Hamlet of Resolute Bay Airport Sewage Lagoon

Quality Assurance/Quality Control Plan

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Community and Government Services

Government of Nunavut

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Appendices

1.0 Introduction

The requirements to develop a QA/QC Plan imposed on the Resolute Airport Sewage Lagoon water licence are for the purpose of ensuring the NWB that samples taken in the field as part of the SNP will maintain a high quality, so as to accurately represent the physical and chemical nature of the samples being taken. It should also be noted that while minimum sampling requirements have been imposed, additional sampling may be requested by an inspector.

1.1 Background

Resolute Airport maintains Municipal Type B license # 3BM-YRB 0308 issued on November 30, 2003 and expired on November 30, 2008. A renewal application was submitted on November 28, 2008. Additional information was requested by NWB on July 20, 2010 to ED&T but was not provided on the due date August 20, 2010. September 24, 2012, NWB was informed about the change of licensee from GN-ED&T to GN-CGS in a letter signed by Art Stewart, Acting Director, Transportation and Planning, ED&T.

The drinking water supply system was changed from the conditions established in the initial licence. initially fresh water was supposed to extract from the Strip Lake. They stopped this process long time ago. Currently treated water is being collected from the Water Treatment Plant located at Signal Hill and trucking to the Airport facilities. And wastewater is being collected from the Airport facilities and truck discharges to the Airport Sewage Lagoon located in an area adjacent to the Airport Terminal

The Sewage Lagoon can only be decommissioned once Mechanical wastewater Treatment plant for Utilidor system is built and commissioned. Unfortunately this facility might not be ready in next 4/5 years. Therefore the Airport water licence is required to be renewed in order to use sewage lagoon. Wastes generated in the Airport area are dumped in the Municipal landfill site.

1.2 Monitoring and Regulatory Requirement Program

Item 3 of Part H water licence requires that the Licensee shall conform to the Quality Assurance/Quality Control (QA/QC) Plan, which shall be provided to the licensee by the NWB within 6 months of the issuance of this licence.

1.3 Objectives

The objectives of this QA/QC plan are to (1) to ensure the reliability of the data collected during monitoring activities at the locations specified in the Hamlet's water licence , and (ii) satisfy the requirement of the water licence.

1.4 Scope of work

The QA/QC Plan covers the environmental monitoring undertaken at the Water treatment plant of the Utilidor system and the Sewage Lagoon disposal facility (fig-1).

1.6 Definitions

The following definitions that are relevant to this plan include:

Quality Assurance is a system that ensures that quality control procedures are correctly performed and documented.

Quality control refers to the established procedures observed both in the field and in the laboratory, designed to ensure that the resulting end data meet intended quality objectives.

Trip Blank is a sample of clean water that was prepared by the analytical laboratory and shipped to the sample site in the cooler along with the empty sample bottles. This trip blank sample remains unopened and is transported back to the laboratory with the monitoring program samples. The trip blanks is analyzed by the Laboratory along with the monitoring program samples. The purpose of the trip blank is the assess contamination introduced during shipping and field handling procedures.

CALA refers to the Canadian Association for Laboratory accreditation, formally known as the Canadian Association of Environmental Analytical laboratories (CAEAL).

Chan of Custody Documentation refers to the documentation that accompanies samples set to an analytical laboratory. It is a legal document which ensures that the sample taken at a specific site is the sample received in the laboratory. It also

provides information on the sample condition and integrity as received by the laboratory.

2.0 Field Sampling

2.1 Sampling procedures

All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of Standard Methods for the examination of Water and wastewater, or by such other methods approved by the Board. All analyses shall be performed in a Canadian Association of Environmental Analytical Laboratories (CAEAL) certified Laboratory, or as otherwise approved by an analyst.

To obtain meaningful results from the analyses, the following six factors are of particular importance:

- Sample collection as per schedule and location
- Correct usage of container/sample bottle for parameter being tested.
- Correct labeling of sample bottles and filling out record/field sheet
- Correct procedure for field sampling
- Proper and timely shipment of samples to the laboratory
- Timely delivery of samples to the laboratory from the air cargo facility.

2.2 Sampling Collection

Refer to the Environmental Monitoring Program Checklist, found in Appendix C for the specific details on the sampling locations, equipment and sampling methods.

2.2.1

The water License issued to the Resolute Airport Authority represented by GN-ED&T by the NWB specifies three monitoring stations across the licensed facilities:

YRB- 1: Raw water supply prior to Treatment. (Currently the Contractor ATCO is getting treated water only from the Utilidor water treatment plant and volume recorded daily)

YRB-2: Raw Sewage at Truck offloads point: Volume recoded daily

YRB- 3: Effluent discharge from the Final discharge point of the sewage disposal facilities.

