </ul>	27-Jan-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 105'C, 2540 D	30-Jan-17	Exova Edmonton
Turbidity in Water	АРНА	* Turbidity - Nephelometric Method, 2130 B	27-Jan-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

Environmental Protection Agency Test Methods - US **EPA US EPA** US Environmental Protection Agency Test Methods

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#### **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1183301

Report To: Town of Inuvik ID: SNP 0036-1 Control Number:

Box 1160 Name: Date Received:

Jan 26, 2017 2 Firth Street Location: E.C.W.T.P. Date Reported: Feb 1, 2017 Inuvik, NT, Canada LSD: Report Number: 2164348

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code: Sampled By: Justin Simms Company: Town of Inuvik

#### Comments:

• Sample 1183301-1; 5628474 Some total metal results were less than dissolved metal results for sample 1183301-1. The results were verified and are within expected measurement uncertainty.

> Please direct any inquiries regarding this report to our Client Services group. Results relate only to samples as submitted.

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#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215675

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P Date Received: Jul 20, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2017

X0E 0T0 P.O.: 100104 Report Number: 2207988

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
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		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
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		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
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		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**

• Samples 1215474-1, 1215479-1, and 1215678-1 turbidity may interfere with Apparent Colour analysis. A more accurate measure of sample colour would be obtained from True Colour Analysis.

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#### **Analytical Report**

Lot ID: 1215675 Bill To: Town of Inuvik Project ID: SNP 0036-1

Project Name: Control Number: Box 1160

2 Firth Street Project Location: E.C.W.T.P Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD:

Date Reported: Jul 27, 2017 X0E 0T0 P.O.: 100104 Report Number: 2207988

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1215675-1 Sample Date July 19, 2017 NA

Sample Time Sample Location

Sample Description snp-0036-1 / Treated Water / 7.5°C

Sample Matrix Water

		Sample Matrix	vvalei			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Aggregate Organic Con	stituents					
Biochemical Oxygen	5 Day	mg/L	<4	4		
Demand						
Inorganic Nonmetallic F						
Sulfide	Total	mg/L	<0.002	0.002	0.05	Below AO
Organic Carbon	Total Nonpurgeable	mg/L	3.1	0.5		
Organic Carbon	Dissolved Nonpurgeable	mg/L	3.0	0.5		
Chlorine	Total	mg/L	1.0	0.1		
Cyanide	Dissolved	mg/L	< 0.002	0.002	0.2	Below MAC
Hydrogen Sulfide	Calculated	mg/L	< 0.002			
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.18	0.02	0.1	Above OG
Calcium	Total	mg/L	39.7	0.2		
Iron	Total	mg/L	< 0.05	0.05	0.3	Below AO
Magnesium	Total	mg/L	9.8	0.2		
Manganese	Total	mg/L	0.006	0.005	0.05	Below AO
Potassium	Total	mg/L	0.9	0.4		
Silicon	Total	mg/L	1.52	0.05		
Sodium	Total	mg/L	7.0	0.4	200	Below AO
Sulfur	Total	mg/L	15.2	0.3		
Mercury	Total	mg/L	< 0.000005	0.000005	0.001	Below MAC
Antimony	Total	mg/L	< 0.0002	0.0002	0.006	Below MAC
Arsenic	Total	mg/L	< 0.0002	0.0002	0.01	Below MAC
Barium	Total	mg/L	0.058	0.001	1.0	Below MAC
Beryllium	Total	mg/L	<0.0001	0.0001		
Bismuth	Total	mg/L	<0.0005	0.0005		
Boron	Total	mg/L	0.015	0.002	5.0	Below MAC
Cadmium	Total	mg/L	0.00002	0.00001	0.005	Below MAC
Chromium	Total	mg/L	<0.0005	0.0005	0.05	Below MAC
Cobalt	Total	mg/L	<0.0001	0.0001		
Copper	Total	mg/L	0.026	0.001	1.0	Below AO
Lead	Total	mg/L	< 0.0001	0.0001	0.01	Below MAC
Lithium	Total	mg/L	0.004	0.001		
Molybdenum	Total	mg/L	0.001	0.001		
Nickel	Total	mg/L	0.0041	0.0005		
Selenium	Total	mg/L	0.0003	0.0002	0.05	Below MAC

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#### **Analytical Report**

Lot ID: 1215675 Bill To: Town of Inuvik Project ID: SNP 0036-1

Project Name: Control Number: Box 1160

2 Firth Street Project Location: E.C.W.T.P Date Received: Jul 20, 2017 Date Reported: Jul 27, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2207988

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> 1215675-1 **Reference Number** Sample Date July 19, 2017

Sample Time NA Sample Location

**Sample Description** snp-0036-1 / Treated Water / 7.5°C

Sample Matrix Water

		Sample Matrix	Water			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Total - Continued						
Silver	Total	mg/L	< 0.00001	0.00001		
Strontium	Total	mg/L	0.240	0.001		
Thallium	Total	mg/L	< 0.00005	0.00005		
Tin	Total	mg/L	< 0.001	0.001		
Titanium	Total	mg/L	0.0005	0.0005		
Uranium	Total	mg/L	< 0.0005	0.0005	0.02	Below MAC
Vanadium	Total	mg/L	0.0003	0.0001		
Zinc	Total	mg/L	0.036	0.001	5.0	Below AO
Microbiological Analysis		-				
Total Coliforms	Membrane Filtration	CFU/100 mL	<1	1	0	Absent - Below MAC
Escherichia coli	Membrane Filtration	CFU/100 mL	<1	1	0	Absent - Below MAC
Physical and Aggregate F	Properties					
Solids	Total Dissolved	mg/L dried at 180 °C	200	7	500	Below AO
Colour	Apparent, Potable	Colour units	<5	5	15	Below AO
Turbidity		NTU	0.5	0.1	0.1	Above OG
Solids	Total Suspended	mg/L	<1	2		
Routine Water						
рН			8.13		7.0-10.5	Within OG Range
Temperature of observed		°C	23.2			
pH		0.4				
Electrical Conductivity	at 25 °C	μS/cm	304	1		
Calcium	Dissolved	mg/L	38.8	0.2		
Magnesium	Dissolved	mg/L	9.6	0.2		5
Sodium	Dissolved	mg/L	6.8	0.4	200	Below AO
Potassium .	Dissolved	mg/L	0.8	0.4		5
Iron	Dissolved	mg/L	<0.01	0.01	0.3	Below AO
Manganese	Dissolved	mg/L	<0.005	0.005	0.05	Below AO
Chloride	Dissolved	mg/L	19.8	0.4	250	Below AO
Fluoride		mg/L	0.09	0.05	1.5	Below MAC
Nitrate - N		mg/L	0.04	0.01	10	Below MAC
Nitrite - N		mg/L	<0.005	0.005	1	Below MAC
Nitrate and Nitrite - N	<b>5</b>	mg/L	0.04	0.01	10	Below MAC
Sulfate (SO4)	Dissolved	mg/L	42.9	0.9	500	Below AO
Hydroxide		mg/L	<5			
Carbonate		mg/L	<6			
Bicarbonate		mg/L	102	_		
P-Alkalinity	as CaCO3	mg/L	<5.0	5		



Date Reported: Jul 27, 2017

#### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215675

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2207988

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

**Reference Number** 1215675-1

Sample Date July 19, 2017
Sample Time NA

Sample Location

Sample Description snp-0036-1 / Treated Water / 7.5°C

Sample Matrix Wa

		Sample Matrix	vvater			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continu	ed			·	-	
T-Alkalinity	as CaCO3	mg/L	83.4	5		
Total Dissolved Solids	Calculated	mg/L	169	1	500	Below AO
Hardness	Dissolved as CaCO3	mg/L	137			
Ionic Balance	Dissolved	%	98			
Trihalomethanes Screen	ı - Water					
Chloroform		mg/L	0.028	0.001		
Bromodichloromethane		mg/L	0.002	0.001		
Dibromochloromethane		mg/L	< 0.001	0.001		
Bromoform		mg/L	< 0.001	0.001		
Total Trihalomethanes		mg/L	0.030	0.001	0.1	Below MAC
Trihalomethanes - Surro	gate Recovery					
Dibromofluoromethane	EPA Surrogate	%	81	86-118		
Toluene-d8	EPA Surrogate	%	93	85-115		
Bromofluorobenzene	EPA Surrogate	%	71	86-115		
	ŭ					

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman



#### **Methodology and Notes**

 Bill To:
 Town of Inuvik
 Project ID:
 SNP 0036-1
 Lot ID:
 1215675

Box 1160 Project Name: Control Number:

 2 Firth Street
 Project Location:
 E.C.W.T.P
 Date Received:
 Jul 20, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 27, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2207988

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis			
Method Name	Reference	Method Date Analysis Location Started	
Alkalinity, pH, and EC in water	APHA	Alkalinity - Titration Method, 2320 B 20-Jul-17 Exova Edmonton	
Alkalinity, pH, and EC in water	APHA	Conductivity, 2510 B 20-Jul-17 Exova Edmonton	
Alkalinity, pH, and EC in water	APHA	pH - Electrometric Method, 4500-H+ B 20-Jul-17 Exova Edmonton	
Anions (Routine) by Ion Chromatography	APHA	Ion Chromatography with Chemical 20-Jul-17 Exova Edmonton Suppression of Eluent Cond., 4110 B	
Approval-Edmonton	APHA	Checking Correctness of Analyses, 1030 24-Jul-17 Exova Edmonton E	
BOD in water	APHA	5 Day, 5210 B 21-Jul-17 Exova Edmonton	
Carbon Organic (Dissolved) in water (DOC)	APHA	High-Temperature Combustion Method, 21-Jul-17 Exova Edmonton 5310 B	
Carbon Organic (Total) in water (TOC)	APHA	High-Temperature Combustion Method, 20-Jul-17 Exova Edmonton 5310 B	
Chloride in Water	APHA	Automated Ferricyanide Method, 4500-Cl- 20-Jul-17 Exova Edmonton E	
Chlorine (Total) in water	APHA	DPD Colorimetric Method, 4500-Cl G 20-Jul-17 Exova Edmonton	
Coliforms - Membrane Filtration	APHA	E. Coli - MF Partition Procedures, 9222 G 21-Jul-17 Exova Calgary	
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 21-Jul-17 Exova Calgary Procedure, 9222 B	
Colour (Apparent) in water	APHA	Visual Comparison Method, 2120 B 21-Jul-17 Exova Edmonton	
Cyanide (Dissolved) in water	Alta. Env. Method	Cyanide, Simple Extractable (Automated 25-Jul-17 Exova Edmonton Pyridine-Barbituric Acid Colorimetric Method), 06608L	
Mercury (Total) in water	US EPA	Determination of Hg in Sediment by Cold 21-Jul-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5	
Metals ICP-MS (Total) in water	US EPA	Determination of Trace Elements in 21-Jul-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8	
Metals Trace (Dissolved) in water	APHA	Hardness by Calculation, 2340 B 21-Jul-17 Exova Edmonton	
Metals Trace (Dissolved) in water	APHA	Inductively Coupled Plasma (ICP) 21-Jul-17 Exova Edmonton Method, 3120 B	
Metals Trace (Total) in water	APHA	Inductively Coupled Plasma (ICP) 21-Jul-17 Exova Edmonton Method, 3120 B	
Solids Dissolved (Total, Fixed and Volatile)	APHA	Total Dissolved Solids Dried at 180 C, 21-Jul-17 Exova Edmonton 2540 C	
Solids Suspended (Total, Fixed and Volatile)	APHA	Total Suspended Solids Dried at 103- 24-Jul-17 Exova Edmonton 105'C, 2540 D	
Sulfide in water	APHA	Gas Dialysis, Automated Methylene Blue 26-Jul-17 Exova Edmonton Method, 4500-S2- E	
THM - Water	US EPA	US EPA method, 8260B/5035 21-Jul-17 Exova Calgary	
Turbidity in Water	APHA	Turbidity - Nephelometric Method, 2130 B 21-Jul-17 Exova Edmonton	

### Page 5 of 5 **EXOVO**

#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215675

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2207988

 Attn:
 Rick Campbell
 Proj. Acct. code:

Sampled By: Jim Crawford
Company: Town of Inuvik

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### Guidelines

Guideline Description Health Canada GCDWQ

Guideline Source Guidelines for Canadian Drinking Water Quality, Health Canada, February 2017

Guideline Comments MAC = Maximum Acceptable Concentration

AO = Aesthetic Objective

OG = Operational Guideline for Water Treatment Plants

Refer to Health Canada GCDWQ for complete guidelines and additional drinking water information at www.hc-sc.gc.ca

#### Comments:

• Samples 1215474-1, 1215479-1, and 1215678-1 turbidity may interfere with Apparent Colour analysis. A more accurate measure of sample colour would be obtained from True Colour Analysis.

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

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EXOVO Testing Advising	Billing Informat	ion:		Copy of	Report To								RUSH	l Priority
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www.exova.com	Address	Box 1160 2 I		Address			03rd A							T T T T T T T T T T T T T T T T T T T
Project Information	AH6	Inuvik, NT X		AHC			AB T5						Date Required	All Ameliania
Project ID snp-0036-1	Attention	Rick Campb		Attention			-eilde						As Indicated	All Analysis
Project Name	Phone	(867) 777-86		Phone	(780	1) 488	3-680	J						quested, turn around will
Project Location E.C.W.T.P.	Cell	(867) 678-53		Cell	/706								The second secon	SH priority, with pricing and tch. Please contact the lat
Legal Location	Fax	(867) 777-86		Fax			3-212							ing RUSH samples
PO/AFE# 100104	E-mail		@town.inuvik.nt.ca	E-mail	richa	ard.te	eilden	@ae	com.c	om			Cianatura (	VVI
Proj. Acct.Code	Agreement ID	2909											Signature	
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Report Results X E-Mail	Online	PDF		QA/QC F	Report	H		1 1			1			m Crawford
Mail x Special Instructions/Comments (please i	Fax	Excel	ding ph. # if different			l I		1						wn of Inuvik
from above).	noidde contact init	imation inclu	ung pn. # n unerent	Indicate Re Requirement		ers		1 1						o proceed with the work on this form:
Sampler: Circle Project ID Below and no	e weather		10.1	requiremen	its below	Containers		1 1					Date.July.19/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W - SNP5 M		/				S								for Lab use only
SNP6 GatePond - SNP7 FarPond - SNP	8 TwinL	100	Mator			₽					1 1		Date/Time stamp:	or Lab use only
Raw Water		rev	Way			Jper		1						(*7
Temp∐ C, precip, Wind dir Vel_		1				Number							JUL 20 PH12:	LE
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method								Indicate below any condition of samples	
1 B.O.D.	snp-0036-1		July.19/2017		Grab					П				Were Exova supplies
2 Metals	snp-0036-1		July.19/2017		Grab	П								used?
3 Nutrients	snp-0036-1		July.19/2017		Grab	П		П						Was there any damage
4 Routine	snp-0036-1		July.19/2017		Grab									to the shipping container?
5 Cyanide	snp-0036-1		July.19/2017		Grab	П					1			
6 Microbiology	snp-0036-1		July.19/2017		Grab	П		Πİ						Were the containers
7 T.H.M.s	snp-0036-1		July.19/2017		Grab	П								packaged well?
8 Sulphides	snp-0036-1		July.19/2017		Grab	П		П						
9 Marcury	Spp-00361		July 19/17	- 3	Gal	П		П						Were the expected
10	/ 001		7 7			П		П						number of samples received (document
11	- PPI	9	^											below)?
12	01					П		H						
13 anadian	Drand	ards	to~ 1)	rinkin	R	П								Are samples within
14					0	П								recommended holding times/temp?
15 Mater:								$\vdash$			1			- uniconcernp
Environmental	Sample Inforn	nation She	et			200				Si	ippin	3:	# and size of coolers re	ceived:
Note: Proper completion of this fo	rm is required in o	rder to procee	ed with analysis	Lot: 121		135-145 American				C	OD Y/	N		
Please indicate any	potentially ha	zordous sa	amples							Co	oler t	emp:	Delivery Method:	24.
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Page 1 of 1	CONTROL #			under chief eld					1		1-	>	Received by://C	_



#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215678

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Jul 20, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2017

X0E 0T0 P.O.: 100104 Report Number: 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
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		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
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		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**

- Sample 1215678-1; 5784093 Some total metal results were less than dissolved metal results for sample 1215678-1. The results were verified and are within expected measurement uncertainty.
- Samples 1215474-1, 1215479-1, and 1215678-1 turbidity may interfere with Apparent Colour analysis. A more accurate measure of sample colour would be obtained from True Colour Analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Date Reported: Jul 27, 2017

#### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215678

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1215678-1 Sample Date July 19, 2017 Sample Time NA

Sample Time N
Sample Location

Sample Description snp-0036-1 / Raw Water / 7.5°C

Sample Matrix Water

		•				
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4	4		
Inorganic Nonmetallic F	Parameters					
Organic Carbon	Total Nonpurgeable	mg/L	6.9	0.5		
Organic Carbon	Dissolved Nonpurgeable	mg/L	5.8	0.5		
Cyanide	Total	mg/L	< 0.002	0.002	0.2	Below MAC
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	2.19	0.02	0.1	Above OG
Calcium	Total	mg/L	44.9	0.2		
Iron	Total	mg/L	3.64	0.05	0.3	Above AO
Magnesium	Total	mg/L	11.9	0.2		
Manganese	Total	mg/L	0.075	0.005	0.05	Above AO
Potassium	Total	mg/L	1.4	0.4		
Silicon	Total	mg/L	5.32	0.05		
Sodium	Total	mg/L	7.0	0.4	200	Below AO
Sulfur	Total	mg/L	1960	0.3		
Mercury	Total	mg/L	<0.000005	0.000005	0.001	Below MAC
Antimony	Total	mg/L	< 0.0002	0.0002	0.006	Below MAC
Arsenic	Total	mg/L	0.0025	0.0002	0.01	Below MAC
Barium	Total	mg/L	0.069	0.001	1.0	Below MAC
Beryllium	Total	mg/L	0.0001	0.0001		
Bismuth	Total	mg/L	< 0.0005	0.0005		
Boron	Total	mg/L	0.015	0.002	5.0	Below MAC
Cadmium	Total	mg/L	0.00009	0.00001	0.005	Below MAC
Chromium	Total	mg/L	0.0034	0.0005	0.05	Below MAC
Cobalt	Total	mg/L	0.0017	0.0001		
Copper	Total	mg/L	0.007	0.001	1.0	Below AO
Lead	Total	mg/L	0.0022	0.0001	0.01	Below MAC
Lithium	Total	mg/L	0.007	0.001		
Molybdenum	Total	mg/L	0.001	0.001		
Nickel	Total	mg/L	0.0063	0.0005		
Selenium	Total	mg/L	0.0007	0.0002	0.05	Below MAC
Silver	Total	mg/L	0.00001	0.00001		
Strontium	Total	mg/L	0.237	0.001		
Thallium	Total	mg/L	<0.00005	0.00005		

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Date Reported: Jul 27, 2017

# **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215678

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1215678-1

Sample Date July 19, 2017
Sample Time NA

Sample Time N
Sample Location

Sample Description snp-0036-1 / Raw Water / 7.5°C

Sample Matrix Water

		Sample Matrix	Water			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Metals Total - Continued						
Tin	Total	mg/L	< 0.001	0.001		
Titanium	Total	mg/L	0.0427	0.0005		
Uranium	Total	mg/L	0.0009	0.0005	0.02	Below MAC
Vanadium	Total	mg/L	0.0044	0.0001		
Zinc	Total	mg/L	0.017	0.001	5.0	Below AO
Microbiological Analysis		-				
Total Coliforms	Membrane Filtration	CFU/100 mL	4	1	0	Present - Above MAC
Escherichia coli	Membrane Filtration	CFU/100 mL	1	1	0	Present - Above MAC
Physical and Aggregate F	Properties					
Solids	Total Dissolved	mg/L dried at 180 °C	180	7	500	Below AO
Colour	Apparent, Potable	Colour units	>60	5	15	Above AO
Turbidity		NTU	186	0.1	0.1	Above OG
Solids	Total Suspended	mg/L	142	2		
Routine Water						
pН			8.08		7.0-10.5	Within OG Range
Temperature of observed pH		°C	23.3			
Electrical Conductivity	at 25 °C	μS/cm	274	1		
Calcium	Dissolved	mg/L	36.6	0.2		
Magnesium	Dissolved	mg/L	9.8	0.2		
Sodium	Dissolved	mg/L	7.2	0.4	200	Below AO
Potassium	Dissolved	mg/L	1.0	0.4		
Iron	Dissolved	mg/L	0.02	0.01	0.3	Below AO
Manganese	Dissolved	mg/L	< 0.005	0.005	0.05	Below AO
Chloride	Dissolved	mg/L	6.5	0.4	250	Below AO
Fluoride		mg/L	0.12	0.05	1.5	Below MAC
Nitrate - N		mg/L	0.04	0.01	10	Below MAC
Nitrite - N		mg/L	< 0.005	0.005	1	Below MAC
Nitrate and Nitrite - N		mg/L	0.04	0.01	10	Below MAC
Sulfate (SO4)	Dissolved	mg/L	44.9	0.9	500	Below AO
Hydroxide		mg/L	<5			
Carbonate		mg/L	<6			
Bicarbonate		mg/L	112			
P-Alkalinity	as CaCO3	mg/L	<5.0	5		
T-Alkalinity	as CaCO3	mg/L	91.6	5		
Total Dissolved Solids	Calculated	mg/L	161	1	500	Below AO
Hardness	Dissolved as CaCO3	mg/L	132			



# **Analytical Report**

Lot ID: 1215678 Bill To: Town of Inuvik Project ID: SNP 0036-1

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Jul 20, 2017

Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2017 X0E 0T0 P.O.: 100104 Report Number: 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1215678-1 Sample Date July 19, 2017

> > **Sample Time** NA

**Sample Location** Sample Description

> Sample Matrix Water

snp-0036-1 / Raw Water / 7.5°C

		Sample Matrix	vvaler			
Analyte		Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
Routine Water - Continue	ed					
Ionic Balance	Dissolved	%	101			
Trihalomethanes Screen	- Water					
Chloroform		mg/L	< 0.001	0.001		
Bromodichloromethane		mg/L	<0.001	0.001		
Dibromochloromethane		mg/L	< 0.001	0.001		
Bromoform		mg/L	< 0.001	0.001		
Total Trihalomethanes		mg/L	< 0.001	0.001	0.1	Below MAC
Trihalomethanes - Surro	gate Recovery					
Dibromofluoromethane	EPA Surrogate	%	92	86-118		
Toluene-d8	EPA Surrogate	%	95	85-115		
Bromofluorobenzene	EPA Surrogate	%	69	86-115		

Approved by:

Anthony Neumann, MSc

# Page 4 of 5

# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215678

Box 1160 Project Name: Control Number:

 2 Firth Street
 Project Location:
 E.C.W.T.P.
 Date Received:
 Jul 20, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 27, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Alkalinity - Titration Method, 2320 B 20-Jul-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 20-Jul-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	<sup>†</sup> pH - Electrometric Method, 4500-H+ B 20-Jul-17 Exova Edmonton
Anions (Routine) by Ion Chromatography	АРНА	lon Chromatography with Chemical 20-Jul-17 Exova Edmonton Suppression of Eluent Cond., 4110 B
Approval-Edmonton	APHA	Checking Correctness of Analyses, 1030 24-Jul-17 Exova Edmonton E
BOD in water	APHA	5 Day, 5210 B 21-Jul-17 Exova Edmonton
Carbon Organic (Dissolved) in water (DOC)	APHA	High-Temperature Combustion Method, 21-Jul-17 Exova Edmonton 5310 B
Carbon Organic (Total) in water (TOC)	APHA	High-Temperature Combustion Method, 20-Jul-17 Exova Edmonton 5310 B
Chloride in Water	APHA	Automated Ferricyanide Method, 4500-Cl- 20-Jul-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	E. Coli - MF Partition Procedures, 9222 G 21-Jul-17 Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 21-Jul-17 Exova Calgary Procedure, 9222 B
Colour (Apparent) in water	APHA	Visual Comparison Method, 2120 B 21-Jul-17 Exova Edmonton
Cyanide (Total) in water	US EPA	US EPA method, 335.3 21-Jul-17 Exova Edmonton
Mercury (Total) in water	US EPA	Determination of Hg in Sediment by Cold 21-Jul-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	Determination of Trace Elements in 21-Jul-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	Hardness by Calculation, 2340 B 21-Jul-17 Exova Edmonton
Metals Trace (Dissolved) in water	APHA	Inductively Coupled Plasma (ICP) 21-Jul-17 Exova Edmonton Method, 3120 B
Metals Trace (Total) in water	APHA	Inductively Coupled Plasma (ICP) 21-Jul-17 Exova Edmonton Method, 3120 B
Solids Dissolved (Total, Fixed and Volatile)	APHA	* Total Dissolved Solids Dried at 180 C, 21-Jul-17 Exova Edmonton 2540 C
Solids Suspended (Total, Fixed and Volatile)	APHA	Total Suspended Solids Dried at 103- 24-Jul-17 Exova Edmonton 105'C, 2540 D
THM - Water	US EPA	US EPA method, 8260B/5035 21-Jul-17 Exova Calgary
Turbidity in Water	APHA	Turbidity - Nephelometric Method, 2130 B 21-Jul-17 Exova Edmonton

# \* Reference Method Modified References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

 Exova
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 E: Edmonton@exova.com

 T6B 3J4, Canada
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#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-1 Lot ID: 1215678

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Jul 20, 2017 Inuvik, NT, Canada LSD: Date Reported: Jul 27, 2017

X0E 0T0 P.O.: 100104 Report Number: 2207996

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

#### Guidelines

Guideline Description Health Canada GCDWQ

Guideline Source Guidelines for Canadian Drinking Water Quality, Health Canada, February 2017

Guideline Comments MAC = Maximum Acceptable Concentration

AO = Aesthetic Objective

OG = Operational Guideline for Water Treatment Plants

Refer to Health Canada GCDWQ for complete guidelines and additional drinking water information at www.hc-sc.gc.ca

#### Comments:

• Sample 1215678-1; 5784093 Some total metal results were less than dissolved metal results for sample 1215678-1. The results were verified and are within expected measurement uncertainty.

• Samples 1215474-1, 1215479-1, and 1215678-1 turbidity may interfere with Apparent Colour analysis. A more accurate measure of sample colour would be obtained from True Colour Analysis.

The comparison of test results to guideline limits is provided for information purposes only. This is not to be taken as a statement of conformance / nonconformance to any guideline, regulation or limit. The data user is responsible for all conclusions drawn with respect to the data and is advised to consult official regulatory references when evaluating compliance.

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVA Testing Advising	Billing Informat	tion:		Copy of l	Report To							RU	SH Priority
Advising	Company	Town of Inuv	<i>r</i> ik	Company	Aec	om -	- Edm	onton					nis section, client accepts that
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	03-1	03rd	Avenue				surcharges wi	I be applied to the analysis
Project Information		Inuvik, NT X	0E 0T0		Edmo	onton	, AB T	5S 1J4				Date Require	
Project ID snp-0036-1	Attention	Rick Campb	ell	Attention	Rich	ard	Feild	en				As Indicated	All Analysis
Project Name	Phone	(867) 777-86	615	Phone	(780	) 48	8-680	00				Mhen "ASAP" i	s requested, turn around will
Project Location E.C.W.T.P.	Cell	(867) 678-53	388	Cell								default to a 100%	RUSH priority, with pricing and
Legal Location	Fax	(867) 777-86	601	Fax	(780	) 48	8-212	21				TANK SECTION OF SECTION	match. Please contact the lab mitting RUSH samples
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	eilder	@aecon	n.com			phor to suc	milling ROSH samples
Proj. Acct.Code	Agreement ID	2909		1 6								Signature	
1	Copy of Report			Copy of in	rvoice							Sample Co	ustody (please print)
Report Results x E-Mail	Online	PDF		QA/QC R	eport							Sampled by:	Jim Crawford
Mail x	Fax	Excel										Company	Town of Inuvik
Special Instructions/Comments (please from above).	include contact info	ormation inclu	ding ph. # if different	Indicate Reg		Containers							va to proceed with the work ated on this form:
Sampler: Circle Project ID Below and n	ote weather:					ıtaiı		$\perp$				Date.July.19/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W - SNP5 I	Mt.B E					S						This section	on for Lab use only
SNP6 GatePond - SNP7 FarPond - SN	P8 TwinL					r of		$\perp$				Date/Time stamp	o:
Raw Water				4		Number		1 1 1			- 1	JUL 20 PH1	2:17
Temp_∐_C, precip, Wind dir Ve	lkm/h					ž						00224	
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $						Indicate below a condition of sam	ny deficiencies in the ples:
1 B.O.D.	snp-0036-1		July.19/2017		Grab	Ħ							Were Exova supplies
2 Metals + Presv	snp-0036-1		July.19/2017		Grab	П							used?
3 Nutrients + Presv	snp-0036-1		July.19/2017		Grab	П							Was there any damage
4 Routine	snp-0036-1		July.19/2017		Grab	П							to the shipping container?
5 Cyanide + Presv	snp-0036-1		July.19/2017	1	Grab	П							
6 Microbiology	snp-0036-1		July.19/2017		Grab	П							Were the containers
7 T.H.M.s	snp-0036-1		July.19/2017		Grab	П							packaged well?
8 Sulphides + Presv	snp-0036-1		July.19/2017		Grab								
9 Mercury	Sna 0036-1		July 19/17		(gra)	П							Were the expected
10			V // /	1									number of samples received (document
11	14 PP 1	4				П			Ï				below)?
12 ()		0											
13 Canadian	5+0	anda.	eds tor			П							Are samples within
14						П							recommended holding times/temp?
15 PINKIN	a lil	ater	,	/ L S	1				$\top$				
Environmenta			et	Lot: 121	E670	COC				Shippir	ng:	# and size of coole	rs received:
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# **Report Transmission Cover Page**

Lot ID: 1234056 Bill To: Town of Inuvik Project ID: SNP 0036-1

Project Name: Box 1160 Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Oct 20, 2017 Inuvik, NT, Canada LSD: Date Reported: Oct 30, 2017

X0E 0T0 P.O.: 100104 Report Number: 2233554

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Justin Simms Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**

T: +1 (403) 291-2022 Bay #5, 2712-37 Avenue N.E. F: +1 (403) 291-2021 Calgary, Alberta E: Calgary@exova.com T1Y-5L3, Canada W: www.exova.com



50-140

Lot ID: 1234056

Oct 20, 2017

Oct 30, 2017

Control Number:

Date Received:

Date Reported:

Report Number: 2233554

#### **Analytical Report**

Bromofluorobenzene

Bill To: Town of Inuvik Project ID: SNP 0036-1

> Box 1160 Project Name:

> > Project Location: E.C.W.T.P.

