

Detailed Water Sampling Procedures

Overview

Scope

This procedure is used to sample water and wastewater safely and efficiently.

Category and attribute

The following provides the category and attribute for this procedure:

Category

- Critical
- Emergency
- Operating
- Other

Attribute

- Routine
- Non-Routine

PPE

The minimum personal protective equipment (PPE) needed to do this job follows:

- Hard hat
- Safety glasses
- Coverall/chemical splash goggles
- Chemical resistant gloves
- Sturdy work shoes
- Protective breathing equipment (in special cases, for stream-specific procedures)

Tools and equipment

The tools and equipment needed to do this job follows

- The appropriate sample containers
- Labels
- Sample container carriers
- Refrigeration equipment
- Sample equipment
- Documentation forms
- Sample log
- Communications equipment
- Other material and equipment necessary

Reference: See the specific sampling requirements by outfall designation later in this procedure

In this procedure

This procedure covers the following sections:

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Section A

Sampling Preparations

Overview

Introduction

This topic provides the information and instructions needed to prepare for sampling solutions.

In this section

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Chemical Hazards

Sample handling policy

Because sample constituents can be toxic, you must always take adequate precautions during the sampling and sample handling to protect you from contact with the sample contents.

Safe sampling requirements

Wastewater streams are normally non-hazardous but may contain materials in sufficient quantities that cause a health hazard at all times to humans.

- Always avoid direct contact with wastewater.
 - Remove any wastewater contact immediately by multiple washings with fresh water.
 - If you use a chemical resistant apron or other protective equipment during the sampling, remove it before you remove the gloves.
 - Wash chemical-resistant gloves worn during sampling operations with clean water before removal.
 - Wash the hands thoroughly after removing the gloves.
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Spills

Clean up all spills immediately.

Hazards and precautions

This table lists job hazards and the precautions that you should be take before beginning this procedure:

Hazard	Description	Precaution
Toxic absorption	Toxic substances can enter through the skin or in the case of vapors through the lungs	Wear your PPE.
Hydrochloric acid	Hydrochloric acid is sometimes used as a preservative in the wastewater samples.	Take special care because of the corrosivity of the acid.
Volatile organics	Some chemicals in the wastewater may be volatile and can volatilize under ambient conditions.	<ul style="list-style-type: none">• Do not allow the sample system to run for an extended time.• Avoid close contact with any potential vapors.• Wear proper PPE if the potential for vapor exposure exists.

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Chemical Hazards, Continued

Hazards and precautions (continued)

Hazard	Description	Precaution
Pressurized containers	Wastewater samples that contain dissolved organics may pressurize the container if allowed to increase in temperature. Samples taken from pressurized equipment could spray or leak liquids which could <ul style="list-style-type: none">• Cause personal injury• Contaminate the sample area• Create unsafe working surfaces	<ul style="list-style-type: none">• Refrigerate these samples as soon as possible after collection.• In an open area or under a ventilated hood, open the containers holding these samples very carefully.
Broken glass	Breakable sample containers should be handled carefully. Glass from a broken container could cause injury.	Clean up any broken containers carefully as soon as possible to prevent injury to personnel.
Slippery surfaces	Access to sample locations may have slippery surfaces.	Always consider fall protection based on the conditions.

Calibrating the pH Meter

Introduction This topic provides the instructions for calibrating the pH meter used in sampling.

Buffer solutions These buffer solutions apply to calibration of the pH meter:

- Buffer solutions are used for calibration purposes.
- Standard pH 4, pH 7, and pH 9 buffer solutions are recommended to be used with the Yokogawa Model PH82 Personal pH meter.
- The Company normally uses standard buffer solutions of pH 7 and pH 10 for 513 sampling because experience shows the actual waste stream pH values to be more basic.

When to use Calibrate the pH meter before use:

- Each morning at the beginning of the first shift or the end of the second shift
- When the battery is replaced
- When the pH meter has been stored for a long time
- When the electrode has been cleaned and rinsed
- When KCl has been added to the electrode

Correction Use only fresh buffer solutions of the correct pH value.

Error messages This table lists the error codes displayed when the meter detects abnormality during calibration:

Code	Error	Solution
E-1	Unstable input. Calibrate again.	After the displayed value becomes stable, press the ENT button. <ul style="list-style-type: none">• Usually, displayed values become stable after two or three minutes.• If the glass electrode is dried up or the liquid injection system is clogged, the displayed value takes much more time to stabilize.
E-2	Abnormal input emf.	<ul style="list-style-type: none">• If CHECK SENSOR is displayed, replace the electrode.• Otherwise, refer to the troubleshooting section of the owner's manual.
E-3	Abnormal buffer solution.	Recalibrate the meter using a new buffer solution.

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Calibrating the pH Meter, Continued

Preparing for calibration

Follow these steps to prepare for the calibration of the pH meter:

Step	Action						
1	Clean the electrode with deionized or demineralized water.						
2	Press the Power key.						
3	Use this table to select the buffer solutions: <table border="1"><thead><tr><th>If you are testing ...</th><th>Then use buffer solutions ...</th></tr></thead><tbody><tr><td>Acidic materials</td><td>pH 4 and pH 7</td></tr><tr><td>Basic materials</td><td>pH 7 and pH 10</td></tr></tbody></table> <p>Result: The manual calibration procedure is used with a buffer solution of pH.</p>	If you are testing ...	Then use buffer solutions ...	Acidic materials	pH 4 and pH 7	Basic materials	pH 7 and pH 10
If you are testing ...	Then use buffer solutions ...						
Acidic materials	pH 4 and pH 7						
Basic materials	pH 7 and pH 10						
4	Prepare three clean containers, one each for the buffer solutions and one for the deionized water rinse.						
5	Rinse the electrode in the deionized water.						

