WASTEWATER SAMPLING INSTRUCTIONS–

TRAINING AT THE CAMBRIGE BAY SEWAGE LAGOON

IEG Environmental was contracted by the Department of Community and Government Services to develop wastewater sampling instructions for operators to conduct wastewater sampling. IEG Environmental is pleased to provide these written instructions and a brief course to operators. [Note that they have been updated by CGS since the original work was done in 2005].

Included in this instruction booklet are all the steps to collect wastewater samples that you send to the lab. We have provided the forms and packing labels for Enviro-Test Labs with these instructions. This is the lab that CGS has selected for the summer of 2005 sampling. [Note: this lab is now operating under a different name, but uses the same phone number. An alternative lab is Taiga Environmental Laboratory in Yellowknife: 867-669-2788]

INTRODUCTION

Before you are going to start your sampling, please read through all of these instructions carefully [and call the laboratory] if you have any questions.

There are two main purposes for sampling wastewater from sewage lagoons:

- To meet the Hamlet's water license requirements; and
- To see how the lagoon is performing.

Every Hamlet has a water license, the water license makes sure that the drinking water source stays safe and that wastes are disposed of properly. Part of the water license is the sampling program called the Surveillance Network Program (SNP) [or Monitoring Program Stations (MPS)]. Part of the Monitoring Program or Surveillance Network Program is to sample the treated wastewater coming out of the lagoon or wetland into the environment.

It is the responsibility of the Hamlet to make sure the SNP or MPS samples are collected and sent to the lab. You can check with your SAO for your water license.

You have probably met with the DIAND [INAC} inspector in the fall when he/she comes to do an inspection of the dump and lagoon/wetland. The DIAND inspector also collects a sample at your SNP or MPS locations to make sure the facilities are working.

The other reason wastewater samples would be collected is to see how the lagoon is doing, sort of like a check-up. For example, in Cambridge Bay for this training we are sampling the water from each lagoon to see how it is working at each different step. This information is needed for engineers to design new lagoons and upgrade old lagoons.

1.0 SAMPLE LOCATION

The SNP or MPS sample for your sewage treatment system will be collected at the point were the treated sewage is discharged (dumped) into the environment. In your community there may be a culvert, like

Cambridge Bay, or a wetland like Kugluktuk. It is important to sample from the last point before the wastewater enters the environment.

Once you've found the sampling points they should be marked with a sign and the sign should have the water license number and the SNP or MPS number for the wastewater posted on it.

For the training location, Cambridge Bay, the culvert where the last lagoon flows into the ocean is the SNP or MPS location. [Other sampling points are located and identified between the lagoon edge and the final sampling point.]

2.0 SAMPLING EQUIPMENT

All of the equipment necessary to collect the samples should be on site before you begin to sample. It is good to always have extra sets of sample jars handy just in case something happens, for example you accidentally contaminate the sample or the plane doesn't make it in.

One of your most important pieces of sampling equipment is the plane bringing your samples south. Because of the type of samples these are they MUST be at the lab within 24 hours of collecting the sample. Before you go to take your samples you have to check with the airline to see when the plane gets in to the city you are sending the samples to and if the lab can pick up the samples at the cargo office after hours. We go through the detailed steps later.

The sampling equipment you need to get from the lab are:

- Sample bottles;
- Coolers; and
- Ice packs.

You can call the lab and tell them the bottles that you need for the parameters of your water license. The water license parameters can be found in the next section. It is important to **use only sample bottles and coolers the lab sends you.** Coolers that have been used for food may contaminate the samples.

To collect the laboratory samples you will need the following:

- 5 gallon pail (sterilized with chlorine and rinsed 10 times with clean water)
- Disposable Nitrile gloves (not latex)
- Sample kit cooler from the lab. These kits will be shipped to you by the lab whenever you need more. You can call Enviro-Test Labs at the following number to order your kit **1-800-668-9878,** you will need to know the sample parameters in the next section before calling them**.** The kit will have the following in it:
    - 1 cooler
    - Sample bottles (there will be 5 per kit)
    - Chain of custody form (to be filled out by the operator)
    - Ice packs (should be frozen prior to taking samples)

- Pens (both a ball point for filling out the chain of custody and a water proof felt for marking sample names on the sample bottles)
- Photo copy of laboratory shipping label (to be taped to sealed cooler)
- Clear packing tape (to cover bottle labels and to seal the coolers for shipping)

3.0 SAMPLING PARAMETERS

For routine sampling of wastewater, the following parameters are going to be analyzed at the lab:

Parameter	**Code on Chain of Custody**	**Container Type**	**Preservation**
Biological Oxygen Demand (BOD_5)	BOD	1 L polyethylene (wide mouth)	Keep cool at 4^oC
Faecal Coliforms	FCC-MF	250 ml sterilized (paper seal on lid) plastic	Keep cool at 4^oC
Oil and Grease	OGG	1 L amber glass with preservative	Keep cool at 4^oC, preservative in vial
Total Suspended Solids (TSS)	TSS (SOLIDS – TOT SUS)	500 mL polyethylene	Keep cool at 4^oC, preservative in vial
Total Residual Chlorine	RESIDUAL CHLORINE (CL2-Free)		
pH	pH		
Ammonia	NH4	500 mL polyethylene, with preservative	

[In addition, other parameters may be required according to the terms of your water license]