X0E 0T0 P.O.: 100104

LSD:

Attn: Rick Campbell Proj. Acct. code:

**EPA Surrogate** 

Sampled By: Justin Simms Company: Town of Inuvik

2 Firth Street

Inuvik, NT, Canada

**Reference Number** 1234056-1 1234056-2 Sample Date Oct 19, 2017 Oct 19, 2017

Sample Time Sample Location

%

Sample Description snp-0036-1 / Treated snp-0036-1 / Raw /

NA

/ 5.7°C 5.7°C

NA

99

Water Matrix Water Nominal Detection **Units** Results Analyte Results Results Limit Trihalomethanes Screen - Water Chloroform 0.023 < 0.001 0.001 mg/L < 0.001 0.001 Bromodichloromethane mg/L 0.002 < 0.001 Dibromochloromethane mg/L < 0.001 0.001 Bromoform < 0.001 < 0.001 0.001 mg/L **Total Trihalomethanes** mg/L 0.025 <0.001 0.001 **Trihalomethanes - Surrogate Recovery** Dibromofluoromethane **EPA Surrogate** % 96 93 50-140 Toluene-d8 **EPA Surrogate** % 97 98 50-140

98

Approved by:

Mike Yohemas, BSc

**Laboratory Operations Manager** 

Mhe footto

Calgary, Alberta T1Y-5L3, Canada

T: +1 (403) 291-2022 Bay #5, 2712-37 Avenue N.E. F: +1 (403) 291-2021 E: Calgary@exova.com W: www.exova.com



# **Methodology and Notes**

Lot ID: 1234056 Bill To: Town of Inuvik Project ID: SNP 0036-1

Project Name: Box 1160 Control Number:

2 Firth Street Project Location: E.C.W.T.P. Date Received: Oct 20, 2017 Inuvik, NT, Canada LSD: Date Reported: Oct 30, 2017

X0E 0T0 P.O.: 100104 Report Number: 2233554

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Justin Simms Company: Town of Inuvik

**Method of Analysis** 

Method Name Reference Method Date Analysis Location Started THM - Water US EPA \* US EPA method, 8260B/5035 Oct 25, 2017 Exova Calgary

\* Reference Method Modified

References

**US EPA** US Environmental Protection Agency Test Methods

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

	-	Billing Information:	)n:		Copy of Report To:	port To:			RUSH	RUSH Priority
DAOAG	Advising	Company	Town of Inuvik	Mary Mary	Company	Aecom -	Aecom - Edmonton		Upon filling out this sec	Upon filling out this section, client accepts that
www.exova.com	_	Address	Box 1160 2 Firth Street	n Street	Address	17203-1	17203-103rd Avenue		surcharges will be applied to the analysis	oplied to the analysis
Project Information			Inuvik, NT X0E 0T0	ОТО		Edmontor	Edmonton, AB T5S 1J4		Date Required	
Project ID S.N.P. 0036-1		Attention	Rick Campbell		Attention	Richard	Richard Feilden			All Analysis
Project Name		Phone	(867) 777-8615		Phone	(780) 488-6800	38-6800		When "ASAP" is requested, turn around will	ested, turn around will
Project Location E.C.W.T.P.		Cell	(867) 678-5388		Cell				default to a 100% RUSH priority, with pricing and	priority, with pricing and
Legal Location		Fax	(867) 777-8601		Fax	(780) 48	488-2121		turn around time to match. Please contact	turn around time to match. Please contact the lab
PO/AFE# 100104		E-mail	rcampbell@t	rcampbell@town.inuvik.nt.ca	E-mail	richard.	richard.feilden@aecom.com	D	prior to desimant	91000
Proj. Acct.Code		Agreement ID	2909						Signature	
		Copy of Report			Copy of invoice	oice			Sample Custody (please print)	ly (please print)
Report Results × E	E-Mail	Online	PDF		QA/QC Report	ort			Sampled by: Jus	Justin Simms
Veboir Keadisa	Mail x	Fax	Excel						Company Town	Town of Inuvik
Special Instructions/Comments (please include contact information including ph. # if different from above).	nents (please inc	lude contact infor	mation including	g ph. # if different	Indicate Regulatory Requirements below				I authorize Exova to proceed with the work indicated on this form:	proceed with the work n this form:
Sampler: Circle Project ID Below and note weather:	Below and note	weather:							Date: Oct.19/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt.B E SNP6 GatePond - SNP7 FarPond - SNP8 TwinL	arPond - SNP8	3 E TwinL				er of Co			This section fo Date/Time stamp:	This section for Lab use only te/Time stamp:
Raw Water Temp7 C, precip_91%.	6, Wind dir_N_	Vel_2km/h				Numb			Amenda Am	
Sample Identification	ation	Location	Depth in cm m	Date/Time sampled	Matrix	Sampling method	-		Indicate below any deficiencies in the condition of samples:	ficiencies in the
1 T.H.M. (Treated)		snp-0036-1	0	Oct. 19/2017	0	Grab				Were Exova supplies used?
ω										Was there any damage
4 T.H.M. (Raw)		snp-0036-1	0	Oct.19/2017		Grab				container?
O1										1700
<b>o</b>										Were the containers
7										G
8										
9										number of samples
-						-				received (document
11										below)?
12					io-	/				(A)
13					Esp			4		Are samples within recommended holding
14						-				times/temp?
15					- Indiana	_				
Envi	ronmental S	<b>Environmental Sample Information Sheet</b>	ation Sheet	d	1 of: 1234056	10 56 COC	O prisi hum	Shipping:	# and size of coolers received:	lived:
Note: Proper completion of this form is required in order to proceed with analysis	pletion of this forr	n is required in or	der to proceed v			-		COD Y/N		
Please in	dicate any p	Please indicate any potentially hazordous samples	ordous sam	ples				Cooler temp:	Method:	
Dogo 1		Control #						5.	Waybill:	LAND HOLD STATE
I			THE RESIDENCE AND ADDRESS OF THE PERSON NAMED IN	-			The second secon			

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project: Lot ID: 1181890

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Box 1160 Name: Sewage Lagoon Date Received: Jan 18, 2017
2 Firth Street Location: Date Reported: Jan 25, 2017
Inuvik, NT, Canada LSD: Report Number: 2162533

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code: Sampled By: Justin Simms

Company: T.O.I

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden Aecom - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Single Report  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

**Notes To Clients:** 



Report Number:

2162533

#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1181890

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Box 1160 Name: Sewage Lagoon Date Received: Jan 18, 2017 2 Firth Street Location: Date Reported: Jan 25, 2017 Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code:

Sampled By: Justin Simms

Company: T.O.I

**Reference Number** 1181890-1 Sample Date Jan 17, 2017 Sample Time NA

**Sample Location** 

Sample Description SNP-0036-3 / 1.6°C

Matrix Water Nominal Detection Analyte **Units** Results Results Results Limit **Aggregate Organic Constituents** Biochemical Oxygen 50 4 mg/L Demand Inhibited 42 Biochemical Oxygen mg/L 4 Demand **Inorganic Nonmetallic Parameters** 20.9 0.025 Ammonium - N mg/L Ammonium/Ammonia Yes Preservation Microbiological Analysis **Total Coliforms** Membrane Filtration CFU/100 mL 630000 1 Fecal Coliforms Membrane Filtration CFU/100 mL 144000 1 **Physical and Aggregate Properties** Solids **Total Suspended** mg/L 5 2 **Routine Water** рΗ 7.42

Approved by:

Anthony Neumann, MSc **Laboratory Operations Manager** 

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1181890

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Box 1160 Name: Sewage Lagoon Date Received: Jan 18, 2017
2 Firth Street Location: Date Reported: Jan 25, 2017
Inuvik, NT, Canada LSD: Report Number: 2162533

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code:

Sampled By: Justin Simms Company: T.O.I

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	19-Jan-17	Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	19-Jan-17	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	19-Jan-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	19-Jan-17	Exova Edmonton
Coliforms - Membrane Filtration	АРНА	Fecal Coliform Membrane Filter Procedure, 9222 D	19-Jan-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	19-Jan-17	Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	20-Jan-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

#### Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Testing	Billing Informat	tion:		Copy of	Report To:				We sylved			18	RUSH	l Priority
EXOVA Testing Advising Assuring	Company	Town of Inuv	vik	Company	Aeco	om -	Edmo	nton					Upon filling out this s	
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	)3-10	3rd Av	enue/					surcharges will be	applied to the analys
roject Information		Inuvik, NT X	0E 0T0	74	Edmo	onton,	AB T5S	1J4					Date Required	
roject ID SNP 0036-3	Attention	Rick Campb	ell	Attention	Rich	ard I	Feilder	1					As Indicated	All Analysis
roject Name	Phone	(867) 777-86	315	Phone	(780	) 488	3-6800						When "ASAP" is re	quested, turn around
roject Location sewage lagoon	Cell	(867) 678-53	888	Cell									default to a 100% RUS	SH priority, with pricin
egal Location	Fax	(867) 777-86		Fax	(780	) 488	3-2121						turn around time to ma	tch. Please contact ing RUSH samples
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	eilden@	Daeco	m.co	<u>m</u>				
roj. Acct.Code	Agreement ID	2909											Signature	
	Copy of Report	_		Copy of i										ody (please print
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pecial Instructions/Comments (please i om above).	nclude contact into	ormation inclu	(F) (A)	Indicate Re Requiremen	-	of Containers								o proceed with the w on this form:
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NP6 GatePond - SNP7 FarPond - SNP	8 TwinL					er of							Date/Time stamp:	
aw Water						Number							TOAL TO to	
emp 28 C, precip_75%, Wind di	r_nnw Vel_8k	(m/h	,L	_		ž,		$\bot$	$\perp \perp$				JAN 18 PX12	
Sample Identification	Location	Depth in cm m	Date/Time sampled	Matrix	Sampling method	$ \downarrow $							Indicate below any condition of sample	
1 C.B.O.D.	snp-0036-3		Jan.17/2017		dip	П		T	TT					Were Exova sup
2 B.O.D.	snp-0036-3				dip									used?
3 Nutrients + preservatives	snp-0036-3				dip									Was there any d
4 Routine	snp-0036-3				dip									to the shipping container?
				-	dip									
5 Microbiology	snp-0036-3				10.10									
6	snp-0036-3				- F	口								
	snp-0036-3								Н			$\perp$		Were the contain packaged well?
6 7	snp-0036-3													packaged well?
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6 7 8 9 0 1 1 2 13 4														packaged well?  Were the expect number of samp received (docum below)?  Are samples with recommended h times/temp?
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6 7 8 9 10 11 12 13 14 15 Environmental	Sample Informorm is required in o	order to procee	ed with analysis		181890					со	1000	np:	Delivery Method:	packaged well?  Were the expect- number of sampl received (docum below)?  Are samples with recommended he times/temp?
6 7 8 9 10 11 12 13 14 15  Environmental Note: Proper completion of this for	Sample Informorm is required in o	order to proceed zordous sa	ed with analysis							со	D Y/N	np:		Were the expecte number of sample received (docume below)?  Are samples with recommended hotimes/temp?

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

Report To: Town of Inuvik ID: SNP 0036-3

Lot ID: 1186780

Report Number: 2169024

Town of Inuvik ID: SNP 0036-3 Control Number:

Name: Date Received: Feb 16, 2017
2 Firth Street Location: Sewage Lagoon Date Reported: Feb 24, 2017

Inuvik, NT, Canada LSD:
X0E 0T0 P.O.: 100104

X0L 010 1.0.. 10010

Attn: Rick Campbell Acct code: Sampled By: Jim Crawford

Company: T.O.I

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden Aecom - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Single Report  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

**Notes To Clients:** 



#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1186780

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Box 1160 Name: Data Passivas

Post 1160 Name: Date Received: Feb 16, 2017
2 Firth Street Location: Sewage Lagoon Date Reported: Feb 24, 2017
Inuvik, NT, Canada LSD: Report Number: 2169024

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code:

Sampled By: Jim Crawford Company: T.O.I

Reference Number 1186780-1
Sample Date Feb 15, 2017

Sample Time NA

Sample Location

Sample Description snp-0036-3 / 3.6°C

Matrix Water Nominal Detection Analyte **Units** Results Results Results Limit **Aggregate Organic Constituents** Biochemical Oxygen mg/L 55 4 Demand 58 Inhibited Biochemical Oxygen mg/L 4 Demand **Inorganic Nonmetallic Parameters** 22.3 0.025 Ammonium - N mg/L Ammonium/Ammonia Yes Preservation Microbiological Analysis **Total Coliforms** Membrane Filtration CFU/100 mL 920000 1 Fecal Coliforms Membrane Filtration CFU/100 mL 120000 1 **Physical and Aggregate Properties** Solids **Total Suspended** mg/L 4 2 **Routine Water** рΗ 7.66

Approved by:

Darlene Lintott, MSc Consulting Scientist

# **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1186780

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Box 1160 Name: Date Received:

Post 1160 Name: Date Received: Feb 16, 2017
2 Firth Street Location: Sewage Lagoon Date Reported: Feb 24, 2017
Inuvik, NT, Canada LSD: Report Number: 2169024

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code: Sampled By: Jim Crawford

Company: T.O.I

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 17-Feb-17 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G 17-Feb-17 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B 17-Feb-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 17-Feb-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 18-Feb-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 17-Feb-17 Exova Calgary Procedure, 9222 B
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 17-Feb-17 Exova Edmonton 105'C, 2540 D

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

# Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Exova	Testin	Billing Information	tion:		Copy of	Report To:									RUS	H Priority
EXOVG	ACIVIS Assur	Company	Town of Inuv	vik	Company	Aec	om -	Edn	nonto	n						section, client accepts that
www.exova.com	- Assur	Address	Box 1160 2 I	Firth Street	Address	1720	03-10	03rd	Ave	nue					surcharges will b	e applied to the analysis
Project Information	on		Inuvik, NT X	0E 0T0	1 1	Edmo	onton,	, AB 1	Γ5S 1	J4					Date Required	
Project ID	SNP 0036-3	Attention	Rick Campb	ell	Attention	Rich	ard	Feild	len						As Indicated	All Analysis
Project Name		Phone	(867) 777-8615 Phone (780) 488-6800				Mhon "ACAD" is a	equated turn around will								
Project Location	sewage lagoon	Cell	(867) 678-53	388	Cell				When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and							
Legal Location		Fax	(867) 777-86	601	Fax	Fax (780) 488-2121				turn around time to match. Please contact the lab prior to submitting RUSH samples						
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	The state of the s				prior to subm	itting ROSH samples					
Proj. Acct.Code		Agreement ID	2909		18										Signature	
		Copy of Report			Copy of in	rvoice	37								Sample Cus	tody (please print)
Report Results	x E-Mail	Online	PDF		QA/QC R	eport				П					Sampled by:	Jim Crawford
	Mail	x Fax	Excel	25									$  \  $		Company T	own of Inuvik
Special Instruction from above).	s/Comments (ple	ase include contact info	ormation inclu	ding ph. # if different	Indicate Reg Requirement		Containers								I authorize Exova to proceed with the work indicated on this form:	
Sampler: Circle Pr	oject ID Below an	d note weather:					ntai			11					Date: Feb.15/2017	Initial: J.C.
SNP3 Lagoon - SN				<i>X</i>						11						for Lab use only
SNP6 GatePond -	SNP7 FarPond -	SNP8 TwinL		V			er o			11					Date/Time stamp:	
Raw Water							Number of			11					FEB 16 AM11	:08
Temp <u>-23</u> C, preci	p, Wind dir	Velkm/h		,I			-								<b>_</b>	
Sample	Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method									Indicate below any condition of sampl	deficiencies in the es:
1 C.B.O.D.		snp-0036-3		Feb.15/2017		dip			T	$\Box$	T					Were Exova supplies
2 B.O.D.		"		U		0	П			$\Box$						used?
3 Nutrients +	preservatives	"		u u		"	П									Was there any damage
4 Microbiology	<i>y</i>	ıı.		"		"										to the shipping container?
5 Routine		"		11		"	П									
6																Were the containers
7																packaged well?
8																
9																Were the expected number of samples
10																received (document
11											3	110				below)?
12																
13																Are samples within recommended holding
14					J.											times/temp?
15							1 1	.1	- 1	- 1				1		
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		Control #	£							111			3	6	Waybill:	
Page 1	of1	00111017												1/12	Received by:	

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Report Transmission Cover Page**

Company: Town of Inuvik

Bill To: Town of Inuvik Project: Lot ID: 1191592

SNP 0036-3 Report To: Town of Inuvik ID: Control Number:

Box 1160 Name: Date Received:

Mar 16, 2017 2 Firth Street Location: Sewage Lagoon Date Reported: Mar 22, 2017 LSD: Inuvik, NT, Canada Report Number: 2175470

X0E 0T0 P.O.: 100104

Attn: Rick Campbell Acct code: Sampled By: Justin Simms

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell 2 Firth Street, Box 1160 Town of Inuvik Inuvik, Northwest Territories X0E 07 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca		On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden Aecom - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Single Report  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report

**Notes To Clients:** 



#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1191592

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Acct code:

Box 1160 Name: Date Received:

Mar 16, 2017 2 Firth Street Location: Sewage Lagoon Date Reported: Mar 22, 2017 Inuvik, NT, Canada LSD: Report Number: 2175470

X0E 0T0 P.O.: 100104

Sampled By: Justin Simms Company: Town of Inuvik

Attn: Rick Campbell

**Reference Number** 1191592-1 Sample Date Mar 15, 2017 Sample Time NA

**Sample Location** 

Sample Description SNP-0036-3 / 1.9C

Matrix Water

		Matrix	vvatci			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	72			4
Biochemical Oxygen Demand	Inhibited	mg/L	52			4
Inorganic Nonmetallic P	arameters					
Ammonium - N		mg/L	22.1			0.025
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis	s					
Total Coliforms	Membrane Filtration	CFU/100 mL	540000			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	520000			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	6			2
Routine Water						
рН			7.66			
			7.66			

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

# **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1191592

Report To: Town of Inuvik ID: SNP 0036-3 Control Number:

Acct code:

Box 1160 Name: Date Received:

Pox 1760 Name: Date Received: Mar 16, 2017
2 Firth Street Location: Sewage Lagoon Date Reported: Mar 22, 2017
Inuvik, NT, Canada LSD: Report Number: 2175470

X0E 0T0 P.O.: 100104

Sampled By: Justin Simms Company: Town of Inuvik

Attn: Rick Campbell

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	17-Mar-17	Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	16-Mar-17	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	16-Mar-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	16-Mar-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	17-Mar-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	17-Mar-17	Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 105'C, 2540 D	20-Mar-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

# Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Exova	Testing	Billing Informat	ion:		Сору	of Report To	o:									RU	ISH Priority	
EXOVG	Advising	Company	Town of Inuv	vik	Compa	iny Ae	com	- Ed	dmor	nton						Upon filling out this section, client accepts that		
www.exova.com	9	Address	Box 1160 2 I	Firth Street	Addres	s 172	203-1	1031	rd A	/enu	ıe						Il be applied to the analys	sis
Project Information			Inuvik, NT X	0E 0T0		Edn	nonto	n, AE	3 T5S	1J4						Date Require		
Project ID S	NP 0036-3	Attention	Rick Campb	ell	Attenti	ention Richard Feilden								As Indicated	All Analysis			
Project Name		Phone	(867) 777-86	515	Phone	Phone (780) 488-6800										When "ASAP" i	s requested, turn around	will
Project Location se	ewage lagoon	Cell	(867) 678-5388 Cell					default to a 100% RUSH priority, with pricing and										
Legal Location		Fax	(867) 777-86	601	Fax	(780) 488-2121					turn around time to match. Please contact the prior to submitting RUSH samples		the lab					
PO/AFE# 10	00104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	rich	ard.	feild	den@	daed	com.	com				p.161 to 641		
Proj. Acct.Code		Agreement ID	2909										Signature					
		Copy of Report			Сору	f invoice							Sample Custody (please print)			,		
Report Results X	E-Mail	Online	PDF		QA/QC	Report										Sampled by:	Justin Simms	
	Mail x	Fax	Excel		20		_	l								Company	Town of Inuvik	
Special Instructions/offrom above).	Comments (please ir	clude contact info	rmation inclu	ding ph. # if different		Regulatory ents below	Containers									ACTION AND AND AND AND AND AND AND AND AND AN	va to proceed with the wo ated on this form:	ork
Sampler: Circle Proje	ect ID Below and note	e weather:		:	******		ntai	1						- 1		Date: March15/2017 Initial: J.S		
SNP3 Lagoon - SNP	4 Mt.B W - SNP5 Mt	BE						ı						-		This section	on for Lab use or	nly
SNP6 GatePond - St	NP7 FarPond - SNP8	TwinL					er of	1								Date/Time stamp	9-22	
Raw Water							Number	1								PRESENT TO LUTE A	- x = 2 x _ 2	
Temp28 C, prec	ip_77%, Wind dir_	E.N.E Velk	m/h				ž	_										
Sample Ide	entification	Location	Depth in cm m	Date/Time sample	d Matr	x Samplin method										Indicate below a condition of sam	ny deficiencies in the ples:	
1 C.B.O.D		snp-0036-3		March.15/2017		Dip											Were Exova supp	olies
2 B.O.D.		snp-0036-3		March.15/2017		Dip												
3 nutrients 👍	Preservatives	snp-0036-3		March.15/2017		Dip											Was there any da to the shipping	mage
4 microbiology		snp-0036-3		March.15/2017		Dip											container?	
5 routine		snp-0036-3		March.15/2017		Dip												
6																	Were the contained packaged well?	ers
7					4			1									packaged well?	
8																		
9					10			L									Were the expecte number of sample	26370
10	Marian Caranta				le le												received (docume	
11					N.												below)?	
12					- 5													
13																	Are samples withi recommended ho	
14					- 7												times/temp?	9
15			EMPERSON VICTORIA		, de		丄											
	Environmental S				t: 1191	<b>502</b> CO	С							ping		# and size of coole	rs received:	
NAME AND ADDRESS OF TAXABLE PARTY.	completion of this for	AL PARTY OF THE PA	CALL DE LA CONTRACTOR D	ou manyoro				<b>.</b>						) Y/N			-	
Pleas	se indicate any p	otentially haz	zordous sa	amples									Coo	ler te	_	Delivery Method	: (and	
		Control #												Ì	9	Waybill:		
Page 1 o	t 1											~		1 -	ノ	Received by:	W	

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1196238

Date Reported: Apr 19, 2017

Report Number: 2181778

Apr 12, 2017

Control Number:

Date Received:

# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-3

2 Firth Street Name:

Location:

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Inuvik, NT, Canada

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (Test Report, COC) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Jason Casault AECOM - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 486-7050 Fax: (780) 486-7070 Email: Jason.Casault@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Merge Reports  On [Report Approval] send  (Test Report, COC) by Email - Merge Reports

Sewage lagoon

**Notes To Clients:** 

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com



#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1196238

Box 1160 ID: SNP 0036-3 Control Number:

2 Firth Street Name: Date Received: Apr 12, 2017

Inuvik, NT, Canada Location: Sewage lagoon Date Reported: Apr 19, 2017 X0E 0T0 LSD: Report Number: 2181778

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

> **Reference Number** 1196238-1 Apr 11, 2017 Sample Date Sample Time NA

**Sample Location** 

Sample Description SNP-0036-3 / 1.9°C

Matrix Water Nominal Detection Analyte **Units** Results Results Results Limit **Aggregate Organic Constituents** Biochemical Oxygen 80 4 mg/L Demand 47 Inhibited Biochemical Oxygen mg/L 4 Demand **Inorganic Nonmetallic Parameters** 23.0 0.025 Ammonium - N mg/L Ammonium/Ammonia Yes Preservation Microbiological Analysis **Total Coliforms** Membrane Filtration CFU/100 mL 800000 1 Fecal Coliforms Membrane Filtration CFU/100 mL 200000 1 **Physical and Aggregate Properties** Solids **Total Suspended** mg/L 7 2 **Routine Water** рΗ 7.58

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik

Project:

Lot ID: 1196238

Box 1160

ID: Name:

Control Number:

2 Firth Street

SNP 0036-3

Date Received: Apr 12, 2017

Inuvik, NT, Canada

Location: Sewage lagoon

100104

Date Reported: Apr 19, 2017

X0E 0T0

LSD:

Report Number: 2181778

Attn: Rick Campbell

P.O.: Acct code:

Sampled By: Justin Simms

Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 13-Apr-17 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G 13-Apr-17 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B 13-Apr-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 13-Apr-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 13-Apr-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 13-Apr-17 Exova Calgary Procedure, 9222 B
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 17-Apr-17 Exova Edmonton 105'C, 2540 D

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

# Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

XOVO Testin	Billing Informa	ation:		Copy of	Report To								RUSI	H Priority	
Assu	Company	Town of Inuv	vik	Company			Edmo							section, client accepts tha	
ww.exova.com	Address	Box 1160 2		Address				venue	9					applied to the analysis	
roject Information		Inuvik, NT X					AB T5						Date Required		
roject ID SNP 0036-3	Attention	Rick Campb	ell	Attention			eilde						As Indicated	All Analysis	
roject Name	Phone	(867) 777-86	615	Phone	(780	) 488	-6800	)					When "ASAP" is re	quested, turn around will	
roject Location sewage lagoon	Cell	(867) 678-53	388	Cell									default to a 100% RU	SH priority, with pricing ar	
egal Location	Fax	(867) 777-86		Fax	20.40		-2121							atch. Please contact the I ting RUSH samples	
O/AFE# 100104	E-mail	the second second	@town.inuvik.nt.ca	E-mail	richa	ard.fe	ilden(	@aec	om.co	<u>om</u>					
roj. Acct.Code	Agreement ID	2909								Signature					
	Copy of Report	THE RESIDENCE OF THE PARTY OF T		Copy of i	nvoice	,			-	-		, ,	Sample Cust	ody (please print)	
Report Results X E-Mail	Online	PDF	_	QA/QC Report				Sampled by: J	ustin Simms						
Mail	x Fax	Excel				11							Company To	own of Inuvik	
pecial Instructions/Comments (ple om above).	ase include contact inf	ormation inclu	ding ph. # if different	Indicate Re Requiremen	•	Containers								to proceed with the work d on this form:	
ampler: Circle Project ID Below ar	d note weather:			7		ntai					1		Date:April.11/2017	Initial: J.S.	
NP3 Lagoon - SNP4 Mt.B W - SN	P5 Mt.B E												This section	for Lab use only	
NP6 GatePond - SNP7 FarPond -	SNP8 TwinL					or of					1		Date/Time stamp	9	
law Water						Number					1		F15 Ex 22 ( ) 2		
emp10 C, precip75%_, Wir	d dir_E Vel11_km	n/h		10		ž					L				
Sample Identification	Location	Depth in cm m	Date/Time sampled	Matrix	Sampling method								Indicate below any condition of sample		
1 C.B.O.D	snp-0036-3		April.11/2017	9	Dip						T	П		Were Exova supplies	
2 B.O.D.	snp-0036-3		April.11/2017		Dip									used?	
3 Microbiology	snp-0036-3		April.11/2017	-	Dip	П					Т	П		Was there any damag	
4 Routine	snp-0036-3		April.11/2017		Dip	П			$\top$		T	$\Box$		to the shipping container?	
5 Nutrients ### + Pres	e.rv snp-0036-3		April.11/2017		Dip	$\sqcap$					T				
					<u> </u>	П			$\top$		T			Were the containers	
6				7-		$\sqcap$			$\top$	$\neg$	$\top$	$\vdash$		packaged well?	
						$\vdash$	$\top$		$\top$	$\neg$	1	T		7	
							_		+	$\neg$	+	+		Were the expected	
6 7		- 1				$\vdash$		1 1	1 1	- 1				number of samples	
6 7 8 9						H	+	$\vdash$	+		+	+			
6 7 8 9							+		$\parallel$	+	F			received (document below)?	
6 7 8 9 10														received (document	
6 7 8 9 10 11							+			+				received (document below)?  Are samples within	
6 7 8 9 10 11 12														received (document below)?  Are samples within recommended holding	
6 7 8														received (document below)?  Are samples within	

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1202943

Report Number: 2191459

# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-3 Control Number:

2 Firth Street Name: sewage lagoon Date Received: May 18, 2017 Inuvik, NT, Canada Location: E.C.W.T.P. Date Reported: May 25, 2017

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

**Notes To Clients:** 

# Page 1 of 2

#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1202943

Box 1160 ID: SNP 0036-3 Control Number:

2 Firth Street Name: sewage lagoon Date Received: May 18, 2017 Inuvik, NT, Canada Location: E.C.W.T.P. Date Reported: May 25, 2017 XOE 0T0 LSD: Report Number: 2191459

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Reference Number 1202943-1 Sample Date May 17, 2017

Sample Time Na Sample Location

Sample Description snp-0036-3 / 3.5°C

Sample Matrix Water

	· ·	oumpic muink water		
Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	tituents			
Biochemical Oxygen Demand	5 Day	mg/L	49	4
Biochemical Oxygen Demand	Inhibited	mg/L	40	4
Inorganic Nonmetallic Pa	arameters			
Ammonium - N		mg/L	14.5	0.025
Ammonium/Ammonia Preservation <b>Microbiological Analysis</b>			Yes	
Total Coliforms	Membrane Filtration	CFU/100 mL	178000	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	103000	1
Physical and Aggregate	Properties			
Solids	Total Suspended	mg/L	5	2
Routine Water				
pH			7.62	

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik

Project:

Lot ID: 1202943

Box 1160

ID: Name:

Control Number:

2 Firth Street

SNP 0036-3 sewage lagoon

Date Received: May 18, 2017

Inuvik, NT, Canada X0E 0T0

Location: LSD:

E.C.W.T.P. Date Reported:

May 25, 2017

Attn: Rick Campbell

P.O.:

Report Number: 2191459

Sampled By: Justin Simms

Acct code:

100104

Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 18-May-17 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G 18-May-17 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B 23-May-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 23-May-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 19-May-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 19-May-17 Exova Calgary Procedure, 9222 B
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 24-May-17 Exova Edmonton 105'C, 2540 D
		* Petarana Method Medified

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

#### Comments:

Please direct any inquiries regarding this report to our Client Services group. Results relate only to samples as submitted.

Exova	Testing	Billing Informa	tion:		Copy of I	Report To:					T XX				Rl	JSH	Priority	
EXOVG	Advisin	Company	Company Town of Inuvik		Company	ompany Aecom - Edmonton							Upon filling out this section, client accepts that					
www.exova.com	ASSUITE	Address	Box 1160 2 I	Firth Street	Address	1720	17203-103rd Avenue					surcharges will be applied to the analysis						
Project Information	n		Inuvik, NT X	0E 0T0		Edmo	Edmonton, AB T5S 1J4						Date Require	ed				
Project ID s	snp.0036-3	Attention	ntion Rick Campbell		Attention	Rich	Richard Feilden					As Indicated	Г	All Analysis				
Project Name	sewage lagoon	Phone (867) 777-8615		Phone	(780	(780) 488-6800												
2 2		Cell	(867) 678-53		Cell	· • · · · · · · ·	,	38. 300	-350							When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location		Fax			Fax	(780) 488-2121						turn around time to	turn around time to match. Please contact the lab					
	100104	E-mail		@town.inuvik.nt.ca			100			aeco	m.co	m			prior to su	prior to submitting RUSH samples		
Proj. Acct.Code	a construction of the second	Agreement ID	2909												Signature	Т		
		Copy of Report			Copy of it	rvoice									Sample Custody (please print)			
J,	E-Mail	Online	PDF	1	QA/QC R					1		Sampled by:		tin Simms				
Report Results	Mail x	Fax	Excel									- 1			Company	Town	of Inuvik	
Special Instructions				ding ph. # if different	Indicate Red	Indicate Regulatory								I authorize Exova to proceed with the			proceed with the work	
from above).						Requirements below										1/2	n this form:	
Sampler: Circle Pro	ject ID Below and n	ote weather:					ntai							11			Initial: J.S	
SNP3 Lagoon - SNI	P4 Mt.B W - SNP5	Mt.B E													This section	on fo	r Lab use only	
SNP6 GatePond - S	SNP7 FarPond - SN	P8 TwinL					Number of								Date/Time stam	p:	17)	
Raw Water	10, -	ac a	~ 1				ğ.								NAY 18 PH 12:23		1	
Temp <u>//</u> C, precip	36/Wind dir E V	el <u>/²/</u> km/h					ž								May 19			
Sample lo	dentification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $									Indicate below any deficiencies in the condition of samples:		
1 C.B.O.D.	2	snp-0036-3		May.17/2017	TI.	dip		П		T	TT						Were Exova supplies used?	
2 Routine	<del></del>	snp-0036-3		May.17/2017		dip	П										used?	
3 Nutrients		snp-0036-3		May.17/2017	1	dip	П										Was there any damage	
4 B.O.D.		snp-0036-3		May.17/2017		dip											to the shipping container?	
5 Microbiology		snp-0036-3		May.17/2017		dip	П											
6							П										Were the containers	
7							П	П			П						packaged well?	
8								П										
9							П										Were the expected	
10																	number of samples received (document	
11																	below)?	
12							П											
13							П										Are samples within	
14							П										recommended holding times/temp?	
15							П											
	Environmenta	I Sample Inform	nation She	et	Ind'							S	hippi	ng:	# and size of cools	ers rece	eived:	
		form is required in o			Lot: 12	02943	co	C				c	OD Y	'/N	1	Ď.	(	
		potentially ha			20 20 20 20 20						H	C	cooler	temp:	Delivery Method	1: 1	20	
				Cooler temp:					Waybill:									
Page 1 c	of 1	Control #			1111111		LI:			111	11		1"	J	Received by: /	1/6		
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T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1208473

Control Number:

# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

Box 1160 ID: S.N.P. 0036-3

2 Firth Street Name: Sewage Lagoon Date Received: Jun 15, 2017 Inuvik, NT, Canada Location: E.C.W.T.P. Date Reported: Jun 21, 2017 X0E 0T0 LSD: Report Number: 2198658

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

**Notes To Clients:** 



#### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1208473

Box 1160 ID: S.N.P. 0036-3 Control Number:

2 Firth Street Name: Sewage Lagoon Date Received: Jun 15, 2017 Inuvik, NT, Canada Location: E.C.W.T.P. Date Reported: Jun 21, 2017 XOE 0T0 LSD: Report Number: 2198658

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Reference Number 1208473-1
Sample Date Jun 14, 2017
Sample Time NA

Sample Location

Sample Description SNP-0036-3 / 1.1°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					_
Biochemical Oxygen Demand	5 Day	mg/L	18			4
Biochemical Oxygen Demand	Inhibited	mg/L	13			4
Inorganic Nonmetallic Pa	arameters					
Ammonium - N		mg/L	13.2			0.025
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis	3					
Total Coliforms	Membrane Filtration	CFU/100 mL	2600			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	400			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	16			2
Routine Water						
рН			7.50			

Approved by:

Anthony Neumann, MSc
Laboratory Operations Manager

Lot ID: 1208473

Report Number: 2198658

#### **Methodology and Notes**

Bill To: Town of Inuvik Project:

Box 1160 ID: S.N.P. 0036-3 Control Number:

2 Firth Street Name: Sewage Lagoon Date Received: Jun 15, 2017 Inuvik, NT, Canada Location: E.C.W.T.P. Date Reported: Jun 21, 2017

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	16-Jun-17	Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	19-Jun-17	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	16-Jun-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	16-Jun-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	16-Jun-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	16-Jun-17	Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	20-Jun-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

# Comments:

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1214231

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: sewage lagoon Date Received: Jul 13, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 20, 2017

X0E 0T0 P.O.: 100104 Report Number: 2206060

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Justin Simms Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**



### **Analytical Report**

Lot ID: 1214231 Bill To: Town of Inuvik Project ID: SNP 0036-3

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Date Received: Jul 13, 2017 sewage lagoon

Inuvik, NT, Canada LSD: Date Reported: Jul 20, 2017 Report Number: 2206060 100104

X0E 0T0 P.O.: Attn: Rick Campbell Proj. Acct. code:

Sampled By: Justin Simms Town of Inuvik Company:

> **Reference Number** 1214231-1 Sample Date July 12, 2017

Sample Time

**Sample Location** 

**Sample Description** snp-0036-3 / 5.8°C

Sample Matrix Water

	,	Sample watrix water		
Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	tituents			
Biochemical Oxygen Demand	5 Day	mg/L	18	4
Biochemical Oxygen Demand	Inhibited	mg/L	13	4
Inorganic Nonmetallic Pa	arameters			
Ammonium - N		mg/L	2.95	0.025
Ammonium/Ammonia Preservation			Yes	
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	2000	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	20	1
<b>Physical and Aggregate</b>	Properties			
Solids	Total Suspended	mg/L	71	2
Routine Water				
рН			8.29	

Approved by:

Darlene Lintott, MSc Consulting Scientist

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1214231

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: sewage lagoon Date Received: Jul 13, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 20, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2206060

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Justin Simms Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 17-Jul-17 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G 14-Jul-17 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B 18-Jul-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 18-Jul-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 14-Jul-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 14-Jul-17 Exova Calgary Procedure, 9222 B
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> <li>* Exova Edmonton</li> </ul>

