QUALITY ASSURANCE / QUALITY CONTROL PLAN FOR THE HAMLET OF BAKER LAKE'S LICENSED MONITORING PROGRAM

Nunavut Water Board License
No. 3BM-BAK1015

FINAL

Prepared for:

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ABBREVIATIONS

CALA.....Canadian Association for Laboratory Accreditation

GN-HSS.....Government of Nunavut Department of Health and Social Services

Hamlet.....Hamlet of Baker Lake

L.....litres

m^3.....cubic metres

mL..... millilitres

NWB.....Nunavut Water Board

O&M..... Operations & Maintenance

QA/QC.....Quality Assurance / Quality Control

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1 INTRODUCTION

1.1 Background

This Quality Assurance / Quality Control (QA/QC) Plan has been developed for use by the Hamlet of Baker Lake (the Hamlet) when conducting water/effluent sampling for their Monitoring Program as outlined in the Hamlet's Water License (3BM-BAK1015), issued by the Nunavut Water Board (NWB) on June 23, 2010. Preparation and execution of this QA/QC Plan satisfies Item 8 of Part H of the Water License.

This QA/QC Plan has been developed based on guidelines issued by the Department of Indian Affairs and Northern Development (DIAND): *Quality Assurance (QA) and Quality Control (QC) Guidelines for use by Class "B" Licensees in Collecting Representative Water Samples in the Field and for Submission of a QA/QC Plan* (July 1996).

1.2 Description

A QA/QC Plan will help ensure that water/effluent samples taken in the field by the Hamlet maintain a high degree of quality, so that they accurately reflect the physical and chemical nature of the sampels being tested. A QA/QC program is a set of standardized protocols that ensures quality data are collected by defining office, field and laboratory procedures to be followed. The development and inclusion of a QA/QC component in a sampling program is essential to its success. In addition to ensuring that the sampling process is properly managed, the QA/QC program provides sources and estimates of the sampling error and variance, including natural variability.

To better understand QA/QC, definitions for Quality Assurance and Quality Control are provided:

- Quality assurance is the system of activities designed to better ensure that quality control is done effectively (DIAND-WRD 1996). QA involves the overall management of the sampling program, and includes planning, documentation, training, consistency in collecting and handling samples, analyses, validation, and reporting (AENV 2006).
- Quality control is an important aspect of QA and is the use of established procedures to achieve standards of measurement for the three principal components of quality – precision, accuracy and reliability (DIAND-WRD 1996). QC refers to the technical activities (e.g., sample procedures, use of QC samples, handling, transport, etc) used to reduce errors throughout a sampling program. These activities measure the performance of a process against defined standards to verify that the data meet the expected quality (AENV 2006).

The following QA/QC Plan outlines proper procedures that should be used to successfully complete the Monitoring Program identified in the Hamlet's Water License. The Plan has been specifically developed for sample stations where water/effluent sample collection is required, however a brief discussion on volume measurement stations is also provided. Figure 1 in **Appendix A** outlines components of the water, sewage and solid waste systems in Baker Lake.

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2 SAMPLE COLLECTION

2.1 Location

The Hamlet's Water License identifies five monitoring program stations, four of which are located from within or downstream of the sewage treatment wetland and solid waste facility. Table 2-1 describes these stations, as well as Figure 2 in **Appendix A** of this QA/QC Plan. An informal station is also described in the table below; this station is not included in the Hamlet's Water License but is required for the drinking water system.

Table 2-1 Monitoring Stations identified in the Hamlet of Baker Lake's Water License 3BM-BAK1015.

Monitoring Program Station Number	Description	Monitoring Requirement	Location
BAK-1	Raw potable water supply from Baker Lake	Volume (m^3) (monthly and annually)	At the Pumphouse or Hamlet Office (using *Fluid Manager*)
BAK-2	Runoff from the Sewage & Solid Waste Disposal Facilities, prior to Airplane Lake	Water Quality (monthly during periods of flow)	64° 19' 14.3" N 95° 58' 29.1" W
BAK-3	Outlet of Airplane Lake	Water Quality (annually during periods of flow)	64° 19' 0.6" N 95° 58' 29.8" W
BAK-4	Runoff from the solid waste disposal facility prior to Finger Lake	Water Quality (annually during periods of flow)	Approximately 64° 19' 44.5" N 95° 59' 43.9" W
BAK-5	At the outlet of the sewage treatment tundra wetland, immediately prior to Finger Lake	Water Quality (annually during periods of flow)	64° 19' 48.5" N 95° 58' 34.2" W
BAK-6 (informal, not included in Water License)	Raw water (pumphouse before chlorination), water trucks, and a few taps within the community	Bacterial water quality (monthly)	–

2.1.1 BAK-1

From the above table, one station is required for volume measurements only: BAK-1. This station will measure the volume of water removed from Baker Lake, the potable water source.

Measurements in cubic metres (m^3) should be recorded at this station every time water is withdrawn from Baker Lake (i.e., when water trucks are filled). The quantities of water used (or delivered) should be reported for each month of the year (e.g., January, February, March, etc) in the Hamlet's

Annual Reports to the NWB. This station is presently not marked by signage. For more information on volume measurements, see Section 3.6.1 in the Hamlet's Operations and Maintenance (O&M) Manual.

2.1.2 BAK-2, BAK-3, BAK-4 and BAK-5

The Hamlet's Water License requires water/effluent sample collection at four stations within and downstream of the sewage treatment wetland and solid waste facility. The sewage treatment wetland is inclusive of the holding cell, area between the holding cell and Lagoon Lake, Lagoon Lake, and the area between Lagoon Lake and Finger Lake. The solid waste facility is located near the southwest shore of Finger Lake (see Figures 1 and 2 in **Appendix A**).

The first sample station, BAK-2, will measure the effluent quality leaving the sewage and solid waste facilities and entering Airplane Lake while the second sample station, BAK-3, measures the quality of water leaving Airplane Lake and subsequently entering Baker Lake. The third sample station, BAK-4, will measure the leachate quality leaving the solid waste facility and entering Finger Lake, while the fourth sample station, BAK-5, measures the effluent quality leaving the sewage treatment wetland and entering Finger Lake. BAK-5 is the compliance point of the sewage treatment wetland.

Sample collection at the BAK-2 sample station should occur monthly during periods of flow (typically May/June to August/September). Sample collection at the BAK-3, BAK-4 and BAK-5 sample stations should occur annually during periods of flow (typically in August).

2.1.3 BAK-6 (Informal)

Though not outlined in the Hamlet's Water License, bacterial sampling of the community's drinking water is required under Nunavut's *Consolidation of Public Water Supply Regulations*, under authority of the Government of Nunavut Department of Health and Social Services (GN-HSS). Bacterial water samples should be obtained from up to 10 different locations, including:

- Raw water supply from within the pumphouse, before water chlorination;
- From each water truck; and,
- From two or three buildings within the community (e.g., Hamlet office, hotel, school, residence, etc).

Though the Government of Nunavut Department of Community and Government Services is responsible for the pumphouse and equipment within, the Hamlet should still collect drinking water samples from their equipment (i.e., water trucks) and community buildings.

Sample collections at the above sample stations should, at a minimum, occur monthly throughout the year (12 sampling events). These stations are not marked by signage.

2.2 Sampling Equipment

The following equipment is required to complete the sampling for the Monitoring Program at Baker Lake:

- Sample bottles:
  - New, clean sample bottles ordered from a laboratory
  - Bottles should not be re-used; if in doubt, send old bottles back to the laboratory
  - Sample bottles include both high-density polyethylene (HDPE), clear glass vials and amber glass bottles
  - A list of required sample bottles is provided in **Appendix B** of this QA/QC Plan.
- Sample preservatives:
  - Preservatives are sent by the laboratory
  - Includes sodium thiosulphate (inside the bacteria bottles), sodium bisulphite (inside the BTEX bottles), nitric acid and sulphuric acid
- Laboratory-grade deionized water
- Nitrile or latex gloves
- Sharpie markers or other waterproof, permanent markers
- Sampling field notebook and pencil or pen
- A watch
- Rubber boots
- Anti-bacterial wipes or gel
- Coolers
- Frozen freeze packs
- Packing material (e.g., Styrofoam packing peanuts, shredded paper, bubble wrap, etc)
- Packing tape
- Chain of Custody/Analysis Request forms

Other sampling equipment, such as sample collection devices, are not needed for the Hamlet's Monitoring Program since all samples will be retrieved by hand. Sample stations in the tundra wetland are located in stream channels or along lake shores, while drinking water samples will be primarily obtained from water taps.

2.3 Sampling Methods

2.3.1 Required Samples

The following parameters should be analysed for at BAK-2, BAK-3 and BAK-5 monitoring stations. See **Appendix B** for a list of required sample bottles, detailing which parameter is collected in which bottle.

- Biochemical Oxygen Demand (BOD_5)
- Carbonaceous Biochemical Oxygen Demand (cBOD)
- Total Metals (including aluminum, arsenic, cadmium, cobalt, chromium, copper, iron, lead, nickel, manganese, mercury and zinc)
- Total Alkalinity
- Total Suspended Solids (TSS)
- Conductivity
- Total Organic Carbon (TOC)
- Fecal Coliforms
- Ammonia Nitrogen
- Nitrate-Nitrite
- Anions and Cations (including calcium, chloride, magnesium, potassium, sodium and sulphate)
- Total Hardness
- pH
- Total Phenols
- Oil and Grease (visual)

The above parameters should also be analysed for at the BAK-4 sample station, with the addition of the following parameters:

- Total Petroleum Hydrocarbons (TPHs)
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs)

The following parameters should be analysed for at the sample stations of BAK-6 (informal station):

- *Escherichia coli* (*E. coli*) bacteria
- Total coliforms (total number of bacteria)

2.3.2 Sample Collection

Sample collection procedures have been developed for collection of bacterial water samples from the drinking water system (BAK-6), as well as for the collection of water samples from within and downstream of the sewage and solid waste facilities. Please see **Appendix C** of this QA/QC Plan for each sample collection method.

