APPENDIX C

GUIDELINES FOR WASTEWATER SAMPLING

Guidelines for Wastewater Sampling

Reference Document

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1 INTRODUCTION

The purpose of this document is to provide guidelines when performing sampling of municipal wastewater. Main objectives are to:

1. provide appropriate methods for conducting wastewater sampling
2. describe the appropriate equipment and containers that should be used in sampling
3. describe the sampling procedure to obtain a representative sample

2 BACKGROUND INFORMATION

2.1 Sampling Equipment

2.1.1 Containers and Bottles

There are two types of sample collection. Intermediate collection uses a bucket, ladle or wide mouthed bottle to collect the sample from the effluent pipe whereas final collection involves transferring the sample to an appropriate sample bottle. Where it is impractical or unsafe to sample by hand, a sampling rod, polycarbonate or stainless steel pole with a clamp or cage on one end, can be used to assist with the sampling. The clamp or cage at the end of the rod is designed to securely hold the sample container during the sampling. This provides extra reach and prevents hands from contaminating the sample and contacting wastes.

The type and size of bottle for the final sample are related to the nature of the analyses needed. Typically, the sample bottle is made of plastic or glass. The sample bottle should not be rinsed before use and care should be taken to not contaminant it; do not touch the inside of the bottle or its cover.

Each laboratory has a preference for the type of bottle that is best for the collection of the sample. Contact the specific laboratory prior to sampling to check what type of bottles is acceptable for final sample collection for a specific parameter.

2.1.2 Apparatus

There are two types of apparatus that are used in obtaining waste water samples: manual and automatic.

For manual sampling, it is not necessary for the same person to always collect the samples. However, it is important to ensure that the person collecting the sample is using proper sampling techniques each time. If a team of 2 or more does the sampling, designate one person to collect the sample while the other person assists. This helps to minimize human error associated with the sampling procedure. When using an automatic sampler, ensure that the sampler is working properly, i.e. the samples that are extracted illustrate a representation sample of the actual waste stream.

2.2 Sampling Procedure

2.2.1 Location

The sampling location should provide a good representative sample of the actual discharge from the facility. Once the best location has been chosen for the sampling location, each sample should be collected at this same point during each time of sampling.

Raw wastewater influent samples may be collected at the wet well of the influent pump station or at the inlet control structure (avoid the bottom where solids may settle). Effluent samples should be collected from the outlet control structure after discharge or from a well-mixed point in the outfall channel.

2.2.2 Frequency and Timing

Each time a sample is taken from a site location, it should always be collected at the same time of day in the case of continuous sampling for monitoring purposes.

2.2.3 Method

There are two distinct types of samples: spot (grab) and composite. In the case of spot sampling, the entire sample is taken at one time whereas with composite sampling, the sample is a mixture of grab samples or a collection of fractions of the waste stream samples taken continuously over a certain time frame.

Samples can be directly collected into the sample bottle when it is practical to do so. However, if it is not practical such as is the case when a sample cannot be collected without the loss of the preservative, an intermediate container may be used. For both types of sampling, the intermediate collection container should be rinsed several times, usual three (3) unless it indicates not to do so, with the liquid being sampled before the actual sample is collected. The sample should be constantly stirred to avoid the settling of any suspended solids to the bottom during the time it takes to extract a final sample. When using a sampling rod, the rod and container should be gently but quickly lowered into the sample to minimize the contribution of surface films to the sample.

Prior to taking the final sample, the sample bottle should be rinsed three (3) times with the sample as well. To take the final sample, insert the container into the sample vertically with the neck facing down, then invert the container to allow sample to flow in, always keeping the month of the container faced into the current. This will minimize surface films from forming on the sample. Once the sample bottle is filled to the appropriate level specified, ensure that the cap is tightly sealed and the outside of the bottle is clean of any contaminants by rinsing it with clean water before shipment. When using a sampling rod, the container should be gently but quickly lowered into the sample to minimize the contribution of surface films to the sample.

2.2.4 Identification and Reporting

Each sample bottle should be clearly labelled, either by writing on the bottle or on a label with waterproof ink or permenant marker. The label should contain the following information:

- Location and/or point of sampling, including site identifier
- Description of sample and/or site
- Test parameter(s) for analysis (if required)
- Date and time of sampling
- Preservative (if required)

The information presented on the collection sample bottle should match that recorded on the sample submission form. A typical example of a properly identified label is shown below.

SAMPLE I.D.:	WWT-01		
DESCRIPTION:	Lagoon Effluent Discharge		
ANALYSIS:	BOD_5	DATE:	08/30/07
PRESERATIVE:	None	TIME:	13:00

Sometimes labels do not correspond to items that are required for the sample such as company name or project number. In those cases, these areas could be used to provide additonal information and description of the

Along with the sample, a sampling or field report should accompany each sample set, which can contain all the below information:

- Type of sample taken;
- Sample identification which includes location/point of sampling and site identifier;
- Date and time (start and stop) of sampling;
- Preserative added, if required;
- Duration of sampling period;
- Purpose of sampling;
- Details of sampling method and field testing.

2.2.5 Preservation, Storage and Transportation

After samples are collected and labled, they should be kept cool, between between 0°C to 4°C either by refrigeration or the use of a ice packed cooler. During the winter months, ensure that the sample does not freeze. If the sample is not cooled, this could have an effect on the final results of the analysis. Cooling the samples ensures that the sample will not be changed due to biological activity while it is transported to the lab. The samples should be transported immediately (no more than 24 hours after the time of sampling) to the specified laboratory for analysis as some test parameters are time sensitive (i.e. FC and BOD_5).

2.3 Protection and Safety Measures

2.3.1 Safety Protection

Generally, it is common practice to wear protective gear such as gloves, goggles and waders when taking samples to protect from the contaminants in the sample. The most important piece of protective clothing is gloves, which should be worn at all times. Typical medical and/or surgical gloves (neoprene) seem to work best for this application. Powdered gloves should not be used as they could contaminate the sample. Before and after the sampling, wash hands with soap and water and disinfect with hand sanitizer.

3 REFERENCES

[1] Water Quality - Sampling - Part 10: Guidance on Sampling of Waste Waters. International Standard ISO 5567-10: 1992(E).

[2] The *Handbook for Sampling and Sample Preservation of Water and Wastewater* (Environmental Protection Agency 1982).

[3] EPA Guidelines: Regulatory Monitoring and Testing - Water and Wastewater Sampling. June 2007.