Completing calibration

Follow these steps to complete the calibration and document it:

Step	Action
1	Dip the electrode tip into the first buffer solution.
2	When the Cal indicator flashes, push the automatic calibration Cal 4 – 7 – 9 button.
3	Press the ENT button. Result: Within 3 minutes, the meter beeps and the calibration is finished.
4	Confirm the buffer solution display and the temperature.
5	Write the results with the date and time of calibration in the operator log.
6	Complete the operator log for the calibration.
7	Clean the electrode with deionized or demineralized water.

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Calibrating the pH Meter, Continued

Slippery surfaces (continued)

Step	Action
8	Have you completed two calibrations? <ul style="list-style-type: none">• If <i>yes</i>, go to the next step.• If <i>no</i>, repeat steps 1-7 to complete the second calibration with the proper buffer standard.
9	Replace the electrode cap to keep the electrode wet during storage. <i>Reason:</i> A correct pH reading may not be obtained when using an electrode that has become dry. <i>Cap description:</i> The cap is fixed cotton wetted with deionized water.

Cleaning Containers

Introduction This topic provides the instructions for cleaning containers to be used for samples.

Requirement Any equipment used for sample collection must be clean.

Preferred container The preferred collection container is a clean sample bottle.
Pre-cleaned sample containers may be purchased and used as received.

Type of plastic container Plastic containers should only be those made of fluorinated polymers.
Example: Polytetrafluoroethylene (TFE)

Cleaning sample container Follow these steps to clean a sample collection glass or plastic container:

Step	Action
1	Thoroughly wash the container with a non-phosphate detergent.
2	Rinse it completely with at least three sequential tap water rinses.
3	Is the container for metals analysis? <ul style="list-style-type: none">• If <i>yes</i>, rinse it with 10 percent nitric acid.• If <i>no</i>, go to the next step. <i>Reason:</i> The analysis is for O&G or VOC.
4	Rinse it completely with at least three sequential deionized or distilled water rinses.
5	Is the container for O&G or VOC analysis? <ul style="list-style-type: none">• If <i>yes</i>, rinse with acetone or methanol. <i>Preference:</i> Use the same solvent as that used in the O&G analysis. <ul style="list-style-type: none">• If <i>no</i>, go to the next step.
6	Oven-dry it at 105°F in a clean oven. <i>Option:</i> Air drying is acceptable in a clean location.
7	Store it in a clean area before use.

Section B

Sampling Procedures

Overview

Introduction

This section contains the procedures for sampling different types of wastewater.

In this section

This section covers the following topics:

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Sampling Wastewater

Purpose

The purpose of this topic is to establish the standard procedure for taking a grab sample from a wastewater stream.

Preparing

Follow these steps to prepare for sampling the wastewater:

Step	Action
1	Accumulate the needed equipment.
2	Transport your equipment to the sample location.
3	Inform the PS in the Power control room of your location and intention to obtain a sample.
4	Check your communication system to make sure it is active and easily accessible in the event of an accident.
5	Arrange for the PS to check on you if you have not called back within 15 minutes.
6	Put on the appropriate PPE for the location, weather, and stream to be sampled.

Choosing a procedure

Use this table to choose which procedure to follow:

If you are grabbing from ...	Then go to ...
A pressurized source <i>Examples:</i> Pump discharge, transfer pipe	Grabbing from a pressurized source
A body of water <i>Examples:</i> Ditch, lagoon, bay, impoundment, containment area	Grabbing from a body of water

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Sampling Wastewater, Continued

Grabbing from a pressurized source

Follow these steps to grab a sample from pressurized equipment:

Step	Action
1	Check the sample drain.
2	Is the sample drain plugged? <ul style="list-style-type: none">• If <i>yes</i>, clean out the drain. <i>Reference:</i> See Drain Cleaning Procedure for more information.• If <i>no</i>, go to the next step.
3	Clear the area of unauthorized or unprotected personnel.
4	Open the sample drain and let it run for a minimum of 30 seconds.
5	Close the valve.
6	Collect the sample.

Grabbing from a body of water

Follow these steps to grab a sample from a body of water:

Step	Action
1	Install a cleaned glass sample collection container in a support frame.
2	Connect the support frame and the bottle to a small metal chain or synthetic (polypropylene) rope either 1/4" or 3/8" in diameter.
3	Secure the chain/rope to the frame in such a manner that no liquid can spill when the collection bottle is lifted from the water surface.
4	Mark the chain/rope 6" above the connection to the support frame.
5	Lower the collection bottle and frame beneath the surface of the liquid to the 6" mark on the chain/rope. <i>Reason:</i> This action helps to ensure that each sample is taken at a consistent depth from this location.
6	Repeat step 5 for each sample collection.

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[Section A](#) [Sampling Wastewater](#) [Taking Oil and Grease Samples](#) [Taking Total Organic Carbon Samples](#)
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