These sample collection procedures are also included in the Hamlet's O&M Manual (Appendices D and F) and in the sampling manuals developed for sampling personnel.

2.3.3 QA/QC Samples

QA/QC samples for the Hamlet's Monitoring Program will include field replicates and field blanks. Table 2-2 describes each type of QA/QC sample as well as how often the samples should be collected (frequency).

Table 2-2 Types of QA/QC samples to be used at the Hamlet of Baker Lake

QA/QC Sample	Description	Frequency
Field Replicate	These are additional samples collected in the same place, at the same time (one after the other), using the same sampling and preservation procedures. Field replicates are taken for entire set of samples. For example, if you have to fill five (5) sample bottles at one monitoring station (one sample set), you will fill five additional bottles at that monitoring station (e.g., fill two of each type of sample bottle). Field replicates are used to determine how precise the sampling and laboratory analysis is and to help to resolve contamination or analytical problems. Field replicates are treated as real samples and are submitted to the laboratory with the rest of collected samples.	Every time sampling is completed. A minimum of one (1) field replicate sample set should be collected each time samples are collected.
Field Blank	These are deionized water samples used to identify contamination or errors in sample collection. Field blanks will show whether samples have been altered by handling or some other process in the field, or by atmospheric exposure. Field blanks can be prepared in the field or by a laboratory. To prepare in the field, deionized water is poured into a clean, empty sample bottle, simulating sample collection and preservation. They are also collected for the entire set of samples. If field blanks are prepared by a laboratory, the bottle(s) must be opened and exposed to the atmosphere for the same amount of time it took to collect a sample. They are submitted to the laboratory for analysis along with the genuine field samples.	Every time sampling is completed. One field blank sample set is required each time samples are collected.

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3 SAMPLE HANDLING

3.1 Hold Times

All water samples have hold times. Hold times are the length of time (e.g., hours, days, weeks, or months) after sample collection that the water sample is considered to still represent the chemical and physical conditions at the monitoring station at the time of sampling. Some hold times are very short (e.g., bacteria hold time is 48 hours after preservation) while others are longer (e.g., total metals hold time is six (6) months once preserved).

Short hold times mean the samples need to get to the laboratory and be analysed by the end of that hold time. It is also the reason why samples need to be shipped as soon as possible after collection. See **Appendix B** for a list of all sample hold times.

3.2 Preservation

Some samples require the addition of chemicals after collection and/or refrigeration for preservation. Sample preservation extends hold times and helps prevent chemical or biochemical changes from occurring within the sample.

Samples are generally preserved by adding an acid or other chemical to the sample immediately after the sample is collected. Refrigeration also extends hold times and all samples should be refrigerated or kept cold with frozen freeze packs (at 4°C) after collection and during transport to the laboratory. Water samples should never be frozen. The following chemical preservatives will be needed for the Hamlet's Monitoring Program:

- Sodium thiosulphate ($Na_2S_2O_3$)
  - Used to preserve bacterial samples; is a white powder
  - This preservative is usually added to the bacterial sample bottles by the laboratory before the bottles are sealed and sent. This does not need to be added by the sample collector.
- Sodium bisulphite ($NaHSO_3$)
  - Used to preserve the BTEX, TPH and PAH samples; is a white powder
  - This preservative is added to the BTEX, TPH and PAH sample bottles by the laboratory before the bottles are sealed and sent. This does not need to be added by the sample collector.
- Sulphuric acid (H_2SO_4)
  - Used to preserve Ammonia and Total Phenols samples; is a liquid.

- The preservative will be sent to you by the laboratory in vials (one vial per sample) and needs to be added to the Ammonia and Total Phenol samples immediately after sample collection.
- 1 milliliter (1 mL) of 50% (1:1) sulphuric acid needs to be added to each Ammonia and Total Phenol sample.

- Nitric acid (HNO_3)
  - Used to preserve Total Metals samples; is a liquid.
  - The preservative will be sent to you by the laboratory in vials (one vial per Total Metals sample) and needs to be added to the Total Metals samples immediately after sample collection.
  - 3 mL of 20% (1:5) nitric acid needs to be added to each Total Metals sample
- Hydrochloric acid (HCl)
  - Used to preserve Oil and Grease samples; is a liquid.
  - The preservative will be sent to you by the laboratory in vials (one vial per Oil and Grease sample) and needs to be added to the Oil and Grease samples immediately after sample collection.
  - 2 mL of 50% (1:1) hydrochloric acid needs to be added to each Oil and Grease sample.

3.3 Sample Identification

For all replicate and blank samples, it is best to develop an identification system that disguises the type of sample from the laboratory. This reduces potential bias, and ensures that the laboratory does not know the identity of samples and runs analyses in the same way for all monitoring stations and QA/QC samples. The following sample identification system could be used at Baker Lake:

- Sewage Treatment and Solid Waste Facilities:
  - BAK-2 – real sample; collected downstream of the sewage and solid waste facilities, prior to Airplane Lake
  - BAK-3 – real sample; collected at the outlet of Airplane Lake (mouth of Garbage Creek)
  - BAK-4 – real sample; collected downstream of the solid waste facility, prior to Finger Lake
  - BAK-5 – real sample; collected downstream of the sewage treatment wetland, prior to Finger Lake
  - BAK-7 – field replicate sample; collected from either BAK-2, BAK-3, BAK-4 or BAK-5
  - BAK-8 – field blank sample; deionized water samples poured or opened at either BAK-2, BAK-3, BAK-4 or BAK-5

- Drinking Water System:
  - BAK-6-1 – real sample; collected from within the pumphouse before water chlorination
  - BAK-6-2 to BAK-6-7 – real samples; collected from each of the water trucks
  - BAK-6-8 – real sample, collected from a community building (e.g., Hamlet office)
  - BAK-6-9 – real sample, collected from a community building (e.g., hotel)
  - BAK-6-10 – field replicate sample; collected from any one of the above BAK-6 sample stations
  - BAK-6-11 – field blank sample; deionized water sample poured at any one of the above BAK-6 sample stations

As described in the Sample Collection Procedures in **Appendix C**, it is good practice to label all sample bottles before the samples are collected. Sticker-type bottle labels are typically provided by the laboratory or bottles may arrive with a bottle label already attached. Prior to going into the field, sample bottles should have a bottle label put on and, at a minimum, labeled with the following:

- Sample identification code/number (e.g., BAK-2; see above)
- Type of sample (e.g., total metals; see **Appendix B** for types of samples)
- Company that the samples are for (i.e., Hamlet of Baker Lake)

Immediately prior to or after the samples are collected, the bottles should be labeled with the date and time sampled (e.g., April 15, 2011 at 11:20 am). All bottle labels should be written with a Sharpie marker or other waterproof, permanent, non-smear marker. Bottle labels should be written so they are clear and easy to read. Once you arrive at your monitoring stations, double check you are using the correct bottles for that monitoring station.

3.4 Transportation

Once the samples have been collected from the monitoring station and have been preserved, samples should be immediately put back in the cooler with the lid closed. Samples should remain in the cooler with frozen freeze packs until they arrive at the laboratory. All attempts should be made to keep the samples cool (never frozen!); frequent changing of frozen freeze packs may be required.

Samples should be packed properly prior to shipment to the laboratory to ensure samples do not break or leak and remain cool. Proper cooler packing includes:

- Lining the bottom of the cooler with packing material (e.g., bubble wrap, shredded paper, Styrofoam packing peanuts, etc)
- Wrapping all glass bottles in bubble wrap or paper
- Arranging samples so that they remain upright during transport
- Ensuring samples will not move around too much during transport

- Using Styrofoam packing peanuts or shredded paper to pack any empty spots in the cooler
- Arranging frozen freeze packs so that they will keep samples cool

Sampling should have been performed on a day where no flight delays or cancellations are expected. Samples need to be shipped to the laboratory as soon as possible after sample collection, preferably on the same day as sample collection. Once all samples are collected and properly packed, ensure the Chain of Custody form is included in the cooler, tape the cooler shut and label the top of the cooler with the laboratory address. The cooler(s) should be shipped out on the next flight to the laboratory, being shipped Guaranteed and/or Express with delivery to the laboratory in Rankin Inlet (drinking water samples) or Winnipeg (sewage wetland/solid waste facilities samples). If available, samples should be kept in refrigerated (never frozen) transport.

4 LABORATORY ANALYSIS

4.1 Laboratory Accreditation

The GN-HSS analyses bacterial water samples from the drinking water system at the Rankin Inlet Wellness Centre. This is a bacterial analysis station and the system is not accredited.

Water samples from within and downstream of the sewage and solid waste facilities are analysed by ALS Laboratories in Winnipeg, MB; ALS is certified by the Canadian Association for Laboratory Accreditation (CALA). A letter approving this QA/QC Plan from ALS Laboratories is included in **Appendix D**.

4.2 Methodology

4.2.1 Methodology

The Rankin Inlet Wellness Centre operates a small bacterial analysis station to identify *E. coli* and total coliforms in drinking water samples collected from communities in the Kivalliq region of Nunavut. The Wellness Centre uses a Millipore filtration system (0.45 µm) to filter drinking water samples and plates the filtrate with agar for incubation. After being incubated for 24 hours, the sample is examined for growth of *E. coli* and total coliforms. The number of *E. coli* and total coliform colonies is recorded and results are reported to the specific community. Following analysis, all equipment is washed and sterilized with ultraviolet light.

All methods used by ALS Laboratory to analyse required parameters are outlined in the "Standard Methods for the Examination of Water and Wastewater". Where methods have deviated from the Standard Methods, or have been adopted from other agencies (e.g., Environmental Protection Agency), these are described in the Reference Information of the reported analytical results. Typical methods for analyses of required parameters at ALS Laboratories are included in Table 4-1.

4.2.2 Detection Limits

Detection limits are the lowest quantities of a parameter (e.g., a metal, suspended solids, ammonia nitrogen, etc) that the laboratory is able to distinguish from the absence of that parameter within a stated confidence level. In other words, it is the lowest level of a parameter that a laboratory is able to detect and be confident that the parameter is below that level or above it.