4.0 SAMPLING INSTRUCTIONS

1. Call the lab and get them to send you sample bottles for the sample parameters in the table above, [and other parameters as required]:
    a. Biological Oxygen Demand (BOD_5)
    b. Faecal Coliforms
    c. Oil and Grease
    d. Total Suspended Solids (TSS)
    e. Total Residual Chlorine
    f. pH

g. Ammonia

2. The day before you are going to collect your samples check the flight schedule for when the plane gets into the city where the lab is located. Also check with the cargo agent for the latest time you can drop off the samples. Make sure you leave enough time to collect your samples.
3. Freeze your ice packs the night before you go sampling.
4. Fill out the chain of custody form that the lab sent you in the cooler and place it in a Ziploc bag to protect it. There is an example of a chain of custody at the back of these instructions. You will have to add:
    a. [MOST IMPORTANT]You will write "Gjoa Haven Sewage Lagoon – GJO4" (or other depending on site and the exact sampling point, such as "750 m down-gradient from berm") and the date (dd/mm/yy) in the **SAMPLE ID** box
    b. "sewage lagoon" – in the **SAMPLE LOCATION** box
    c. Your initials, the date & time – in the **SAMAPLED BY/DATE/TIME** box
    d. "Grab" – in the **SAMPLE METHOD** box
    e. "Wastewater" – in the **SAMPLE TYPE** box
    f. Under the **ANALYSIS REQUEST** column you will have to add the tests we are doing. See the attached COC for this. You must then check the box for each sample, as has been done in the example.
    g. On the right hand side of the Chain of Custody there are triangular boxes to mark with an "F" or "P" if the sample is filtered or preserved. None of the samples will be filtered; however the Oil and Grease (OGG) in the amber bottle and the Ammonia sample in the 500 mL polyethylene will be preserved. Put a "P" in the triangle above **OGG** and **NH4**
    h. In the columns marked **HAZARDOUS** and **HIGHLY CONTAMINATED** write and **N** for NO. And in the Column marked **NUMBER OF CONTAINERS** you will write **1**.
    i. At the bottom of the form there is a box **RELINQUISHED BY** – sign your name and put the date in the **DATE & TIME** box
    j. For the Boxes marked **REPORT TO, INVOICE TO,** and **REPORT DISTRIBUTION** fill these out as they are in the sample COC. The same should be done for the **JOB #, and PO/ AFE.**
5. Write the date (dd/mm/yy) and "Cambridge Bay Sewage Lagoon" (or the name of your community) on all the sample bottles. Then put a piece of clear packing tape over the label so the ink will not run if the outside of the bottles get wet.
6. In the Hamlet garage or somewhere where there is a sink, wash your 5-gallon pail really well with chlorine and then rinse it a minimum of 10 times. Do not wash this bucket in your water treatment plant or truckfill station.
7. Put the bucket in the cab of your truck but don't put anything in it because this could contaminate the sample. It is OK to put the cooler in the box of your truck. Drive out to your site.

8. Carry all the sampling equipment out to SNP or MPS location and get the equipment organized.
9. **Put on the Nitrile gloves. This will protect you and the samples.**
10. Fill the clean 5- gallon pail half full with wastewater from where the sewage treatment system enters the environment 3 times to rinse the pail. After the third rinse, fill the bucket with effluent and stand it up.
11. Take out of the cooler the 1 l glass amber bottle, the 500ml poly bottle with preservative and the 250ml poly bottle that is sealed with paper because it is sterilized and put them beside your cooler.
12. **With the rest of the bottles in the cooler, rinse each of them 3 times (fill from the bucket and dump back to the stream).** Fill each of the bottles from this bucket by dipping them into the water so as not to create any splashes or bubbles. Holding the bottle with the top up and submersing it against the side of the bucket is a good way to do this.
13. **For the sterilized 250 ml bottle, be careful when opening the bottle and fill up to the line indicated on the label and recap it right away. DO NOT rinse this bottle.**
14. For the 1L glass bottle and the 500ml poly there may be preservative already in the bottom of the bottles. If there is, slowly fill the bottles and do not rinse or overflow the bottles. If you overfill them the preservative is lost and you should start again with a fresh bottle and preservative. If the preservative is not in the bottle it will be in a small vial, there will be a coloured dot on the lid of the bottle to tell you which preservative goes with which bottle. Fill the bottle slowly, DO NOT RINSE, to the shoulder of the bottle and then add the preservative and recap the bottles.
15. Wrap the glass bottle in bubble wrap.
16. Put all the bottles in the cooler, put in the Ziploc bag with the filled out chain of custody form and the ice pack.
17. Throw out the nitrile gloves.
18. Shut the cooler.
19. Tape up the cooler with packing tape and tape on an EnviroTest label. This label should contain all the information necessary to get the samples back to the lab in Edmonton. See attached for an example.
20. Clean the 5-gallon pail with chlorine and rinse it 10 times.

5.0 SAMPLE TRANSPORTATION

As we have said before, one of the most important pieces of sampling equipment is the plane south. If the samples don't make the plane or the samples don't make it to the lab within 24 hours after you have collected them, they are no good and have to be collected again.

For this training we are using Enviro-Test Labs in Edmonton as an example.

If you call First Air or Canadian North and they can't get your samples delivered in Edmonton until after 5:00pm then you need to call Enviro-Test Labs and get them to pick up your samples at cargo in Edmonton. Before you send your samples, call Enviro-Test to let them know they are coming and to let

them know if you need an after 5:00pm pickup. The toll free number is **1-800-668-9878.** Or Taiga Environmental Laboratory in Yellowknife: **867-669-2788**

Take the samples in the labeled and sealed cooler to the airport or to the expediter depending on your location. As you will already have made sure the flight is going to be on time and will not be delayed simply drop of the cooler and fill out the required shipping paper work. Once you leave the shippers office **call the lab to inform them that a cooler is on the way** and give them the waybill number so they can track the shipment.

Cargo Phone Numbers

Canadian North Cargo	1-800-661-1505
Canadian North Cargo, Cambridge Bay	983-2453
First Air Cargo	1-800-267-1247
First Air Cargo, Cambridge Bay	983-2656