The following table includes the geographic coordinates for the three monitoring stations described above:

Monitoring Station	Latitude	Longitude
YRB-1		
YRB-2		
YRB-3		

NWB has been advised to renew the future Water Licence under the name of GN-CGS instead of GN-ED&T in a letter dated --.

2.2.2 Sampling Equipment

Dedicated latex or nitrile gloves (i.e., one pair per sample) are to be used during sample handling. Dedicated sampling equipment such as sampling poles (see photo below for an example) are to be cleaned with soap and water after each sample is collected to prevent cross-contamination. Environmental monitoring samples collected for analysis of selected chemical parameters are to be placed directly into new pre-cleaned, laboratory-supplied sample bottles. All monitoring samples are to be placed in clean coolers for transportation to the subcontract laboratory. The samples are transported/submitted under Chain of Custody documentation. Included on a Chain of Custody form is the client information, the sample information, the analyses requested, the relevant regulations, the turnaround time for the analytical results, comments, and temperature of the samples at the time they arrived in the laboratory. An example of a completed Chain of Custody form is included in Appendix D.

2.2.3 Sampling Methods

Please see Appendix E for the Environmental Monitoring Program Schedule. As a general recommendation, please refrain from using insect repellant, disinfection hand gel or other chemical products before and during sample collection. Also, please refrain from smoking during sample collection.

2.2.3.1 Wastewater Sampling

Wastewater influent samples are collected from the active sewage disposal facility (YRB-2) beginning one week prior to the proposed discharge date, once at the beginning of the discharge and weekly thereafter until the cessation of discharge. Wastewater influent samples are collected from the lagoon by immersing the sample bottle into the lagoon neck first to a depth of 5 to 10 cm (if possible). The sampling container is filled with influent wastewater and the sample bottle is raised neck first to prevent sample spillage.

2.3 Sample Handling

All water samples are to be collected in laboratory-supplied containers with the proper preservative, where applicable. A complete list of parameter handling and preservatives can be found in Appendix C.

All sample containers are to be tightly sealed and properly labeled with the sample ID, date and time of sample collection, location of sample collection and parameters to be analyzed. The outside of the bottles are to be cleaned with soap and water after sampling and dried off prior to placing the samples in the cooler. The samples are to be stored on ice in a cooler until delivery to the laboratory. A chain of custody form is to be filled out completely and is used to track the samples and placed in the cooler with the samples, in a zip lock bag. Keep the last page of the Chain of Custody and give it to the Hamlet Foreman for their records.

The following checks are generally performed by the laboratory upon receipt:

- Verification of the integrity and condition of all sample coolers.
- Verification of the integrity and condition of all sample containers.
- Checks for leakage, cracked or broken closures or containers, evidence of grossly contaminated container exteriors or shipping cooler interiors, and obvious odors, etc.
- Verification of receipt of complete documentation for each container.
- Verification that sample identification numbers on sample transmittal forms corresponds to sample identification numbers on the sample containers.
- Verifications that holding times were met and samples were kept cool during transit.

2.4 Quality Assurance and Quality Control Program

Cross contamination is a common source of error in sampling procedures. QC samples help identify when and how contamination might occur. There are various types of QC samples. For the purposes of the Hamlet's environmental monitoring, CGS recommends the use of trip blanks.

It is essential to request a trip blank sample to be prepared when placing the bottle order with the contract laboratory.

3.0 Laboratory Analyses

3.1 Laboratory Accreditation

As indicated in the Guidelines, the Hamlet should use an analytical laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA); formally known as the Canadian Association for Environmental Analytical Laboratories (CAEAL) for the monitoring program for NWB Licence NWB YRB 0308. Appendix F includes a copy of the laboratory's CALA accreditation certificate and a list of the parameters for which they are certified.

3.2 Method Detection Limits

The method detection limits (MDLs) are provided on the contract laboratory's Certificates of Analysis.

4.0 **Reporting Requirements**

4.1 **General Submissions**

As a condition of NWB Licence 3BM-YRB 0308, the CGS is required to submit an Annual Report to the NWB, no later than March 31st of the year following the calendar year reported which shall contain the information of item 1 of Part B of the Water Licence.