Detection limits for all parameters analysed for the licensed monitoring program in Baker Lake effluent samples are provided in Table 4-1. Detection limits for all parameters analysed are also reported with the results from the laboratory.

Table 4-1 ALS Laboratories detection limits and analytical methods for parameters analysed in water/effluent samples from within and downstream of the sewage and solid waste facilities at Baker Lake, NU

Parameter	Detection Limit[a]	Analytical Method Reference (Based on)[b]
Faecal coliforms	10 CFU/100 mL	APHA 9222D
Biochemical Oxygen Demand (BOD)	1.0 mg/L	APHA 5210 B
Carbonaceous Biochemical Oxygen Demand (cBOD)	1.0 mg/L	APHA 5210 B-5 day Incub.-O2 electrode
Total suspended solids (TSS)	5 mg/L	APHA 2540D
pH	0.10 pH units	APHA 4500H
Conductivity	0.40 µS/cm	APHA 2510B
Total Alkalinity	1.0 mg/L	APHA 2320B
Total Hardness	0.30 mg/L	Calculated
Total Organic Carbon (TOC)	1.0 mg/L	APHA 5310 B-Instrumental-WP
Major Ions:		
▪ Calcium	0.20 mg/L	U.S. EPA 200.8-T
▪ Chloride	0.50 mg/L	U.S. EPA 300.1 IC
▪ Magnesium	0.050 mg/L	U.S. EPA 200.8-T
▪ Potassium	0.10 mg/L	U.S. EPA 200.8-T
▪ Sodium	0.050 mg/L	U.S. EPA 200.8-T
▪ Sulphate	0.50 mg/L	U.S. EPA 300.1 IC
Oil & grease	1.0 mg/L	APHA METHOD 5520C
Total phenols	0.0010 mg/L	U.S. EPA 9066
Ammonia nitrogen	0.050 mg/L	APHA 4500 NH3 F
Nitrate-nitrite	0.070 mg/L	Calculated
Total metals:		
▪ Aluminum	0.020 mg/L	U.S. EPA 200.8-T
▪ Arsenic	0.0010 mg/L	U.S. EPA 200.8-T
▪ Cadmium	0.00020 mg/L	U.S. EPA 200.8-T
▪ Chromium	0.0020 mg/L	U.S. EPA 200.8-T
▪ Copper	0.0020 mg/L	U.S. EPA 200.8-T
▪ Iron	0.10 mg/L	U.S. EPA 200.8-T
▪ Lead	0.0010 mg/L	U.S. EPA 200.8-T
▪ Manganese	0.0010 mg/L	U.S. EPA 200.8-T

Parameter	Detection Limit[a]	Analytical Method Reference (Based on)[b]
▪ Mercury	0.000050 mg/L	U.S. EPA 245.7 V2.0
▪ Nickel	0.0020 mg/L	U.S. EPA 200.8-T
▪ Zinc	0.020 mg/L	U.S. EPA 200.8-T
Total Petroleum Hydrocarbons (TPHs) (Extractable)	0.10 mg/L	U.S. EPA SW846 3510, 8000
Polycyclic Aromatic Hydrocarbons (PAHs)	0.0000050 to 0.000050 mg/L	U.S. EPA SW 846/8270-GC/MS
Benzene	0.0005 mg/L	U.S. EPA SW846 8260B REV 2 Sept 1994
Toluene	0.001 mg/L	U.S. EPA SW846 8260B REV 2 Sept 1994
Ethylbenzene	0.0005 mg/L	U.S. EPA SW846 8260B REV 2 Sept 1994
Xylenes	0.002 mg/L	U.S. EPA SW846 8260B REV 2 Sept 1994

NOTES:

[a] CFU/100 mL = colony forming units per 100 millilitres of sample (e.g., water, effluent, etc)
mg/L = milligrams per one litre of sample
µS/cm = microSiemens per one centimetre

[b] APHA = American Public Health Association
U.S. EPA = United States Environmental Protection Agency
Calculated implies the parameter is calculated based on results of related parameters

4.3 Reporting Requirements

As mentioned above in Table 2-2 (Section 2.3.3), at least one field replicate must be collected at one monitoring station during each sampling event. Similarly, one field blank must also be collected during each sampling event. These will serve as checks for sample collection procedures (internal Hamlet procedures) and sample analysis procedures (external laboratory procedures).

Analytical results from real, replicate and blank samples must be submitted to the NWB with the Hamlet's Annual Report by March 31st of every year (e.g., March 31st, 2012 for the year 2011).

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5 REFERENCES

Alberta Environment (AENV). Guidelines for Quality Assurance and Quality Control in Surface Water Quality Monitoring Programs in Alberta. Edmonton, AB: AENV, 2006. Available at http://environment.gov.ab.ca/info/library/7739.pdf

Department of Indian and Northern Affairs Canada – Water Resources Division (DIAND-WRD) and the Northwest Territories Water Board. Quality Assurance (QA) and Quality Control (QC) Guidelines for Use by Class "B" Licensees in Collecting Representative Water Samples in the Field and for Submission of a QA/QC Plan. Yellowknife, NT: DIAND-WRD, 1996. Available at ftp://nunavutwaterboard.org/ADMINISTRATION/Guidelines/

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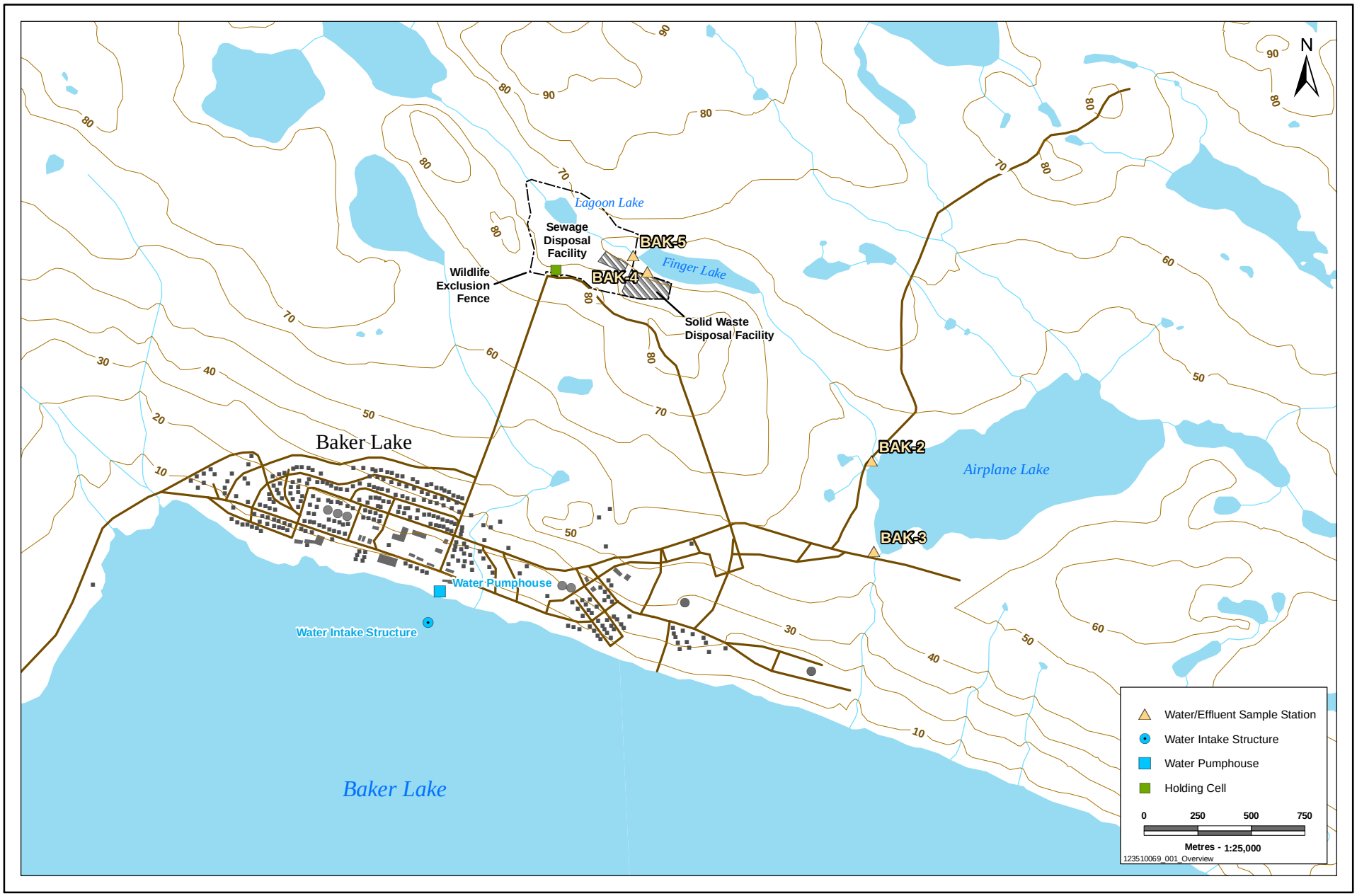
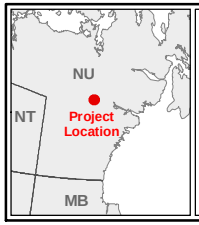
APPENDIX A

Figures





Operations and Maintenance Manual for the Water, Sewage and Solid Waste Facilities