<sup>\*</sup> Reference Method Modified

# References

APHA Standard Methods for the Examination of Water and Wastewater

# **Comments:**

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVA Testing Advisin	Billing Informat	ion:		Copy of I	Copy of Report To:								RU	SH Priority
www.exova.com	Company Address	Town of Inuv Box 1160 2		100	Company Aecom - Edmonton Address 17203-103rd Avenue								nis section, client accepts that I be applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0		Edmonton, AB T5S 1J4							Date Require	d l	
Project ID snp-0036-3	Attention	Rick Campb	ell	Attention	ACCORDING CONTRACTOR AND ACCORDING TO ACCORD							As Indicated	All Analysis	
Project Name	Phone	(867) 777-86		Phone	The state of the s								3-70-307-307-30-3	
Project Location sewage lagoon	Cell	(867) 678-53		Cell	28 70									s requested, turn around will RUSH priority, with pricing and
Legal Location	Fax	(867) 777-86	가는 사람들이 되었다.							turn around time to match. Please contact the lab				
PO/AFE# 100104	E-mail		@town.inuvik.nt.ca						econ	con	1		prior to sub	omitting RUSH samples
Proj. Acct.Code	Agreement ID	2909											Signature	
	Copy of Report			Copy of in	rvoice									ustody (please print)
x E-Mail	Online	PDF	***************************************	QA/QC R		П	$\top$	T	TT		ТТ	$\Box$	Sampled by:	Justin Simms
Report Results Mail x	Fax	Excel				Н							Company	Town of Inuvik
pecial Instructions/Comments (please include contact information including ph. # if different om above).			Indicate Req Requiremen		Containers							The state of the s	va to proceed with the work ated on this form:	
Sampler: Circle Project ID Below and r	ote weather:					ntai		1					Date: July.12/2017	Initial: J.S
SNP3 Lagoon - SNP4 Mt.B W - SNP5	Mt.B E					ပ္မိ	1						This section	on for Lab use only
SNP6 GatePond - SNP7 FarPond - SN	P8 TwinL					er of	- 1		11				Date/Time stamp	o:
Raw Water	ara amango sa la law			l		Number	1	İ					JUL 13 PM	12:46
Temp_9 C, precip_76%, Wind dir	_N_ Vel_4_km/h			L		ž		L						
Sample Identification	Location	Depth in cm m	Date/Time sample	ed Matrix	Sampling method	$ \downarrow $							Indicate below a condition of sam	ny deficiencies in the ples:
1 B.O.D.	snp-0036-3		July.12/2017		Dip									Were Exova supplies used?
2 C.B.O.D.	snp-0036-3		July.12/2017		Dip									
3 nutrients + Preservative	snp-0036-3		July.12/2017		Dip									Was there any damage to the shipping
4 routine	snp-0036-3		July.12/2017		Dip	Ш								container?
5 Microbiology	snp-0036-3		July.12/2017		Dip	Ш			Ш		$\perp$			
6						Ш					Ш	$\perp$		Were the containers packaged well?
7						Ш								padiagea wein
8						Ш		_						
9						Ш	_ _		$\sqcup$	1	$\perp$			Were the expected number of samples
10						Ш			$\sqcup$		$\perp$			received (document
11						Ш								below)?
12						Ш		_	$\perp$	_		$\perp$		
13						Ш	_	_	$\sqcup$		$\perp$			Are samples within recommended holding
14						Ш			$\sqcup$	_ _	$\perp$			times/temp?
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Page 1 of 1							014			-			Received by: \	73000



Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1221094

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215101

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address								
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road								
		Edmonton, AB T5S 0C2								
		Phone: (780) 486-7050 Fax: (780) 486-7070								
		Email: Jason.Casault@aecom.com								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / COA								
Email - Merge Reports	PDF	COC / Test Report								
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-8615 Fax: (867) 777-8601								
		Email: kwainman@town.inuvik.nt.ca								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Single Report	PDF	Invoice								
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue								
		Edmonton, AB T5S 1J4								
		Phone: (780) 488-6800 Fax: (780) 488-2121								
		Email: richard.feilden@aecom.com								
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / Test Report								
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-8615 Fax: (867) 777-8601								
		Email: rcampbell@town.inuvik.nt.ca								
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / Test Report								
Email - Single Report	PDF	Invoice								
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-2607 Fax: (867) 777-2071								
		Email: utilidor@town.inuvik.nt.ca								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Single Report	PDF	Invoice								

#### **Notes To Clients:**

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1221094

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215101

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1221094-1 Sample Date August 16, 2017

Sample Time NA

Sample Location

Sample Description snp 0036-3 / 3.2°C

Sample Matrix Water

	•	Sample Matrix Water		
Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	tituents			
Biochemical Oxygen Demand	5 Day	mg/L	16	4
Biochemical Oxygen Demand	Inhibited	mg/L	7	4
Inorganic Nonmetallic Pa	rameters			
Ammonium - N		mg/L	3.50	0.025
Ammonium/Ammonia Preservation			Yes	
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	6000	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	500	1
Physical and Aggregate I	Properties			
Solids	Total Suspended	mg/L	28	2
Routine Water				
рН			1.45	
•			-	

Approved by:

Darlene Lintott, MSc Consulting Scientist

T: +1 (780) 438-5522
d NW F: +1 (780) 434-8586
ta E: Edmonton@exova.com
a W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1221094

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Aug 17, 2017

Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215101

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 17-Aug-17 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G 21-Aug-17 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B 22-Aug-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 22-Aug-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 B
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103-</li> <li>21-Aug-17</li> <li>Exova Edmonton</li> <li>105'C, 2540 D</li> </ul>

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

#### **Comments:**

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVO Testing Advising Billing Information: Copy of Report To: RI											RUSH	l Priority			
Assuring	Company	Town of Inu	vik	Company		om - E								Upon filling out this section, client accepts that	
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	03-10	3rd A	/enue						applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0	1.0	Edmo	onton, A	AB T5S	1J4					Date Required		
Project ID snp 0036-3	Attention	Rick Campb	ell	Attention	Rich	ard F	eilder	1					As Indicated	All Analysis	
Project Name	Phone	(867) 777-86	315	Phone	Phone (780) 488-6800								When "ASAP" is rea	nuested, turn around will	
Project Location sewage lagoon	Cell	(867) 678-53	388	Cell									default to a 100% RUS	When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and	
Legal Location	Fax	(867) 777-86	601	Fax	Fax (780) 488-2121							tch. Please contact the lab ing RUSH samples			
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fei	Iden@	Daeco	m.cor	n			prior to submitting Noory samples		
Proj. Acct.Code	Agreement ID	2909											Signature		
	Copy of Report			Copy of i	nvoice								Sample Custo	ody (please print)	
Report Results × E-Mail	Online	PDF		QA/QC F	eport	П							Sampled by: Ji	m Crawford	
Mail x	Fax	Excel				11				1			Company To	vn of Inuvik	
Special Instructions/Comments (please in from above).	nclude contact inf	ormation inclu	ding ph. # if different	Indicate Re		Sī							The particular with the first of the second	proceed with the work	
Sampler: Circle Project ID Below and not	la woother		ļ	Requiremen	is below	Number of Containers							The same of the sa	on this form:	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 M						ont							Date: Aug.16/2017	Initial: J.S	
SNP6 GatePond - SNP7 FarPond - SNP						of				1	Ш		Date/Time stamp:	for Lab use only	
Daw Water						per				1			Dater inite stamp.		
Temp 1 C, precip 7 Wind dir 8 EVel	4/km/h					E I									
		Depth			Sampling	-							Indicate below any o	leficiencies in the	
Sample Identification	Location	in cm m	Date/Time sampled	d Matrix	method	$ \downarrow $							condition of samples		
1 C.B.O.D.	snp 0036-3		Aug.16/2017		Dip									Were Exova supplies used?	
2 B.O.D.	snp 0036-3		Aug.16/2017		Dip									used?	
3 microbiology	snp 0036-3		Aug.16/2017		Dip									Was there any damage to the shipping	
4 nutrients + preservatives	snp 0036-3		Aug.16/2017		Dip									container?	
5 routine	snp 0036-3		Aug.16/2017		Dip										
6														Were the containers packaged well?	
7														packaged well?	
8															
9														Were the expected number of samples	
10	4						$\perp$							received (document	
11		10				$\Box$								below)?	
12				, P											
13														Are samples within recommended holding	
14							1 1		1					times/temp?	
15			manager b	/		COC									
Environmental	Sample Inforr	nation She	et	Lot: 12	21094				1		pping		# and size of coolers re	ceived:	
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Please indicate any	potentially ha	zordous sa	amples						11		oler te		Delivery Method:	OURIER	
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Page 1 of 1	56,11,511			\									Received by:	UUNEZ	



Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1226599

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222216

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address								
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road								
		Edmonton, AB T5S 0C2								
		Phone: (780) 486-7050 Fax: (780) 486-7070								
		Email: Jason.Casault@aecom.com								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / COA								
Email - Merge Reports	PDF	COC / Test Report								
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-8615 Fax: (867) 777-8601								
		Email: kwainman@town.inuvik.nt.ca								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Single Report	PDF	Invoice								
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue								
		Edmonton, AB T5S 1J4								
		Phone: (780) 488-6800 Fax: (780) 488-2121								
		Email: richard.feilden@aecom.com								
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / Test Report								
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-8615 Fax: (867) 777-8601								
		Email: rcampbell@town.inuvik.nt.ca								
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>								
Email - Merge Reports	PDF	COC / Test Report								
Email - Single Report	PDF	Invoice								
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street								
		Inuvik, NT X0E 0T0								
		Phone: (867) 777-2607 Fax: (867) 777-2071								
		Email: utilidor@town.inuvik.nt.ca								
Delivery	<u>Format</u>	<u>Deliverables</u>								
Email - Single Report	PDF	Invoice								

#### **Notes To Clients:**



### **Analytical Report**

Lot ID: 1226599 Bill To: Town of Inuvik Project ID: SNP 0036-3

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Sep 14, 2017

Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017 X0E 0T0 P.O.: 100104 Report Number: 2222216

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1226599-1 Sample Date Sep 13, 2017 Sample Time NA

Sample Location

Sample Description SNP-0036-3 / 5.9°C

Water Matrix Nominal Detection Units Results Results Results Analyte Limit **Aggregate Organic Constituents** Biochemical Oxygen 18 4 mg/L Demand Inhibited 5 Biochemical Oxygen mg/L 4 Demand **Inorganic Nonmetallic Parameters** 0.969 0.025 Ammonium - N mg/L Ammonium/Ammonia Yes Preservation Microbiological Analysis **Total Coliforms** Membrane Filtration CFU/100 mL 2800 Fecal Coliforms CFU/100 mL Membrane Filtration 300 1 **Physical and Aggregate Properties** Solids 2 **Total Suspended** mg/L 38 **Routine Water** 7.95 рΗ

Approved by:

Anthony Neumann, MSc

Anthony Weuman

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Methodology and Notes**

Lot ID: 1226599 Bill To: Town of Inuvik Project ID: SNP 0036-3

Project Name: Box 1160 Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Sep 14, 2017 Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

100104 X0E 0T0 P.O.: Report Number: 2222216

Proj. Acct. code: Attn: Rick Campbell

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis					
Method Name	Reference	Method	Date Analysis Started	Location	
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	18-Sep-17	Exova Edmonton	
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	15-Sep-17	Exova Edmonton	
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	15-Sep-17	Exova Edmonton	
BOD in water	APHA	* 5 Day, 5210 B	15-Sep-17	Exova Edmonton	
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	15-Sep-17	Exova Calgary	
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	15-Sep-17	Exova Calgary	
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	15-Sep-17	Exova Edmonton	

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

# **Comments:**

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page. Results relate only to samples as submitted.

Exova	Testing	Billing Informat	tion:		Copy of	Copy of Report To:									RUSH Priority		
EXOVG	Advisin	Company	Town of Inu	vik	Company	/ Aec	om -	Edn	nonto	n						section, client accepts that	
www.exova.com	11/1000/11	Address	Box 1160 2	Firth Street	Address	172	03-10	03rd	Ave	nue					surcharges will be applied to the analysis		
Project Information	on		Inuvik, NT X	(0E 0T0		Edmo	onton,	AB T	T5S 1.	14					Date Required		
Project ID	snp 0036-3	Attention	Rick Campb	ell	Attention	Rich	ard l	Feild	len						As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	315	Phone	(780	) 48	8-68	00						When "ASAP" is r	equested turn around will	
Project Location	sewage lagoon	Cell	(867) 678-53	388	Cell										When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location		Fax	(867) 777-86	501	Fax	(780	(780) 488-2121								atch. Please contact the lab itting RUSH samples		
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	eilde	n@a	econ	n.com	1			prior to subm	itting ROSH samples	
Proj. Acct.Code		Agreement ID	2909		1 6										Signature		
		Copy of Report			Copy of i	nvoice									Sample Cus	tody (please print)	
Report Results	x E-Mail	Online	PDF		QA/QC F	Report	П							$\top$	Sampled by:	Sampled by: Jim Crawford	
Report Results	Mail x	Fax	Excel				П					1 1			Company Town of Inuvik		
Special Instruction from above).	s/Comments (please	e include contact info	ormation inclu	ding ph. # if different	Indicate Re Requiremen		Containers								I authorize Exova to proceed with the work indicated on this form:		
Sampler: Circle Pr	oject ID Below and r	ote weather:					ntai								Date: Sept.13/2017 Initial: J.S.		
SNP3 Lagoon - SN	NP4 Mt.B W - SNP5	Mt.B E					ပိ								This section for Lab use only		
SNP6 GatePond -	SNP7 FarPond - SN	IP8 TwinL					er of								Date/Time stamp:		
Raw Water							Number of					1 1			SEP 14 Pk12:4	13	
Temp C, preci	o, Wind dir V	elkm/h					ž										
Sample	Identification	Location	Depth in cm m	Date/Time sample	ed Matrix	Sampling method	$ \downarrow $								Indicate below any condition of sample	deficiencies in the es:	
1 B.O.D.		snp-0036-3		Sept.13/2017		Dip	11					TT				Were Exova supplies	
2 C.B.O.D.		snp-0036-3		Sept.13/2017		Dip	П									used?	
3 Routine		snp-0036-3		Sept.13/2017		Dip	П			П		$\Box$				Was there any damage	
4 Nutrients	+ preservatives	snp-0036-3		Sept.13/2017		Dip	П									to the shipping container?	
5 Microbiology	/	snp-0036-3		Sept.13/2017		Dip	П										
6							П			$\Box$		$\Box$				Were the containers	
7							П		T			$\Box$				packaged well?	
8							П					T					
9					1		П						T			Were the expected	
10							П			$\Box$						number of samples received (document	
11							П									below)?	
12							П		T								
13							П									Are samples within	
14							П	一		$T^{\dagger}$	_	$\top$	$\neg$			recommended holding times/temp?	
15					7 1 1		H	-1	1	Ħ		T				unicartempr	
	Environmenta	l Sample Inforn	nation She	et	Lot do		1-4-1	ahel h	nere:			Ship	ping		# and size of coolers	received:	
Note: Prop	er completion of this			ed with analysis	Lot: 122	26599	COC					COE	O Y/N	(	1		
A STREET PROPERTY.	ase indicate an			amples								Coo	ler te	mp:	Delivery Method:	(out	
					#!       <b>    </b>				1111	111		<	_	a	Waybill:	. 7	
Page 1	of 1	Control #	F									2	>_		Received by:	NA	
										111						L	



Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1234006

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: sewage lagoon Date Received: Oct 20, 2017
Inuvik, NT, Canada LSD: Date Reported: Oct 27, 2017

X0E 0T0 P.O.: 100104 Report Number: 2233465

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh/ Dale Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

# **Notes To Clients:**



### **Analytical Report**

Lot ID: 1234006 Bill To: Town of Inuvik Project ID: SNP 0036-3

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Date Received: Oct 20, 2017 sewage lagoon

Inuvik, NT, Canada LSD: Date Reported: Oct 27, 2017 100104 X0E 0T0 P.O.: Report Number: 2233465

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh/ Dale Company: Town of Inuvik

> **Reference Number** 1234006-1 Sample Date Oct 19, 2017 Sample Time NA

**Sample Location** 

**Sample Description** snp-0036-3 / 8°C

> Matrix Water

		Watrix	vvatci			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					
Biochemical Oxygen	5 Day	mg/L	6			4
Demand						
Biochemical Oxygen	Inhibited	mg/L	6			4
Demand						
Inorganic Nonmetallic P	arameters					
Ammonium - N		mg/L	26.0			0.025
Ammonium/Ammonia			Yes			
Preservation						
Microbiological Analysis	s					
Total Coliforms	Membrane Filtration	CFU/100 mL	6200			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	1000			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	18			2
Routine Water						
pН			7.40			
•						

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

T: +1 (780) 438-5522 NW F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1234006

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: sewage lagoon Date Received: Oct 20, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Oct 27, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2233465

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh/ Dale Company: Town of Inuvik

Method of Analysis			
Method Name	Reference	Method Date Analysis Started	sis Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B Oct 25, 201	7 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G Oct 27, 201	7 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B Oct 20, 201	7 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B Oct 20, 201	7 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Oct 21, 201 Procedure, 9222 D	7 Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Oct 21, 201 Procedure, 9222 B	7 Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> <li>Oct 20, 201</li> </ul>	7 Exova Edmonton

<sup>\*</sup> Reference Method Modified

# References

APHA Standard Methods for the Examination of Water and Wastewater

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVA Testing Advising	Billing Informa	ion:		Copy	of Report 7	o:									RUS	H Priority		
Assuring	Company	Town of Inuv	vik	Com	pany Ae	com	- E	dmo	nton						Upon filling out this			at
www.exova.com	Address	Box 1160 2	Firth Street	Addr	ess 17	203-1	103	rd A	venu	ıe					surcharges will b	e applied to the a	nalysis	
Project Information		Inuvik, NT X	0E 0T0		Ed	nonto	n, A	B T58	3 1J4						Date Required			
Project ID snp 0036-3	Attention	Rick Campb	ell	Atten	ition Ri	chard	l Fe	ilder	ì						As Indicated	All Analy	sis	
Project Name	Phone	(867) 777-86	315	Phon	e (78	30) 48	88-6	3800	)						Mary IIA CA DII in a		accordered to	
Project Location sewage lagoon	Cell	(867) 678-53	388	Cell											When "ASAP" is re default to a 100% Rt			
Legal Location	Fax	(867) 777-86	601	Fax	(78	30) 48	88-2	2121							turn around time to m			lab
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-ma	il <u>ric</u>	hard.	feil	den@	gae	com.	com				prior to subm	itting RUSH samp	ies	
Proj. Acct.Code	Agreement ID	2909													Signature			
	Copy of Report			Сору	of invoice										Sample Cus	tody (please p	rint)	
Report Results X E-Mail	Online	PDF		QA/C	C Report	T	T	П				ГΤ		Г	Sampled by:	losh/Dale		
Mail x	Fax	Excel					ı					$  \cdot  $			Company T	own of Inuvik		
Special Instructions/Comments (please from above).	include contact info	ormation inclu	ding ph. # if different		Regulatory ments below	Containers	l								I authorize Exova indicate	to proceed with ted on this form:	he work	
Sampler: Circle Project ID Below and no	te weather:					ntai	ı	1 1		4	1				Date: Oct.19/2017	Initial:	I.S	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 N	It.B E			l			L	1 1			1	П			This section	for Lab us	e only	,
SNP6 GatePond - SNP7 FarPond - SNF	8 TwinL			l		er of	ı								Date/Time stamp:			
Raw Water						Number	1	1 1							OCT 20 PM12	-99		
Temp7 C, precip90 %_, Wind dir	N_ Vel2_km/h					Ž	L								WWI ZWINGZ	of Section		
Sample Identification	Location	Depth in cm m	Date/Time sample	ed Ma	trix Sampli metho										Indicate below any condition of sample		the	
1 C.B.O.D.	snp-0036-3		Oct. 19/2017		Dip	7		П		77		ГТ				Were Exova	supplies	3
2 B.O.D.	snp-0036-3		Oct.19/2017		Dip											used?		
3 Microbiology	snp-0036-3		Oct. 19/2017		Dip	1	İ									Was there a		ge
4 Nutrients + preservatives	snp-0036-3		Oct. 19/2017		Dip		Т									to the shipping container?	ng	
5 Routine	snp-0036-3		Oct.19/2017		Dip	丁	Τ	$\Box$										
6							Ī									Were the co		
7																packaged we	ell?	
8							T	$\Box$				$\sqcap$	-					
9						J.	Γ									Were the ex		
10																number of sa received (do		
11					-		Т	$\Box$				П				below)?		
12							Г	П										
13																Are samples		
14							Ī									recommende times/temp?		ıg
15												$\Box$						
Environmental	Sample Inform	nation She	et									Shipp	oing:	•	# and size of coolers	received:		
Note: Proper completion of this for				Lot: 1	234006	COC	2					COD	Y/N					
Please indicate any	potentially ha	zordous sa	amples	11111		1111			11 8	11		Cool	r tem	o:	Delivery Method:	7 1	11	
	Control			11111								(	+		Waybill:	And an	100	th
Page 1 of 1	Control #	7	- (							11			$\bigcup$		Received by: //	0	,	



Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1239965

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Nov 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Nov 23, 2017

X0E 0T0 P.O.: 100104 Report Number: 2244259

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh / Dale Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

# **Notes To Clients:**

• Nov 17, 2017 - Upon receipt, sample 1 had exceeded recommended temperature for bacterial analysis.



## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1239965

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Nov 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Nov 23, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2244259

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh / Dale Company: Town of Inuvik

Reference Number 1239965-1
Sample Date Nov 16, 2017
Sample Time NA

Sample Location

Sample Description snp-0036-3 / -1.0°C

		Matrix	Water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	4			4
Biochemical Oxygen Demand	Inhibited	mg/L	<4			4
Inorganic Nonmetallic P	arameters					
Ammonium - N		mg/L	3.68			0.025
Ammonium/Ammonia Preservation			Yes			
Microbiological Analysis	S					
Total Coliforms	Membrane Filtration	CFU/100 mL	10000			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<10000			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	4			2
Routine Water						
рН			7.29			

Approved by:

Darlene Lintott, MSc Consulting Scientist Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1239965

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Nov 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Nov 23, 2017

X0E 0T0 P.O.: 100104 Report Number: 2244259

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Josh / Dale Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	Nov 17, 2017	Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G	Nov 22, 2017	Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B	Nov 22, 2017	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	Nov 22, 2017	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	Nov 18, 2017	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	Nov 18, 2017	Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	Nov 20, 2017	Exova Edmonton

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater

#### Comments:

• Nov 17, 2017 - Upon receipt, sample 1 had exceeded recommended temperature for bacterial analysis.

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

_			\												
EXOVO Testing Advising	Billing Informat	ion:		Copy of	Report To	:								RUS	SH Priority
Advising Assuring	Company	Town of Inuv	rik	Company	Aec	om -	Edm	onto	n					Upon filling out this	s section, client accepts that
www.exova.com	Address	Box 1160 2 F	irth Street	Address	1720	03-10	03rd	Aver	iue					surcharges will	be applied to the analysis
Project Information		Inuvik, NT X	0E 0T0		Edmo	onton,	AB T	5S 1J	4					Date Required	
Project ID snp- 0036-3	Attention	Rick Campbe	ell	Attention	Rich	ard	Feild	en						As Indicated	All Analysis
Project Name	Phone	(867) 777-86	15	Phone	(780	) 48	8-680	00						Minor #ASAD!! is	requested, turn around will
Project Location sewage lagoon	Cell	(867) 678-53	88	Cell											USH priority, with pricing and
Legal Location	Fax	(867) 777-86	01	Fax	(780	) 48	8-212	21							match. Please contact the lab nitting RUSH samples
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	eilder	n@a	econ	n.cor	n			prior to subi	nituring ROSH samples
Proj. Acct.Code	Agreement ID	2909		1 1										Signature	
	Copy of Report	- 15 No. 10 No.		Copy of i	nvoice									Sample Cus	stody (please print)
Report Results × E-Mail	Online	PDF		QA/QC R	eport	П								Sampled by:	Josh / Dale
Mail x	Fax	Excel				IJ							1	Company	Town of Inuvik
Special Instructions/Comments (please in from above).	clude contact info	ormation includ	ding ph. # if different	Indicate Re Requiremen		Number of Containers									a to proceed with the work ted on this form:
Sampler: Circle Project ID Below and note	e weather:					ntai								Date:Nov.16/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt.	B E					ပ္ပိ								This section	n for Lab use only
SNP6 GatePond - SNP7 FarPond - SNP8	TwinL					910								Date/Time stamp:	
Raw Water						Ę.								1001-09-20	ien.
Temp20 C, precip_80%, Wind dir_	E_ Vel12_km/l	1				1		1_						NOV 17 PH12	
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	↓								Indicate below an condition of samp	y deficiencies in the les:
1 B.O.D.	snp-0036-3		Nov.16/2017		Dip	П									Were Exova supplies
2 Routine	snp-0036-3		Nov.16/2017		Dip	П					18				used?
3 Microbiology	snp-0036-3		Nov.16/2017		Dip										Was there any damage
4 C.B.O.D.	snp-0036-3		Nov.16/2017		Dip										to the shipping container?
5 Nutrients + preservatives	snp-0036-3		Nov.16/2017		Dip	П									= 1
6															Were the containers
7															packaged well?
8															
9															Were the expected
10				V											number of samples received (document
11				4											below)?
12						$\Box$									
13										, V					Are samples within recommended holding
14															times/temp?
15						1 1		1	1						
Environmental S			CL	Lot: 123	9965	coc						pping D Y/I		# and size of coolers	received:
Note: Proper completion of this for			A STATE OF THE PARTY OF THE PAR	10.010								oler t			
Please indicate any p	octentially ha	zordous sa	imples								300	1		Delivery Method:	ovoles
Page 1 of 1	Control #	ŧ		HII I I AND				25 MESS			~	1.0		Waybill:	6
rage I UII				139				- \ =	W-1				-	received by.	



Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1245045

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Dec 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Dec 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2251699

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim/Dale Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**



### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1245045

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Dec 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Dec 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2251699

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim/Dale Company: Town of Inuvik

Reference Number 1245045-1
Sample Date Dec 13, 2017
Sample Time NA

Sample Location

Sample Description snp-0036-3 / 2C

Matrix Water

		Matrix	vvater			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	29			4
Biochemical Oxygen Demand	Inhibited	mg/L	26			4
Inorganic Nonmetallic P	arameters					
Ammonium - N		mg/L	10.5			0.025
Ammonium/Ammonia Preservation Microbiological Analysis	s		Yes			
Total Coliforms	Membrane Filtration	CFU/100 mL	>80000			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	>60000			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	9			2
Routine Water						
рН			7.44			

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-3 Lot ID: 1245045

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Sewage Lagoon Date Received: Dec 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Dec 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2251699

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim/Dale Company: Town of Inuvik

Method of Analysis			
Method Name	Reference		te Analysis Location urted
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B Dec	c 18, 2017 Exova Edmonton
Ammonium-N in Water	APHA	* Automated Phenate Method, 4500-NH3 G Dec	c 18, 2017 Exova Edmonton
BOD (Carbonaceous) in water	APHA	* 5 Day, 5210 B Dec	c 19, 2017 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B Dec	c 19, 2017 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Dec Procedure, 9222 D	c 15, 2017 Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Dec Procedure, 9222 B	c 15, 2017 Exova Calgary
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	c 20, 2017 Exova Edmonton
		+ D (	

<sup>\*</sup> Reference Method Modified

# References

APHA Standard Methods for the Examination of Water and Wastewater

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

Address Box 1160 2 Firth Street Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and Address 17203-103rd Avenue sucharges will be applied to the analysis and the analysis ana	EXOVA Testing Advising	Billing Informat	tion:		Copy of I	Report To								RI	JSH Priority
Project Information   Incurk, NT XIG T07   Attention   Risk Campbell   Risk Campbell   Attention   Risk Campbell   Risk Campb	Assuring	Company	Town of Inuv	<b>/ik</b>	Company	Aec	om -	- Ed	mont	on					
Project Name	www.exova.com	Address	Box 1160 2 I	Firth Street	Address	1720	03-1	03rd	d Ave	nue				surcharges w	ill be applied to the analysis
Project Name Project Castiline sewage lagoon Cell (887) 777-8815 Cell (887) 675-8388 Cell (887) 675-8388 Cell (887) 675-8388 Cell (887) 675-8388 Cell (887) 675-8388 Cell (887) 675-8388 Cell (887) 675-8388 Cell (780) 488-2121 Exact (780) 488	Project Information		Inuvik, NT X	0E 0T0	- 1	Edmo	onton	, AB	T5S 1	J4				Date Require	ed
Peoplet Location sewage lagoon   Call   (887) 678-8388   Call   Fax   (780) 488-2121   Fax	Project ID snp-0036-3	Attention	Rick Campb	ell	Attention	Rich	ard	Feil	den					As Indicated	All Analysis
Project Location sewage largorn Legal Location   Fax (87) 777-861   Fax (780) 488-2121   Fax	Project Name	Phone	(867) 777-86	315	Phone	(780	) 48	8-68	800					14/1- HA O A DII	
Legal Lozation Proj. AFCE   Fax   (887) 777-8601   Fax   (780) 488-2121   richard feliden@aecom.com   Fax	Project Location sewage lagoon	Cell	(867) 678-53	388	Cell	•	•								
PORAFER 100104 E-mail rocampbell@cown.inuvik.nt.ca Agreement ID 2909 Signature Sample Custody (please print)  Report Results	Legal Location	Fax			Fax	(780	) 48	8-2	121					turn around time to	o match. Please contact the lab
Signature   Signature   Signature   Signature   Signature   Signature   Signature   Sample Custody (please print)	PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	280				aecor	n.con	n		prior to su	bmitting RUSH samples
Report Results X E-Mail Online PDF OA/OC Report Special Instructions/Comments (please include contact information including ph. # if different from above).  Sampler Circle Project ID Below and note weather:  SMP2 Lagaon - SNP4 Mt. BW - SNP5 Mt. B E  SNP6 GatePond - SNP7 FarPond - SNP6 Twithout - SNP6	Proj. Acct.Code	Agreement ID	POTENTIAL PRODUCTION											Signature	
Report Results		Copy of Report			Copy of in	voice									ustody (please print)
Special Instructions/Comments (please include contact information including ph. # if different from above).  Sampler Circle Project ID Below and note weather:  Sampler Circle Project ID Below and note weather:  ShPS Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt. B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5 Mt.1 B SNP5 Lagoon SNP4 Mt.1 B W - SNP5 Mt.1 B SNP5	_ ,_ , x E-Mail	Online	PDF	T			П	П		TT	TT	TT			
from above).  Requirements below  Sampler Circle Project ID Below and note weather:  SNPS Lagonor SNP4 Mt.B.W. SNP5 Mt.B E  SNPS Casponor SNP4 Mt.B.W. SNP5 Mt.B E  SNPS GatePond - SNP7 FarPond - SNP8 TwinL  Raw Water  TempHH C, precip HL/Winld dir E vel Hzmith    C.B.O.D.	Report Results Mail x	Fax	Excel	T T		•	П							Company	
Requirements balow   Sampler Circle Project ID Below and note weather:   SNPS Lagoon - SNP4 Mt.B W - SNP5 Mt.B E   SNP6 GatePond - SNP8 Twint.   Sampler dentification   Location   Depth in cm m   Date/Time sampled   Matrix   Sampler dentification   Location   Depth in cm m   Date/Time sampled   Matrix   Sampler dentification   Location   Depth in cm m   Date/Time sampled   Matrix   Sampler dentification   Location   Depth in cm m   Date/Time sampled   Matrix   Sampler dentification   Location   Depth in cm m   Date/Time sampled   Matrix   Sampler dentification   Dec. 13/2017   Dip   Di	Special Instructions/Comments (please in	nclude contact info	ormation inclu	ding ph. # if different	Indicate Red	ulatory	1,							I authorize Exc	ova to proceed with the work
SNP6 GatePond - SNP7 FarPond - SNP8 TwinL Raw Water Temp##C c, precip##wind dir _vel _/ km/h  Sample Identification	from above).			56-H3701			ner								
SNP6 GatePond - SNP7 FarPond - SNP8 TwinL Raw Water Temp##C c, precip##wind dir _vel _/ km/h  Sample Identification	Sampler: Circle Project ID Below and not	e weather:		Γ			ntai							Date: Dec.13/2017	' Initial: J.S
Raw Water Tempf C, precip	SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt	t.B E					ပိ							This section	on for Lab use only
Sample Identification  Location in cm m Date/Time sampled Matrix Sampling method metho	SNP6 GatePond - SNP7 FarPond - SNP	8 TwinL					er of							Date/Time stam	p:
Sample Identification  Location in cm m Date/Time sampled Matrix Sampling method metho	Raw Water						đ							DEC 14 PM1	2:01
Calcoling   Sample definition   Sample   Matrix   method     thod   meth	Temp <u>17</u> C, precip <u>\$2</u> , Wind dir <u>/</u> Vel_	<u>/ /</u> km/h					ž								
2 B.O.D. snp-0036-3 Dec.13/2017 Dip Was there any damage to the shipping container?  3 Microbiology snp-0036-3 Dec.13/2017 Dip Was there any damage to the shipping container?  5 Nutrients + preservatives snp-0036-3 Dec.13/2017 Dip Were the containers packaged well?  7 Were the containers packaged well?  8 Were the containers packaged well?  9 Were the expected number of samples received (document below)?  10 Were the expected number of samples received (document below)?  11 Dec.13/2017 Dip Were the expected number of samples received (document below)?  12 Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Was there any damage to the shipping container?  Were the expected number of samples received (document below)?  Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Was there any damage to the shipping container?  Dip Were the expected number of samples in container?  Shipping: COD Y/N  Cooler temp: Delivery Methed: Waybill: Waybill: Waybill: Waybill:	Sample Identification	Location	The second second	Date/Time sampled	l Matrix		$ \downarrow $								
2 B.O.D. snp-0036-3 Dec.13/2017 Dip Used?  3 Microbiology snp-0036-3 Dec.13/2017 Dip Used?  4 Routine snp-0036-3 Dec.13/2017 Dip Used?  5 Nutrients + preservatives snp-0036-3 Dec.13/2017 Dip Used?  6 Substituting the preservative snp-0036-3 Dec.13/2017 Dip Used Used?  7 Substituting the preservative snp-0036-3 Dec.13/2017 Dip Used Used Used Used Used Used Used Used	1 C.B.O.D.	snp-0036-3	-	Dec.13/2017	1000	Dip		П		TT		TT	$\neg \neg \neg$		
4 Routine snp-0036-3 Dec.13/2017 Dip Container?  5 Nutrients + preservatives snp-0036-3 Dec.13/2017 Dip Container?  6 Were the containers packaged well?  8 Were the expected number of samples received (document below)?  10 Were the expected number of samples container of samples containers packaged well?  11 Are samples within recommended holding times/temp?  12 Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #	2 B.O.D.	snp-0036-3		Dec.13/2017		Dip	П			$\top$		$\top$			used?
4 Routine snp-0036-3 Dec.13/2017 Dip	3 Microbiology	snp-0036-3		Dec.13/2017	77	Dip						$\top$			
5 Nutrients + preservatives snp-0036-3 Dec.13/2017 Dip Dip Dip Dip Dip Dip Dip Dip Dip Dip		snp-0036-3		Dec.13/2017		Dip									
Were the containers packaged well?    Second	5 Nutrients + preservatives	snp-0036-3		Dec.13/2017		Dip	П	$\Box$				77			
8 Were the expected number of samples received (document below)?  10							П	П				$\top$			
9	7						П			$\top$		$\top$			packaged well?
10	8				457			П		$\top$		$\top$			
10   received (document below)?  12   Are samples within recommended holding times/temp?  14   Shipping: Note: Proper completion of this form is required in order to proceed with analysis Please indicate any potentially hazordous samples  Control #  Control #  I Lot: 1245045 COC Shipping: COD Y/N Cooler temp: Delivery Methad: Waybill: Ware T	9				10			$\Box$		$\top$		$\top$			
11   Delow)?  12   Are samples within recommended holding times/temp?  15   Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Lot: 1245045 COC Shipping: COD Y/N Cooler temp: Delivery Methød: Waybill: W	10		ļ		- N							$\top$			The control of the set for a find and the control of the
12 13 14 15  Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis Please indicate any potentially hazordous samples  Control #  Control #  Are samples within recommended holding times/temp?  Shipping: COD Y/N  Cooler temp: Delivery Method: Waybill:				302	, No.		П					$\dagger \dagger$			
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Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Control #  I Lot: 1245045 COC  Shipping: COD Y/N  Cooler temp: Delivery Methød: Waybill			<b> </b>				Н	$\vdash$	$\dashv$	+	$\dashv$	+-	++		Are samples within
Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Control #  Lot: 1245045 COC  Shipping: # and size of coolers received:  COD Y/N  Cooler temp: Delivery Method:  Waybill: Waybill:			<u> </u>	. Alle			Н	$\vdash$	-	+		+	++	1	
Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Lot: 1245045 COC  Shipping: # and size of coolers received:  COD Y/N  Cooler temp: Delivery Methød:  Waybill: CVC/CCC							-	$\vdash$	_	+-	_	+			unies/tellip?
Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Control #  Control #  Control #  Control #  Control #  Control #  Control #		Sample Inform	nation She	et	Lat. 12	A5045	cc	C			-	Ship	ping:	# and size of coole	ers received:
Please indicate any potentially hazordous samples  Control #  Cooler temp:  Waybill:  Cooler temp:  Waybill:  Cooler temp:  Delivery Method:  Waybill:					22										
Control #												Coo	ler temp:	Delivery Method	
COULDI#	riouse maleute uny		11000								l	/	)		
	Page 1 of 1	Control #	Ė									-			M. CA
	Biographic Control of the Control of			-		THE PERSON NAMED IN									

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1204923

Control Number:

## **Report Transmission Cover Page**

Company: Town of Inuvik

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-4

2 Firth Street Name: E.C.W.T.P. Date Received: May 30, 2017
Inuvik, NT, Canada Location: Pit NW of dump Date Reported: Jun 6, 2017
X0E 0T0 LSD: Report Number: 2194070

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send  (COC, Test Report) by Email - Merge Reports  On [Lot Approval and Final Test Report Approval] send  (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Jason Casault AECOM - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 486-7050 Fax: (780) 486-7070 Email: Jason.Casault@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Merge Reports  On [Report Approval] send  (Test Report, COC) by Email - Merge Reports
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

#### **Notes To Clients:**

- Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.
- Sample 1204923-1; 5729717 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1204923

Box 1160

1160

ID: SNP 0036-4 Name: E.C.W.T.P.