References

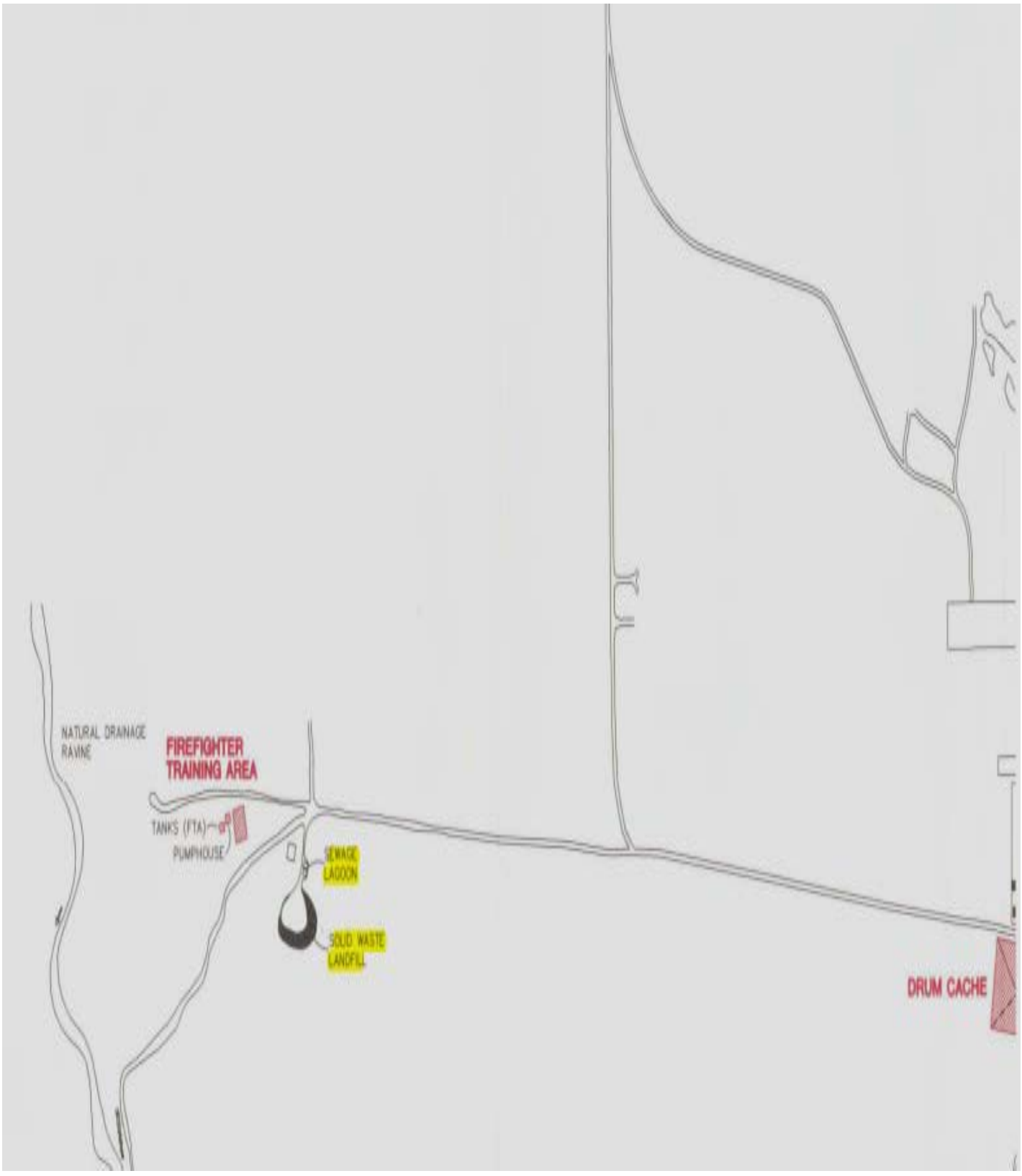
Quality Assurance (QA) and Quality Control (QC) Guidelines for use by Class “B” Licensees in Collecting Representative Water Samples in the Field and for Submission of a QA/QC Plan, Department of Indian and Northern Affairs Canada, July 1996.

Standard Methods for the Examination of Water and Wastewater, American Public Health Association, American Water Works Association, and Water Environment Federation, 22nd Edition, 2012.

exp Services Inc. (2013) ; QA/QC Plan for Cape Dorset, Kimmirut and Hall Beach

Appendix-A:

Site Plan


NATURAL DRAINAGE
RAVINE
FIREFIGHTER
TRAINING AREA
TANKS (FTA)
PUMPHOUSE
SEWAGE
LAGOON
SOLID WASTE
LANDFILL
DRUM CACHE

Appendix-B:

Resolute Bay Airport Water Licence

Appendix-C:

Environmental Monitoring Program Checklist,

Summary of Sample Bottle Requirements