Overview of the Water, Sewage and Solid Waste Facilities at Baker Lake, NU

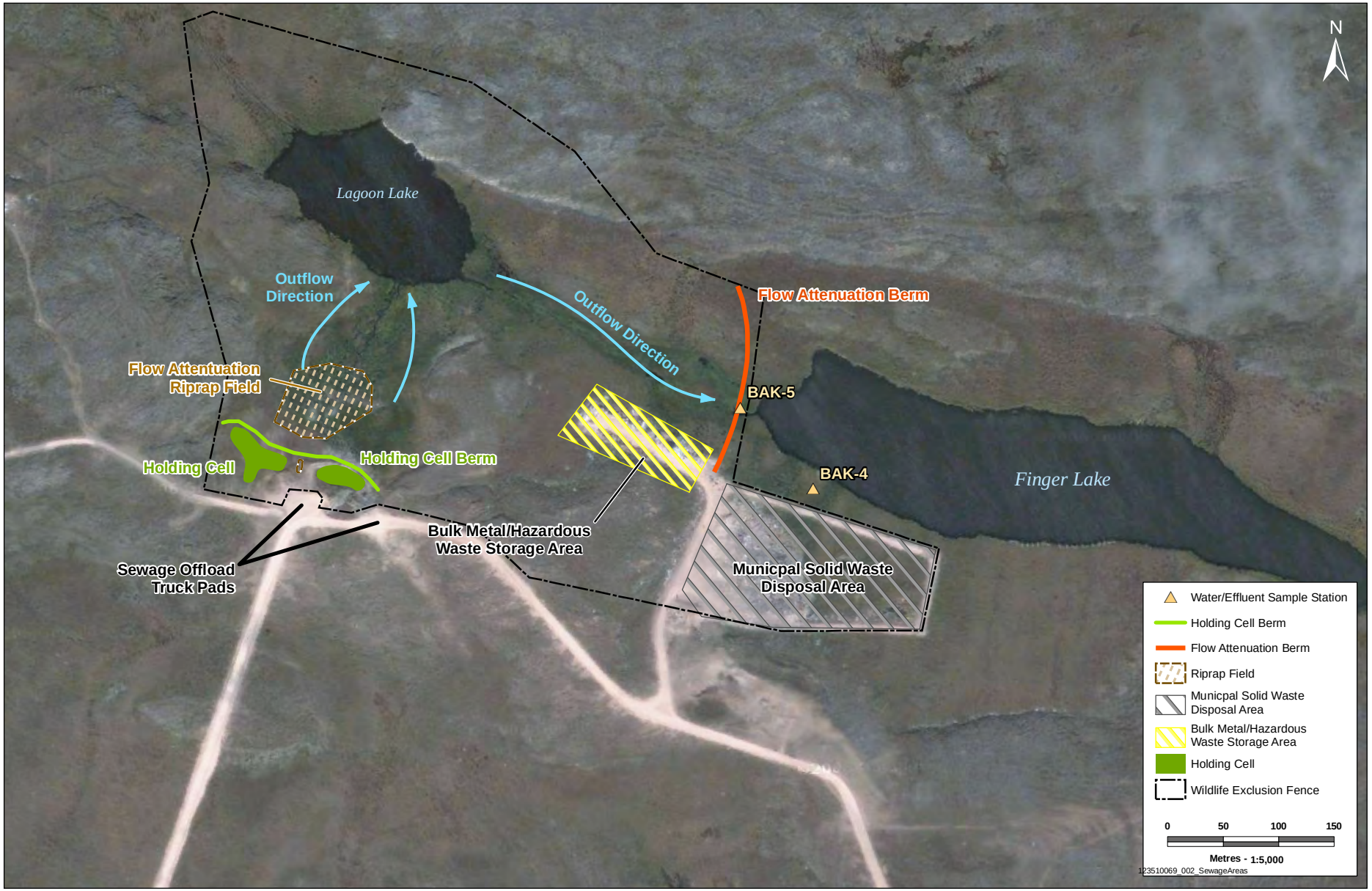
Acknowledgements: Original Drawing by Nunami Stantec

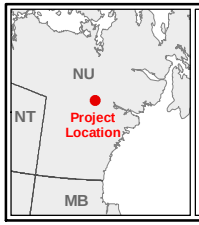
PREPARED FOR NUNAMI STANTEC

PREPARED FOR

FIGURE NO. 1

Last Modified: April 5, 2011 by jastino





Operations and Maintenance Manual for the Water, Sewage and Solid Waste Facilities

Overview of the Sewage and Solid Waste Disposal Facilities at Baker Lake, NU

Acknowledgements: Original Drawing by Nunami Stantec

PREPARED FOR NUNAMI STANTEC

PREPARED FOR

FIGURE NO. **2**

Last Modified: April 5, 2011 by jantho

APPENDIX B

ALS Laboratories Wastewater Sampling Guide

Unit 12 – 1329 Niakwa Road
Winnipeg, Manitoba, R2J 3T4
Tel: (204) 255-9720
Fax: (204) 255-9721
Toll Free: 1-800-607-7555

Wastewater Sampling Guide

1. **BOD / CBOD (Biochemical Oxygen Demand), Solids and Nutrient Analysis (Chloride, Sulphate, Nitrates and Nitrites)**
   - Use the 1L plastic bottle.
   - Fill to 95% capacity
   - No preservatives required
   - Keep samples cool, and return to lab as soon as practical. Hold times range from 48 hours to 28 days (i.e., analysis should begin within 48 hours of sampling)

2. **Ammonia Analysis**
   - Use the 250 mL plastic bottle
   - Fill to 95% capacity
   - Add preservative found in plastic vial. **CAUTION:** Preservative is a strong acid (1 mL of 1:1 Sulphuric acid). Add entire contents of the vial to the sample.
   - Cap bottle tightly and invert to mix.
   - Maximum hold time is 28 days.

3. **Metals Analysis (Total Metals)**
   - Use the 250 mL plastic bottle
   - Fill to near capacity
   - Add preservative found in the blue-taped plastic vial. **CAUTION:** Preservative is a strong acid (3 mL of 20% Nitric acid). Add entire contents of the vial to the sample.
   - Cap bottle tightly and invert to mix.
   - Maximum hold time is 6 months.

4. **Fecal Coliforms**
   - This procedure is used for wastewaters and dirty surface waters
   - Use one 100 mL sterile plastic container. Bottles already contain a powder preservative (sodium thiosulphate).
   - Uncap bottle (inside of cap must not come into contact with any surfaces)
   - Fill bottle to the mark. Cap bottle tightly and invert to mix.
   - Keep cool and return to the laboratory as soon as possible
   - Maximum hold time is 48 hours (i.e., analysis should be started within 48 hours).

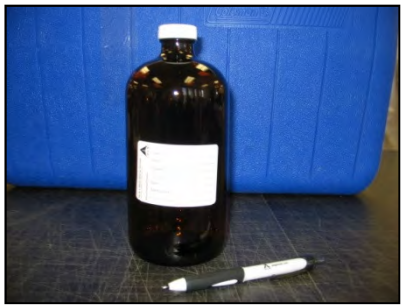
5. **Oil and Grease as Total Recoverable**
   - Use a one litre (1 L) glass amber bottle
   - Fill to greater than 95% capacity
   - Add preservative found in the yellow-taped plastic vial. **CAUTION:** Preservative is a strong acid (2 mL of 1:1 Hydrochloric acid). Add entire contents of the vial to the sample.
   - Cap bottle tightly and invert to mix.
   - Keep cool, return to lab as soon as possible
   - Maximum hold time is 28 days.

6. **Colourmetric Phenols (Total Phenols)**
   - Use the 250 mL glass amber bottle
   - Fill to 90% capacity
   - Add preservative found in the orange-taped plastic vial. **CAUTION:** Preservative is a strong acid (1 mL of 1:1 Sulphuric acid). Add entire contents of the vial to the sample.
   - Cap bottle tightly and invert to mix.
   - Maximum hold time is 30 days.

7. **BTEX / Volatile Organic Compounds (benzene, ethylbenzene, toluene, xylenes, and fraction one (F1) / total volatile hydrocarbons)**
   - Use three 40 mL clear glass vials for each sample.
   - There is a white powder preservative (sodium bisulfite) in each of the vials.
   - Completely fill the sample vial. There should be no head space (i.e., no bubbles) at the top of the vial. This is best done by carefully overfilling the bottle, then capping it.
   - Invert the vial to verify no air space left in the vial
   - If air spaces (bubbles) are present, uncap the bottle and add more of the sample water. Recap and recheck to verify no air space.
   - Kepp samples cool and return to laboratory as soon as possible.
   - Maximum hold time is 5 days.

8. Total Extractable Hydrocarbons

- Use two 250 mL glass amber bottles for each sample. Bottles already contain preservative (sodium bisulfite)
- Fill to greater than 95% capacity
- Cap bottle tightly and invert to mix.
- Keep cool and return to the laboratory as soon as possible.
- Maximum hold time is 14 days.



9. Polycyclic Aromatic Hydrocarbons (PAHs)

- Use the 1 L glass amber bottle. Bottles already contain preservative (sodium bisulfite)
- Fill to greater than 95% capacity
- Cap bottle tightly and invert to mix.
- Keep cool and return to the laboratory as soon as possible.
- Maximum hold time is 14 days.

APPENDIX C

Sample Collection Procedures

GUIDELINES FOR COLLECTION OF WATER SAMPLES FOR BACTERIAL ANALYSIS AT THE WATER DISTRIBUTION FACILITY

Baker Lake, NU

These sample collection procedures should be followed for all bacterial water sampling carried out for drinking water from the water distribution facility in Baker Lake, NU. Following the sample collection procedures will help ensure the correct sample bottles are obtained, proper sampling procedures are completed, and contamination of the samples is minimized.

A. Bottle Order:

1. Clean and sterilised sample bottles must obtained from the laboratory before any water sampling can begin. This is especially important for water samples being analysed for bacteria. Clean and sterilised sample bottles help ensure the water samples are not contaminated during collection, handling, storage and transport.
2. To obtain clean sample bottles, contact the Environmental Health Officer in Rankin Inlet. If the Environmental Health Officer in Rankin Inlet is unavailable, contact the Environmental Health Officer in Iqaluit to send you bottles. You will be sent the correct sample bottles and an Analysis Request form to submit with the water samples. Contact information for the Environmental Health Officers in Rankin Inlet and Iqaluit are provided:

Craig van Lankveld
Environmental Health Officer
Bag 72
Rankin Inlet, NU X0E 0G0
Ph: (867) 645 – 8273
Fax: (867) 645 – 8274
Email: cvanlankveld1@gov.nu.ca

Wanda Joy
Environmental Health Officer
Station 1031, Building 155
Iqaluit, NU X0A 1H0
Ph: (867) 975 – 4817
Fax: (867) 975 – 4833
Email: wjoy@gov.nu.ca

3. Once you receive the sample bottles, they should remain unopened, be kept in the sample cooler they arrived in, and stored in an area away from potential contamination sources (e.g., wastewater, gasoline/diesel, oils, chemicals, etc). DO NOT open the sample bottles you are ready to sample.