Control Number:

2 Firth Street Inuvik, NT, Canada Name: E.C.W.T.P. Location: Pit NW of dump

100104

Date Received: May 30, 2017 Date Reported: Jun 6, 2017

X0E 0T0

LSD:

ale Reported. J

Attn: Rick Campbell

P.O.: Acct code: Report Number: 2194070

Sampled By: Jim Crawford

Company: Town of Inuvik

1204923-1

Sample Date

May 29, 2017

Sample Time

NA

Sample Location Sample Description

**Reference Number** 

n snp-0036-4 / 5°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol		mg/L	0.001			0.001
Oil and Grease	Total	mg/L	<5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	0.07			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.11			0.02
Calcium	Total	mg/L	224			0.2
Iron	Total	mg/L	0.27			0.05
Magnesium	Total	mg/L	97.6			0.2
Manganese	Total	mg/L	0.108			0.005
Potassium	Total	mg/L	4.0			0.4
Silicon	Total	mg/L	2.61			0.05
Sodium	Total	mg/L	71.8			0.4
Sulfur	Total	mg/L	2120			0.3
Mercury	Total	mg/L	0.000066			0.000005
Antimony	Total	mg/L	0.0003			0.0002
Arsenic	Total	mg/L	0.0006			0.0002
Barium	Total	mg/L	0.030			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.088			0.002
Cadmium	Total	mg/L	0.00004			0.00001
Chromium	Total	mg/L	<0.0005			0.0005
Cobalt	Total	mg/L	0.0005			0.0001
Copper	Total	mg/L	0.004			0.001
Lead	Total	mg/L	<0.0001			0.0001
Lithium	Total	mg/L	0.039			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0039			0.0005
Selenium	Total	mg/L	0.0189			0.0002
Silver	Total	mg/L	<0.00001			0.00001

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1204923

Control Number:

### **Analytical Report**

Bill To: Town of Inuvik Project:

> Box 1160 ID: SNP 0036-4

2 Firth Street E.C.W.T.P. Name: Date Received: May 30, 2017 Inuvik, NT, Canada Location: Pit NW of dump Date Reported: Jun 6, 2017 X0E 0T0 LSD: Report Number: 2194070

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

**Reference Number** 1204923-1 Sample Date May 29, 2017 Sample Time NA **Sample Location** 

**Sample Description** snp-0036-4 / 5°C

> Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						-
Strontium	Total	mg/L	0.618			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0095			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0006			0.0001
Zinc	Total	mg/L	0.016			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	•					
Total Coliforms	Membrane Filtration	CFU/100 mL	82			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	1			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	2			2
Routine Water						
рН			7.72			
Electrical Conductivity	at 25 °C	μS/cm	1760			1
Calcium	Extractable	mg/L	212			0.2
Magnesium	Extractable	mg/L	93.1			0.2
Sodium	Extractable	mg/L	67.8			0.4
Potassium	Extractable	mg/L	3.7			0.4
Sulfate (SO4)	Dissolved	mg/L	935			0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Methodology and Notes**

Bill To: Town of Inuvik

Project: ID:

Lot ID: 1204923

Box 1160

Name:

Control Number:

2 Firth Street Inuvik, NT, Canada

E.C.W.T.P. Location: Pit NW of dump

100104

SNP 0036-4

Date Received: May 30, 2017 Jun 6, 2017

X0E 0T0

LSD:

Date Reported:

Report Number: 2194070

Attn: Rick Campbell

P.O.:

Sampled By: Jim Crawford

Acct code:

Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 01-Jun-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 01-Jun-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 31-May-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 31-May-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 31-May-17 Exova Calgary Procedure, 9222 B
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold 31-May-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 01-Jun-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Oil and Grease in water	US EPA	* n-Hexane Extractable Material and Silica 30-May-17 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
Phenol in water	APHA	* Direct Photometric Method, 5530 D 31-May-17 Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction 01-Jun-17 Exova Edmonton Method, 4500-P F</li> </ul>
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> <li>* Exova Edmonton</li> </ul>
		+ Defended Method Medified

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

**EPA** Environmental Protection Agency Test Methods - US **US EPA** US Environmental Protection Agency Test Methods

#### Comments:

• Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.

\* Reference Method Modified

• Sample 1204923-1; 5729717 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 T6B 3J4, Canada
 W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik Project: Lot ID: 1204923

Box 1160 ID: SNP 0036-4 Control Number:

2 Firth Street Name: E.C.W.T.P. Date Received: May 30, 2017
Inuvik, NT, Canada Location: Pit NW of dump Date Reported: Jun 6, 2017
X0E 0T0 LSD: Report Number: 2194070

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Exova III	esting Bil	lling Informat	ion:		Сору	f Report To	• /			a i i					RUSI	l Priority
LAOVU	co	ompany	Town of Inuv	ik	Compa	ny Aec	om .	- Edm	onto	n						section, client accepts that
www.exova.com	Ad	Address Box 1160 2 Firth Street			Addres	Address 17203-103rd Avenue									surcharges will be applied to the analysis	
Project Information		Inuvik, NT X0E 0T0				Edmonton, AB T5S 1J4									Date Required	
Project ID	Att	tention	Rick Campbe	ell	Attentio	n Rich	nard	Feild	en						As Indicated	All Analysis
Project Name snp-0036-	-4 Ph	none	(867) 777-8615			(780	) 48	8-680	00						148 440 458	
Project Location E.C.W.T.P.	. Ce	ell	(867) 678-53	88	Cell	74.00										quested, turn around will SH priority, with pricing an
egal Location Pit NW of d	lump Fa:	x	(867) 777-86		Fax	(780	) 48	8-212	21							tch. Please contact the la
PO/AFE# 100104	E-r	mail	rcampbell	@town.inuvik.nt.ca	E-mail	rich	ard.f	eilder	n@ae	com	.com	1			prior to submit	ting RUSH samples
Proj. Acct.Code	Ag	reement ID	2909												Signature	
	Co	py of Report			Сору о	invoice									Sample Cust	ody (please print)
Report Results X E-Mai	il On	nline	PDF		QA/QC	Report	П								Sampled by: Ji	m Crawford
Mail	x Fa:	X	Excel												Company To	wn of Inuvik
Special Instructions/Comment	s (please includ	de contact info	rmation includ	ling ph. # if different	Indicate F	egulatory	s								I authorize Exova	o proceed with the work
om above).					Requireme	nts below	Containers								indicated	d on this form:
Sampler: Circle Project ID Belo							onta								Date. May29/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W							of C									for Lab use only
SNP6 GatePond - SNP7 FarPo	ond - SNP8 Tw	vinL					135	l			1				Date/Time stamp:	
Raw Water	dia Maj la	To the					Number		1 1						1 10	4
emp C, precip, Wind	air veik	km/n					-	$\vdash$							May 29	
Sample Identification	n	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	] ↓								Indicate below any deficiencies in the condition of samples:	
1 B.O.D.	sn	p-0036-4		May.29/2017		Dip										Were Exova supplies used?
2 Oil & Grease + preser	vatives	II.		11		11										usedr
3 Microbiology		U.		U		11										Was there any damag
4 Routine		))j		u		"										to the shipping container?
5 Nutrients + preservativ	ves			Т = = =		"										
6 Metals + preservatives	S	.0		"		"										Were the containers
7 Phenol + preservative	s	10		u		li .										packaged well?
8																
9				1												Were the expected number of samples
10	-															received (document
11																below)?
12										₩.						
13			4													Are samples within
14																recommended holding times/temp?
15								7.5								over a time a tree a site and Nover
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Page 1 of 1		Control #			<b>C</b>							>	-0			K V
Note: Proper completio Please indicate Page 1 of 1			ordous sa	d with analysis				استوسون				Coo		ip:	Delivery Method: Waybill:	Come

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Lot ID: 1211379

Control Number:

Report Number: 2202327

## **Report Transmission Cover Page**

Company: Town of Inuvik

Bill To: Town of Inuvik Project:

> Box 1160 ID: SNP 0036-4

2 Firth Street Name:

Date Received: Jun 29, 2017 Inuvik, NT, Canada Location: pit n/w of dump Date Reported: Jul 6, 2017

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Jason Casault AECOM - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 486-7050 Fax: (780) 486-7070 Email: Jason.Casault@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Merge Reports  On [Report Approval] send  (COC, Test Report) by Email - Merge Reports
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

#### **Notes To Clients:**

• Sample 1211379-1; 5762389 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



### **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1211379

Box 1160

ID:

Control Number:

2 Firth Street

Name:

Date Received: Jun 29, 2017

Inuvik, NT, Canada X0E 0T0 Location: LSD:

Date Reported: Jul 6, 2017

Attn: Rick Campbell

P.O.:

Report Number: 2202327

Sampled By: Justin Simms

Company: Town of Inuvik

Acct code:

**Reference Number** 

1211379-1

Sample Date

Jun 28, 2017

Sample Time

NA

Sample Location

Sample Description anp-0036-4 / 5.9°C

SNP 0036-4

pit n/w of dump

100104

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					Littie
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol		mg/L	<0.001			0.001
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	< 0.05			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.09			0.02
Calcium	Total	mg/L	324			0.2
Iron	Total	mg/L	0.2			0.05
Magnesium	Total	mg/L	125			0.2
Manganese	Total	mg/L	0.13			0.005
Potassium	Total	mg/L	2.5			0.4
Silicon	Total	mg/L	3.03			0.05
Sodium	Total	mg/L	105			0.4
Sulfur	Total	mg/L	443			0.3
Mercury	Total	mg/L	<0.000005			0.000005
Antimony	Total	mg/L	<0.0004			0.0002
Arsenic	Total	mg/L	0.0005			0.0002
Barium	Total	mg/L	0.030			0.001
Beryllium	Total	mg/L	<0.0002			0.0001
Bismuth	Total	mg/L	<0.001			0.0005
Boron	Total	mg/L	0.100			0.002
Cadmium	Total	mg/L	0.00005			0.00001
Chromium	Total	mg/L	<0.001			0.0005
Cobalt	Total	mg/L	0.0005			0.0001
Copper	Total	mg/L	0.002			0.001
Lead	Total	mg/L	<0.0002			0.0001
Lithium	Total	mg/L	0.061			0.001
Molybdenum	Total	mg/L	<0.002			0.001
Nickel	Total	mg/L	0.0035			0.0005
Selenium	Total	mg/L	0.0042			0.0002
Silver	Total	mg/L	< 0.00002			0.00001

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### **Analytical Report**

Bill To: Town of Inuvik Project: Lot ID: 1211379

Box 1160 ID: SNP 0036-4 Control Number:

2 Firth Street Name: Control Number

Inuvik, NT, Canada Location: pit n/w of dump Date Received: Jun 29, 2017

Date Received: Jul 6, 2017

X0E 0T0 LSD: Report Number: 2202327 Rick Campbell P.O.: 100104

Attn: Rick Campbell P.O.: 1
Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Reference Number 1211379-1
Sample Date Jun 28, 2017
Sample Time NA
Sample Location

Sample Description anp-0036-4 / 5.9°C

Matrix Water

		Matrix	vvater			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Strontium	Total	mg/L	0.962			0.001
Thallium	Total	mg/L	< 0.0001			0.00005
Tin	Total	mg/L	< 0.002			0.001
Titanium	Total	mg/L	0.0064			0.0005
Uranium	Total	mg/L	<0.001			0.0005
Vanadium	Total	mg/L	0.0005			0.0001
Zinc	Total	mg/L	0.037			0.001
Zirconium	Total	mg/L	< 0.002			0.001
Microbiological Analysis	<b>;</b>					
Total Coliforms	Membrane Filtration	CFU/100 mL	1200			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	60			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	<5			2
Routine Water						
рН			7.41			
Electrical Conductivity	at 25 °C	μS/cm	2400			1
Calcium	Extractable	mg/L	305			0.2
Magnesium	Extractable	mg/L	127			0.2
Sodium	Extractable	mg/L	102			0.4
Potassium	Extractable	mg/L	2.5			0.4
Sulfate (SO4)	Dissolved	mg/L	1310			0.9
		-				

Approved by:

Darlene Lintott, MSc Consulting Scientist

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## **Methodology and Notes**

Bill To: Town of Inuvik Project:

Lot ID: 1211379 SNP 0036-4 Box 1160 ID: Control Number:

2 Firth Street Name:

Date Received: Jun 29, 2017 Inuvik, NT, Canada Location: pit n/w of dump Date Reported: Jul 6, 2017

X0E 0T0 LSD: Report Number: 2202327 Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	30-Jun-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	30-Jun-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	04-Jul-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	30-Jun-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	30-Jun-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	30-Jun-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	29-Jun-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	05-Jul-17	Exova Edmonton
Phosphorus - Total in Water	АРНА	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	05-Jul-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	05-Jul-17	Exova Edmonton

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US **US EPA** US Environmental Protection Agency Test Methods

#### Comments:

• Sample 1211379-1; 5762389 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 W: www.exova.com



Lot ID: 1211379

Date Received: Jun 29, 2017

Date Reported: Jul 6, 2017

Report Number: 2202327

Control Number:

# **Methodology and Notes**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-4

2 Firth Street Name:

Inuvik, NT, Canada Location: pit n/w of dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Exova	Testing Advising	Billing Informat	ion:		Сор	y of Re	port To:	ŧ.			1				I 1	RUS	H Priority	
LXOVG	Assuring	Company	Town of Inuv	rik	Con	Company Aecom - Edmonton										Upon filling out this section, client accepts that		
www.exova.com		Address	Box 1160 2 I	Firth Street	Add	Address 17203-103rd Avenue										surcharges will be applied to the analysis		
Project Information	on		Inuvik, NT X0E 0T0			Edmonton, AB T5S 1J4										Date Required		
Project ID	snp-0036-4	Attention	Rick Campb	ell	Atte	ntion	Rich	ard	Feild	den						As Indicated	All Analysis	
Project Name		Phone	(867) 777-86	15	Pho	ne	(780	48 (	8-68	00						When "ASAP" is n	equested turn around will	
Project Location	pit n/w of dump	Cell	(867) 678-53	88	Cell											When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location		Fax	(867) 777-86		Fax		(780	48 (	8-21	21						turn around time to match. Please contact the la prior to submitting RUSH samples		
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-m	ail	richa	rd.f	eilde	n@	aeco	m.cc	m			prior to dobrin	tang recert samples	
Proj. Acct.Code		Agreement ID	2909													Signature		
		Copy of Report				y of invo											tody (please print)	
Report Results	x E-Mail	Online	PDF		QA/	QC Rep	ort									Sampled by: J	ustin Simms	
	Mail x	Fax	Excel											1 1		Company T	own of Inuvik	
from above).	s/Comments (please in	iclude contact info	rmation includ	ding ph. # if different		e Regula		of Containers								I authorize Exova to proceed with the work indicated on this form:		
Sampler: Circle Pr	oject ID Below and note	e weather:		i				ntai								Date: June.28/2017	Initial: J.S.	
	NP4 Mt.B W - SNP5 Mt							ပို						1 1		This section	for Lab use only	
	SNP7 FarPond - SNP8	3 TwinL						er o						1 1		Date/Time stamp:		
Raw Water	0= 2	ð						Number								JUN 29 PK12:0	)4	
Temp_ O C, precip	95 Wind dir MUEVel_	<u>ð</u> km/h						ž										
Sample	Identification	Location	Depth in cm m	Date/Time sample	d Ma		ampling nethod	J								Indicate below any condition of sample		
1 B.O.D.		snp-0036-4		June.28/2017		D	ip						T	TI			Were Exova supplies	
2 Oil and gree	ce preservatives	snp-0036-4		June.28/2017		D	ip										used?	
3 Microbiology	/	snp-0036-4		June.28/2017		D	ip										Was there any damage	
4 Nutrients	preservatives	snp-0036-4		June.28/2017		D	ip										to the shipping container?	
5 Phenol	preservatives	snp-0036-4		June.28/2017		D	ip											
6 Mercury		snp-0036-4		June.28/2017		D	ip										Were the containers packaged well?	
7 Routine		snp-0036-4		June.28/2017		D	ip										packaged weil?	
8 Metals	preservatives	snp-0036-4		June.28/2017		D	ip											
9								Ш									Were the expected number of samples	
10								Ш		1							received (document	
11								Ш									below)?	
12								Ш	$\perp$					Ш			4	
13								Ш							$\perp$		Are samples within recommended holding	
14																	times/temp?	
15					Lot: 1	2113	379 <sup>C</sup>	oc						Ш				
	Environmental S			et	30111	11881			11 11		III			ipping		# and size of coolers r	eceived:	
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Dog 1	af 1	Control #	1		-									5.	)	Waybill:		
Page 1	of 1															Received by: \	V	



Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1221115

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W dump Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215118

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**

• Sample 1221115-1; 5810373 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



#### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1221115

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W dump Date Received: Aug 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Aug 24, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2215118

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1221115-1 Sample Date August 16, 2017

Sample Time NA

Sample Location

Sample Description snp-0036-4 / 2.9°C

Sample Matrix Water

		vvale		<del> </del>
Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Con	stituents			
Biochemical Oxygen Demand	5 Day	mg/L	<4	4
Phenol		mg/L	0.011	0.001
Oil and Grease	Total	mg/L	<5	5
pH adjustment	adjustment required		No	
Inorganic Nonmetallic F				
Phosphorus	Total	mg/L	0.11	0.05
Metals Dissolved				
Subsample	Field Filtered		Lab Filtered	
Metals Total				
Aluminum	Total	mg/L	0.68	0.02
Calcium	Total	mg/L	210	0.2
Iron	Total	mg/L	3.75	0.05
Magnesium	Total	mg/L	91.9	0.2
Manganese	Total	mg/L	0.910	0.005
Potassium	Total	mg/L	28.0	0.4
Silicon	Total	mg/L	4.63	0.05
Sodium	Total	mg/L	144	0.4
Sulfur	Total	mg/L	230	0.3
Mercury	Total	mg/L	<0.00005	0.00005
Antimony	Total	mg/L	<0.0004	0.0002
Arsenic	Total	mg/L	0.0026	0.0002
Barium	Total	mg/L	0.155	0.001
Beryllium	Total	mg/L	<0.0002	0.0001
Bismuth	Total	mg/L	<0.001	0.0005
Boron	Total	mg/L	0.847	0.002
Cadmium	Total	mg/L	0.00004	0.00001
Chromium	Total	mg/L	0.0019	0.0005
Cobalt	Total	mg/L	0.002	0.0001
Copper	Total	mg/L	0.003	0.001
Lead	Total	mg/L	0.001	0.0001
Lithium	Total	mg/L	0.043	0.001
Molybdenum	Total	mg/L	<0.002	0.001
Nickel	Total	mg/L	0.0089	0.0005
Selenium	Total	mg/L	0.001	0.0002
Silver	Total	mg/L	<0.00002	0.00001
Strontium	Total	mg/L	0.666	0.001
Thallium	Total	mg/L	<0.0001	0.00005
Tin	Total	mg/L	<0.002	0.001

# Page 2 of 4 **EXOVA**

# **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1221115

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W dump Date Received: Aug 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Aug 24, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2215118

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1221115-1

Sample Date August 16, 2017

Sample Time NA

Sample Location

Sample Description snp-0036-4 / 2.9°C

Sample Matrix Water

	'	Sample Matrix Walt	51	
Analyte		Units	Result	Nominal Detection Limit
Metals Total - Continued				
Titanium	Total	mg/L	0.011	0.0005
Uranium	Total	mg/L	0.001	0.0005
Vanadium	Total	mg/L	0.0035	0.0001
Zinc	Total	mg/L	0.010	0.001
Zirconium	Total	mg/L	<0.002	0.001
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	900	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	340	1
Physical and Aggregate F	Properties			
Solids	Total Suspended	mg/L	30	2
Routine Water				
рН			7.97	
<b>Electrical Conductivity</b>	at 25 °C	μS/cm	2070	1
Calcium	Extractable	mg/L	201	0.2
Magnesium	Extractable	mg/L	91.0	0.2
Sodium	Extractable	mg/L	140	0.4
Potassium	Extractable	mg/L	26.6	0.4
Sulfate (SO4)	Dissolved	mg/L	670	0.9

Approved by:

Darlene Lintott, MSc Consulting Scientist

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1221115

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W dump Date Received: Aug 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Aug 24, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2215118

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 21-Aug-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 21-Aug-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 18-Aug-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 B
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold 18-Aug-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 18-Aug-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Oil and Grease in water	US EPA	<ul> <li>* n-Hexane Extractable Material and Silica 17-Aug-17 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>
Phenol in water	APHA	* Direct Photometric Method, 5530 D 17-Aug-17 Exova Edmonton
Phosphorus - Total in Water	APHA	* Automated Ascorbic Acid Reduction 17-Aug-17 Exova Edmonton Method, 4500-P F
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103-</li> <li>21-Aug-17</li> <li>Exova Edmonton</li> <li>105'C, 2540 D</li> </ul>
		* Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### **Comments:**

• Sample 1221115-1; 5810373 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 F: +1 (780) 434-8586

 Edmonton, Alberta
 E: Edmonton@exova.com

 T6B 3J4, Canada
 W: www.exova.com



#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1221115

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W dump Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215118

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

Testing	Billing Informat	ion:		Copy of F	Report To:									RUS	H Priority	
EXOVA Advising Assuring	Company Address	Town of Inuv		Company Address	Aec										section, client accepts that e applied to the analysis	
Project Information	Address	Inuvik, NT X		Address	Edmo								ŀ	Date Required		
Project ID snp-0036-4	Attention	Rick Campbe		Attention	Rich									As Indicated	All Analysis	
Project Name	Phone	(867) 777-86		Phone	(780								ŀ	- 11 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		
Project Location Pit N/W dump	Cell	(867) 678-53		Cell	(100	,, 400	5 00	00						When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location	Fax	(867) 777-86			Fax (780) 488-2121										atch. Please contact the lab	
PO/AFE# 100104	E-mail	8 8	@town.inuvik.nt.ca											prior to submit	tting RUSH samples	
Proj. Acct.Code	Agreement ID	2909	COMILITAVIK.III.Ca	L-man	HOH	ai G.ic	Siluci	ICO	CCOII				ŀ	Signature		
1 10,1 7 100.1.000.0	Copy of Report	2000		Copy of in	voice								ħ		tody (please print)	
_ x E-Mail	Online	PDF		QA/QC R		П		Т	T	1	П				im Crawford	
Report Results Mail x	Fax	Excel	-			П					Н		P	100000000000000000000000000000000000000	own of Inuvik	
Special Instructions/Comments (please in from above).	ding ph. # if different	Indicate Reg Requirement	100	Containers									to proceed with the work d on this form:			
Sampler: Circle Project ID Below and note	e weather:		İ			uţaj			1 1					Date: Aug.16/2017	Initial: J.S	
SNP3 Lagoon - <mark>SNP4 Mt.B W - S</mark> NP5 Mt.	.B E													This section	for Lab use only	
SNP6 GatePond - SNP7 FarPond - SNP8	3 TwinL					er of								Date/Time stamp:		
Raw Water						Number			1					2007.0		
Temp/ C, precip, Wind dir Vel_	km/h					1-1								AUG 17 PM12:		
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $								Indicate below any condition of sample		
1 B.O.D.	snp-0036-4		Aug.16/2017		Dip										Were Exova supplies used?	
2 nutrients + preservatives	snp-0036-4		Aug.16/2017		Dip	Ш									used?	
3 oil & greece + preservatives	snp-0036-4		Aug.16/2017		Dip										Was there any damage	
4 metals + preservatives	snp-0036-4		Aug.16/2017		Dip										to the shipping container?	
5 phenol +preservatives	snp-0036-4		Aug.16/2017		Dip											
6 microbiology	snp-0036-4		Aug.16/2017		Dip										Were the containers packaged well?	
7 mercury	snp-0036-4		Aug.16/2017		Dip										packaged well?	
8 routine	snp-0036-4		Aug.16/2017	-	Dip											
9			o.l			Ш	$\perp$						Ш	1	Were the expected number of samples	
10		L				$\sqcup$									received (document	
11						Ш									below)?	
12 13						Ш					$\perp$					
13						Ш									Are samples within recommended holding	
14 15									] ]						times/temp?	
15				7												
Environmental S	Sample Inforn	nation She	et	Lot: 122	21115	COC			of 20 and		Shipp			# and size of coolers re	eceived:	
Note: Proper completion of this for	rm is required in o	rder to procee	ed with analysis		B   B	11111					COD					
Please indicate any p	ootentially ha	zordous sa	amples									er temp	);	Delivery Method:	Course	
	Control #			THE LEGIS							12	9	ı	Waybill:		
Page 1 of 1	2011.011										-			Received by:	NUNEZ	



#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1226595

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222210

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address						
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road						
		Edmonton, AB T5S 0C2						
		Phone: (780) 486-7050 Fax: (780) 486-7070						
		Email: Jason.Casault@aecom.com						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / COA						
Email - Merge Reports	PDF	COC / Test Report						
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: kwainman@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue						
		Edmonton, AB T5S 1J4						
		Phone: (780) 488-6800 Fax: (780) 488-2121						
		Email: richard.feilden@aecom.com						
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: rcampbell@town.inuvik.nt.ca						
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Email - Single Report	PDF	Invoice						
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-2607 Fax: (867) 777-2071						
		Email: utilidor@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						

# **Notes To Clients:**

- Due to interference, Total Phosphorus for sample 1226595-1 was reported at a dilution.
- Sample 1226595-1; 5838088 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Lot ID: 1226595

Date Reported: Sep 21, 2017

# **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-4

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W of dump Date Received: Sep 14, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2222210

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226595-1 Sample Date Sep 13, 2017 Sample Time NA

Sample Location

Sample Description SNP-0036-4 / 4.0°C

A la .d .		11-16-	Water	D It .	D It -	Nominal Detection
Analyte		Units	Results	Results	Results	Limit
Aggregate Organic Cons						
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol	Tatal	mg/L	0.003			0.001
Oil and Grease	Total	mg/L	<5 N			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P			0.0			0.05
Phosphorus	Total	mg/L	0.3			0.05
Metals Dissolved	E: 11E%					
Subsample	Field Filtered		Lab Filtered			
Metals Total		,,				
Aluminum	Total	mg/L	2.51			0.02
Calcium	Total	mg/L	232			0.2
Iron	Total	mg/L	10.8			0.05
Magnesium	Total	mg/L	108			0.2
Manganese	Total	mg/L	1.61			0.005
Potassium	Total	mg/L	30.8			0.4
Silicon	Total	mg/L	6.69			0.05
Sodium	Total	mg/L	151			0.4
Sulfur	Total	mg/L	237			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0004			0.0002
Arsenic	Total	mg/L	0.0053			0.0002
Barium	Total	mg/L	0.172			0.001
Beryllium	Total	mg/L	0.0002			0.0001
Bismuth	Total	mg/L	<0.001			0.0005
Boron	Total	mg/L	0.870			0.002
Cadmium	Total	mg/L	0.0001			0.00001
Chromium	Total	mg/L	0.0200			0.0005
Cobalt	Total	mg/L	0.0049			0.0001
Copper	Total	mg/L	0.010			0.001
Lead	Total	mg/L	0.0041			0.0001
Lithium	Total	mg/L	0.053			0.001
Molybdenum	Total	mg/L	<0.002			0.001
Nickel	Total	mg/L	0.017			0.0005
Selenium	Total	mg/L	0.0005			0.0002
Silver	Total	mg/L	0.00004			0.00001
Strontium	Total	mg/L	0.781			0.001
Thallium	Total	mg/L	<0.0001			0.00005



# **Analytical Report**

Lot ID: 1226595 Bill To: Town of Inuvik Project ID: SNP 0036-4

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Date Received: Sep 14, 2017 Pit N/W of dump

Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017 X0E 0T0 P.O.: 100104 Report Number: 2222210

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1226595-1 Sample Date Sep 13, 2017 NA

Sample Time **Sample Location** 

Sample Description SNP-0036-4 / 4.0°C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Tin	Total	mg/L	< 0.002			0.001
Titanium	Total	mg/L	0.0220			0.0005
Uranium	Total	mg/L	0.001			0.0005
Vanadium	Total	mg/L	0.012			0.0001
Zinc	Total	mg/L	0.038			0.001
Zirconium	Total	mg/L	< 0.002			0.001
Microbiological Analysis	•					
Total Coliforms	Membrane Filtration	CFU/100 mL	50			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	6			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	13			2
Routine Water						
рН			7.97			
Electrical Conductivity	at 25 °C	μS/cm	2140			1
Calcium	Extractable	mg/L	215			0.2
Magnesium	Extractable	mg/L	101			0.2
Sodium	Extractable	mg/L	147			0.4
Potassium	Extractable	mg/L	29.3			0.4
Sulfate (SO4)	Dissolved	mg/L	656			0.9

Approved by:

Anthony Neumann, MSc

Anthony Weuman

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#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1226595

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222210

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method Date Analysis Started	Location	
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 18-Sep-17	Exova Edmonton	
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 18-Sep-17	Exova Edmonton	
BOD in water	APHA	* 5 Day, 5210 B 15-Sep-17	Exova Edmonton	
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 15-Sep-17 Procedure, 9222 D	Exova Calgary	
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 15-Sep-17 Procedure, 9222 B	Exova Calgary	
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold 15-Sep-17</li> <li>Vapor Atomic Absorption Spec, 245.5</li> </ul>	Exova Edmonton	
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 15-Sep-17 Waters and Wastes by ICP-MS, 200.8	Exova Edmonton	
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton	
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton	
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton	
Oil and Grease in water	US EPA	<ul> <li>* n-Hexane Extractable Material and Silica 15-Sep-17</li> <li>Gel Treated n-Hexane Extractable</li> <li>Material by Extraction and Gravimetry,</li> <li>1664</li> </ul>	Exova Edmonton	
Phenol in water	APHA	* Direct Photometric Method, 5530 D 15-Sep-17	Exova Edmonton	
Phosphorus - Total in Water	APHA	* Automated Ascorbic Acid Reduction 14-Sep-17 Method, 4500-P F	Exova Edmonton	
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	Exova Edmonton	