B. Preparation:

1. Check local weather forecasts to determine weather conditions when sampling and if there are going to be flight delay or cancellations. Bacterial water samples need to be shipped to the laboratory as soon as possible. Ideally they should make it to the laboratory within 24 to 48 hours of sampling. If there are going to be flight delays or cancellations, collect samples on another day.
2. Double check that you have the required bottles, nitrile or latex gloves, and forms.

C. Sample Collection:

1. Once you arrive at your sampling station, wash your hands thoroughly with soap and water.
2. Turn on the COLD water tap and let the tap run continuously for 2 to 5 minutes. This ensures the water lines are being properly flushed. It is best to run the tap at a medium to slow speed.
3. Put your on nitrile or latex gloves and get the sample bottle ready for sampling. Remove any plastic seal if present. DO NOT OPEN THE SAMPLE BOTTLE.
4. Once the tap has run, remove the lid from the sample bottle and either hold the lid in your hand or place it in a secure location. DO NOT touch the inside of the lid, bottle or neck of the sample bottle.
5. Holding the sample bottle near the base of the bottle, place the sample bottle under the running water and carefully fill the sample bottle to just past the mark on the side of the bottle. DO NOT let the bottle touch the tap at all. DO NOT OVERFILL THE BOTTLE.

   You will notice that there is a white powder already present in the sample bottle. This is a preservative (sodium thiosulphate) and is required to properly preserve the bacterial sample. DO NOT dump this white powder out, rinse the sample bottle or overfill the sample bottle! You will lose some or all of the white powder by doing this and will need to start over with a new sample bottle.
6. When the sample bottle is full, IMMEDIATELY replace the lid of the sample bottle and screw it back on. DO NOT over tighten! DO NOT RE-OPEN THIS BOTTLE.
7. Write the identification information on the label of the sample bottle, including:

   Date and Time of sampling
   Location sampled
   Sampler initials
8. Place the sample back in the cooler.
9. Repeat Steps C.3 to C.8 if taking more than one sample, changing nitrile or latex gloves between each sample.

D. Sample Storage and Transport:

1. Sample Storage – bacterial water samples MUST analysed at the laboratory as soon as possible (within 24 hours) and must be shipped out as soon as they can. Until you are able to ship the sample(s) out, you must ensure they stay cold. Pack the sample cooler with frozen freeze packs or place the samples in a fridge. NEVER FREEZE THE SAMPLE(S).
2. Fill out the Analysis Request form that came with the sample bottles. Before you can send the samples to the laboratory, you must tell them what to analyse the samples for. A completed example and a blank form is included following this procedure.

   It is good practice to put the form in a Ziploc bag to ensure it does not get wet during transport.
3. To properly ship the water samples, ensure sample bottles are wrapped so they do not get broken during transport. Pack the sample coolers with freeze packs so the samples stay cold during transport. You can also fill the remaining space in the cooler with Styrofoam or shredded paper to ensure samples do not move around too much during transport. Make certain the completed Analysis Request form is in the cooler and tape the cooler shut.

4. Label the top of the cooler(s) with the laboratory address and your address. Mark the top of the cooler as URGENT. The address of the laboratory in Rankin Inlet is provided:

   Rankin Inlet Wellness Centre
   Bag 72
   Rankin Inlet, NU
   X0C 0G0

   Attention: Craig van Lankveld
   Ph: (867) 645 – 8273

5. Ship the cooler(s) to the laboratory using Guaranteed or Express service. Ensure the airline delivers the cooler(s) to the Rankin Inlet Wellness Centre. Call the laboratory to ensure they have received the cooler(s) and samples.

Ontario

Ministry of Health and Long-Term Care
Ministère de la Santé et des Soins de longue durée
Public Health Laboratories /
Direction des laboratoires de santé publique

Bacteriological Analysis of Drinking Water for Private Citizen, SINGLE HOUSEHOLD ONLY
Analyse bactériologique de l'eau potable – Particuliers, MÉNAGES UNIFAMILIAUX SEULEMENT

Property owner or resident's name and mailing address/
Nom et adresse postale du propriétaire de la propriété ou du résident

Name/Nom (First/Prénom Last/Nom de famille)
John Doe

Street, R.R., Box No./Rue, R.R., casier postal
Hamlet of Baker Lake

City, Town/Ville
Baker Lake

Province: Nunavut

Postal Code/Code postal: X0C 0A0

Location of Water Source/Emplacement de la source d'eau

Street address/Adresse municipale
Hamlet office, Nunamiut Lodge, Elementary School

or Lot, Concession/ou lot, concession

Township/Municipality/Canton, municipalité: Baker Lake

Emergency Locator #/

County/Comté: Nunavut

ON

Postal Code/Code postal: X0C 0A0

☐ Location of Water Source same as Property owner or resident's mailing address/
Emplacement de la source d'eau identique à l'adresse postale du propriétaire ou du résident

☐ No Phone / Pas de téléphone

Date collected/Date du prélèvement: 2011 / 08 / 15

Health Unit #/N° du bureau de santé *

Your Daytime Telephone #/Votre n° tél. le jour: (867) 793-2874

☐ I will pick up report at the laboratory./Je viendrai chercher le rapport au laboratoire.

☑ Please mail to my mailing address above./Veuillez le faire parvenir à mon adresse postale indiquée ci-dessus.

WATER WILL NOT BE TESTED IF THE SHADED AREAS OF THIS FORM ARE NOT COMPLETELY AND ACCURATELY FILLED IN/
NOUS N'ANALYSERONS PAS L'ÉCHANTILLON D'EAU SI LES PARTIES OMBRÉES DE LA FORMULE N'ONT PAS ÉTÉ REMPLIES EN ENTIER ET DE FAÇON EXACTE

Instructions - Please read instructions page carefully before sampling and note information or reverse of this page./Prière de lire la page d'instructions attentivement avant l'échantillonnage et prendre note des renseignements figurant au verso de cette page.

* Please assist the laboratory if possible by also providing this information. / The 4-digit Health Unit numbers is on the previous page./
Ces renseignements faciliteront le travail du laboratoire. La liste des numéros à quatre chiffres des bureaux de santé se trouve à la page précédente.

For Laboratory Use Only/Réservé à l'usage du laboratoire

Interpretation for this water sample/Interprétation de cet échantillon d'eau

This water sample was only tested for the presence of both total coliform and *E.coli* bacterial indicators of contamination, by Membrane Filtration. / Cet échantillon d'eau n'a été analysé que pour déceler la présence des coliformes totaux et des bactéries colibacillaires, indicateurs de contamination par filtration sur membrane.

☐ NO SIGNIFICANT EVIDENCE OF BACTERIAL CONTAMINATION
(3 consecutive samples, taken 1 to 3 weeks apart, with this designation are needed to determine the stability of the water supply).
AUCUNE PREUVE DE CONTAMINATION BACTÉRIENNE SIGNIFICATIVE
(cette désignation doit être affectée à 3 échantillons consécutifs, dont le prélèvement aura été espacé de 1 à 3 semaines, pour que la source d'approvisionnement en eau soit jugée stable).

☐ SIGNIFICANT EVIDENCE OF BACTERIAL CONTAMINATION May be unsafe to drink. *(Consult local health unit for information as soon as possible).*
PREUVE DE CONTAMINATION BACTÉRIENNE SIGNIFICATIVE
Peut être non potable. *(Consultez le bureau de santé local le plus tôt possible pour plus de détails).*

Date Reported Stamp/
Date du rapport

☐ UNSAFE TO DRINK Evidence of sewage contamination.
Consult local health unit for appropriate action as soon as possible
EAU NON POTABLE Preuve de contamination par les égouts.
Consultez le bureau de santé local le plus tôt possible pour de plus amples renseignements sur les mesures à prendre.

Total Coliform per 100 mL/Coliformes totaux par 100 mL		*E. coli* per/par 100 mL	
Date of Analysis/ Date de l'analyse	Read by/ Analyse par	Date Read/ Analyse effectuée le	Authorized by (Technologist)/ Autorisé par (Technologiste)

3748-44 (01/07)

These results relate only to the sample tested. / Le résultat obtenu se rapporte seulement à cet échantillon d'eau analysé.

Barcode/Code à barres

Date Received/Reçu le

Laboratory No./N° du laboratoire

Ontario

Ministry of Health and Long-Term Care
Ministère de la Santé et des Soins de longue durée
Public Health Laboratories /
Direction des laboratories de sante publique

Bacteriological Analysis of Drinking Water for Private Citizen, SINGLE HOUSEHOLD ONLY
Analyse bactériologique de l'eau potable – Particuliers, MÉNAGES UNIFAMILIAUX SEULEMENT

Property owner or resident's name and mailing address/
Nom et adresse postale du propriétaire de la propriété ou du résident

Name/Nom (First/Prénom Last/Nom de famille)	
Street, R.R., Box No./Rue, R.R., casier postal	
City, Town/Ville	
Province	Postal Code/Code postal *

Location of Water Source/Emplacement de la source d'eau

Street address/Adresse municipale	
or Lot, Concession/ou lot, concession	
Township/Municipality/Canton, municipalité	Emergency Locator #/ *
County/Comté * ON	Postal Code/Code postal *

☐ Location of Water Source same as Property owner or resident's mailing address/
Emplacement de la source d'eau identique à l'adresse postale du propriétaire ou du résident

No Phone / Pas de téléphone ☐

Date collected/Date du prélèvement	Health Unit #/N° du bureau de santé *	Your Daytime Telephone #/Votre n° tél. le jour
yyyy/aaaa/mm/mm/dd/jj		( ) -

☐ I will pick up report at the laboratory./Je viendrai chercher le rapport au laboratoire.

☐ Please mail to my mailing address above./Veuillez le faire parvenir à mon adresse postale indiquée ci-dessus.

WATER WILL NOT BE TESTED IF THE SHADED AREAS OF THIS FORM ARE NOT COMPLETELY AND ACCURATELY FILLED IN/ NOUS N'ANALYSERONS PAS L'ÉCHANTILLON D'EAU SI LES PARTIES OMBRÉES DE LA FORMULE N'ONT PAS ÉTÉ REMPLIES EN ENTIER ET DE FAÇON EXACTE

Instructions - Please read instructions page carefully before sampling and note information on reverse of this page./Prière de lire la page d'instructions attentivement avant l'échantillonnage et prendre note des renseignements figurant au verso de cette page.

* Please assist the laboratory if possible by also providing this information. A List of the 4-digit Health Unit numbers is on the previous page./ Ces renseignements faciliteront le travail du laboratoire. La liste des numéros à quatre chiffres des bureaux de santé se trouve à la page précédente.

For Laboratory Use Only/Réservé à l'usage du laboratoire

Interpretation for this water sample/Interprétation de cet échantillon d'eau

This water sample was only tested for the presence of both Total Coliform and *E.coli* bacterial indicators of contamination, by Membrane Filtration. / Cet échantillon d'eau n'a été analysé que pour déceler la présence des coliformes totaux et des bactéries collibacillaires, indicateurs de contamination par filtration sur membrane.

☐ NO SIGNIFICANT EVIDENCE OF BACTERIAL CONTAMINATION
(3 consecutive samples, taken 1 to 3 weeks apart, with this designation are needed to determine the stability of the water supply).
AUCUNE PREUVE DE CONTAMINATION BACTÉRIENNE SIGNIFICATIVE
(cette désignation doit être affectée à 3 échantillons consécutifs, dont le prélèvement aura été espacé de 1 à 3 semaines, pour que la source d'approvisionnement en eau soit jugée stable).

☐ SIGNIFICANT EVIDENCE OF BACTERIAL CONTAMINATION May be unsafe to drink. *(Consult local health unit for information as soon as possible).*
PREUVE DE CONTAMINATION BACTÉRIENNE SIGNIFICATIVE
Peut être non potable. *(Consultez le bureau de santé local le plus tôt possible pour plus de détails).*

Date Reported Stamp/
Date du rapport

☐ UNSAFE TO DRINK Evidence of sewage contamination.
Consult local health unit for appropriate action as soon as possible
EAU NON POTABLE Preuve de contamination par les égouts.
Consultez le bureau de santé local le plus tôt possible pour de plus amples renseignements sur les mesures à prendre.

Total Coliform per 100 mL/Coliformes totaux par 100 mL		*E. coli* per/par 100 mL	
Date of Analysis/ Date de l'analyse	Read by/ Analyse par	Date Read/ Analyse effectuée le	Authorized by (Technologist)/ Autorisé par (Technologiste)

3743-44 (01/07)

These results relate only to the sample tested. / Le résultat obtenu se rapporte seulement à cet échantillon d'eau analysé.

GUIDELINES FOR COLLECTION OF WATER / EFFLUENT SAMPLES FOR GENERAL CHEMISTRY ANALYSES AT THE SEWAGE AND SOLID WASTE DISPOSAL FACILITIES

Baker Lake, NU

These sample collection procedures should be followed for all water/effluent sampling carried out within and downstream of the sewage treatment wetland and solid waste disposal facility in Baker Lake, NU. Following the sample collection procedures will help ensure the correct sample bottles are obtained, proper sampling procedures are completed, and contamination of the samples is minimized.

A. Bottle Order:

1. Clean sample bottles must obtained from the laboratory before any water sampling can begin. Clean sample bottles help ensure samples are not contaminated during collection, handling, storage and transport. The Hamlet's Senior Administrative Officer (SAO) or Operations Manager must order clean sample bottles from the laboratory. If clean sample bottles are or will be required, please contact the SAO or Operations Manager.
2. Some water samples will require preservatives. Preservatives are typically acids and help ensure the chemical characteristics of the sample stays the same once it has been sampled. The required preservatives will be added to your bottle order by the laboratory.
3. The SAO or Operations Manager will order clean sample bottles from ALS Laboratories in Winnipeg, Manitoba. The SAO or Operations Manager will contact the Hamlet's Laboratory Representative at ALS (Christine Herrod) by email or phone to order the bottles. The SAO or Operations Manager will order a minimum of six sample sets and some deionised water for field blank samples.
4. Once you receive the sample bottles and preservatives, they should be kept in the sample cooler they arrived in, or stored in an area away from potential contamination sources (e.g., wastewater, gasoline/diesel, oils, chemicals, etc)

B. Field Preparation:

1. Check local weather forecasts to determine weather conditions when sampling and if there are going to be flight delay or cancellations. Water samples should be shipped to the laboratory as soon as possible. If there are going to be flight delays or cancellations, you may have to collect samples on another day.
2. Pre-label sample bottles – before you go into the field to collect water samples, it is good practice to label all required sample bottles first. This ensures all required bottles are present, no samples are missed, and samples between monitoring stations do not get mixed up. Always wear nitrile gloves when handling sample bottles.
3. Ensure you have all required preservatives, nitrile gloves, personal equipment (e.g. rubber boots, bug net) and field book or forms (if any).

C. Sample Collection:

1. To further ensure samples remain free from contamination, it is best practice to begin sampling at the "cleanest" monitoring station in the sewage treatment tundra wetland: BAK-3, the outlet of

Airplane Lake. From this point, you can work your way backwards through the wetland, sampling at BAK-5 last. If additional monitoring stations are added to the Hamlet's water license, these should be sampled in order from cleanest to "polluted" (e.g., a station closest to the holding cell).

2. Once you arrive at your monitoring station, try not to disturb anything. Ensure the streambed, banks and water upstream of your station are not disturbed. Try to confine all your activities and equipment downstream of the sampling station.
3. Put your on nitrile gloves and get all bottles and preservatives ready for sampling at the station.
4. If possible, stand in the middle of the stream or outlet point, downstream from where you will be sampling.
5. Holding the sample bottle near the base of the bottle, remove the lid from the sample bottle and either hold the lid in your hand or place it in a secure location. DO NOT touch the inside of the lid, bottle or neck of the sample bottle.
6. Dip the sample bottle into the water upstream from where you are standing, being careful not to touch the stream bottom with the bottle or your hand. Allow the bottle to fill up.

   If there is preservative already in the sample bottle (i.e., the bottle for bacterial samples has a white powder in it), be careful not to fill the bottle too fast or dunk the entire bottle in the stream. This will cause you to lose all the preservative.
7. If your sample requires you to add a preservative, pour some water out of the sample bottle making room for the preservative. Ensure you add the correct preservative to the correct sample. The following samples should have the following preservatives added:

Sample	Preservative
Bacteria (Faecal Coliforms)	Sodium thiosulphate ($Na_2S_2O_3$) (white powder; already in bottle)
Benzene, Toluene, Ethylbenzene and Xylene (BTEX)	Sodium bisulfite ($NaHSO_3$) (white powder or pills; already in vials)
Total Petroleum Hydrocarbons (TPHs)	Sodium bisulfite ($NaHSO_3$) (white powder or pills; already in bottles)
Polycyclic Aromatic Hydrocarbons (PAHs)	Sodium bisulfite ($NaHSO_3$) (white powder or pills; already in bottles)
Ammonia Nitrogen	Sulphuric acid (H_2SO_4)
Total Phenols	Sulphuric acid (H_2SO_4)
Total Metals	Nitric acid (HNO_3)
Oils and Grease	Hydrochloric acid (HCl)

8. Screw the lid of the sample bottle back on. If you have added preservative, lightly shake the sample to mix it with the preservative. Place the sample in the cooler.
9. Repeat Steps C.5 to C.8 for the remaining sample bottles at the monitoring station.
10. Repeat Steps C.2 to C.9 for the remaining monitoring stations. Ensure you change your nitrile gloves between each sampling station.
11. DON'T FORGET – as described in the Quality Assurance / Quality Control (QA/QC) Plan, you have to collect a replicate sample (BAK-7) at one station (repeat sample) and a field blank

sample (BAK-8) of deionised water at the other station. For more information on replicate and field blank samples, please see the Hamlet's QA/QC Plan.

12. To collect the replicate sample (BAK-7), just repeat all sampling procedures in Steps C.2 to C.9 at one monitoring station with a second set of sample bottles.
13. To collect the field blank sample (BAK-8), you will pour water from the deionised water container into each sample bottle. Be sure to follow a similar procedure in attempts to mimic the same sampling conditions. For example, ensure you follow Steps C.5 to C.7.
14. When you have finished sampling, ensure you wash your hands thoroughly with soap and water!

D. Sample Storage and Transport:

1. Sample Storage – water samples MUST analysed at the laboratory as soon as possible; bacterial samples must be analysed within 48 hours. All water samples must be shipped out as soon as possible. Until you are able to ship the sample(s) out, you must ensure they stay cold. Pack the sample cooler with frozen freeze packs or place the samples in a fridge. DO NOT FREEZE THE SAMPLES.
2. Fill out the Chain of Custody form – before you can send the samples to the laboratory, you must tell them what to analyse the samples for. This is done through a Chain of Custody (COC) form, which must be filled out and sent with the samples. An example COC form and a blank COC form are included following this procedure.