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### **Comments:**

- Due to interference, Total Phosphorus for sample 1226595-1 was reported at a dilution.
- Sample 1226595-1; 5838088 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 F: +1 (780) 434-8586

 Edmonton, Alberta
 E: Edmonton@exova.com

 T6B 3J4, Canada
 W: www.exova.com



#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-4 Lot ID: 1226595

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222210

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVA Testing Advising	Billing Informa	tion:		Copy of	Report To	3)	7	Ŧ						RUSI	H Priority	
Actising	Company	Town of Inu	<i>i</i> ik	Company			- Edn								section, client accepts that	
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	03-1	03rd	Ave	nue					surcharges will be	e applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0		Edmo	ontor	1, AB 1	T5S 1	J4					Date Required		
Project ID S.N.P. 0036-4	Attention	Rick Campb	ell	Attention	Rich	ard	Feild	len						As Indicated	All Analysis	
Project Name	Phone	(867) 777-86	515	Phone	(780	) 48	38-68	00						When "ASAP" is re	quested, turn around will	
Project Location Pit N/W of dump	Cell	(867) 678-53	888	Cell										default to a 100% RUSH priority, with pricing ar turn around time to match. Please contact the I prior to submitting RUSH samples		
Legal Location	Fax	(867) 777-86	501	Fax	(780	) 48	38-21	21								
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	feilde	n@a	ecom	.com			prior to submitting ROSH samples			
Proj. Acct.Code	Agreement ID	2909												Signature		
	Copy of Report			Copy of it	nvoice									Sample Cust	ody (please print)	
Report Results X E-Mail	Online	PDF		QA/QC R	eport									Sampled by: J	im Crawford	
Mail x	Fax	Excel												Company To	own of Inuvik	
Special Instructions/Comments (please from above).	include contact inf	ormation inclu	ding ph. # if different	Indicate Reg		S									to proceed with the work	
	1			Requiremen	ts below	Containers								SALUE OF THE PARTY	d on this form:	
Sampler: Circle Project ID Below and no SNP3 Lagoon - SNP4 Mt.B W - SNP5 M						Cont							l	Date: Sept.13/2017	Initial: J.S.	
SNP6 GatePond - SNP7 FarPond - SNF						φ								Date/Time stamp:	for Lab use only	
Raw Water						ber								SEP 14 PM 12	.40	
Temp C, precip, Wind dir Ve	lkm/h					Number	П									
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	-							_	Indicate below any condition of sample		
1 Oil and Greece preservative	snp-0036-4	1	Sept.13/2017		Dip	+	$\vdash$		ТТ	Т-	П	Т	Т		Were Exova supplies	
2 Routine	snp-0036-4		Sept.13/2017		Dip	T				-					used?	
3 Nutrients + preservatives	snp-0036-4		Sept.13/2017		Dip	T					$\vdash$				Was there any damage	
4 Microbiology	snp-0036-4		Sept.13/2017		Dip	Г							П		to the shipping container?	
5 Phenol + preservatives	snp-0036-4		Sept.13/2017		Dip								П			
6 Mercury	snp-0036-4		Sept.13/2017		Dip	П									Were the containers	
7 B.O.D.	snp-0036-4		Sept.13/2017		Dip		П						П		packaged well?	
8 Metals + preservatives	snp-0036-4		Sept.13/2017		Dip	Г							П		7	
9						Г									Were the expected	
10															number of samples received (document	
11															below)?	
12																
13	4														Are samples within	
14															recommended holding times/temp?	
15					1											
Environmental	Sample Inforr	nation She	et	Lot: 122	6505	coc	:				Shipp	ing:		# and size of coolers re	eceived:	
Note: Proper completion of this f	orm is required in o	order to procee	ed with analysis								COD	Y/N				
Please indicate any	potentially ha	zordous sa	imples								Coole	er temp	o:	Delivery Method:	Court	
	Control #	+									1	. 0		Waybill:		
Page 1 of 1	501111017	E:										. 0		Received by:		

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Lot ID: 1204927

May 30, 2017

Jun 6, 2017

Control Number:

Date Received:

Date Reported:

Report Number: 2194077

#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-5

2 Firth Street Name: E.C.W.T.P. Inuvik, NT, Canada Location: Pit. S/E dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: rcampbell@town.inuvik.nt.ca	On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Jason Casault AECOM - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 486-7050 Fax: (780) 486-7070 Email: Jason.Casault@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Merge Reports  On [Report Approval] send  (Test Report, COC) by Email - Merge Reports
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

#### **Notes To Clients:**

- Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.
- Sample 1204927-1; 5729728 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

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Nominal Detection

# **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1204927

Box 1160

2 Firth Street

ID: SNP 0036-5 E.C.W.T.P. Name:

Pit. S/E dump

100104

Control Number:

Date Received: May 30, 2017

Inuvik, NT, Canada

Location:

Date Reported:

Jun 6, 2017

X0E 0T0

LSD:

Attn: Rick Campbell

P.O.: Acct code: Report Number: 2194077

Sampled By: Jim Crawford

Company: Town of Inuvik

**Reference Number** 

1204927-1

Sample Date

May 29, 2017

Sample Time

NA

Water

**Sample Location** 

**Sample Description** snp-0036-5 / 5°C

Matrix

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	5			4
Phenol		mg/L	0.001			0.001
Oil and Grease	Total	mg/L	<5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	Parameters					
Phosphorus	Total	mg/L	0.21			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.11			0.02
Calcium	Total	mg/L	31.8			0.2
Iron	Total	mg/L	1.23			0.05
Magnesium	Total	mg/L	11.3			0.2
Manganese	Total	mg/L	0.278			0.005
Potassium	Total	mg/L	3.4			0.4
Silicon	Total	mg/L	1.37			0.05
Sodium	Total	mg/L	12.3			0.4
Sulfur	Total	mg/L	24.6			0.3
Mercury	Total	mg/L	0.000006			0.000005
Antimony	Total	mg/L	0.0002			0.0002
Arsenic	Total	mg/L	0.0016			0.0002
Barium	Total	mg/L	0.043			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	< 0.0005			0.0005
Boron	Total	mg/L	0.022			0.002
Cadmium	Total	mg/L	0.00006			0.00001
Chromium	Total	mg/L	< 0.0005			0.0005
Cobalt	Total	mg/L	0.0005			0.0001
Copper	Total	mg/L	0.002			0.001
Lead	Total	mg/L	0.0002			0.0001
Lithium	Total	mg/L	0.005			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0023			0.0005
Selenium	Total	mg/L	< 0.0002			0.0002
Silver	Total	mg/L	<0.0001			0.00001

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#### **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1204927

Box 1160

ID:

SNP 0036-5

100104

Control Number:

2 Firth Street Inuvik, NT, Canada

E.C.W.T.P. Name: Location: Pit. S/E dump

Date Received: May 30, 2017 Date Reported: Jun 6, 2017

X0E 0T0

LSD: Attn: Rick Campbell P.O.: Report Number: 2194077

Sampled By: Jim Crawford

Acct code:

Company: Town of Inuvik

**Reference Number** 

1204927-1

Sample Date Sample Time May 29, 2017 NA

**Sample Location Sample Description** 

snp-0036-5 / 5°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						-
Strontium	Total	mg/L	0.090			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0015			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0014			0.0001
Zinc	Total	mg/L	0.017			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	<b>;</b>					
Total Coliforms	Membrane Filtration	CFU/100 mL	78			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	29			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	9			2
Routine Water						
рН			7.74			
Electrical Conductivity	at 25 °C	μS/cm	292			1
Calcium	Extractable	mg/L	30.7			0.2
Magnesium	Extractable	mg/L	10.9			0.2
Sodium	Extractable	mg/L	12.0			0.4
Potassium	Extractable	mg/L	3.2			0.4
Sulfate (SO4)	Dissolved	mg/L	68.6			0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

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# **Methodology and Notes**

Bill To: Town of Inuvik

Project:

Lot ID: 1204927

Box 1160 2 Firth Street ID: Name: SNP 0036-5 E.C.W.T.P. Pit. S/E dump

100104

Date Received: May 30, 2017

Inuvik, NT, Canada

Location: LSD:

Acct code:

Date Reported: Jun 6, 2017

Control Number:

X0E 0T0 Attn: Rick Campbell

P.O.:

Report Number: 2194077

Sampled By: Jim Crawford

Company: Town of Inuvik

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	01-Jun-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	01-Jun-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	31-May-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	31-May-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	31-May-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	31-May-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	30-May-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	31-May-17	Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	01-Jun-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	02-Jun-17	Exova Edmonton

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

**EPA** Environmental Protection Agency Test Methods - US **US EPA** US Environmental Protection Agency Test Methods

#### Comments:

• Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.

\* Reference Method Modified

• Sample 1204927-1; 5729728 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 W: www.exova.com



Lot ID: 1204927

Date Received: May 30, 2017

Date Reported: Jun 6, 2017

Report Number: 2194077

Control Number:

# **Methodology and Notes**

Bill To: Town of Inuvik Project:

 Box 1160
 ID:
 SNP 0036-5

 2 Firth Street
 Name:
 E.C.W.T.P.

Inuvik, NT, Canada Location: Pit. S/E dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

Address Box 1160 2 Firth Street Inuvik, NT X0E 0T0  Project ID Project ID Project Name snp-0036-5 Project Location Project Lo	Evova line Testing	Billing Informat	ion:		Copy of	Report To	:							ψħ,	RUS	H Priority
Project Information Project ID P	EXOVA Advising	Company	Town of Inuv	rik	Compan	y Aec	om -	- Ed	mor	nton					Upon filling out this	section, client accepts that
Perject ID Project Name anno-038-5 Project Location E.C.W.T.P. Cell (867) 678-838 Cell (867) 678-838 Cell (867) 778-8015 Project Location E.C.W.T.P. Cell (867) 678-838 Cell (867) 778-8016 E-mail Campbell@town inuvik.nt.ca Agreement ID 2009 Report Results X Mail Nation Place   Pope   ope   Pope   Pope   Pope   Pope   Pope   Pope   Pope   Pope	www.exova.com	Address	Box 1160 2 F	Firth Street	Address	1720	03-1	103r	d Av	enu	е				surcharges will be	e applied to the analysis
Project Location E.C.W.T.P. Cell (867) 777-8615 Project Location E.C.W.T.P. Cell (867) 777-8615 Project Location E.C.W.T.P. Cell (867) 777-8615 Project Location E.C.W.T.P. Cell (867) 777-8615 Project Location E.C.W.T.P. Cell (867) 777-8615 Project Location E.C.W.T.P. Cell (867) 777-8610 Proj. Acc.Code Proj. Acc.Code Proj. Acc.Code Proj. Acc.Code Report Results Res	Project Information		Inuvik, NT X	0E 0T0		Edmo	ontor	n, AB	T5S	1J4					Date Required	
Project Location E.G.W.T.P. Legal Location P.P. S./E d.t.m.P. Legal Location P.P. S./E d.t.m.P. Project Code  Report Results X  Report Results X  Report Results X  Sepecial Instructions Comments (please include contact information including ph. # if different from above).  Special Instructions Comments (please include contact information including ph. # if different from above).  Shape Categora S.NP FarPand - S.NPS Twind.  Sample Clicke Project ID Below and note weather:  SNP2 Lagoan - SNPA Mt.B W - SNPS Mt.B E  SNP2 Lagoan - SNPA Mt.B W - SNPS Mt.B E  SNP2 Lagoan - SNPA Mt.B W - SNPS Twind.  Sample Identification Location Depth in mm DaterTime sampled Matrix Sampling method  I B.O.D.  SnP-0036-5  May 29/2017  Dipl Note The Snew August Wind Matrix Sampling method  I Routine Servatives " " " " " " " " " " " " " " " " " " "	Project ID	Attention	Rick Campbe	ell	Attention	Rich	ard	Fei	lden						As Indicated	All Analysis
Project Location P. P. L. S./F. d. Lun-y Proj. Act Code Proj. Act	Project Name snp-0036-5	Phone	(867) 777-86	15	Phone	(780	) 48	38-6	800						When "ASAP" is re	equested turn around will
Price   Pric	Project Location E.C.W.T.P.	Cell	(867) 678-53	88	Cell											
PO/AFE# 100104 E-mail reambeli@town.inuvik.nt.ca Agreement ID 2909 Copy of Report Report Results X E-Mail Nolline PDF Excel PD	Legal Location P.L. S/F dump	Fax	(867) 777-86	01	Fax	(780	) 48	88-2	121							그리고 보는 것이 없는 그는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없다.
Report Results   X   E-Mail   Online   PDF   QA/CR Report   Sample Custody (please print)   Sample day. Jim Crawford   Sampled by Jim Crawford   Sampled by Jim Crawford   Town above). Special Instructions/Comments (please include contact information including ph. # if different from above). Sampler: Circle Project ID Below and note weather:  SAMP Jagoon - SNP4 Mit B W - SNP5 Mit. B E   SNP3 Lagoon - SNP5 Mit. B E   SNP3 Lagoon - SNP6 Mit. B E   SNP4 Lagoon - SNP6 Mit. B E   SNP5 Lagoon - SNP6 Mit. B E   SNP5 Lagoon - SNP6 Mit. B E   SNP6 Lagoon - SNP6 Mit. B La	PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	feild	en@	)aec	om.	com			prior to submi	tung Room samples
Report Results   E-Mail   Online   PDF   Excel   Sempled by:   Jim Crawford   Sepecial Instructions/Comments (please include contact information including ph. # if different from above).  Sampler Circle Project ID Below and note weather:  SMPS Lagoon - SNP4 Mt.B W - SNP5 Mt.B E  SNP6 SatePord - SNP5 Princh - SNP5 Wind.  Raw Water   Temp   C, precip   Wind dir Vel   km/h   Date/Time sampled   Matrix   Sampling method   Indicate the dise wany deficiencies in the condition of samples:  1 B.O.D.   Snp-0036_5   May 29/2017   Dip   User Time sampled   Matrix   Sampling method   User Time sampled   Matrix   Sampling method   User Time sampled   Matrix   Sampling method   User Time sampled   Wind time samples   User Time sampled   Wind time samples   User Time sampled   Wind time samples   User Time sampled   Wind time samples   User Time sam	Proj. Acct.Code	Agreement ID	2909												Signature	
Report Results   Mail   X   Fax   Excel   Exce		Copy of Report			Copy of i	nvoice									Sample Cust	tody (please print)
Special Instructions/Comments (please include contact information including ph. # if different from above).  Sampler: Circle Project ID Below and note weather:  ShPS Lagoon - SNP4 Mt.B W - SNP5 Mt.B E  ShPS GatePond - SNP5 TarPond - SNP8 TwinL  Raw Water  Temp_ C, precipWind dirvelkm/h  Location	Report Results X E-Mail	Online	PDF		QA/QC F	Report					1	П		1 1	Sampled by: J	im Crawford
from above).  Sampler: Circle Project ID Below and note weather:  SAPP Gagon - SNPA Mt.B W - SNP5 Mt.B E  SNPG GatePond - SNP7 FarPond - SNP8 TwinL  Requirements below  SAPP Cappon - SNPA Mt.B W - SNP5 Mt.B E  SNPG GatePond - SNP7 FarPond - SNP8 TwinL  Sample Identification  Location  Depth in cm m Date/Time sampled  Matrix Sampling in cm in cm m Date/Time sampled  Matrix Sampling in cm	Mail x	3.3-2-2	AND 10 10 10 10 10 10 10 10 10 10 10 10 10				1							1 1	Company To	own of Inuvik
SNP6 GatePond - SNP7 FarPond - SNP8 TwinL  Raw Water  Temp _ C, precip _ Wind dir _ Vel _ km/h  Sample Identification	from above).	nclude contact info	ormation includ	ding ph. # if different			iners									- grant and a second
SNP6 GatePond - SNP7 FarPond - SNP8 TwinL  Raw Water  Temp _ C, precip _ Wind dir _ Vel _ km/h  Sample Identification							onta								Date. May29/2017	Initial: J.S.
Raw Water Temp_C, precip, Wind dirVelkm/h  Sample Identification  Location  Depth in cm m  Date/Time sampled  Matrix  Sampling method  Indicate Below any deficiencies in the condition of samples:  I B.O.D.  Snp-0036-5  May.29/2017  Dip  Were Exova supplies  used?  Was there any danage to condition of samples:  Were Exova supplies  used?  Was there any danage to condition of samples:  Were Exova supplies  used?  Was there any danage to the shipping  container?  Indicate Below any deficiencies in the condition of samples:  Were Exova supplies  used?  Was there any danage to the shipping  container?  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of samples:  Indicate Below any deficiencies in the condition of the samples with the condition of the samples with the condition of the samples with an alysis  Indicate Below any deficiencies in the condition of the samples with an alysis  Indicate Below any deficiencies in the condition of the samples with the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the samples with an alysis and the condition of the sam					ļ -									1 1		for Lab use only
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Sample identification   Location   in cm m   Date/ lime sampled   Matrix   method	TempC, precip, wind dirvel	km/n		~			-	H		_					110ay 29	//7
2 Oil & Grease + preservatives " " " " " Was there any damage to the shipping container?  5 Nutrients + preservatives " " " " Were the containers packaged well?  6 Metals + preservatives " " " " Were the containers packaged well?  7 Phenol + preservatives " " " " Were the containers packaged well?  8 Were the containers packaged well?  8 Were the containers packaged well?  10 Were the expected quumber of samples received (document below)?  11 Are samples within recommended holding times/temp?  12 Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control # Waybill:  Control # Waybill:  Waybill:	Sample Identification	Location	100000000000000000000000000000000000000	Date/Time sample	d Matrix		1 ↓									
2 Oil & Grease + preservatives " " " " Was there any damage to the shipping container?  Nutrients + preservatives " " " " Were the containers packaged well?  Phenol + preservatives " " " " Were the containers packaged well?  Were the containers packaged well?  Were the expected number of samples received (document below)?  Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control # Was there any damage to the shipping to the shipping to the shipping to the shipping container?  Were the containers packaged well?  Were the expected number of samples received (document below)?  Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control # Waybili:  Was there any damage to the shipping to	1 B.O.D.	snp-0036-5		May.29/2017		Dip										
4 Routine " " " " Control # A Routine " " Control # A Routine " " " The shipping container?  5 Nutrients + preservatives " " " " The shipping container?  6 Metals + preservatives " " " The shipping container?  7 Phenol + preservatives " " " The shipping container?  8 Were the containers packaged well?  8 Were the containers packaged well?  9 Were the expected number of samples received (document below)?  10 below)?  11 below)?  12 Are samples within recommended holding times/temp?  13 Are samples within the shipping container?  14 The shipping container?  15 Shipping: Shipping: COD YN  Cooler temp:  16 Delivery Method: Switch analysis  17 Cooler temp:  18 Delivery Method: Switch analysis  19 Cooler temp:  10 Delivery Method: Switch analysis  10 Delivery Method: Switch analysis  11 Delivery Method: Switch analysis  12 Delivery Method: Switch analysis  13 Delivery Method: Switch analysis  15 Delivery Method: Switch analysis  16 Delivery Method: Switch analysis  17 Delivery Method: Switch analysis  18 Delivery Method: Switch analysis  19 Delivery Method: Switch analysis  10 Delivery Method: Switch analysis  10 Delivery Method: Switch analysis  10 Delivery Method: Switch analysis	2 Oil & Grease + preservatives			u		"										
4 Routine " " " " " " " " " " " " " " " " " " "	3 Microbiology			"		n										
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Were the expected number of samples received (document below)?    10				₩.			L				_			11		
10 11 12 13 14 15 Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis Please indicate any potentially hazordous samples  Control #  Control #  In mumber of samples received (document below)?  Are samples within recommended holding times/temp?  Shipping: COD Y/N HAY 30 PM12:05  Cooler temp: Delivery Method: Waybill:							_			_			$\perp$			
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12 13 14 15  Environmental Sample Information Sheet Note: Proper completion of this form is required in order to proceed with analysis Please indicate any potentially hazordous samples  Control #  Control #  Are samples within recommended holding times/temp?  Shipping: COD Y/N  MAY 30 Px12:05  Cooler temp: Delivery Method: Waybill:							⊢	L		+	_	+	_	11		Contract of the second second
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Environmental Sample Information Sheet  Note: Proper completion of this form is required in order to proceed with analysis  Please indicate any potentially hazordous samples  Control #  Control #  Environmental Sample Information Sheet  Lot: 1204927 COC  COD Y/N  Cooler temp:  Delivery Method:  Waybill:	13					-		$\vdash$	-	-	+		+	+	<b>_</b>	
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Lot ID: 1211381

2202329

Report Number:

# **Report Transmission Cover Page**

Company: Town of Inuvik

Bill To: Town of Inuvik Project:

> Box 1160 ID: SNP 0036-5

Control Number: 2 Firth Street Name:

Date Received: Jun 29, 2017 Inuvik, NT, Canada Location: pond S/E of dump Date Reported: Jul 6, 2017

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Contact & Affiliation Address **Delivery Commitments** Rick Campbell 2 Firth Street, Box 1160 On [Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (COC, Test Report) by Email - Merge Reports Phone: (867) 777-8615 On [Lot Approval and Final Test Report Approval] send Fax: (867) 777-8601 (Invoice) by Email - Single Report Email: rcampbell@town.inuvik.nt.ca Utilidor 2 Firth Street, Box 1160 On [Lot Approval and Final Test Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (Invoice) by Email - Single Report Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca Kim Wainman 2 Firth Street, Box 1160 On [Lot Approval and Final Test Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (Invoice) by Email - Single Report Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca Jason Casault 101, 18817 Stony Plain Road On [Lot Verification] send AECOM - Edmonton Edmonton, Alberta T5S 0C2 (COA, COC) by Email - Merge Reports Phone: (780) 486-7050 On [Report Approval] send Fax: (780) 486-7070 (COC, Test Report) by Email - Merge Reports Email: Jason.Casault@aecom.com Richard Feilden 17203 - 103 Avenue On [Report Approval] send AECOM - Edmonton Edmonton, Alberta T5S 1J4 (COC, Test Report) by Email - Merge Reports Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com

#### **Notes To Clients:**

• Sample 1211381-1; 5762410 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

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#### **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1211381

Box 1160

ID: Name:

Control Number:

2 Firth Street Inuvik, NT, Canada

SNP 0036-5

pond S/E of dump

Date Received: Jun 29, 2017

X0E 0T0

Location: LSD:

Date Reported: Jul 6, 2017

Attn: Rick Campbell

P.O.:

Report Number: 2202329

Sampled By: Justin Simms

Company: Town of Inuvik

100104

Acct code:

**Reference Number** 

1211381-1

Sample Date

Jun 28, 2017

Sample Time

NA

Sample Location

Sample Description snp-0036-5 / 5.9°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol	<b>T</b>	mg/L	<0.001			0.001
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P						
Phosphorus	Total	mg/L	0.13			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.10			0.02
Calcium .	Total	mg/L	41.2			0.2
Iron	Total	mg/L	0.80			0.05
Magnesium	Total	mg/L	15.0			0.2
Manganese	Total	mg/L	0.062			0.005
Potassium	Total	mg/L	3.5			0.4
Silicon	Total	mg/L	0.31			0.05
Sodium	Total	mg/L	16.5			0.4
Sulfur	Total	mg/L	32.9			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0017			0.0002
Barium	Total	mg/L	0.057			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.024			0.002
Cadmium	Total	mg/L	<0.00001			0.00001
Chromium	Total	mg/L	<0.0005			0.0005
Cobalt	Total	mg/L	0.0003			0.0001
Copper	Total	mg/L	0.001			0.001
Lead	Total	mg/L	0.0001			0.0001
Lithium	Total	mg/L	0.008			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0027			0.0005
Selenium	Total	mg/L	< 0.0002			0.0002
Silver	Total	mg/L	< 0.00001			0.00001



#### **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1211381

Jun 29, 2017

Box 1160

ID:

Control Number:

2 Firth Street

Inuvik, NT, Canada

Name:

Date Received: pond S/E of dump

X0E 0T0

Location: LSD:

Jul 6, 2017 Date Reported:

Attn: Rick Campbell

P.O.:

Sampled By: Justin Simms

Report Number: 2202329

Company: Town of Inuvik

Acct code:

**Reference Number** 

1211381-1 Jun 28, 2017

Sample Date Sample Time

NA

**Sample Location** 

**Sample Description** 

snp-0036-5 / 5.9°C

Matrix Water

SNP 0036-5

100104

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						-
Strontium	Total	mg/L	0.131			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0013			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0014			0.0001
Zinc	Total	mg/L	0.003			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis						
Total Coliforms	Membrane Filtration	CFU/100 mL	100			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	32			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	7			2
Routine Water						
рН			7.64			
Electrical Conductivity	at 25 °C	μS/cm	378			1
Calcium	Extractable	mg/L	40.5			0.2
Magnesium	Extractable	mg/L	14.9			0.2
Sodium	Extractable	mg/L	16.2			0.4
Potassium	Extractable	mg/L	3.4			0.4
Sulfate (SO4)	Dissolved	mg/L	94.9			0.9

Approved by:

Darlene Lintott, MSc Consulting Scientist

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Lot ID: 1211381

Date Reported: Jul 6, 2017

Report Number: 2202329

# **Methodology and Notes**

Company: Town of Inuvik

Bill To: Town of Inuvik Project:

Location:

SNP 0036-5 Box 1160 ID: Control Number:

2 Firth Street Name: Date Received: Jun 29, 2017 pond S/E of dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Inuvik, NT, Canada

Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	30-Jun-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	30-Jun-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	04-Jul-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	30-Jun-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	30-Jun-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	30-Jun-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP) Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP) Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	29-Jun-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	05-Jul-17	Exova Edmonton
Phosphorus - Total in Water	АРНА	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	05-Jul-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	05-Jul-17	Exova Edmonton

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US **US EPA** US Environmental Protection Agency Test Methods

#### Comments:

• Sample 1211381-1; 5762410 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 W: www.exova.com



Lot ID: 1211381

Date Received: Jun 29, 2017

Date Reported: Jul 6, 2017

Report Number: 2202329

Control Number:

# **Methodology and Notes**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-5

2 Firth Street Name:

Inuvik, NT, Canada Location: pond S/E of dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

EXOVA Testing Advising	Billing Informat	ion:		Copy of	Report To:									RUSI	l Priority
<b>EXOVO</b> Advising Assuring	Company	Town of Inux	<i>r</i> ik	Company	/ Aec	om -	- Edr	nonto	on						ection, client accepts that
www.exova.com	Address	Box 1160 2 I	Firth Street	Address	1720	03-1	03rd	Ave	nue					surcharges will be	applied to the analysis
Project Information		Inuvik, NT X	0E 0T0		Edmo	Edmonton, AB T5S 1J4								Date Required	
Project ID snp-0036-5	Attention	Rick Campb	ell	Attention	Attention Richard Feilden									As Indicated	All Analysis
Project Name	Phone	(867) 777-86	515	Phone	(780	) 48	8-68	00						When "ASAP" is re	quested, turn around will
Project Location pond S/E of dump	Cell	(867) 678-53	888	Cell										default to a 100% RUS	SH priority, with pricing and
Legal Location	Fax	(867) 777-86	601	Fax	(780	) 48	8-21	21						become a construction of account for example of the collision	tch. Please contact the lab ting RUSH samples
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	eilde	n@a	ecor	n.cor	<u>n</u>			prior to submit	ang Noon samples
Proj. Acct.Code	Agreement ID	2909												Signature	
	Copy of Report			Copy of i	nvoice										ody (please print)
Report Results X E-Mail	Online	PDF		QA/QC F	Report									Sampled by: Ju	ustin Simms
Mail x	Fax	Excel				1								Company To	wn of Inuvik
Special Instructions/Comments (please in from above).	clude contact info	ormation inclu	ding ph. # if different	Indicate Re Requirement		Containers									o proceed with the work I on this form:
Sampler: Circle Project ID Below and not	e weather:					ntai	11		1 1					Date: June.28/2017	Initial: J.S
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt	.B E					ပို	1	ľ	П					This section	for Lab use only
SNP6 GatePond - SNP7 FarPond - SNP8	3 TwinL					er of	11		1 1	-				Date/Time stamp:	A
Raw Water						Number			1 1					JUN 29 PM 12:0	tug.
Temp8_ C, precip95%_, Wind dir_N	NEVel_8_km	/h				ž				$\perp$					
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $								Indicate below any condition of sample	
1 B.O.D.	snp-0036-5		June.28/2017		Dip										Were Exova supplies used?
2 Oil and Greece preservatives	snp-0036-5		June.28/2017		Dip										used?
3 Microbiology	snp-0036-5		June.28/2017		Dip										Was there any damage to the shipping
4 Nutrients preservatives	snp-0036-5		June.28/2017		Dip										container?
5 Phenol preservatives	snp-0036-5		June.28/2017		Dip										
6 Mercury	snp-0036-5		June.28/2017		Dip										Were the containers packaged well?
7 Routine	snp-0036-5		June.28/2017		Dip										puokages trent
8 Metals preservatives	snp-0036-5		June.28/2017		Dip										
9						Ш									Were the expected number of samples
10						Ш									received (document
11															below)?
12						$\Box$									
13	Δ,					Ш									Are samples within recommended holding
14													1		times/temp?
15							1	_1_	1						
Environmental S				In Lot: 12		-						oping: D Y/N		# and size of coolers re	eceived:
Note: Proper completion of this fo						111				ı		ler ter		Delliner M. H. d	(
Please indicate any p	octentially na	zoraous sa	ampies										14/	Delivery Method:	(anun)
Dogo 1 of 1	Control #	<b>‡</b>				49 <b>8</b> 3		- 11		1	1		1	Waybill:	.1
Page 1 of 1												_		Received by:	V



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1214561

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Jul 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2206532

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

#### **Notes To Clients:**

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# **Analytical Report**

Bill To: Town of Inuvik

Project ID:

SNP 0036-5

Lot ID: 1214561

Box 1160

Project Name:

Proj. Acct. code:

Control Number:

2 Firth Street Inuvik, NT, Canada Project Location: Pond S/E of dump Date Received: Jul 14, 2017 Date Reported: Jul 21, 2017

X0E 0T0

LSD: P.O.:

100104 Report Number: 2206532

Attn: Rick Campbell

Sampled By: Dale Hvatum Company: Town of Inuvik

**Reference Number** 

1214561-1

Sample Date

Jul 13, 2017

Sample Time **Sample Location**  NA

Sample Description snp-0036-5 / 6.8°C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection
Aggregate Organic Co	onstituents				11000.110	Limit
Phenol		mg/L	<0.001			0.001
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required	3	No			
Inorganic Nonmetallic	, ,					
Phosphorus	Total	mg/L	0.10			0.05
Metals Dissolved		Ü				
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.06			0.02
Calcium	Total	mg/L	46.3			0.2
Iron	Total	mg/L	0.60			0.05
Magnesium	Total	mg/L	17.1			0.2
Manganese	Total	mg/L	0.046			0.005
Potassium	Total	mg/L	2.9			0.4
Silicon	Total	mg/L	0.21			0.05
Sodium	Total	mg/L	18.9			0.4
Sulfur	Total	mg/L	39.4			0.3
Mercury	Total	mg/L	0.000006			0.000005
Antimony	Total	mg/L	< 0.0002			0.0002
Arsenic	Total	mg/L	0.0016			0.0002
Barium	Total	mg/L	0.059			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	< 0.0005			0.0005
Boron	Total	mg/L	0.020			0.002
Cadmium	Total	mg/L	<0.0001			0.00001
Chromium	Total	mg/L	< 0.0005			0.0005
Cobalt	Total	mg/L	0.0003			0.0001
Copper	Total	mg/L	0.001			0.001
Lead	Total	mg/L	0.0001			0.0001
Lithium	Total	mg/L	0.009			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0026			0.0005
Selenium	Total	mg/L	<0.0002			0.0002
Silver	Total	mg/L	<0.00001			0.00001
Strontium	Total	mg/L	0.143			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0010			0.0005

# Page 2 of 4 **EXOVA**

#### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1214561

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Jul 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2206532

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Reference Number 1214561-1
Sample Date Jul 13, 2017
Sample Time NA

Sample Location
Sample Description snp-0036-5 / 6.8°C

Matrix Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0014			0.0001
Zinc	Total	mg/L	0.002			0.001
Zirconium	Total	mg/L	<0.001			0.001
<b>Microbiological Analysis</b>						
Total Coliforms	Membrane Filtration	CFU/100 mL	80			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<10			1
Physical and Aggregate F	Properties					
Solids	Total Suspended	mg/L	8			2
Routine Water						
рН			7.60			
Temperature of observed pH		°C	21.3			
Electrical Conductivity	at 25 °C	μS/cm	410			1
Calcium	Extractable	mg/L	43.7			0.2
Magnesium	Extractable	mg/L	16.7			0.2
Sodium	Extractable	mg/L	18.0			0.4
Potassium	Extractable	mg/L	2.7			0.4
Sulfate (SO4)	Dissolved	mg/L	113			0.9

Approved by:

Randy Neumann, BSc Vice President

RhDeunson

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Jul 21, 2017

Date Reported:

#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1214561

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Jul 14, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2206532

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 18-Jul-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 18-Jul-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 15-Jul-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 15-Jul-17 Exova Calgary Procedure, 9222 B
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold 17-Jul-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 17-Jul-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	* Inductively Coupled Plasma (ICP) 17-Jul-17 Exova Edmonton Method, 3120 B
Metals Trace (Extractable) in water	APHA	* Inductively Coupled Plasma (ICP) 17-Jul-17 Exova Edmonton Method, 3120 B
Metals Trace (Total) in water	APHA	* Inductively Coupled Plasma (ICP) 17-Jul-17 Exova Edmonton Method, 3120 B
Oil and Grease in water	US EPA	* n-Hexane Extractable Material and Silica 17-Jul-17 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
Phenol in water	APHA	* Direct Photometric Method, 5530 D 19-Jul-17 Exova Edmonton
Phosphorus - Total in Water	APHA	* Automated Ascorbic Acid Reduction 17-Jul-17 Exova Edmonton Method, 4500-P F
Solids Suspended (Total, Fixed and Volatile)	АРНА	* Total Suspended Solids Dried at 103- 17-Jul-17 Exova Edmonton 105'C, 2540 D

# \* Reference Method Modified References

APHA Standard Methods for the Examination of Water and Wastewater
APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### Comments:

Exova T: 4
7217 Roper Road NW F: 4
Edmonton, Alberta E: 1
T6B 3J4, Canada W: 7

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1214561

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Jul 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2206532

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

E	xova	Testing	Billing Informat	ion:	16.11	Copy of	Report To	Œ.						H	RUSH	Priority
	AUVU	Assuring	Company	Town of Inuv	<i>i</i> ik	Company	/ Aec	om -	Edmo	nton						ection, client accepts that
WW	w.exova.com		Address	Box 1160 2 F	Firth Street	Address	1720	03-10	3rd A	venue	9				surcharges will be	applied to the analysis
Pro	ject Informatio	on	ľ	Inuvik, NT X	0E 0T0		Edmo	onton,	AB T5	5 1J4					Date Required	
Pro	ject ID	snp 0036-5	Attention	Rick Campb	ell	Attention	Rich	ard F	eilde	1					As Indicated	All Analysis
Pro	ject Name		Phone	(867) 777-86	15	Phone	(780	) 488	3-6800	)					M/hon "ACAD" in son	uested, turn around will
Pro	ject Location	Pond S/E of dump	Cell	(867) 678-53	88	Cell										H priority, with pricing and
Leg	al Location		Fax	(867) 777-86	601	Fax	(780	) 488	3-2121							ch. Please contact the lab
PO	AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	ilden(	Daec	om.co	m			prior to submitti	ng RUSH samples
Pro	j. Acct.Code		Agreement ID	2909											Signature	
			Copy of Report			Copy of i	nvoice								Sample Custo	dy (please print)
R	port Results	x E-Mail	Online	PDF		QA/QC F	eport	П			TT				Sampled by: Da	ale Hvatum
	<i>*</i>	Mail x	Fax	Excel				IJ							Company Tov	n of Inuvik
		s/Comments (please in	clude contact info	rmation includ	ding ph. # if different	Indicate Re		g.							I authorize Exova to	proceed with the work
	n above).	1 12 1				Requiremen	ts below	Containers							indicated	on this form:
	•	oject ID Below and note						onte							Date: July.13/2017	Initial: J.S.
		IP4 Mt.B W - SNP5 Mt.						ofC							The second secon	or Lab use only
	v Water	SNP7 FarPond - SNP8	IWINL					Jer (						1	Date/Time stamp:	
1000		_71%, Wind dir NN	M Val 3 km	v/h	1			Number	i						JUL 14 PHI2:	53
101	npro_ o, precip	7_7 178, Willia dii 1414	VVVel3_kii				I	1 -			44				1-31	E 1 1 1 1 1
	Sample	Identification	Location	Depth in cm m	Date/Time sampled	d Matrix	Sampling method	↓							Indicate below any d condition of samples	
1	B.O.D.		snp-0036-5		July.13/2017		Dip							T		Were Exova supplies
2	Oil and Gree	ece preservatives	snp-0036-5		July.13/2017		Dip	П								used?
3	Microbiology	1	snp-0036-5		July.13/2017		Dip	П								Was there any damage
4	Nutrients	preservatives	snp-0036-5		July.13/2017		Dip	П								to the shipping container?
5	Phenol	preservatives	snp-0036-5		July.13/2017		Dip	П						$\top$		
6	Mercury		snp-0036-5		July.13/2017		Dip	П								Were the containers
7	Routine		snp-0036-5		July.13/2017		Dip	П								packaged well?
8	Metals	preservatives	snp-0036-5		July.13/2017		Dip	П			$\top$					
9																Were the expected
10								П								number of samples received (document
11								П								below)?
12			•					П			$\top$					
13																Are samples within
14								П						1		recommended holding times/temp?
15							3			1	$\top$					
		Environmental S	Sample Inform	ation She	et	Indicate 214	561 CC	C				Shi	pping:		# and size of coolers red	ceived:
	Note: Prope	er completion of this for				and the second second	-					co	D Y/N			~
		se indicate any p			mples							Cod	oler ten	ıp:	Delivery Method:	(one
						TILL I I III							6		Waybill:	
Pa	ge1_	of 1	Control #	r.	\ T								0,0	7	Received by:	



#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1221103

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215110

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

# **Notes To Clients:**

• Sample 1221103-1; 5810353 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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#### **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1221103

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Aug 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Aug 24, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2215110

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1221103-1 Sample Date August 16, 2017

Sample Time NA

Sample Location

Sample Description snp-0036-5 / 2.9°C

Sample Matrix Water

Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	stituents			
Biochemical Oxygen Demand	5 Day	mg/L	<4	4
Phenol		mg/L	0.001	0.001
Oil and Grease	Total	mg/L	<5	5
pH adjustment	adjustment required		No	
Inorganic Nonmetallic Pa	arameters			
Phosphorus	Total	mg/L	0.11	0.05
Metals Dissolved				
Subsample	Field Filtered		Lab Filtered	
Metals Total				
Aluminum	Total	mg/L	0.03	0.02
Calcium	Total	mg/L	41.8	0.2
Iron	Total	mg/L	0.73	0.05
Magnesium	Total	mg/L	16.4	0.2
Manganese	Total	mg/L	0.063	0.005
Potassium	Total	mg/L	2.4	0.4
Silicon	Total	mg/L	0.68	0.05
Sodium	Total	mg/L	18.6	0.4
Sulfur	Total	mg/L	1810	0.3
Mercury	Total	mg/L	<0.00005	0.000005
Antimony	Total	mg/L	<0.0002	0.0002
Arsenic	Total	mg/L	0.0020	0.0002
Barium	Total	mg/L	0.054	0.001
Beryllium	Total	mg/L	<0.0001	0.0001
Bismuth	Total	mg/L	<0.0005	0.0005
Boron	Total	mg/L	0.013	0.002
Cadmium	Total	mg/L	<0.0001	0.00001
Chromium	Total	mg/L	0.0008	0.0005
Cobalt	Total	mg/L	0.0003	0.0001
Copper	Total	mg/L	<0.001	0.001
Lead	Total	mg/L	0.0001	0.0001
Lithium	Total	mg/L	0.008	0.001
Molybdenum	Total	mg/L	<0.001	0.001
Nickel	Total	mg/L	0.0022	0.0005
Selenium	Total	mg/L	0.0004	0.0002
Silver	Total	mg/L	<0.0001	0.00001
Strontium	Total	mg/L	0.127	0.001
Thallium	Total	mg/L	<0.0005	0.00005
Tin	Total	mg/L	<0.001	0.001

# Page 2 of 4 **EXOVO**

#### **Analytical Report**

Lot ID: 1221103 Bill To: Town of Inuvik Project ID: SNP 0036-5

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Aug 17, 2017

Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017 100104 X0E 0T0 P.O.: Report Number: 2215110

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Town of Inuvik Company:

> **Reference Number** 1221103-1 Sample Date August 16, 2017

Sample Time

**Sample Location** 

Sample Description snp-0036-5 / 2.9°C

> Sample Matrix Water

	:	Sample Matrix vvate	<b>9</b> F	
Analyte		Units	Result	Nominal Detection Limit
Metals Total - Continued				
Titanium	Total	mg/L	0.0223	0.0005
Uranium	Total	mg/L	<0.0005	0.0005
Vanadium	Total	mg/L	0.0014	0.0001
Zinc	Total	mg/L	0.002	0.001
Zirconium	Total	mg/L	<0.001	0.001
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	30	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	16	1
Physical and Aggregate F	Properties			
Solids	Total Suspended	mg/L	2	2
Routine Water				
рН			7.21	
<b>Electrical Conductivity</b>	at 25 °C	μS/cm	407	1
Calcium	Extractable	mg/L	42.2	0.2
Magnesium	Extractable	mg/L	16.5	0.2
Sodium	Extractable	mg/L	18.2	0.4
Potassium	Extractable	mg/L	2.5	0.4
Sulfate (SO4)	Dissolved	mg/L	108	0.9

Approved by:

Darlene Lintott, MSc Consulting Scientist

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



#### **Methodology and Notes**

Lot ID: 1221103 Bill To: Town of Inuvik Project ID: SNP 0036-5

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Aug 17, 2017 Date Reported: Aug 24, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2215110

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 17-Aug-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 17-Aug-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 18-Aug-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 18-Aug-17 Exova Calgary Procedure, 9222 B
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold 18-Aug-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 18-Aug-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>
Oil and Grease in water	US EPA	<ul> <li>* n-Hexane Extractable Material and Silica 17-Aug-17 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>
Phenol in water	APHA	* Direct Photometric Method, 5530 D 17-Aug-17 Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction 17-Aug-17 Exova Edmonton Method, 4500-P F</li> </ul>
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103-</li> <li>21-Aug-17</li> <li>Exova Edmonton</li> <li>105'C, 2540 D</li> </ul>
		* Reference Method Modified

#### References

**APHA** Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

Environmental Protection Agency Test Methods - US **EPA US EPA** US Environmental Protection Agency Test Methods

#### Comments:

• Sample 1221103-1; 5810353 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

 Exova
 T:

 7217 Roper Road NW
 F:

 Edmonton, Alberta
 E:

 T6B 3J4, Canada
 W:

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



#### **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1221103

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215110

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

EXOVA Testing Advising	Billing Informat	ion:		Copy of F	Report To	:							RUSH	l Priority
Assuring	Company	Town of Inuv	vik	Company	Aec	om -	Edmo	nton						ection, client accepts that
www.exova.com	Address	Box 1160 2	Firth Street	Address	172	03-10	3rd A	venu	Э				surcharges will be	applied to the analysis
Project Information		Inuvik, NT X	OE 0T0		Edmonton, AB T5S 1J4							Date Required		
Project ID snp-0036-5	Attention	n Rick Campbell		Attention	Rich	Richard Feilden						As Indicated	All Analysis	
Project Name	Phone	ne (867) 777-8615		Phone	Phone (780) 488-6800							When "ASAP" is requested, turn around will		
Project Location Pond S/E of dump	Cell	(867) 678-53	388	Cell									default to a 100% RUS	SH priority, with pricing and
Legal Location	Fax	(867) 777-86	601	Fax	(780	) 488	3-2121							tch. Please contact the lab ling RUSH samples
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	E-mail richard.feilden@aecom.com						L	A Code Code and Code and Code Code Code Code Code Code Code Cod		
Proj. Acct.Code	Agreement ID	2909		1 1									Signature	
	Copy of Report			Copy of in	voice			-				_[	Sample Custo	ody (please print)
Report Results × E-Mail	Online	PDF		QA/QC R	eport								Sampled by: Jit	m Crawford
Mail x	Fax	Excel				11							Company Tov	wn of Inuvik
Special Instructions/Comments (please i from above).	nclude contact info	ormation inclu	ding ph. # if different	Indicate Reg Requirement		Containers								o proceed with the work I on this form:
Sampler: Circle Project ID Below and no						ntai				11			Date: Aug.16/2017	Initial: J.S
SNP3 Lagoon - SNP4 Mt.B W - SNP5 M														for Lab use only
SNP6 GatePond - SNP7 FarPond - SNP	8 TwinL					er o							Date/Time stamp:	
Raw Water	descourse					Number of				1 1			AUG 17 PH12:	35
Temp	km/h					+ +						Ц		
Sample Identification	Location	Depth in cm m	Date/Time sampled	Matrix	Sampling method	" ↓							Indicate below any o condition of samples	
1 B.O.D.	snp-0036-5		Aug.16/2017		Dip									Were Exova supplies
2 nutrients + preservatives	snp-0036-5		Aug.16/2017		Dip									used?
3 oil & Greece + preservatives	snp-0036-5		Aug.16/2017		Dip						200			Was there any damage
4 metals + preservatives	snp-0036-5	E.	Aug.16/2017		Dip									to the shipping container?
5 phenol + preservatives	snp-0036-5		Aug.16/2017		Dip	Ш								
6 microbiology	snp-0036-5		Aug.16/2017		Dip	Ш								Were the containers packaged well?
7 mercury	snp-0036-5		Aug.16/2017		Dip	$\sqcup$		-						packaged Well 1
8 routine	snp-0036-5		Aug.16/2017		Dip									
9						Ш								Were the expected number of samples
10						Ш								received (document
11						Ш								below)?
12						Ш								
13						Ш			$\perp$			Ш		Are samples within recommended holding
14						Ш				$\perp$			H	times/temp?
15				, 1	1		•							
Environmental  Note: Proper completion of this for			et analysis	Lot: 122	1103	coc			•	Ship	ping: Y/N	ľ	# and size of coolers re	ceived:
Please indicate any			ou with analysis							Coo	er temp	);	Delivery Method:	Courier
*		V <sup>a</sup>				Cooler temp:						Waybill:		
Page 1 of 1	Control #			111 111 111	2.						Received by:			
														141



#### **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1226587

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222202

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

# **Notes To Clients:**

- Due to interference, Total Phosphorus for sample 1226587-1 was reported at a dilution.
- Sample 1226587-1; 5838063 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1226587

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222202

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226587-1 Sample Date Sep 13, 2017 Sample Time NA

Sample Location

Sample Description SNP-0036-5 / 4.0°C

Analysta		Unita	Water	Danulta	Danulta	Nominal Detection
Analyte		Units	Results	Results	Results	Limit
Aggregate Organic Con						
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol	Tatal	mg/L	0.001			0.001
Oil and Grease	Total	mg/L	5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P		/I	0.0			0.05
Phosphorus  Metals Dissolved	Total	mg/L	<0.3			0.05
	Field Filtered		Lab Filtarad			
Subsample Matala Tatal	rieia riilerea		Lab Filtered			
Metals Total Aluminum	Tatal	/I	0.00			0.00
	Total	mg/L	0.08			0.02
Calcium	Total	mg/L	49.3			0.2
Iron	Total	mg/L	0.73			0.05
Magnesium	Total	mg/L	19.6			0.2
Manganese	Total	mg/L	0.060			0.005
Potassium	Total	mg/L	2.0			0.4
Silicon	Total	mg/L	0.56			0.05
Sodium	Total	mg/L	20.2			0.4
Sulfur	Total	mg/L	1880			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0017			0.0002
Barium	Total	mg/L	0.062			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	0.0007			0.0005
Boron	Total	mg/L	0.017			0.002
Cadmium	Total	mg/L	<0.0001			0.00001
Chromium	Total	mg/L	0.0029			0.0005
Cobalt	Total	mg/L	0.0003			0.0001
Copper	Total	mg/L	0.002			0.001
Lead	Total	mg/L	0.0002			0.0001
Lithium	Total	mg/L	0.010			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0026			0.0005
Selenium	Total	mg/L	0.0004			0.0002
Silver	Total	mg/L	0.00002			0.00001
Strontium	Total	mg/L	0.149			0.001
Thallium	Total	mg/L	<0.00005			0.00005

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1226587

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222202

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

 Reference Number
 1226587-1

 Sample Date
 Sep 13, 2017

 Sample Time
 NA

Sample Location

Sample Description SNP-0036-5 / 4.0°C

Matrix Water

		Matrix	water			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0291			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0016			0.0001
Zinc	Total	mg/L	0.010			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	<b>;</b>					
Total Coliforms	Membrane Filtration	CFU/100 mL	<1			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<1			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	6			2
Routine Water						
рН			7.34			
Electrical Conductivity	at 25 °C	μS/cm	464			1
Calcium	Extractable	mg/L	47.1			0.2
Magnesium	Extractable	mg/L	18.8			0.2
Sodium	Extractable	mg/L	20.3			0.4
Potassium	Extractable	mg/L	2.0			0.4
Sulfate (SO4)	Dissolved	mg/L	143			0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

1226587 Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID:

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Sep 14, 2017 Date Reported: Sep 21, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2222202

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis			
Method Name	Reference	Method Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 18-Sep-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 18-Sep-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 15-Sep-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 15-Sep-17 Procedure, 9222 D	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 15-Sep-17 Procedure, 9222 B	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold 15-Sep-17</li> <li>Vapor Atomic Absorption Spec, 245.5</li> </ul>	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 15-Sep-17 Waters and Wastes by ICP-MS, 200.8	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>* n-Hexane Extractable Material and Silica 15-Sep-17</li> <li>Gel Treated n-Hexane Extractable</li> <li>Material by Extraction and Gravimetry,</li> <li>1664</li> </ul>	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D 15-Sep-17	Exova Edmonton
Phosphorus - Total in Water	APHA	* Automated Ascorbic Acid Reduction 14-Sep-17 Method, 4500-P F	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	Exova Edmonton

<sup>\*</sup> Reference Method Modified

### References

**APHA** Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

**EPA** Environmental Protection Agency Test Methods - US **US EPA** US Environmental Protection Agency Test Methods

### Comments:

- Due to interference, Total Phosphorus for sample 1226587-1 was reported at a dilution.
- Sample 1226587-1; 5838063 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.



# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-5 Lot ID: 1226587

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pond S/E of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222202

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

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EXOVA Advising	Company	Town of Inuv	⁄ik	Company	ompany Aecom - Edmonton						Upon filling out t	Upon filling out this section, client accepts that				
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	17203-103rd Avenue						surcharges w	ill be applied	d to the analysis		
Project Information		Inuvik, NT X	0E 0T0		Edmo	Edmonton, AB T5S 1J4						Date Require	ed			
Project ID snp-0036-5	Attention	Rick Campb	ell	Attention	Rich	ard	Feild	den					As Indicated	All	Analysis	
Project Name	Phone	(867) 777-86	315	Phone	(780	) 48	8-68	300					14/5 UA C A DU		4 V	
Project Location Pond S/E of dump	Cell (867) 678-5388			Cell									When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and			
Legal Location	Fax	(867) 777-86	601	Fax	(780	) 48	8-21	121						turn around time to match. Please contact the lat		
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail		-			aecoi	m.con	1		prior to su	bmitting RU	SH samples	
Proj. Acct.Code	Agreement ID	2909											Signature			
	Copy of Report			Copy of i	nvoice								Sample C	ustody (p	lease print)	
Banart Bassilta X E-Mail	Online	PDF		QA/QC F	eport	П							Sampled by:	Jim Cra	awford	
Report Results Mail x	Fax	Excel											Company	Town of Ir	nuvik	
Special Instructions/Comments (please in from above).	nclude contact info	rmation inclu	ding ph. # if different	Indicate Re		SIS								ova to proce	ed with the work	
Sampler: Circle Project ID Below and not	e weather:			Requiremen	is below	Containers							Date: Sept.13/201		-0.000 MMS	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 M	t.B E														ab use only	
SNP6 GatePond - SNP7 FarPond - SNP	8 TwinL					r of							Date/Time stam			
Raw Water						Number	1					1	SEP 14 PM12:40			
Temp C, precip, Wind dir Vel	km/h					Ž							15 = 15 555, 7 16/63	107		
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $							Indicate below a condition of san		ncies in the	
1 B.O.D.	snp-0036-5		Sept.13/2017s		Dip		T				TT	$\top$		and the state of	re Exova supplies	
2 Nutrients + preservatives	snp-0036-5		Sept.13/2017s		Dip									used	a?	
3 Oil n Greece + preservatives	snp-0036-5		Sept.13/2017s		Dip	П								125 783	s there any damage	
4 Phenol + preservatives	snp-0036-5		Sept.13/2017s		Dip	П									ne shipping tainer?	
5 Metals + preservatives	snp-0036-5		Sept.13/2017s		Dip											
6 Micrbiology	snp-0036-5		Sept.13/2017s		Dip										re the containers	
7 Mercury	snp-0036-5		Sept.13/2017s		Dip	П								paci	kaged well?	
8 Routine	snp-0036-5		Sept.13/2017s		Dip											
9															re the expected	
10															nber of samples eived (document	
11														belo	ow)?	
12																
13															samples within	
14															ommended holding es/temp?	
15				7	1	1	1	1								
Environmental Sample Information Sheet					26587	COC				***************************************	Shipp	ing:	# and size of coole	ers received:		
Note: Proper completion of this form is required in order to proceed with analysis								1821			COD	Y/N				
Please indicate any	potentially ha	zordous sa	amples									r temp:	Delivery Method	d: (	aurier	
ecc 0 (an a)	Control #	!		111 1 111	Cooler				F. 0							
							Received by:	Received by: W								



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-6 Lot ID: 1226606

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Gate Pond Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222223

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address						
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road						
		Edmonton, AB T5S 0C2						
		Phone: (780) 486-7050 Fax: (780) 486-7070						
		Email: Jason.Casault@aecom.com						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / COA						
Email - Merge Reports	PDF	COC / Test Report						
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: kwainman@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue						
		Edmonton, AB T5S 1J4						
		Phone: (780) 488-6800 Fax: (780) 488-2121						
		Email: richard.feilden@aecom.com						
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: rcampbell@town.inuvik.nt.ca						
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Email - Single Report	PDF	Invoice						
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-2607 Fax: (867) 777-2071						
		Email: utilidor@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						

### **Notes To Clients:**

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## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-6 Lot ID: 1226606

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Gate Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222223

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226606-1

Sample Date September 13, 2017

Sample Time N.

Sample Location

Sample Description snp-0036-6 / 4.0°C

Sample Matrix Water

		ampie watrix vvater		
Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Con	stituents			
Biochemical Oxygen Demand	5 Day	mg/L	<4	4
Phenol		mg/L	0.001	0.001
Oil and Grease	Total	mg/L	<5	5
pH adjustment	adjustment required		No	
Inorganic Nonmetallic F	Parameters			
Phosphorus	Total	mg/L	0.07	0.05
Metals Dissolved				
Subsample	Field Filtered		Lab Filtered	
Metals Total				
Aluminum	Total	mg/L	0.36	0.02
Calcium	Total	mg/L	229	0.2
Iron	Total	mg/L	0.78	0.05
Magnesium	Total	mg/L	65.4	0.2
Manganese	Total	mg/L	4.84	0.005
Potassium	Total	mg/L	9.1	0.4
Silicon	Total	mg/L	3.62	0.05
Sodium	Total	mg/L	62.1	0.4
Sulfur	Total	mg/L	206	0.3
Mercury	Total	mg/L	0.000011	0.00005
Antimony	Total	mg/L	<0.0002	0.0002
Arsenic	Total	mg/L	0.0006	0.0002
Barium	Total	mg/L	0.018	0.001
Beryllium	Total	mg/L	<0.0001	0.0001
Bismuth	Total	mg/L	<0.0005	0.0005
Boron	Total	mg/L	0.158	0.002
Cadmium	Total	mg/L	0.00005	0.00001
Chromium	Total	mg/L	0.0023	0.0005
Cobalt	Total	mg/L	0.0011	0.0001
Copper	Total	mg/L	0.001	0.001
Lead	Total	mg/L	0.0004	0.0001
Lithium	Total	mg/L	0.034	0.001
Molybdenum	Total	mg/L	<0.001	0.001
Nickel	Total	mg/L	0.0067	0.0005
Selenium	Total	mg/L	<0.0002	0.0002
Silver	Total	mg/L	<0.0001	0.00001
Strontium	Total	mg/L	0.892	0.001
Thallium	Total	mg/L	0.00007	0.00005
Tin	Total	mg/L	<0.001	0.001

# Page 2 of 4 **EXOVA**

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-6 Lot ID: 1226606

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Gate Pond Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222223

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226606-1

Sample Date September 13, 2017

Sample Time Sample Location

Sample Description snp-0036-6 / 4.0°C

Sample Matrix Water

	:	Sample Matrix vvate	er –	
Analyte		Units	Result	Nominal Detection Limit
Metals Total - Continued				
Titanium	Total	mg/L	0.0080	0.0005
Uranium	Total	mg/L	0.0013	0.0005
Vanadium	Total	mg/L	0.0009	0.0001
Zinc	Total	mg/L	0.005	0.001
Zirconium	Total	mg/L	<0.001	0.001
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	16	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	2	1
Physical and Aggregate F	Properties			
Solids	Total Suspended	mg/L	19	2
Routine Water				
рН			7.79	
<b>Electrical Conductivity</b>	at 25 °C	μS/cm	1600	1
Calcium	Extractable	mg/L	208	0.2
Magnesium	Extractable	mg/L	58.7	0.2
Sodium	Extractable	mg/L	59.8	0.4
Potassium	Extractable	mg/L	8.4	0.4
Sulfate (SO4)	Dissolved	mg/L	547	0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-6 Lot ID: 1226606

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Gate Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222223

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis		
Method Name	Reference	Method Date Analysis Location Started
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B 18-Sep-17 Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B 18-Sep-17 Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B 15-Sep-17 Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter 15-Sep-17 Exova Calgary Procedure, 9222 D
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter 15-Sep-17 Exova Calgary Procedure, 9222 B
Mercury (Total) in water	US EPA	* Determination of Hg in Sediment by Cold 15-Sep-17 Exova Edmonton Vapor Atomic Absorption Spec, 245.5
Metals ICP-MS (Total) in water	US EPA	* Determination of Trace Elements in 18-Sep-17 Exova Edmonton Waters and Wastes by ICP-MS, 200.8
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> <li>18-Sep-17 Exova Edmonton</li> </ul>
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> <li>18-Sep-17 Exova Edmonton</li> </ul>
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> <li>18-Sep-17 Exova Edmonton</li> </ul>
Oil and Grease in water	US EPA	* n-Hexane Extractable Material and Silica 15-Sep-17 Exova Edmonton Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664
Phenol in water	APHA	* Direct Photometric Method, 5530 D 15-Sep-17 Exova Edmonton
Phosphorus - Total in Water	APHA	* Automated Ascorbic Acid Reduction 14-Sep-17 Exova Edmonton Method, 4500-P F
Solids Suspended (Total, Fixed and Volatile)	APHA	* Total Suspended Solids Dried at 103- 15-Sep-17 Exova Edmonton 105'C, 2540 D

<sup>\*</sup> Reference Method Modified

### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

## **Comments:**



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-6 Lot ID: 1226606

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Gate Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222223

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

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														t		
Exave Testing	Billing Informat	ion:		Copy of	Report To	);								RUSH Priority		
EXOVA Advising	Company	Town of Inuv	rik	Company	y Aec	com -	Edm	onto	n					Upon filling out this se	ection, client accepts that	
www.exova.com	Address	Box 1160 2 F	Firth Street	Address	172	203-10	03rd	Aver	iue					surcharges will be	applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0	- 10 - 1	Edm	Edmonton, AB T5S 1J4					Date Required					
Project ID snp-0036-6	Attention	Rick Campb	ell	Attention	Ric	Richard Feilden						As Indicated	All Analysis			
Project Name	Phone	(867) 777-86	15	Phone	Phone (780) 488-6800									When "ASAP" is rec	wested turn around will	
Project Location Gate Pond	Cell	(867) 678-5388		Cell			13.							When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location	Fax	(867) 777-8601			Fax (780) 488-2121									tch. Please contact the lab ing RUSH samples		
PO/AFE# 100104	E-mail rcampbell@town.inuvik.nt.ca			E-mail	rich	ard.fe	eilder	n@a	econ	.con	1			prior to submitte	ing Koori samples	
Proj. Acct.Code	Agreement ID	2909												Signature		
	Copy of Report			Copy of i	nvoice									Sample Custo	ody (please print)	
Report Results × E-Mail	Online	PDF		QA/QC F	Report									Sampled by: Jir	m Crawford	
Mail x	Fax	Excel												Company Tov	vn of Inuvik	
Special Instructions/Comments (please in from above).	include contact information including ph. # if different		Indicate Re Requiremen		Containers									o proceed with the work on this form:		
Sampler: Circle Project ID Below and not	e weather:					ntail					H			Date: Sept.13/2017	Initial: J.S.	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt	.B E													This section f	or Lab use only	
SNP6 GatePond - SNP7 FarPond - SNP8	3 TwinL					io la					1 1			Date/Time stamp:		
Raw Water						Number of								SEP 14 PM12	2:41	
Temp C, precip, Wind dir Vel_	km/h		,		_	Ž										
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method									Indicate below any of condition of samples	the state of the s	
1 B.O.D.	snp-0036-6		Sept.13/2017		Dip								$\top$		Were Exova supplies	
2 Nutrients + preservatives	snp-0036-6		Sept.13/2017		Dip		+:								used?	
3 Oil n Greece + preservatives	snp-0036-6		Sept.13/2017		Dip	П									Was there any damage	
4 Phenol + preservatives	snp-0036-6		Sept.13/2017		Dip	П					$\Box$		Т	1	to the shipping container?	
5 Metals + preservatives	snp-0036-6		Sept.13/2017		Dip	П										
6 Microbiology	snp-0036-6		Sept.13/2017		Dip										Were the containers	
7 Mercury	snp-0036-6		Sept.13/2017		Dip										packaged well?	
8 Routine	snp-0036-6		Sept.13/2017		Dip											
9															Were the expected number of samples	
10															received (document	
11															below)?	
12 13																
13						100									Are samples within recommended holding	
14				ì				1	ΙĮ						times/temp?	
15																
Environmental S	Sample Inforn	nation She	et		6606	COC		5			- 22	ping:		# and size of coolers re	ceived:	
Note: Proper completion of this fo	The state of the second	A COLUMN BY S. P. STATE STORY	ed with analysis	Lot: 122	0000		1111				1,000,000	N/Y C				
Please indicate any p	ootentially ha	zordous sa	amples	Lot: 122		1 111 1					Coo	ler ter	np:	Delivery Method:	(guny	
	Control #	£									1	1.0		Waybill:	. /	
Page 1 of 1	3071017			1011111								Again S		Received by: 认	V	



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-7 Lot ID: 1226604

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Far Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222221

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address						
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road						
		Edmonton, AB T5S 0C2						
		Phone: (780) 486-7050 Fax: (780) 486-7070						
		Email: Jason.Casault@aecom.com						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / COA						
Email - Merge Reports	PDF	COC / Test Report						
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: kwainman@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue						
		Edmonton, AB T5S 1J4						
		Phone: (780) 488-6800 Fax: (780) 488-2121						
		Email: richard.feilden@aecom.com						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-8615 Fax: (867) 777-8601						
		Email: rcampbell@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Merge Reports	PDF	COC / Test Report						
Email - Single Report	PDF	Invoice						
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street						
		Inuvik, NT X0E 0T0						
		Phone: (867) 777-2607 Fax: (867) 777-2071						
		Email: utilidor@town.inuvik.nt.ca						
Delivery	<u>Format</u>	<u>Deliverables</u>						
Email - Single Report	PDF	Invoice						

# **Notes To Clients:**

• Sample 1226604-1; 5838105 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Analytical Report**

 Bill To:
 Town of Inuvik
 Project ID:
 SNP 0036-7
 Lot ID:
 1226604

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Far Pond Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222221

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226604-1
Sample Date Sep 13, 2017
Sample Time NA

Sample Location

Sample Description SNP-0036-7 / 4.0°C

		Matrix	Water			Nominal Detection
Analyte		Units	Results	Results	Results	Limit
Aggregate Organic Con						
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol	Taral	mg/L	<0.001			0.001
Oil and Grease	Total	mg/L	<5 N			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P			0.05			0.05
Phosphorus	Total	mg/L	<0.05			0.05
Metals Dissolved	Field Filtered		Lab Ellianad			
Subsample	Field Filtered		Lab Filtered			
Metals Total	Taral		0.00			0.00
Aluminum	Total	mg/L	<0.02			0.02
Calcium	Total	mg/L	93.3			0.2
Iron	Total	mg/L	<0.05			0.05
Magnesium	Total	mg/L	69.3			0.2
Manganese	Total	mg/L	0.007			0.005
Potassium	Total	mg/L	4.1			0.4
Silicon	Total	mg/L	2.58			0.05
Sodium	Total	mg/L	28.6			0.4
Sulfur	Total	mg/L	134			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0015			0.0002
Barium	Total	mg/L	0.060			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.015			0.002
Cadmium	Total	mg/L	<0.00001			0.00001
Chromium	Total	mg/L	0.0009			0.0005
Cobalt	Total	mg/L	<0.0001			0.0001
Copper	Total	mg/L	<0.001			0.001
Lead	Total	mg/L	<0.0001			0.0001
Lithium	Total	mg/L	0.026			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	< 0.0005			0.0005
Selenium	Total	mg/L	< 0.0002			0.0002
Silver	Total	mg/L	<0.00001			0.00001
Strontium	Total	mg/L	0.455			0.001
Thallium	Total	mg/L	< 0.00005			0.00005



## **Analytical Report**

Lot ID: 1226604 Bill To: Town of Inuvik Project ID: SNP 0036-7

Box 1160 Project Name: Control Number:

Far Pond 2 Firth Street Project Location: Date Received: Sep 14, 2017 LSD: Sep 21, 2017

Inuvik, NT, Canada Date Reported: X0E 0T0 P.O.: 100104 Report Number: 2222221

Attn: Rick Campbell Proj. Acct. code:

**Sample Location** 

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1226604-1 Sample Date Sep 13, 2017 Sample Time NA

Sample Description SNP-0036-7 / 4.0°C

Matrix Water

		Watrix	vvater			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0022			0.0005
Uranium	Total	mg/L	<0.0005			0.0005
Vanadium	Total	mg/L	0.0002			0.0001
Zinc	Total	mg/L	<0.001			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	•					
Total Coliforms	Membrane Filtration	CFU/100 mL	2			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<1			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	<1			2
Routine Water						
рН			8.04			
Electrical Conductivity	at 25 °C	μS/cm	966			1
Calcium	Extractable	mg/L	87.6			0.2
Magnesium	Extractable	mg/L	64.6			0.2
Sodium	Extractable	mg/L	28.3			0.4
Potassium	Extractable	mg/L	3.9			0.4
Sulfate (SO4)	Dissolved	mg/L	373			0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-7 Lot ID: 1226604

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Far Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222221

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	18-Sep-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	18-Sep-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	15-Sep-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	15-Sep-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	15-Sep-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	15-Sep-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	15-Sep-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	15-Sep-17	Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	14-Sep-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	15-Sep-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified

### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

### **Comments:**

• Sample 1226604-1; 5838105 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

# Page 4 of 4 **EXOVO**

## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-7 Lot ID: 1226604

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Far Pond Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222221

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Exover IIII Testing	Billing Informat	ion:		Copy of I	Report To	:	91				10		RU	SH Priority	
EXOVA Advising Advising Assuring	Company	Town of Inux	rik	Company	Aec	om -	Edr	nont	on				Upon filling out th	is section, client accepts that	
www.exova.com	Address	Box 1160 2 I	Firth Street	Address	172	03-1	03rd	l Ave	nue				surcharges will	be applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0	1.3	Edm	onton	, AB	T5S 1	J4				Date Required	<u> </u>	
Project ID snp0036-7	Attention	Rick Campb	ell	Attention	Rich	nard	Feild	den			As Indicated	All Analysis			
Project Name	Phone	(867) 777-86	15	Phone	Phone (780) 488-6800								When "ASAP" is	requested, turn around will	
Project Location Far Pond	Cell	(867) 678-53	88	Cell									default to a 100% F	RUSH priority, with pricing and	
Legal Location	Fax	(867) 777-86	01	Fax	(780	) 48	8-21	21					turn around time to match. Please contact the lab prior to submitting RUSH samples		
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.f	eilde	en@a	ecom	.com			prior to dub	Tiltung (You'r burnpies	
Proj. Acct.Code	Agreement ID	2909										Signature			
	Copy of Report			Copy of it	nvoice								Sample Cu	stody (please print)	
Report Results × E-Mail	Online	PDF		QA/QC R	eport								Sampled by:	Jim Crawford	
Mail x	Fax	Excel				IJ							Company	Town of Inuvik	
Special Instructions/Comments (please in from above).	ding ph. # if different	Indicate Reg Requirement		Containers			П				and the second of the second o	a to proceed with the work ted on this form:			
Sampler: Circle Project ID Below and not	e weather:			0		ntai							Date: Sept.13/2017	Initial: J.S.	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt													This section	n for Lab use only	
SNP6 GatePond - SNP7 FarPond - SNP8	3 TwinL					er of							Date/Time stamp		
Raw Water	045					Number		1					SEP 14 P	12:41	
Temp C, precip, Wind dir Vel_	km/h				,	ž	$\perp$								
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	' ↓							Indicate below an condition of samp	y deficiencies in the bles:	
1 B.O.D.	snp-0036-7		Sept.13/2017		Dip									Were Exova supplies	
2 Nutrients + preservatives	snp-0036-7		Sept.13/2017		Dip									used?	
3 Oil n Greece + preservatives	snp-0036-7		Sept.13/2017		Dip									Was there any damage	
4 Phenol + preservatives	snp-0036-7	11	Sept.13/2017		Dip									to the shipping container?	
5 Metals + preservatives	snp-0036-7		Sept.13/2017		Dip									3.50	
6 Microbiology	snp-0036-7		Sept.13/2017		Dip								1	Were the containers	
7 Mercury	snp-0036-7		Sept.13/2017		Dip									packaged well?	
8 Routine	snp-0036-7		Sept.13/2017		Dip										
9														Were the expected number of samples	
10														received (document	
11														below)?	
12															
13														Are samples within recommended holding	
14 15					9 6		1	1.16	ı					times/temp?	
15				ot: 12266	04 CO	0									
Environmental S	Sample Inform	ation She	er - 19					18 81			Shipp		# and size of cooler	s received:	
Note: Proper completion of this for	rm is required in o	rder to procee	ed with analysis							COD Y/N					
Please indicate any p		Cooler temp:						Delivery Method:	(exily						
_ Control #					4.0						Waybill:				
Page 1 of 1									Received by:						



## **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-8 Lot ID: 1226610

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Twin Lakes Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222226

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

### **Notes To Clients:**

• Sample 1226610-1; 5838188 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-8 Lot ID: 1226610

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Twin Lakes Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222226

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226610-1

Sample Date September 13, 2017

Sample Time N.