   It is good practice to put the COC form in a Ziploc bag to ensure it does not get wet during transport.
3. To properly ship the water samples, ensure any glass sample bottles are wrapped with paper or bubble wrap so they do not get broken during transport. Pack the sample coolers with freeze packs so the samples stay cold during transport. You can also fill the remaining space in the cooler with Styrofoam or shredded paper to ensure samples do not move around too much during transport. Make certain the completed COC is in the cooler and tape the cooler shut.
4. Label the top of the cooler(s) with the laboratory address and your address. If you are sending more than one cooler, ensure you write 1 of _, 2 of _, etc. The address to the laboratory has been provided:

   ALS Laboratories
   Unit 12 – 1329 Niakwa Road
   Winnipeg, MB R2J 3T4
   Ph: (204) 255 – 9720
   Fax: (204) 255 – 9721
5. Ship the cooler(s) to the laboratory with Guaranteed or Express service. Ensure the airline delivers the cooler(s) to ALS Laboratories in Winnipeg. Call the laboratory to ensure they have received the cooler(s) and samples.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Hamlet of Baker Lake	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Gary Perkins	☑ PDF ☐ Excel ☐ Digital ☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3022 - 4 Avenue P.O. Box 149	Email 1: blforeman@netkaster.ca	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Baker Lake, NU X0C 0A0	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(867) 793-2874 Fax: (867) 793-2509	Email 3:	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: Baker Lake Monitoring Program	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q288887	
Lab Work Order # (lab use only)		**ALS Contact:** Christine Herrod	**Sampler:** JD

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD, CBOD	Alk, pH, EC, TSS	TOC	Metals & Mercury /Hardness	Anions /Ammonia	Phenols (colourmetric)	Oil & Grease	FC-MF-High	PAH	TEH	BTX, F1		Number of Containers
	BAK-2	15-Aug-11	10:30	Surface Water	X	X	X	X	X	X	X	X					6
	BAK-3	15-Aug-11	11:00	Surface Water	X	X	X	X	X	X	X	X					6
	BAK-4	15-Aug-11	11:30	Surface Water	X	X	X	X	X	X	X	X	X	X	X		9
	BAK-5	15-Aug-11	12:00	Surface Water	X	X	X	X	X	X	X	X					6
	BAK-7	15-Aug-11	11:30	Surface Water	X	X	X	X	X	X	X	X					6
	BAK-8	15-Aug-11	10:30	Surface Water	X	X	X	X	X	X	X	X					6

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
John Doe	15-Aug-11	13:30				°C				

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page ____ of ____

Report To		**Report Format / Distribution**	**Service Requested** (Rush for routine analysis subject to availability)
Company:	Hamlet of Baker Lake	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Gary Perkins	☑ PDF ☐ Excel ☐ Digital ☑ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	5021-49th Street PO Box 1680	Email 1: blforeman@netkaster.ca	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Baker Lake, NU X0A 0C0	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(867) 793-2874 Fax: (867) 793-2509	Email 3:	**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: Baker Lake Monitoring Program	
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #: Q288887	
Lab Work Order # (lab use only)		**ALS Contact:** Christine Herrod	**Sampler:**

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD, CBOD	Alk, pH, EC, TSS	TOC	Metals & Mercury /Hardness	Anions /Ammonia	Phenols (colourmetric)	Oil & Grease	FC-MF-High	PAH	TEH	BTX, F1		Number of Containers
	BAK-2																
	BAK-3																
	BAK-4																
	BAK-5																
	BAK-7																
	BAK-8																

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature: ºC	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENERAL TERMS AND CONDITIONS:

These terms and conditions are incorporated in and form part of the Agreement between ALS Laboratory Group – Environmental Division ("ALS") and the party named in the Offer (the "Client").
1. Definitions. Capitalized Terms not defined in these Terms and Conditions have the definitions set out in the other Agreement documents.
2. The Services. ALS will provide the Services to the Client as described in the Offer and in any change of custody form provided with any sample.
3. Prices. ALS may review and change all prices, fees, surcharges or other charges set out in the Agreement if there are changes to ALS's cost beyond ALS's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding Condition 3, all quotations are reviewed and updated on a yearly basis.
4. Payment Terms. The Client shall pay ALS within 30 days of the invoice date OAC. ALS may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. Quotation Numbers. The Client shall provide the quotation number to ALS (where applicable) to ensure correct pricing.
6. Taxes. Applicable taxes are not included in prices, surcharges and additional fees and will be added at the time of invoicing.
7. Quality Control. ALS has an extensive QA/QC program and all analytical data reported is analyzed using approved, referenced procedures followed by checks and reviews of senior managers and quality assurance personnel.
8. No Guarantee of Results. Results are obtained from chemical measurements. The Client is responsible for informing itself on the limitation of the results and acknowledges that the results are not guaranteed.
9. Standard of Care. ALS will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested.
10. Storage. Where possible, ALS will store samples for 30 days from the date a final report is issued to the Client, after which ALS may discard the sample.
11. Holds. If the Client requests a sample be placed on hold, ALS will store the sample for 60 days for the quoted price, after which ALS will invoice the Client and discard the sample.
12. Archives. If the Client requests a sample be archived, ALS will stored the sample for 6 months for the quoted price, after which ALS will invoice the Client and discard the sample.
13. Handling Protocol. Legal sample handling protocol must be arranged before samples are collected. ALS may charge a 20% surcharge on the list price plus the hourly technologist or chemist rates for legal sample protocol. Samples processed under legal protocol are stored indefinitely (storage charges may apply).
14. Samples. The quality, condition, content and source of samples stored and tested are not known to ALS except as declared and described on the chain of custody form completed and submitted by the Client and accompanying the sample.
15. Risk of Loss. ALS will use reasonable care to protect samples during storage, however all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the Client releases ALS from any claim the Client may have for any loss or damage to the sample.
16. Environmental. The Client must comply with all applicable environment legislation, including labeling all hazardous samples to comply with WHMIS and TDG regulations, and must provide appropriate material safety data sheets that include the nature of the hazard and a contact name and phone number to call for information. The Client will indemnify ALS for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
17. Hazardous Materials Disposal. ALS may return, at the Client's cost, hazardous material to the Client for disposal.
18. Hazardous Materials Surcharge. ALS may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occuring Radioactive Materials (NORM), H_2S, CN, etc.
19. Sample Containers. ALS may ship sample containers to the Client's location by the most cost effective means using ALS preferred courier suppliers, within the specified project timeline.
20. Additional Charges. ALS may charge the Client (a) its cost for emergency bottle shipments and shipments to and from a remote site, and (b) where pick up and delivery services are provided, subject in each instance to a minimum charge of $25.00.
21. Large Bottle Orders. The Client shall provide ALS with 24 hours notice for large bottle orders.
22. Re-Tests. ALS reserves the right to re-test any samples that remains in its possession. Re-tests requested by the Client may be charged.
23. Waiver. The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any claims against ALS it may have as a result of the interpretation of the results. The Client shall indemnify ALS for all claims made by any third party against ALS in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
24. Limitation of Liability. In no event shall ALS be liable for any consequential, indirect, incidental, special, exemplary or punitive damages, whether foreseeable of unforeseeable, (including claims for loss of profits or revenue or losses caused by stoppage of other work or impairment of other assets) incurred by the Client arising out of breach or failure of express of implied warranty, breach of contract, breach of warranty, misrepresentation, negligence, strict liability in tort or otherwise. In any event, the liability of ALS to the Client shall be limited to the cost of testing the sample as requested in the chain of custody form under which the sample was originally deposited. For the purposes of this paragraph and paragraphs 8, 15, 16, 23 and 25, as the applicable, "ALS" includes without limitations its directors, officers, employees and affiliates and the "Client" includes without limitation any third party that may have a claim against ALS through the Client.
25. Notice of Liability. Notwithstanding paragraph 24, ALS shall not be liable to the Client unless the Client provides notice in writing to ALS of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk under the Agreement between the Client and ALS, and the fees to be paid by the Client to ALS reflect this allocation of risks and the limitations of liability in this Agreement.
26. Entire Agreement. The Agreement is the entire agreement between the parties and supercedes and takes precedence over any terms and conditions contained in any documentation provided by the Client. ALS's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein. If there is a conflict between these terms and conditions and any other Agreement document, these terms and conditions prevail.

GENF 19.00 Terms

ALS Environmental

Canadian Locations (Toll Free 1-800-668-9878)

Vancouver, BC
8081 Lougheed Hwy
Burnaby, BC, Ph: 604-253-4188
V5A 1W9 Fax: 604-253-6700

Fort St. John, BC
10345A Dogwood Street
Grandhaven, BC
Mailing: Box 256, 9420 - 93rd Ave
Fort St. John , BC Ph: 250-261-5517
V1J 6W7 Fax: 250-261-5587
After Hours / Emergency Ph: 250-261-4947

Grande Prairie, AB
9505-111 Street
T8V 5W1 Fax: 780-513-2191
After Hours / Emergency Ph: 780-512-4343

Calgary, AB
1313-44 Avenue NE
T2E 6L5 Fax: 403-291-0298
After Hours / Emergency Ph: 403-651-1471

Edmonton, AB
9936-67 Avenue NW
Edmonton, AB Ph: 780-413-5227
T6E 0P5 Fax: 780-437-2311
After Hours / Emergency Ph: 780-913-2299

The Centre, AB
5424 97th Street
Edmonton, AB Ph: 780-391-2300
T6E 5C1 Fax: 780-434-9178

Fort McMurray, AB
Bay 1, 245 MacDonald Crescent
Fort McMurray, AB Ph: 780-791-1524
T9H 4B5 Fax: 780-791-1586
After Hours / Emergency Ph: 780-714-8482

Saskatoon, SK
819 - 58 Street East
Saskatoon, SK Ph: 306-668-8370
S7K 6X5 Fax: 306-668-8383
After Hours / Emergency Ph: 306-221-7147

Winnipeg, MB
1329 Niakwa Road East, Unit 12
Winnipeg, MB Ph: 204-255-9720
R2J 3T4 Fax: 204-255-9721
After Hours / Emergency Ph: 204-784-6677

Thunder Bay, ON
1081 Barton Street
Thunder Bay, ON Ph: 807-623-6463
P7B 5N3 Fax: 807-623-7598
After Hours / Emergency Ph: 807-624-4482

Waterloo, ON
60 Northland Drive, Unit 1
Waterloo, ON Ph: 519-886-6910
N2V 2B8 Fax: 519-886-9047
After Hours / Emergency Ph: 519-589-0044

London, ON
309 Exeter Road, Unit #29
London, ON Ph: 519-652-6044
N6L 1C1 Fax: 519-652-0671

Mississauga, ON
5730 Coopers Avenue, Unit 26
Mississauga, ON Ph: 905-507-6910
L4Z 2E9 Fax: 905-507-6927

Burlington, ON
5420 Mainway Drive, Unit 5
Burlington, ON Ph: 905-331-3111
L7L 6A4 Fax: 905-331-4567

Richmond Hill, ON
95 West Beaver Creek Road, Unit 1
Richmond Hill, ON Ph: 905-881-9887
L4B 1H2 Fax: 905-881-8062

Yellowknife, NT
75 Con Road
Yellowknife, NT Ph: 867-873-5593
X1A 2M1 Fax: 867-920-4238
After Hours / Emergency Ph: 867-446-5593

Sample Container, Preservation and Holding Time Table. Keep samples cool (4ºC) and ship to an ALS location as soon as possible.