Sample Location

Sample Description snp-0036-8 / 4.0°C

Sample Matrix Water

Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	stituents			
Biochemical Oxygen Demand	5 Day	mg/L	<4	4
Phenol		mg/L	0.001	0.001
Oil and Grease	Total	mg/L	<5	5
pH adjustment	adjustment required		No	
Inorganic Nonmetallic Pa	arameters			
Phosphorus	Total	mg/L	<0.05	0.05
Metals Dissolved				
Subsample	Field Filtered		Lab Filtered	
Metals Total				
Aluminum	Total	mg/L	0.07	0.02
Calcium	Total	mg/L	214	0.2
Iron	Total	mg/L	0.25	0.05
Magnesium	Total	mg/L	71.5	0.2
Manganese	Total	mg/L	0.856	0.005
Potassium	Total	mg/L	5.0	0.4
Silicon	Total	mg/L	0.84	0.05
Sodium	Total	mg/L	36.1	0.4
Sulfur	Total	mg/L	219	0.3
Mercury	Total	mg/L	<0.00005	0.000005
Antimony	Total	mg/L	<0.0002	0.0002
Arsenic	Total	mg/L	0.0008	0.0002
Barium	Total	mg/L	0.048	0.001
Beryllium	Total	mg/L	<0.0001	0.0001
Bismuth	Total	mg/L	<0.0005	0.0005
Boron	Total	mg/L	0.106	0.002
Cadmium	Total	mg/L	<0.0001	0.00001
Chromium	Total	mg/L	0.0015	0.0005
Cobalt	Total	mg/L	0.0005	0.0001
Copper	Total	mg/L	<0.001	0.001
Lead	Total	mg/L	0.0001	0.0001
Lithium	Total	mg/L	0.030	0.001
Molybdenum	Total	mg/L	0.001	0.001
Nickel	Total	mg/L	0.0035	0.0005
Selenium	Total	mg/L	0.0003	0.0002
Silver	Total	mg/L	<0.0001	0.00001
Strontium	Total	mg/L	0.766	0.001
Thallium	Total	mg/L	<0.0005	0.00005
Tin	Total	mg/L	<0.001	0.001

# Page 2 of 4 **EXOVA**

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-8 Lot ID: 1226610

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Twin Lakes Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222226

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226610-1

Sample Date September 13, 2017

Sample Time

Sample Location

Sample Description snp-0036-8 / 4.0°C

Sample Matrix Water

		Sample Matrix Wat	er	
Analyte		Units	Result	Nominal Detection Limit
Metals Total - Continued				
Titanium	Total	mg/L	0.0054	0.0005
Uranium	Total	mg/L	0.0013	0.0005
Vanadium	Total	mg/L	0.0005	0.0001
Zinc	Total	mg/L	0.004	0.001
Zirconium	Total	mg/L	<0.001	0.001
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	<1	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	<1	1
Physical and Aggregate F	Properties			
Solids	Total Suspended	mg/L	10	2
Routine Water				
рН			7.97	
<b>Electrical Conductivity</b>	at 25 °C	μS/cm	1460	1
Calcium	Extractable	mg/L	204	0.2
Magnesium	Extractable	mg/L	67.2	0.2
Sodium	Extractable	mg/L	36.8	0.4
Potassium	Extractable	mg/L	4.9	0.4
Sulfate (SO4)	Dissolved	mg/L	620	0.9

Approved by:

Anthony Neumann, MSc
Laboratory Operations Manager

Anthony Weuman

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Edmonton, Alberta
T6B 3J4, Canada

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# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-8 Lot ID: 1226610

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Twin Lakes Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222226

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	18-Sep-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	18-Sep-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	15-Sep-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	15-Sep-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	15-Sep-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	15-Sep-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	18-Sep-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Sep-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Sep-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Sep-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	15-Sep-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	15-Sep-17	Exova Edmonton
Phosphorus - Total in Water	АРНА	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	14-Sep-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	15-Sep-17	Exova Edmonton
		* Deference Method Medified		

<sup>\*</sup> Reference Method Modified

### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

### Comments:

• Sample 1226610-1; 5838188 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.



# **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-8 Lot ID: 1226610

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Twin Lakes Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222226

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Exova lili Testing	Billing Informat	ion:		Copy of	Report To:							·	$\mathbf{T}$	RUSH Priority		
EXOVA Advising Assuring	Company	Town of Inuv	/ik	Compan	y Aec	om -	Edn	nonto	n						section, client accepts that	
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	03-10	03rd	Aven	ue					surcharges will be	e applied to the analysis	
Project Information		Inuvik, NT X	0E 0T0		Edm	onton,	AB T	5S 1J	4					Date Required		
Project ID snp -0036-8	Attention	Rick Campb	ell	Attention	ı Rich	Richard Feilden								As Indicated	All Analysis	
Project Name	Phone	(867) 777-86	515	Phone	(780	) 48	8-68	00		When "ASAP" is requested, turn around will						
Project Location Twin Lakes	Cell	(867) 678-53	388	Cell	Cell									default to a 100% RUSH priority, with pricing and		
Legal Location	Fax	(867) 777-86	601	Fax	Fax (780) 488-2121								and the second s	atch. Please contact the lab		
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	eildei	n@ae	ecom	.com	1			prior to submitting RUSH samples		
Proj. Acct.Code	Agreement ID	2909												Signature		
	Copy of Report			Copy of	invoice									Sample Cust	tody (please print)	
Report Results × E-Mail	Online	PDF		QA/QC F	Report	П								Sampled by: J	im Crawford	
Mail x	Fax	Excel				IJ					1 1			Company To	own of Inuvik	
Special Instructions/Comments (please in from above).	Project ID Below and note weather:  SNP4 Mt.B W - SNP5 Mt.B E  Indicate Regulatory Requirements below							to proceed with the work d on this form:								
Sampler: Circle Project ID Below and not	te weather:					nta					1 1			Date:Sept.13/2017	Initial: J.S.	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 M										1					for Lab use only	
SNP6 GatePond - SNP7 FarPond - SNP	8 TwinL					e o					1 1			Date/Time stamp:		
Raw Water	9					Number of		J.						SEP 14 PH12	A1	
Temp C, precip, Wind dir Vel_	km/h					+-+										
Sample Identification	Location	Depth in cm m	Date/Time sample	ed Matrix	Sampling method	" ↓								Indicate below any condition of sample		
1 B.O.D.	snp-0036-8		Sept.13/2017		Dip	$\Box$									Were Exova supplies used?	
2 Nutrients + preservatives	snp-0036-8		Sept.13/2017		Dip										usedr	
3 Oil n Greece + preservatives	snp-0036-8		Sept.13/2017		Dip										Was there any damage to the shipping	
4 Phenol + preservatives	snp-0036-8		Sept.13/2017		Dip										container?	
5 Metals + preservatives	snp-0036-8		Sept.13/2017		Dip											
6 Microbiology	snp-0036-8		Sept.13/2017		Dip										Were the containers packaged well?	
7 Mercury	snp-0036-8		Sept.13/2017		Dip										packaged well?	
8 Routine	snp-0036-8		Sept.13/2017		Dip											
9						Ш	$\perp$				$\perp$				Were the expected number of samples	
10							V								received (document	
11															below)?	
12 13				- 12		Ш						$\perp$				
						Ш					Ш				Are samples within recommended holding	
14						Ш					Ш				times/temp?	
15	1							1	1							
Environmental :	Sample Inforn	nation She	et	Indicate 1-1		COC						ping:		# and size of coolers r	eceived:	
Note: Proper completion of this fo			ed with analysis	Lot: 12	26610			1 1 1 1 1	212			Y/N			1	
Please indicate any	potentially ha	zordous sa	amples	011111		$\ \ $		IIIII	III		Coo	ler tem	p:	Delivery Method:	Conen	
	Control #	£									1	0,		Waybill:		
Page 1 of 1	23,103(1)	1		_ milin								1.0		Received by: 🕠	$\sim$	

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Lot ID: 1204932

May 30, 2017

Jun 6, 2017

Control Number:

Date Received:

Date Reported:

Report Number: 2194089

# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project:

 Box 1160
 ID:
 SNP 0036-9

 2 Firth Street
 Name:
 E.C.W.T.P.

Inuvik, NT, Canada Location: Pit 8/E dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Contact & Affiliation	Address	Delivery Commitments
Rick Campbell 2 Firth Street, Box 1160  Town of Inuvik Inuvik, Northwest Territories X0E 0T0  Phone: (867) 777-8615  Fax: (867) 777-8601  Email: rcampbell@town.inuvik.nt.ca		On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Utilidor Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Kim Wainman Town of Inuvik	2 Firth Street, Box 1160 Inuvik, Northwest Territories X0E 0T0 Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca	On [Lot Approval and Final Test Report Approval] send (Invoice) by Email - Single Report
Jason Casault AECOM - Edmonton	101, 18817 Stony Plain Road Edmonton, Alberta T5S 0C2 Phone: (780) 486-7050 Fax: (780) 486-7070 Email: Jason.Casault@aecom.com	On [Lot Verification] send  (COA, COC) by Email - Merge Reports  On [Report Approval] send  (Test Report, COC) by Email - Merge Reports
Richard Feilden AECOM - Edmonton	17203 - 103 Avenue Edmonton, Alberta T5S 1J4 Phone: (780) 488-6800 Fax: (780) 488-2121 Email: richard.feilden@aecom.com	On [Report Approval] send (COC, Test Report) by Email - Merge Reports

## **Notes To Clients:**

- Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.
- Sample 1204932-1; 5729771 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

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## **Analytical Report**

Bill To: Town of Inuvik

Project:

P.O.:

Lot ID: 1204932

Box 1160

ID: SNP 0036-9

Control Number:

2 Firth Street Inuvik, NT, Canada

E.C.W.T.P. Name: Location: Pit 8/E dump

100104

May 30, 2017 Date Received: Date Reported: Jun 6, 2017

X0E 0T0 Attn: Rick Campbell

LSD:

Report Number: 2194089

Sampled By: Jim Crawford

Company: Town of Inuvik

Acct code:

**Reference Number** 

1204932-1

Sample Date Sample Time

May 29, 2017

NA

Sample Location

**Sample Description** snp-0036-9 / 5°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Cons	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol		mg/L	0.001			0.001
Oil and Grease	Total	mg/L	<5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	0.11			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.50			0.02
Calcium	Total	mg/L	15.5			0.2
Iron	Total	mg/L	1.72			0.05
Magnesium	Total	mg/L	6.2			0.2
Manganese	Total	mg/L	0.614			0.005
Potassium	Total	mg/L	1.7			0.4
Silicon	Total	mg/L	1.69			0.05
Sodium	Total	mg/L	4.7			0.4
Sulfur	Total	mg/L	1780			0.3
Mercury	Total	mg/L	0.000009			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0012			0.0002
Barium	Total	mg/L	0.025			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	< 0.0005			0.0005
Boron	Total	mg/L	0.020			0.002
Cadmium	Total	mg/L	0.00003			0.00001
Chromium	Total	mg/L	0.0008			0.0005
Cobalt	Total	mg/L	0.0017			0.0001
Copper	Total	mg/L	0.003			0.001
Lead	Total	mg/L	0.0004			0.0001
Lithium	Total	mg/L	0.006			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0076			0.0005
Selenium	Total	mg/L	0.0004			0.0002
Silver	Total	mg/L	0.00001			0.00001

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## **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1204932

Box 1160

2 Firth Street

ID: SNP 0036-9 E.C.W.T.P. Name:

Pit 8/E dump

100104

Date Received: May 30, 2017

Inuvik, NT, Canada

Location:

Date Reported:

Control Number:

X0E 0T0

LSD:

Jun 6, 2017

Attn: Rick Campbell

P.O.:

Report Number: 2194089

Sampled By: Jim Crawford

Acct code:

Company: Town of Inuvik

**Reference Number** 

1204932-1

Sample Date Sample Time May 29, 2017

**Sample Location** 

NA

**Sample Description** 

snp-0036-9 / 5°C

Matrix

Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						-
Strontium	Total	mg/L	0.047			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0113			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0021			0.0001
Zinc	Total	mg/L	0.011			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	<b>;</b>					
Total Coliforms	Membrane Filtration	CFU/100 mL	72			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	1			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	19			2
Routine Water						
рН			7.21			
Electrical Conductivity	at 25 °C	μS/cm	159			1
Calcium	Extractable	mg/L	14.9			0.2
Magnesium	Extractable	mg/L	5.9			0.2
Sodium	Extractable	mg/L	4.6			0.4
Potassium	Extractable	mg/L	1.6			0.4
Sulfate (SO4)	Dissolved	mg/L	48.9			0.9

Approved by:

Anthony Neumann, MSc Laboratory Operations Manager

Anthony Weuman

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## **Methodology and Notes**

Bill To: Town of Inuvik

Project: ID:

Lot ID: 1204932

Control Number:

2 Firth Street Inuvik, NT, Canada Name: E.C.W.T.P. Location: Pit 8/E dump

SNP 0036-9

100104

Date Received: May 30, 2017 Date Reported: Jun 6, 2017

X0E 0T0

Box 1160

LSD:

Date Reported: Jui

Attn: Rick Campbell

P.O.:

Report Number: 2194089

Sampled By: Jim Crawford

Acct code:

Company: Town of Inuvik

Alkalinity, pH, and EC in water	nity, pH, and EC in water APHA * Conductivity, 2510 B		Date Analysis Started	Location
	APHA	* Conductivity, 2510 B	01-Jun-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	01-Jun-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	31-May-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	31-May-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	31-May-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	31-May-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	01-Jun-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	30-May-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	31-May-17	Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	01-Jun-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	02-Jun-17	Exova Edmonton

### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

### Comments:

- Sample was received in a plastic container which does not meet the sample requirements for mercury analysis as specified by the reference method.
- Sample 1204932-1; 5729771 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.



# **Methodology and Notes**

Bill To: Town of Inuvik Project:

 Box 1160
 ID:
 SNP 0036-9

 2 Firth Street
 Name:
 E.C.W.T.P.

Inuvik, NT, Canada Location: Pit 8/E dump X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104
Sampled By: Jim Crawford Acct code:

Company: Town of Inuvik

Lot ID: 1204932

Control Number:

Date Received: May 30, 2017 Date Reported: Jun 6, 2017 Report Number: 2194089

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

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Exova Testing Advisi		tion:		Copy of	Report To					<b>7</b>		1	RUSI	l Priority		
Advisi Assuri	ng Company	Town of Inuv	vik	Company	Aec	om -	Edm	onto	n					ection, client accepts that		
www.exova.com	Address	Box 1160 2	Firth Street	Address	1720	03-1	03rd <i>i</i>	Aver	nue				surcharges will be	applied to the analysis		
Project Information		Inuvik, NT X	0E 0T0		Edmo	onton	, AB T	5S 1J	4				Date Required			
Project ID	Attention	Rick Campb	ell	Attention	Rich	ard	Feilde	en					As Indicated	All Analysis		
Project Name snp-0036-9	Phone	(867) 777-86	315	Phone	(780	) 48	8-680	00					When "A CA D" in re	When "ASAP" is requested, turn around will		
Project Location E.C.W.T.P.	Cell	(867) 678-53	388	Cell										default to a 100% RUSH priority, with pricing and		
Legal Location Pit 3/E dump	Fax	(867) 777-86	501	Fax	(780	) 48	8-212	21						tch. Please contact the lab		
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	E-mail richard.feilden@aecom.com							phor to submit	ting RUSH samples			
Proj. Acct.Code	Agreement ID	2909											Signature			
	Copy of Report			Copy of in	rvoice								Sample Cust	ody (please print)		
Report Results X E-Mail	Online	PDF		QA/QC R	eport	П		T	П	T			Sampled by: Ji	m Crawford		
Mail	x Fax	Excel				IJ						.1.1	Company To	wn of Inuvik		
Special Instructions/Comments (plea from above).	se include contact inf	ormation inclu	ding ph. # if different	Indicate Reg Requiremen		Containers							and the second s	o proceed with the work I on this form:		
Sampler: Circle Project ID Below and	d note weather:					ntai			ll				Date. May29/2017	Initial: J.S.		
SNP3 Lagoon - SNP4 Mt.B W - SNF	5 Mt.B E								1		1		This section	for Lab use only		
SNP6 GatePond - SNP7 FarPond - S	SNP8 TwinL					er of							Date/Time stamp:			
Raw Water						Number							1/1/ 1/			
Temp C, precip, Wind dir	Velkm/h					ž							May 29117			
Sample Identification	Location	Depth in cm m	Date/Time sample	d Matrix	Sampling method	$ \downarrow $							Indicate below any condition of sample			
1 B.O.D.	snp-0036 Q	i	May.29/2017		Dip	П		T	П			TI		Were Exova supplies		
2 Oil & Grease + preservative	s "		"		11	П								used?		
3 Microbiology	u		u .		"									Was there any damage		
4 Routine	ж		"		11									to the shipping container?		
5 Nutrients + preservatives			0		10	П		1								
6 Metals + preservatives	u		,,		.00									Were the containers		
7 Phenol + preservatives	- 10		0		îi.									packaged well?		
8						П										
9														Were the expected		
10														number of samples received (document		
11						П		T						below)?		
12	4					П			П							
13						П								Are samples within recommended holding		
14 15				. 1									MAV Shew12			
15				Ţ				o.	1 [				11111			
Environmen	Lot: 120	4932	COC					Shipp	oing:	# and size of coolers re						
Note: Proper completion of the	is form is required in	order to procee	ed with analysis								COD Y/N MAY 30 PM1		MAY 30 PM 12:0	)5		
Please indicate a	ny potentially ha	zordous sa	amples		COD Y/N Cooler tel						er temp:	Delivery Method:				
Control #				v							()	Waybill:				
									Received by: 🕠	Received by: \						

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Lot ID: 1211383

Report Number: 2202332

# **Report Transmission Cover Page**

Company: Town of Inuvik

Bill To: Town of Inuvik Project:

> Box 1160 ID: SNP 0036-9

Control Number: 2 Firth Street Name:

Date Received: Jun 29, 2017 Inuvik, NT, Canada Location: Pit. S/E of dump Date Reported: Jul 6, 2017

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Contact & Affiliation Address **Delivery Commitments** Rick Campbell 2 Firth Street, Box 1160 On [Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (COC, Test Report) by Email - Merge Reports Phone: (867) 777-8615 On [Lot Approval and Final Test Report Approval] send Fax: (867) 777-8601 (Invoice) by Email - Single Report Email: rcampbell@town.inuvik.nt.ca Utilidor 2 Firth Street, Box 1160 On [Lot Approval and Final Test Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (Invoice) by Email - Single Report Phone: (867) 777-2607 Fax: (867) 777-2071 Email: utilidor@town.inuvik.nt.ca Kim Wainman 2 Firth Street, Box 1160 On [Lot Approval and Final Test Report Approval] send Town of Inuvik Inuvik, Northwest Territories X0E 0T0 (Invoice) by Email - Single Report Phone: (867) 777-8615 Fax: (867) 777-8601 Email: kwainman@town.inuvik.nt.ca Jason Casault 101, 18817 Stony Plain Road On [Lot Verification] send AECOM - Edmonton Edmonton, Alberta T5S 0C2 (COA, COC) by Email - Merge Reports Phone: (780) 486-7050 On [Report Approval] send Fax: (780) 486-7070 (COC, Test Report) by Email - Merge Reports Email: Jason.Casault@aecom.com Richard Feilden 17203 - 103 Avenue On [Report Approval] send AECOM - Edmonton Edmonton, Alberta T5S 1J4 (COC, Test Report) by Email - Merge Reports Phone: (780) 488-6800 Fax: (780) 488-2121

#### **Notes To Clients:**

• Sample 1211383-1; 5762412 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

Email: richard.feilden@aecom.com

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1211383

Box 1160

ID:

Control Number:

2 Firth Street

Name:

Date Received: Jun 29, 2017

Inuvik, NT, Canada X0E 0T0

Location: LSD:

Date Reported: Jul 6, 2017

Attn: Rick Campbell Sampled By: Justin Simms

P.O.: Acct code: Report Number: 2202332

Company: Town of Inuvik

**Reference Number** 

1211383-1

Sample Date

Jun 28, 2017

Sample Time Sample Location NA

Sample Description snp-0036-9 / 5.9°C

SNP 0036-9

100104

Pit. S/E of dump

Matrix Wate
-------------

Analyte		Units	Results	Results	Results	Nominal Detectio Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol		mg/L	<0.001			0.001
Oil and Grease	Total	mg/L	8			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	0.06			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.46			0.02
Calcium	Total	mg/L	56.7			0.2
Iron	Total	mg/L	1.13			0.05
Magnesium	Total	mg/L	26.8			0.2
Manganese	Total	mg/L	0.667			0.005
Potassium	Total	mg/L	1.6			0.4
Silicon	Total	mg/L	2.43			0.05
Sodium	Total	mg/L	18.5			0.4
Sulfur	Total	mg/L	77.7			0.3
Mercury	Total	mg/L	< 0.000005			0.000005
Antimony	Total	mg/L	< 0.0002			0.0002
Arsenic	Total	mg/L	0.0008			0.0002
Barium	Total	mg/L	0.035			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	< 0.0005			0.0005
Boron	Total	mg/L	0.044			0.002
Cadmium	Total	mg/L	0.00006			0.00001
Chromium	Total	mg/L	0.0008			0.0005
Cobalt	Total	mg/L	0.0017			0.0001
Copper	Total	mg/L	0.003			0.001
Lead	Total	mg/L	0.0003			0.0001
Lithium	Total	mg/L	0.016			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0124			0.0005
Selenium	Total	mg/L	0.0003			0.0002
Silver	Total	mg/L	<0.0001			0.00001

## **Analytical Report**

Bill To: Town of Inuvik

Project:

Lot ID: 1211383

Box 1160

ID: Name: Control Number:

2 Firth Street

Date Received: Jun 29, 2017

Inuvik, NT, Canada X0E 0T0

Location: LSD:

Jul 6, 2017 Date Reported:

Attn: Rick Campbell

P.O.: Acct code:

Sampled By: Justin Simms

100104

SNP 0036-9

Pit. S/E of dump

Report Number: 2202332

Company: Town of Inuvik

**Reference Number** 

1211383-1

Sample Date Sample Time Jun 28, 2017 NA

**Sample Location Sample Description** 

snp-0036-9 / 5.9°C

Matrix

Water

		Matrix	vvater			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Strontium	Total	mg/L	0.172			0.001
Thallium	Total	mg/L	< 0.00005			0.00005
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0076			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0013			0.0001
Zinc	Total	mg/L	0.026			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	<b>;</b>					
Total Coliforms	Membrane Filtration	CFU/100 mL	500			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	200			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	22			2
Routine Water						
pН			7.41			
Electrical Conductivity	at 25 °C	μS/cm	569			1
Calcium	Extractable	mg/L	56.9			0.2
Magnesium	Extractable	mg/L	27.4			0.2
Sodium	Extractable	mg/L	18.3			0.4
Potassium	Extractable	mg/L	1.7			0.4
Sulfate (SO4)	Dissolved	mg/L	233			0.9
		-				

Approved by:

Darlene Lintott, MSc Consulting Scientist

T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



# **Methodology and Notes**

Bill To: Town of Inuvik

Project:

Lot ID: 1211383

Box 1160

ID: Name: SNP 0036-9 Control Number:

2 Firth Street Inuvik, NT, Canada

Pit. S/E of dump

100104

Date Received: Jun 29, 2017

X0E 0T0

Location: LSD:

Date Reported: Jul 6, 2017

Attn: Rick Campbell

P.O.: Acct code: Report Number: 2202332

Sampled By: Justin Simms

Company: Town of Inuvik

Method Name	Reference	Method	Date Analysis Started	Location		
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	30-Jun-17	Exova Edmonton		
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	30-Jun-17	Exova Edmonton		
BOD in water	APHA	* 5 Day, 5210 B	04-Jul-17	Exova Edmonton		
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	30-Jun-17	Exova Calgary		
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	30-Jun-17	Exova Calgary		
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	30-Jun-17	Exova Edmonton		
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	30-Jun-17	Exova Edmonton		
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton		
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton		
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	30-Jun-17	Exova Edmonton		
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	29-Jun-17	Exova Edmonton		
Phenol in water	APHA	* Direct Photometric Method, 5530 D	05-Jul-17	Exova Edmonton		
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	05-Jul-17	Exova Edmonton		
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	05-Jul-17	Exova Edmonton		

### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

### Comments:

• Sample 1211383-1; 5762412 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

\* Reference Method Modified



Lot ID: 1211383

Date Received: Jun 29, 2017

Date Reported: Jul 6, 2017

Report Number: 2202332

Control Number:

# **Methodology and Notes**

Bill To: Town of Inuvik Project:

Box 1160 ID: SNP 0036-9

2 Firth Street Name:

Inuvik, NT, Canada Location: Pit. S/E of dump

X0E 0T0 LSD:

Attn: Rick Campbell P.O.: 100104

Sampled By: Justin Simms Acct code:

Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Testing	Billing Information	tion:		Copy of	Report To											RUSH	l Priority
XOVA Advising	Company	Town of Inu	vik	Company	Aec	om -	Edr	mon	ton	-	_				Upon filling	out this s	ection, client accepts that
www.exova.com	Address Box 1160 2 Firth Street		Address											surcharges will be applied to the analysis			
Project Information		Inuvik, NT X	OE 0T0		Edmo	onton	, AB	T5S	1J4						Date Req	uired	
Project ID snp-0036-9	Attention	Rick Campbell		Attention	Attention Richard Feilden										As Indicat	ted	All Analysis
roject Name	Phone	(867) 777-8615		Phone	The state of the s												
Project Location Pit. S/E of dump	Cell	(867) 678-53	388	Cell	- 3	*									When "ASAP" is requested, turn around water default to a 100% RUSH priority, with pricing turn around time to match. Please contact the		• A Community of Management of Management of the Community  • A Community  •
egal Location	Fax	(867) 777-86	501	Fax	(780	) 48	8-21	121									tch. Please contact the la
PO/AFE# 100104	E-mail	rcampbell	@town.inuvik.nt.ca	prior to su		o submitt	ing RUSH samples										
Proj. Acct.Code	Agreement ID	2909													Signature	)	
	Copy of Report			Copy of i	nvoice										Sampl	le Custo	ody (please print)
x E-Mail	Online	PDF		QA/QC F	eport	П	П			1			П		Sampled by:	Ju	ıstin Simms
Report Results Mail x	Fax	Excel			-	П									Company	To	wn of Inuvik
pecial Instructions/Comments (please in	clude contact info	ormation inclu	ding ph. # if different	Indicate Re	Indicate Regulatory o										I authorize	Exova to	proceed with the work
rom above).				Requiremen	Requirements below												on this form:
Sampler: Circle Project ID Below and not					Requirements below  Solution  Soluti										Date. June.28	/2017	Initial: J.S.
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt	**************************************												- 1	This section for Lab use or			
SNP6 GatePond - SNP7 FarPond - SNP8												Date/Time stamp:					
Raw Water						Number									JUN 29 F	MIZH	10
Temp8_ C, precip_95%, Wind dir_N	NE Vel_8km	/h				ž			Ь.					L	_		
Sample Identification	Location	Depth in cm m	Date/Time sample	ed Matrix	Sampling method	$\downarrow$									Indicate belo condition of	and the second	deficiencies in the s:
1 B.O.D	snp-0036-9		June.28/2017		Dip					Т							Were Exova supplies
2 Oil and Greece preservatives	snp-0036-9		June.28/2017		Dip												used?
3 Microbiology	snp-0036-9		June.28/2017		Dip	П											Was there any damag
4 Nutrients preservatives	snp-0036-9		June.28/2017		Dip	П						П		$\neg$			to the shipping container?
5 Phenol preservatives	snp-0036-9		June.28/2017		Dip	П											
6 Mercury	snp-0036-9		June.28/2017		Dip	П											Were the containers
7 Routine	snp-0036-9		June.28/2017		Dip	П	$\Box$		$\top$	Τ		П					packaged well?
8 Metals preservatives	snp-0036-9		June.28/2017		Dip	П											
9						П											Were the expected
10						П				T							number of samples received (document
11						П							T				below)?
12						П								$\neg$	i		
13						П			7	1					1		Are samples within
14						П				$\top$	$\vdash$	$\Box$	17	$\neg$			recommended holding times/temp?
15						П	$\Box$					$\Box$	21	_			_ imesitempi
Environmental S	Sample Inforn	nation She	et	Ir .					•		-	Ship	ping	1:	# and size of o	coolers re	ceived:
Note: Proper completion of this for	rm is required in o	order to procee	ed with analysis	Lot: 12	11383	COC	,					COE	1\Y C	N.			
Please indicate any potentially hazordous samples											Coo	Cooler temp:		Delivery Me	thod:	(our	
												< C∖ Waybill:					
	Control #	<b>+</b>				1 1 11				18				-	evayon.		



# **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1214560

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit S/E of dump Date Received: Jul 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2206525

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

### **Notes To Clients:**

• Sample 1214560-1; 5777882 Some total metal results were less than dissolved metal results for sample 1214560-1. The results were verified and are within expected measurement uncertainty.

Exova
7217 Roper Road NW
Edmonton, Alberta
T6B 3J4, Canada

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Lot ID:

Date Reported:

1214560

Jul 21, 2017

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-9

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit S/E of dump Date Received: Jul 14, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2206525

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum Company: Town of Inuvik

Reference Number 1214560-1
Sample Date Jul 13, 2017
Sample Time NA

Sample Location

Sample Description snp-0036-9 / 6.8°C

Matrix Water Nominal Detection Analyte Units Results Results Results Limit **Aggregate Organic Constituents** < 0.001 0.001 Phenol mg/L Oil and Grease 5 Total mg/L <5 pH adjustment adjustment required No **Inorganic Nonmetallic Parameters** 0.05 Phosphorus Total mg/L 0.05 **Metals Dissolved** Subsample Field Filtered Lab Filtered **Metals Total** Aluminum Total mg/L 0.02 0.02 Total Calcium 245 0.2 mg/L Total 0.05 Iron mg/L 1.11 85.8 Magnesium Total mg/L 0.2 Manganese Total mg/L 0.981 0.005 Potassium Total mg/L 4.6 0.4 Silicon Total 2.01 0.05 mg/L Sodium Total mg/L 93.6 0.4 Sulfur Total 304 mg/L 0.3 Mercury Total mg/L < 0.00005 0.000005 Total < 0.0002 0.0002 Antimony mg/L Arsenic Total 0.0012 0.0002 mg/L Total 0.027 Barium mg/L 0.001 Total < 0.0001 0.0001 Beryllium mg/L **Bismuth** Total < 0.0005 0.0005 mg/L Boron Total mg/L 0.167 0.002 0.00001 Cadmium Total mg/L 0.00001 Chromium Total < 0.0005 0.0005 mg/L Cobalt Total mg/L 0.0006 0.0001 Copper Total mg/L < 0.001 0.001 Lead Total mg/L < 0.0001 0.0001 Lithium Total 0.040 0.001 mg/L Molybdenum Total < 0.001 0.001 mg/L Nickel Total 0.0037 0.0005 mg/L Selenium Total mg/L < 0.0002 0.0002 Silver Total < 0.00001 0.00001 mg/L Strontium Total mg/L 0.898 0.001 Thallium Total mg/L < 0.00005 0.00005 < 0.001 Tin Total mg/L 0.001 Titanium Total mg/L 0.0037 0.0005

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1214560

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit S/E of dump Date Received: Jul 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Jul 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2206525

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Reference Number 1214560-1
Sample Date Jul 13, 2017
Sample Time NA
Sample Location

Sample Description snp-0036-9 / 6.8°C

Matrix Water

		IVIALITX	vvalei			
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Uranium	Total	mg/L	0.0021			0.0005
Vanadium	Total	mg/L	0.0002			0.0001
Zinc	Total	mg/L	0.009			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis						
Total Coliforms	Membrane Filtration	CFU/100 mL	40			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	10			1
Physical and Aggregate P	roperties					
Solids	Total Suspended	mg/L	<5			2
Routine Water						
рН			7.86			
Temperature of observed pH		°C	21.2			
Electrical Conductivity	at 25 °C	μS/cm	1900			1
Calcium	Extractable	mg/L	244			0.2
Magnesium	Extractable	mg/L	85.4			0.2
Sodium	Extractable	mg/L	93.6			0.4
Potassium	Extractable	mg/L	4.6			0.4
Sulfate (SO4)	Dissolved	mg/L	927			0.9

Approved by:

Randy Neumann, BSc Vice President

RhDeunson

7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



Date Reported:

Jul 21, 2017

## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1214560

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit S/E of dump Date Received: Jul 14, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2206525

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	18-Jul-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	18-Jul-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	15-Jul-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	15-Jul-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	17-Jul-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	17-Jul-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	17-Jul-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	17-Jul-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	17-Jul-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	17-Jul-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	19-Jul-17	Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	17-Jul-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	17-Jul-17	Exova Edmonton
		* Reference Method Modified		

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

## Comments:

• Sample 1214560-1; 5777882 Some total metal results were less than dissolved metal results for sample 1214560-1. The results were verified and are within expected measurement uncertainty.

 Exova
 T: +1 (780) 438-5522

 7217 Roper Road NW
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 Edmonton, Alberta
 E: Edmonton@exova.com

 T6B 3J4, Canada
 W: www.exova.com

Page 4 of 4 **EXOVO** 

## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1214560

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Pit S/E of dump Date Received: Jul 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Jul 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2206525

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Dale Hvatum
Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

			Mr. Inc.															
Fx (0)	Testing	Billing Informat	ion:			Copy of F	Report To:	-		-	ď					RU	JSH P	riority
Exova	Advising	Company	Town of Inuv	⁄ik		Company	Aeco	om -	Edr	mont	on							on, client accepts that
www.exova.com	I Assumig	Address	Box 1160 2 F	Firth Street		Address	1720	03-1	03rc	d Ave	enue			,		surcharges w	ill be app	lied to the analysis
Project Information	n	Ī	Inuvik, NT X	0E 0T0			Edmo	onton	, AB	T5S 1	J4					Date Require	ed	
Project ID	snp-0036-9	Attention	Rick Campb	ell		Attention Richard Feilden									As Indicated	1	All Analysis	
Project Name		Phone	(867) 777-86	515		Phone	(780	) 48	8-68	300						When "ASAP" is requested, turn around will		
Project Location	Pit S/E of dump	Cell	(867) 678-53	888		Cell										default to a 100% RUSH priority, with pricing and		
Legal Location		Fax	(867) 777-86	601	.00	Fax	(780	) 48	8-21	121						turn around time to match. Please contact the lab prior to submitting RUSH samples		
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	į	E-mail	richa	ard.fe	eilde	en@a	aeco	m.co	m				, many	(OC) (CO)
Proj. Acct.Code		Agreement ID	2909												N. H	Signature		
	-	Copy of Report				Copy of invoice						. 1	Sample C	ustody	(please print)			
Report Results	x E-Mail	Online	PDF			QA/QC R	eport	Н								Sampled by:	11442000	Hvatum
	Mail x	Fax	Excel									Company	Town o	of Inuvik				
Special Instructions from above).						dicate Reg equirement		Containers									ova to pro cated on	oceed with the work this form:
Sampler: Circle Pro	ject ID Below and note	e weather:						ntai								Date: July.13/2017	/ Ir	nitial: J.S.
	P4 Mt.B W - SNP5 Mt							of Cc				1 1				This section	on for	Lab use only
-576	SNP7 FarPond - SNP8	3 TwinL								Date/Time stam		10						
Raw Water			- T. (1980)			(4)		Number								SOC ATIONS	4-1-1-2	
Temp10_ C, pre	cip_71%, Wind dir_I	NNVV Vel_3k			<u> </u>			-	$\perp$			LL.				<b>!</b>		
Sample	dentification	Location	Depth in cm m	Date/Time sample	:d	Matrix	Sampling method	$\downarrow$								Indicate below a condition of san		ciencies in the
1 B.O.D.		snp-0036-9		July.13/2017			Dip	$\Box$										Vere Exova supplies sed?
2 Oil and Gree	ce preservatives	snp-0036-9		July.13/2017			Dip	Ш										.000.07
3 Microbiology	,	snp-0036-9		July.13/2017			Dip	Ш										Vas there any damage the shipping
4 Nutrients	preservatives	snp-0036-9		July.13/2017			Dip											ontainer?
5 Phenol	preservatives	snp-0036-9		July.13/2017			Dip	Ш										
6 Mercury		snp-0036-9		July.13/2017			Dip	Ш										Vere the containers ackaged well?
7 Routine		snp-0036-9		July.13/2017			Dip	Ш										achaged well?
8 Metals	preservatives	snp-0036-9		July.13/2017			Dip	Ц										
9					100			Ш										Vere the expected umber of samples
10								Ш	Ц								re	eceived (document
11								Ц						$\Box$			b	elow)?
12								Ш										
13								Ш										re samples within ecommended holding
14								Ш			$\perp$			$\perp$			66	mes/temp?
15					_			$\sqcup$										
	Environmental S	Sample Inforn	nation She	et	1					hara,				oping:		# and size of coole	ers receive	ed:
221192411412 11112 1212	er completion of this for					ot: 121								D Y/N				
Plea	ise indicate any p	ootentially ha	zordous sa	amples							11 810			ler te		Delivery Method	l: (	www.
	* 10	Ł	7 7 9							120	6.	X	Waybill:					
Page 1	of 1	Control #													U	Received by:	VW	



## **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1221110

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Aug 17, 2017
Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215114

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / COA
Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Email - Single Report	PDF	Invoice
Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

## **Notes To Clients:**

• Sample 1221110-1; 5810369 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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## **Analytical Report**

Lot ID: 1221110 Bill To: Town of Inuvik Project ID: SNP 0036-9

Project Name: Control Number: Box 1160

2 Firth Street Project Location: Creek N/W of dump Date Received: Aug 17, 2017 Date Reported: Aug 24, 2017

Inuvik, NT, Canada LSD:

X0E 0T0 P.O.: 100104 Report Number: 2215114

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

> **Reference Number** 1221110-1

Sample Date August 16, 2017

Sample Time

**Sample Location** 

Sample Description snp-0036-9 / 2.9°C

Sample Matrix Water

Analyte		Units	Result	Nominal Detection Limit
Aggregate Organic Cons	stituents			
Biochemical Oxygen Demand	5 Day	mg/L	<4	4
Phenol		mg/L	<0.001	0.001
Oil and Grease	Total	mg/L	<5	5
pH adjustment	adjustment required		No	
Inorganic Nonmetallic Pa	arameters			
Phosphorus	Total	mg/L	0.15	0.05
Metals Dissolved				
Subsample	Field Filtered		Lab Filtered	
Metals Total				
Aluminum	Total	mg/L	0.20	0.02
Calcium	Total	mg/L	64.7	0.2
Iron	Total	mg/L	1.11	0.05
Magnesium	Total	mg/L	34.4	0.2
Manganese	Total	mg/L	0.528	0.005
Potassium	Total	mg/L	1.5	0.4
Silicon	Total	mg/L	2.50	0.05
Sodium	Total	mg/L	25.3	0.4
Sulfur	Total	mg/L	92.4	0.3
Mercury	Total	mg/L	<0.00005	0.00005
Antimony	Total	mg/L	<0.0002	0.0002
Arsenic	Total	mg/L	0.0008	0.0002
Barium	Total	mg/L	0.020	0.001
Beryllium	Total	mg/L	<0.0001	0.0001
Bismuth	Total	mg/L	<0.0005	0.0005
Boron	Total	mg/L	0.042	0.002
Cadmium	Total	mg/L	0.00003	0.00001
Chromium	Total	mg/L	0.0010	0.0005
Cobalt	Total	mg/L	0.0009	0.0001
Copper	Total	mg/L	0.003	0.001
Lead	Total	mg/L	0.0001	0.0001
Lithium	Total	mg/L	0.015	0.001
Molybdenum	Total	mg/L	<0.001	0.001
Nickel	Total	mg/L	0.0097	0.0005
Selenium	Total	mg/L	0.0004	0.0002
Silver	Total	mg/L	<0.0001	0.00001
Strontium	Total	mg/L	0.196	0.001
Thallium	Total	mg/L	<0.0005	0.00005
Tin	Total	mg/L	<0.001	0.001

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## **Analytical Report**

Lot ID: 1221110 Bill To: Town of Inuvik Project ID: SNP 0036-9

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Aug 17, 2017 Date Reported: Aug 24, 2017

Inuvik, NT, Canada LSD:

100104 X0E 0T0 P.O.: Report Number: 2215114

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Town of Inuvik Company:

> **Reference Number** 1221110-1

Sample Date August 16, 2017

Sample Time

**Sample Location** 

Sample Description snp-0036-9 / 2.9°C

> Sample Matrix Water

	:	Sample Matrix vvate	ſ	
Analyte		Units	Result	Nominal Detection Limit
Metals Total - Continued				
Titanium	Total	mg/L	0.0045	0.0005
Uranium	Total	mg/L	<0.0005	0.0005
Vanadium	Total	mg/L	0.0007	0.0001
Zinc	Total	mg/L	0.013	0.001
Zirconium	Total	mg/L	<0.001	0.001
Microbiological Analysis				
Total Coliforms	Membrane Filtration	CFU/100 mL	150	1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	100	1
Physical and Aggregate F	Properties			
Solids	Total Suspended	mg/L	<2	2
Routine Water				
рН			7.28	
<b>Electrical Conductivity</b>	at 25 °C	μS/cm	645	1
Calcium	Extractable	mg/L	61.6	0.2
Magnesium	Extractable	mg/L	32.8	0.2
Sodium	Extractable	mg/L	23.4	0.4
Potassium	Extractable	mg/L	1.5	0.4
Sulfate (SO4)	Dissolved	mg/L	259	0.9

Approved by:

Darlene Lintott, MSc Consulting Scientist

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1221110

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Aug 17, 2017

Inuvik, NT, Canada LSD: Date Reported: Aug 24, 2017

X0E 0T0 P.O.: 100104 Report Number: 2215114

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	21-Aug-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	21-Aug-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	18-Aug-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	18-Aug-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	18-Aug-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	18-Aug-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	18-Aug-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Aug-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Aug-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	18-Aug-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	17-Aug-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	17-Aug-17	Exova Edmonton
Phosphorus - Total in Water	APHA	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	17-Aug-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	21-Aug-17	Exova Edmonton

<sup>\*</sup> Reference Method Modified

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### Comments:

• Sample 1221110-1; 5810369 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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 W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1221110

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Aug 17, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Aug 24, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2215114

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

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						Ser.											
Exova	Testing	Billing Informat	ion:		Copy of	Report To								R	USH Priority		
EXOVG	Advising Assuring	Company	Town of Inuv	ik	Company	Aec	om -	Edr	mont	on				Upon filling out	this section, client accep	ots that	
www.exova.com	- Assaining	Address	Box 1160 2 F	Firth Street	Address	1720	03-1	03rd	d Ave	nue					will be applied to the anal		
Project Information	on		Inuvik, NT X	0E 0T0		Edmo	onton	, AB	T5S 1	J4				Date Requir	ed		
Project ID	snp-0036-9	Attention	Rick Campbe	ell	Attention	Rich	Richard Feilden						As Indicated	All Analysis	S		
Project Name		Phone	(867) 777-86	15	Phone	(780	) 48	8-68	300					14/5 #4 O A D			
Project Location	Creek N/W of dump	Cell	(867) 678-53	88	Cell										When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and		
Legal Location		Fax	(867) 777-86	01	Fax	(780	) 48	8-21	121					turn around time to match. Please contact the lab			
PO/AFE#	100104	E-mail	rcampbell	@town.inuvik.nt.ca	E-mail	richa	ard.fe	eilde	en@a	econ	1.cor	n		prior to si	ubmitting RUSH samples		
Proj. Acct.Code		Agreement ID	2909											Signature			
		Copy of Report			Copy of it	rvoice								Sample (	Custody (please prin	nt)	
Report Results	x E-Mail	Online	PDF		QA/QC R	eport	П							Sampled by:	Jim Crawford		
	Mail x	Fax	Excel	2			IJ					1 1		Company	Town of Inuvik		
	s/Comments (please in	nclude contact info	rmation includ	ling ph. # if different	Indicate Reg		ıω							I authorize Ex	xova to proceed with the	work	
from above).				- 8	Requiremen	s below	ine					1 1		ind	licated on this form:		
CONTRACTOR CONTRACTOR	oject ID Below and not			Τ.			Containers							Date: Aug.16/201			
	IP4 Mt.B W - SNP5 Mt		note NIANI net also	40.0			of C					1 1			ion for Lab use o	only	
SNP6 GatePond - SNP7 FarPond - SNP8 TwinL SNP9-Creek N/W of dump Raw Water											1 1		Date/Time stan				
	, Wind dir Vel_	km/h					Number			11				NUM ET (S	ALL SELL FREE FOR		
			Depth			Sampling	1							Indicate below	any deficiencies in th		
Sample	Identification	Location	in cm m	Date/Time sample	d Matrix	method	$ \downarrow $							condition of sai	The six of the same of the same and the	ž	
1 B.O.D.		snp-0036-9		Aug.16/2017		Dip					3			S-2	Were Exova su	pplies	
2 nutrients + p	reservatives	snp-0036-9		Aug.16/2017		Dip	П		74.6	1					used?		
3 oil & Greece	+ preservatives	snp-0036-9		Aug.16/2017		Dip	П			$\Box$					Was there any	damage	
4 metals + pre	servatives	snp-0036-9		Aug.16/2017		Dip	П								to the shipping container?		
5 phenol + pre	eservatives	snp-0036-9		Aug.16/2017	J. J	Dip											
6 microbiology	<i>f</i>	snp-0036-9		Aug.16/2017		Dip	П					11			Were the conta	377554	
7 mercury		snp-0036-9		Aug.16/2017		Dip									packaged well?	1	
8 routine		snp-0036-9		Aug.16/2017	1	Dip	П										
9									-6						Were the expec	1000	
10															number of samp received (docur	•======	
11															below)?		
12				- 4										No.			
13															Are samples wi	(15) to a construction	
14					-48								- 1		recommended t times/temp?	lolding	
15						_ =	I, I		l	1 1			1,85				
	Environmental S	Sample Inforn	nation She	et	Lot: 12	04440	CO	2				Ship		# and size of cool	ers received:		
	er completion of this for				Lot: 12	21110			as ===			COD			-		
Plea	ase indicate any p	otentially ha	zordous sa	mples									er temp	Delivery Metho	d: Cours	N	
		Control #	ži.									2	.9	Waybill:	1 10 10 0		
Page 1	of 1	5011.01 #												Received by: _	30005	7	



## **Report Transmission Cover Page**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1226584

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222196

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Contact	Company	Address
Jason Casault	AECOM - Edmonton	101, 18817 Stony Plain Road
		Edmonton, AB T5S 0C2
		Phone: (780) 486-7050 Fax: (780) 486-7070
		Email: Jason.Casault@aecom.com
Delivery	<u>Format</u>	<u>Deliverables</u>
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Email - Merge Reports	PDF	COC / Test Report
Kim Wainman	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: kwainman@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice
Richard Feilden	AECOM - Edmonton	17203 - 103 Avenue
		Edmonton, AB T5S 1J4
		Phone: (780) 488-6800 Fax: (780) 488-2121
		Email: richard.feilden@aecom.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Reports	PDF	COC / Test Report
Rick Campbell	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-8615 Fax: (867) 777-8601
		Email: rcampbell@town.inuvik.nt.ca
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
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Utilidor	Town of Inuvik	Box 1160, 2 Firth Street
		Inuvik, NT X0E 0T0
		Phone: (867) 777-2607 Fax: (867) 777-2071
		Email: utilidor@town.inuvik.nt.ca
Delivery	<u>Format</u>	<u>Deliverables</u>
Email - Single Report	PDF	Invoice

## **Notes To Clients:**

• Sample 1226584-1; 5838059 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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## **Analytical Report**

Bill To: Town of Inuvik

Project ID:

SNP 0036-9

Lot ID: 1226584

Box 1160

Project Name:

LSD:

P.O.:

Control Number:

2 Firth Street

Project Location: Creek N/W of dump Date Received: Sep 14, 2017

Inuvik, NT, Canada X0E 0T0

100104

Date Reported: Sep 21, 2017

Attn: Rick Campbell

Proj. Acct. code:

Report Number: 2222196

Sampled By: Jim Crawford Company: Town of Inuvik

**Reference Number** 

1226584-1

Sample Date Sample Time

Sep 13, 2017

NA

**Sample Location** 

Sample Description SNP-0036-9 / 4.0°C

A L . d -		Matrix	Water	D 11	D. "	Nominal Detection
Analyte		Units	Results	Results	Results	Limit
Aggregate Organic Con	stituents					
Biochemical Oxygen Demand	5 Day	mg/L	<4			4
Phenol		mg/L	0.001			0.001
Oil and Grease	Total	mg/L	<5			5
pH adjustment	adjustment required		No			
Inorganic Nonmetallic P	arameters					
Phosphorus	Total	mg/L	0.06			0.05
Metals Dissolved						
Subsample	Field Filtered		Lab Filtered			
Metals Total						
Aluminum	Total	mg/L	0.08			0.02
Calcium	Total	mg/L	60.8			0.2
Iron	Total	mg/L	0.52			0.05
Magnesium	Total	mg/L	25.9			0.2
Manganese	Total	mg/L	0.312			0.005
Potassium	Total	mg/L	1.6			0.4
Silicon	Total	mg/L	1.73			0.05
Sodium	Total	mg/L	21.2			0.4
Sulfur	Total	mg/L	77.2			0.3
Mercury	Total	mg/L	<0.00005			0.000005
Antimony	Total	mg/L	<0.0002			0.0002
Arsenic	Total	mg/L	0.0005			0.0002
Barium	Total	mg/L	0.018			0.001
Beryllium	Total	mg/L	<0.0001			0.0001
Bismuth	Total	mg/L	<0.0005			0.0005
Boron	Total	mg/L	0.046			0.002
Cadmium	Total	mg/L	0.00002			0.00001
Chromium	Total	mg/L	0.0009			0.0005
Cobalt	Total	mg/L	0.0004			0.0001
Copper	Total	mg/L	0.002			0.001
Lead	Total	mg/L	<0.0001			0.0001
Lithium	Total	mg/L	0.016			0.001
Molybdenum	Total	mg/L	<0.001			0.001
Nickel	Total	mg/L	0.0082			0.0005
Selenium	Total	mg/L	<0.0002			0.0002
Silver	Total	mg/L	<0.00001			0.00001
Strontium	Total	mg/L	0.187			0.001
Thallium	Total	mg/L	< 0.00005			0.00005

## **Analytical Report**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1226584

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

Inuvik, NT, CanadaLSD:Date Reported:Sep 21, 2X0E 0T0P.O.:100104Report Number:2222196

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Reference Number 1226584-1
Sample Date Sep 13, 2017
Sample Time NA

Sample Location

Sample Description SNP-0036-9 / 4.0°C

Matrix Water

		- Matinx				
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total - Continued						
Tin	Total	mg/L	<0.001			0.001
Titanium	Total	mg/L	0.0019			0.0005
Uranium	Total	mg/L	< 0.0005			0.0005
Vanadium	Total	mg/L	0.0004			0.0001
Zinc	Total	mg/L	0.011			0.001
Zirconium	Total	mg/L	<0.001			0.001
Microbiological Analysis	•					
Total Coliforms	Membrane Filtration	CFU/100 mL	3			1
Fecal Coliforms	Membrane Filtration	CFU/100 mL	1			1
<b>Physical and Aggregate</b>	Properties					
Solids	Total Suspended	mg/L	2			2
Routine Water						
pН			7.44			
Electrical Conductivity	at 25 °C	μS/cm	570			1
Calcium	Extractable	mg/L	58.4			0.2
Magnesium	Extractable	mg/L	25.0			0.2
Sodium	Extractable	mg/L	21.1			0.4
Potassium	Extractable	mg/L	1.5			0.4
Sulfate (SO4)	Dissolved	mg/L	224			0.9

Approved by:

Anthony Neumann, MSc
Laboratory Operations Manager

Anthony Weuman

Exova 7217 Roper Road NW Edmonton, Alberta T6B 3J4, Canada T: +1 (780) 438-5522 F: +1 (780) 434-8586 E: Edmonton@exova.com W: www.exova.com



## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1226584

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Sep 14, 2017
Inuvik, NT, Canada LSD: Date Reported: Sep 21, 2017

X0E 0T0 P.O.: 100104 Report Number: 2222196

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Method of Analysis				
Method Name	Reference	Method	Date Analysis Started	Location
Alkalinity, pH, and EC in water	APHA	* Conductivity, 2510 B	18-Sep-17	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	* pH - Electrometric Method, 4500-H+ B	18-Sep-17	Exova Edmonton
BOD in water	APHA	* 5 Day, 5210 B	15-Sep-17	Exova Edmonton
Coliforms - Membrane Filtration	APHA	Fecal Coliform Membrane Filter Procedure, 9222 D	15-Sep-17	Exova Calgary
Coliforms - Membrane Filtration	APHA	Standard Total Coliform Membrane Filter Procedure, 9222 B	15-Sep-17	Exova Calgary
Mercury (Total) in water	US EPA	<ul> <li>Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5</li> </ul>	15-Sep-17	Exova Edmonton
Metals ICP-MS (Total) in water	US EPA	<ul> <li>Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Extractable) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Metals Trace (Total) in water	APHA	<ul> <li>* Inductively Coupled Plasma (ICP)</li> <li>Method, 3120 B</li> </ul>	15-Sep-17	Exova Edmonton
Oil and Grease in water	US EPA	<ul> <li>n-Hexane Extractable Material and Silica Gel Treated n-Hexane Extractable Material by Extraction and Gravimetry, 1664</li> </ul>	15-Sep-17	Exova Edmonton
Phenol in water	APHA	* Direct Photometric Method, 5530 D	15-Sep-17	Exova Edmonton
Phosphorus - Total in Water	АРНА	<ul> <li>* Automated Ascorbic Acid Reduction Method, 4500-P F</li> </ul>	14-Sep-17	Exova Edmonton
Solids Suspended (Total, Fixed and Volatile)	APHA	<ul> <li>* Total Suspended Solids Dried at 103- 105'C, 2540 D</li> </ul>	15-Sep-17	Exova Edmonton
		* Reference Method Modified		

#### References

APHA Standard Methods for the Examination of Water and Wastewater APHA/USEPA Standard Methods For Water/ Environmental Protection Agency

EPA Environmental Protection Agency Test Methods - US
US EPA US Environmental Protection Agency Test Methods

#### Comments:

• Sample 1226584-1; 5838059 Sample formed an emulsion during oil and grease extraction. Centrifugation was required in order to complete analysis.

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## **Methodology and Notes**

Bill To: Town of Inuvik Project ID: SNP 0036-9 Lot ID: 1226584

Box 1160 Project Name: Control Number:

2 Firth Street Project Location: Creek N/W of dump Date Received: Sep 14, 2017

 Inuvik, NT, Canada
 LSD:
 Date Reported:
 Sep 21, 2017

 X0E 0T0
 P.O.:
 100104
 Report Number:
 2222196

Attn: Rick Campbell Proj. Acct. code:

Sampled By: Jim Crawford Company: Town of Inuvik

Please direct any inquiries regarding this report to our Client Services Group or to the Operations Manager at the coordinates indicated at the top left of this page.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

EXOVA Testing Advising Assuring	Billing Information:			Copy of	Copy of Report To: RUSH Priority										
Assuring	Company Town of Inuvik			Company	Company Aecom - Edmonton								Upon filling out this section, client accepts that		
www.exova.com	Address	Box 1160 2 Firth Street			Address 17203-103rd Avenue								surcharges will be applied to the analysis		
Project Information		Inuvik, NT X0E 0T0			Edmonton, AB T5S 1J4								Date Required		
Project ID snp- 0036-9	Attention	Rick Campb	Attention	ntion Richard Feilden								As Indicated	All Analysis		
Project Name	Phone	(867) 777-86	Phone	Phone (780) 488-6800								When "ASAP" is requested, turn around will			
Project Location Creek N/W of dump	Cell	(867) 678-53	Cell	Description of the control of the co								default to a 100% RUSH priority, with pricing and			
Legal Location	Fax	(867) 777-86	601	Fax	Fax (780) 488-2121								turn around time to match. Please contact the lab prior to submitting RUSH samples		
PO/AFE# 100104	E-mail	rcampbell	E-mail	E-mail richard.feilden@aecom.com											
Proj. Acct.Code	Agreement ID										Signature				
	Copy of Report		Copy of invoice								Sample Custody (please print)				
Report Results X E-Mail	Online	PDF	Į.	QA/QC R	eport	H				1 1			Sampled by: J	im Crawford	
Mail x	Mail x Fax Excel												Company Town of Inuvik		
					Indicate Regulatory Requirements below  of Countries  of C								The second of th	to proceed with the work d on this form:	
Sampler: Circle Project ID Below and note weather:													Date:Sept. 13/2017	Initial: J.S.	
SNP3 Lagoon - SNP4 Mt.B W - SNP5 Mt			ပ္ရိ								for Lab use only				
SNP6 GatePond - SNP7 FarPond - SNP8										Date/Time stamp:	:40				
Raw Water			ğ.				1 1								
Temp C, precip, Wind dir Vel_	km/h		المستر المستنيس			ž			LL						
Sample Identification	Location	Depth in cm m	Date/Time sampled	Matrix	Sampling method	$ \downarrow $					Indicate below any deficiencies in the condition of samples:				
1 B.O.D.	snp- 0036-9		Sept.13/2017		Dip				TT			Т		Were Exova supplies	
2 Nutrients + preservatives	snp- 0036-9		Sept.13/2017		Dip	П			-6	$\Box$				used?	
3 Oil n Greece + preservatives	snp- 0036-9		Sept.13/2017		Dip									Was there any damage	
4 Phenol + preservatives	snp- 0036-9		Sept.13/2017		Dip									to the shipping container?	
5 Metals + preservatives	snp- 0036-9		Sept.13/2017		Dip										
6 Microbiology	snp- 0036-9		Sept.13/2017		Dip									Were the containers	
7 Mercury	snp- 0036-9		Sept.13/2017		Dip									packaged well?	
8 Routine	snp- 0036-9		Sept.13/2017		Dip	Ш									
9														Were the expected number of samples	
10														received (document	
11														below)?	
12				4											
13				1		Ш								Are samples within recommended holding	
14						$oxed{oxed}$								times/temp?	
15				/ · =		1	1 1	•	,						
Environmental S	Lot: 12	ot: 1226584 COC Shipping								# and size of coolers received:					
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Page 1 of 1		4.1							)	Waybill: Received by: W					
raye 1 or 1												received by. W	V		



# Appendix C

**Lagoon Berm Inspection Report** 



AECOM 4916 47th Street, Floor 3 GoGa Cho Building (PO Box 1259) Yellowknife, NT, Canada X1A 2N9 www.aecom.com

867 873 6316 tel 867 873 6407 fax

March 27, 2018.

Mr. Leonard DeBastien
Executive Director
Gwich'in Land and Water Board
Box 2018
Inuvik, N.W.T.
X0E 0T0

Mr. Rolland Malegana
Regional Environmental Assessment Coordinator
Energy and Natural Resources
Box 2749
Inuvik, N.T.
X0E 0T0

Dear Sir:

Project No: 60555250

Regarding: Town of Inuvik - Water Licence No. G17L3-001

Licence Condition D8, Lagoon Earthen Water Retaining Structures

On behalf of Inuvik, we wish to respond to Water License Condition D8 for year 2017.

Water Licence Condition D8 states, "The dams, dykes and other engineered earth structures designed to contain waste within the Sewage Disposal facilities shall be inspected annually by a professional engineer to determine the stability of the structures". In Water Licence A2, Definitions, "Professional Engineer – a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientist, and whose principal field of specialization is appropriate to address the components of the undertaking at hand".

The lagoon's west dyke was built on native permafrost soils in the late 1950's. The interior dykes forming the sludge cells and primary lagoon cells were added in 1981. The west dyke was rebuilt at the same time. In 1987-88, initial settlement of the new interior dikes and further erosion of the west dike were restored in a major re-grading project. In 2003, subsidence and erosion of the inner face of the west dike was again repaired, and the inner face was armored with geotextile and blast rock. In 2006, subsidence of the interior dikes was repaired by raising the dike crests back to designed level. In 2015, subsidence of the dike along the north end of the lagoon was repaired by raising the dike crests back to designed level.

Inuvik has the dikes inspected by its engineers, AECOM, at least annually.

Gradual uneven settlement of the dikes has been ongoing since they were first built. Settlement is believed to be due primarily to thawing of the permafrost under the dykes, and subsequent consolidation of the soils. Historically, slow subsidence has not threatened the integrity or water tightness of the dikes and it is not expected to do so as long as it is countered by periodic restoration.

In some years significant thaw-subsidence occurs in the portion of the lagoon system's west dike that runs between the west sludge cell and "Gate Pond" (as named in the SNP program). Gate Pond was formed early in Inuvik's history by gravel borrowing, and is thought to have been deepened (and probably enlarged) by subsequent thaw-subsidence. Gate pond probably is the main heat source



causing the recurrent dike thaw-subsidence in the vicinity. Routinely, the dike is restored to designed levels and lines whenever significant thaw-subsidence has occurred.

Undercutting and sloughing of inner faces has also been ongoing since the dikes were first built, caused by soft subsoils and the flat slopes that the dike soils trend toward under water. Permafrost thaw subsidence and seasonal freeze-thaw may contribute locally. Sloughing narrows the crest. From time to time, dikes need to be restored to designed width in order to maintain water tightness, stability, and safe vehicle access along the crests. Sloughing affects all dikes, and major restoration projects have been needed roughly every ten to fifteen years. The 2003 armoring work was intended to reduce sloughing of the inner face of the west dike. Dikes around the smaller cells have not been armored.

Over the years the two karst ponds just outside the west dike, toward its downstream end, have shown a tendency to grow. There has been some undercutting and sloughing of the outer face of the west dike along the pond shorelines. Fill was added to slope toes in the fall of 2006 and again in 2007 and 2009. It is reasonably certain similar restoration work will be needed in future at these locations, probably in most years.

In late 2010 the dykes separating the inner ponds were rebuilt and the west dyke was graded to fill all the cracks. During summer 2015, the north dyke was raised about 0.5 metre to restore grade, and the surface of all other dykes was graded.

During spring of 2016, the Town of Inuvik hired a local contractor to drill test holes along the lagoon dykes and obtain soils samples at various depths. The samples were sent to AECOM for laboratory testing. According to the results the soil beneath the dykes generally consists of ice rich clays, silts and sands.

The 2017 annual inspection was carried out on September 30, 2017. All dykes were found to be in satisfactory condition. No unusual longitudinal cracks or fissures were noted. Maintenance activities carried out in 2017 included restoring grade around the inner ponds and grading of all the dykes to fill longitudinal cracks.

The longitudinal cracking that occurs on an annual basis confirms that subsidence and undercutting continue to occur at a slow rate, and in some future year major restoration work will be required. This underscores the need for continued maintenance. Nevertheless all dikes appear to remain at or very near to designed shapes and levels, and on that basis we believe that all of the dikes in Inuvik's lagoon at this time are safe and adequate water retaining structures.



We trust that this submission fulfills the requirements of the Town of Inuvik water license Condition D8 for year 2017.

Sincerely,

AECOM Canada Ltd.

Michel Lanteigne, P.Eng.

Manager, Northwest Territories
Michel.lanteigne@aecom.com

ML:sw

mr. Rick Campbell, Town of Inuvik

Mr. Grant Hood, S.A.O., Town of Inuvik

Inuvik Utilidor Crew Foreman Inuvik Public Works Committee Reviewed by

Jordan Hoffart, P.Eng.

Project Engineer, Municipal Infrastructure

jordan.hoffart@aecom.com



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- was prepared for the specific purposes described in the Report and the Agreement; and
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Gwich'in Land and Water Board