Note: Specific container, preservation and holding times may vary based on regulatory requirements - consult your local ALS laboratory for assistance prior to sampling.

Inorganics	Analysis [1]	Water Container	Water Preservation	Additional Notes	Soil Container	Water / Soil Hold Time
ROUTINE INORGANICS AND MISC	Acidity and Alkalinity	0.5-1 L Plastic			125-250 mL Jar or Bag	14 Days / NA
	Anions (Br, Cl, SO4, F) and Electrical Conductivity	0.5-1 L Plastic			125-250 mL Jar or Bag	28 Days / 6 Months
	Bromate, Chlorate and Chlorite	125 mL Plastic	EDA (Ethylenediamine)		NA	28 Days (Chlorite 14 Days) / NA
	BOD, Colour or Turbidity	0.5-1 L Plastic			NA	2-3* Days / NA
	COD and Phenols (colourimetric)	100 - 250 mL Glass	1:1 Sulfuric Acid (H2SO4)		NA	28 Days / NA
	Cyanide, Total or Weak Acid Dissociable	250 mL Plastic	6N NaOH		125-250 mL Jar or Bag	14 Days / 7 Days
	Dissolved Oxygen	300 mL BOD bottle	1 each; MnSO4 & alkaline iodide azide pillows		NA	8 Hours / NA
	Dissolved or Total Inorganic Carbon (DIC or TIC)	100 mL Amber Glass		Field Filter for Dissolved	125-250 mL Jar or Bag	14 Days / 14 Days
	Dissolved or Total Organic Carbon (DOC or TOC)	100 mL Amber Glass	1:1 Hydrochloric Acid (HCl)	Field Filter for Dissolved	125-250 mL Jar or Bag	28 Days / 14 Days
	Flashpoint	2 x 100mL Amber Glass		Zero Headspace	125-250 mL Jar	14 Days / 14 Days
	pH	0.5-1 L Plastic			125-250 mL Jar or Bag	0.25 Hours / 1 Year
	Solids (TS, TSS, TDS)	0.5-1 L Plastic			NA	7 Days / NA
	Sulfide	125 mL Plastic	Zinc Acetate & 6N NaOH		125-250 mL Jar or Bag	7 Days / 7 Days
	Sulfite	125 mL Plastic	EDA (Ethylenediamine)		NA	48 Hours / NA
NUTRIENTS	Ammonia Nitrogen	250 mL Plastic	1:1 Sulfuric Acid (H2SO4)		125-250 mL Jar or Bag	28 Days / 48 Hours
	Nitrate or Nitrite Nitrogen (and Ammonia unpreserved)	0.5-1 L Plastic			NA	2-3* Days / NA
	Nitrogen, Kjeldahl, Organic, Total or Dissolved	250 mL Glass/Plastic	1:1 Sulfuric Acid (H2SO4)	Field Filter for Dissolved	NA	28 Days / NA
	Nitrogen, Total or TKN-Calc (BC Only)	250 mL Glass/Plastic	1:1 Hydrochloric Acid (HCl)		NA	28 Days / NA
	Nutrients, Available (N,P,K,S)	NA			125-250 mL Jar or Bag	NA / 14 Days
	Phoshorous, Reactive (orthophosphate)	0.5-1 L Plastic			NA	2-3* Days / NA
	Phosphorous, Total Dissolved	0.5-1 L Plastic	1:1 Sulfuric Acid (H2SO4)	Field Filter for Dissolved	NA	28 Days / NA
	Phosphorus, Total	500 mL Plastic	1:1 Sulfuric Acid (H2SO4)		NA	28 Days / NA
METALS	Chromium VI (Hexavalent)	125 mL Plastic	50 % NaOH		125-250 mL Jar or Bag	30 Days / 30 Days
	Mercury, Methyl	250 mL pre-cleaned Glass or TFE	Contact Lab	Contact Lab	125-250 mL Jar or Bag	6 Months / 40 Days
	Mercury, Total or Dissolved	250 mL Plastic	1:3 Nitric Acid to pH<2	Field Filter for Dissolved	125-250 mL Jar or Bag	28 Days / 28 Days
	Metals, Total or Dissolved	250 mL Plastic	1:3 Nitric Acid to pH<2	Field Filter for Dissolved	125-250 mL Jar or Bag	6 Months / 6 Months
Organics						
HYDRO-CARBONS	BTEX / FI or VPH	2 or 3 x 40 mL Glass Vials [3]	Sodium Bisulfate	Zero Headspace	125 mL Jar	14 Days / 7 Days
	Volatile Organics (THM, EPA 624, Perchloroethylene)	2 or 3 x 40 mL Glass Vials [3]	Sodium Bisulfate [2]	Zero Headspace	125 mL Jar	14 Days / 7 Days
	CWS F2-F4	2 x 250 mL Amber Glass	Sodium Bisulfate [2]		125 - 500 mL Jar	14 Days / 14 Days
	EPH or LEPH/HEPH	2 x 500 mL Amber Glass	Sodium Bisulfate [2]		125 - 500 mL Jar	14 Days / 14 Days
	Polycyclic Aromatic Hydrocarbons (PAHs)	2 x 0.5 - 1 L Amber Glass	Sodium Bisulfate [2]		125 - 500 mL Jar	14 Days / 14 Days
	Oil &Grease or Mineral Oil & Grease	2 x 0.5 - 1 L Amber Glass	1:1 HCl or H2SO4		125 - 500 mL Jar	28 Days / 28 Days
TRACE ORGANICS	Alcohols	2 x 40 mL Glass Vials [3]		Zero Headspace	125 - 500 mL Jar	7 Days / 14 Days
	Alkanolamines (MEA, DEA, DIPA)	1 L Amber Glass			125 - 500 mL Jar	7 Days / 14 Days
	Dioxins and Furans	2 x 1 L Amber Glass			125 - 500 mL Jar	Unlimited / Unlimited
	EOC (Extractable Organic Chlorides)	1 L Amber Glass			125 - 500 mL Jar	14 Days / 28 Days
	Formaldehyde	2 x 40 mL Glass Vials [3]	Copper Sulphate	Zero Headspace	125 - 500 mL Jar	7 Days / 5 Days
	Glycols	2 x 40 mL Amber Glass Vials			125 - 500 mL Jar	7 Days / 14 Days
	Naphthenic Acids	2 x 250 mL Amber Glass			125 - 500 mL Jar	14 Days / 14 Days
	PCB	2 x 0.5 - 1 L Amber Glass			125 - 500 mL Jar	Unlimited / Unlimited
	Phenolics, Chlorinated and Non-Chlorinated	2 x 0.5 - 1 L Amber Glass	Ascorbic Acid & Sodium Bisulfate		125 - 500 mL Jar	14 Days / 14 Days
	Priority Pollutants (EPA 625 list)	2 x 1 L Amber Glass			500 mL Jar	7 Days / 14 Days
	Resin Acids & Fatty Acids	2 x 0.5 - 1 L Amber Glass	Ascorbic Acid & NaOH		125 mL Jar	14 Days / 14 Days
	Sulfolane	2 x 0.5 - 1 L Amber Glass			125 mL Jar	7 Days / 14 Days
PESTICIDE RESIDUES	Carbamate Pesticides	2 x 1 L Amber Glass	Potassium Dihydrogen Citrate or ChlorAC buffer		125 - 500 mL Jar	28 Days / 14 Days
	Glyphosate / AMPA	2 x 1 L Amber Glass	Use Sodium Thiosulfate if chlorinated		125 - 500 mL Jar	14 Days / 14 Days
	Herbicides, Acidic	2 x 1 L Amber Glass	Sodium Bisulfate		125 - 500 mL Jar	14 Days / 14 Days
	Nonylphenol & Ethoxylates	2 x 0.5 - 1 L Amber Glass	Sodium Bisulfate		125 - 500 mL Jar	28 Days / 14 Days
	Organochlorine or Organophosphate Pesticides	2 x 1 L Amber Glass			125 - 500 mL Jar	7 Days / 14 Days
	Soil Sterilant Scan	2 x 1 L Amber Glass			250 g Poly Bag	7 Days / 14 Days
Micro						
MICRO-BIOLOGICAL	Coliforms - Fecal /Total/E-coli or Heterotrphic Plate Count(HPC)	250 mL Sterilized Plastic	Sodium Thiosulfate		500 mL Sterilized Jar	24-30 Hours (24 - HPC) / NA
	Microtox	1 L Amber Glass			125-250 mL Jar or Bag	3 Days / 3 Days

1. Additional analyses with the same container and preservation may be possible - consult the lab for details.
2. Use Sodium Thiosulfate instead of Sodium Bisulfate if sample is chlorinated.
3. The number of 40 mL glass vials required (2 or 3) for BTEX & VOC varies by lab based on instrumentation. Consult the lab for details.

* 3 Day holding time for British Columbia as per BC Ministry of Environment (2009)

APPENDIX D

ALS Laboratory Approval Letter

April 20, 2011

Stantec
5021 - 49th Street PO Box 1680
Yellowknife NT
X1A 2N4

ATTENTION: Mr. Jeff Elliot & Ms. Carey Sibbald

Dear Mister Elliot and Ms Sibbald

RE: QA/QC Plan for Baker Lake Licensed Monitoring Program

The enclosed QA/QC plan for the Baker Lake water sampling follows ALS Winnipeg sampling recommendations and is acceptable to ALS for the analyses to be performed.

Yours sincerely

C. Herrod

Christine Herrod
Account Manager