Importance and guidelines for proper sample collection, preservation, and transportation procedure for FSTP effluents

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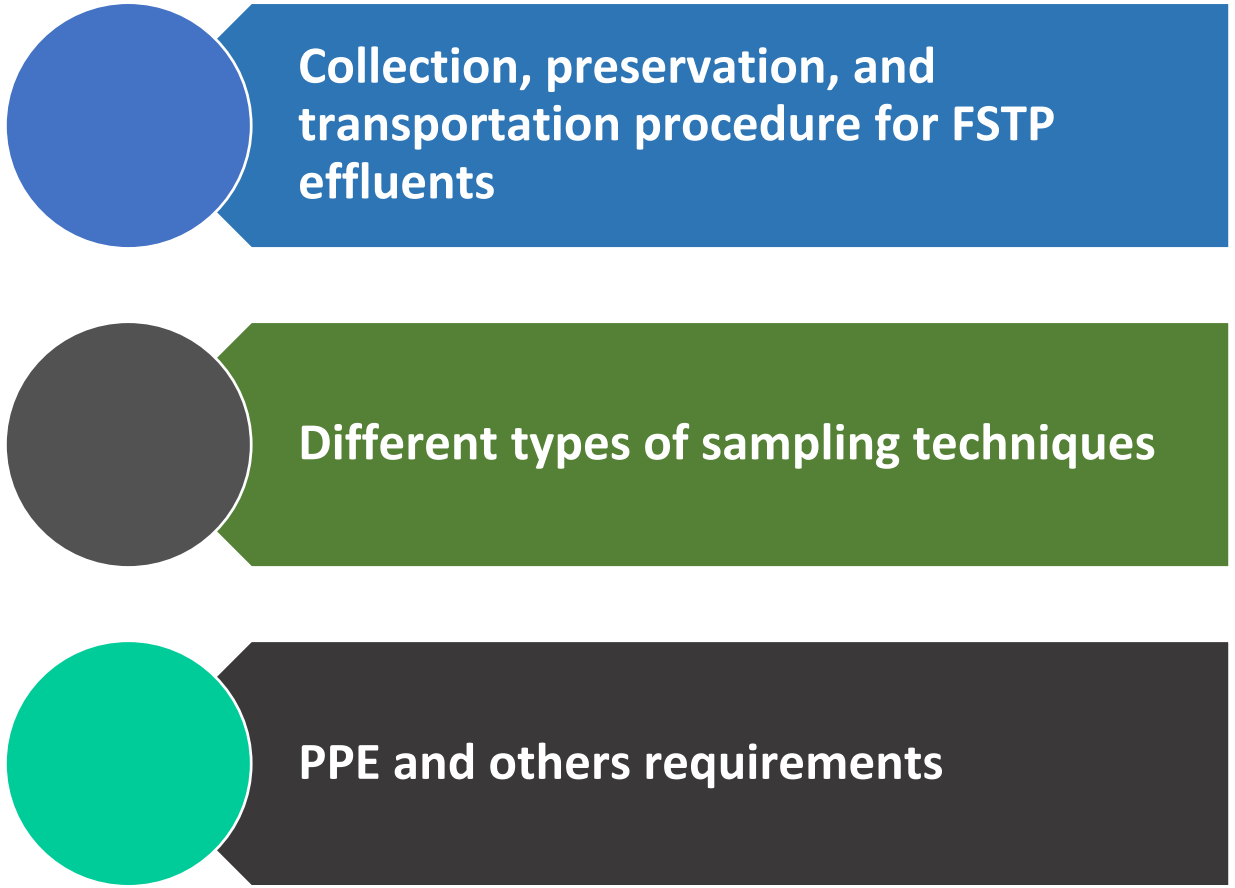
Importance of testing, sample collection and transportation procedure



Sample Collection Containers

- Cleaned & Sterile
- Different sample containers for different parameters
- Preservatives if required

Maintenance of Equipment and Supplies

- Maintenance and Calibration
- Check field instrument before sampling
- Observe preventive schedules
- Supplies (e.g. batteries, probes, standard solutions, laboratory wares, etc.) should be kept on hand.
- Keep Spare parts

Checklist for sampling

1. Coordination

❑Institutional coordination

Travel arrangements, sampling arrangements and transport of samples

❑Notification to the laboratory

Expected date, time of sample arrival, list of parameters & QA/QC

❑Verification of local weather conditions and feasibility of travel

Checklist for sampling

2. For documentation

- ❑Pens, clip board, Sample labels, Field notebook, Chain of Custody, Other forms
- ❑Camera- digital camera or recorder for photo documentation
- ❑GPS

Checklist for sampling

3. For Safety measures

- ❑First-aid kit
- ❑Rubber gloves, or disposable vinyl gloves, boots, etc.
- ❑Material safety data sheets (MSDS)
- ❑Waterless hand wash or hand wipes

Safety Considerations

Personal Protective Equipment (PPE):

- ❑**EYE AND FACE PROTECTION: Goggles and face protection from flying particles, liquid chemicals, acids or caustic liquids, chemical gases or vapors**
- ❑**HEAD PROTECTION: hard hat.**
- ❑**FOOT PROTECTION: Safety shoes.**
- ❑**HAND PROTECTION: Safety gloves. protect workers from cuts, scrapes, punctures, burns, chemical absorption, or temperature extremes.**
- ❑**HEARING PROTECTION: Earplugs.**

Types of Effluent Sampling

There are two types of effluent samples:

- **Grab Sample**
- **Composite Sample**

Types of Effluent Sampling

Grab Sample

- **A grab sample** is a single water sample collected at one time from a single point

- **A grab sample** can represent only the composition of the source at the time and place of sampling

Types of Effluent Sampling

Composite Sample

A composite sample is a series of individual grab samples taken at different times from the same sampling point and mixed together.

A composite sample may also be a number of grab samples of equal or weighted volumes mixed in one container.

Composite samples are preferred when the concentration of the parameter under consideration is expected to vary with time (or location).

On-site Measurement

- **On-site measurement of samples is necessary to obtain actual concentration of effluent quality parameters that might change during transport to the laboratory.**

- **on-site measurements (pH, DO, temperature, salinity, conductivity and total dissolved solids)**

- **Follow the on-site measurement procedures provided from instrument manufacturer**

Field Data Forms and labelling

Field Data Forms

Good-quality data collection is an essential component of a sampling program

- ❑**the date and time of sample collection for each parameter tested,**
- ❑**names of collectors,**
- ❑**sample site names or codes,**
- ❑**influent/effluent flows,**
- ❑**color and odor of the water sample, etc.**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Preservation, Storage, and Transport of Samples

Preparing sample for transport

Pack

Preservation, Storage, and Transport of Samples

Chain-of-Custody

- Chain of Custody (COC) form should be filled up (at least duplicate), which will accompany the samples, during transport to the laboratory.

- The person handling the samples to the laboratory should sign the COC.

- Once the samples are received by the laboratory, the laboratory personnel who receive the samples should also sign the COC and provide the duplicate copy to the one releasing the samples for documentation.

Preservation, Storage, and Transport of Samples

Chain-of-Custody demo form

SS/COC Control #

SAMPLE SUBMITTAL/CHAIN OF CUSTODY FORM

Client/Facility/Source: Industrial Water Supply,

Tel: 02-988 88 88

Fax: 02-988 88 87

Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
Research and Development Division
DENR Compound, Visayas Avenue, Diliman, Quezon City
Tel. Nos. (0632)-4264338/4339; Fax. No. (0632) 426-4335/4340

Project Name:

Sampled by:

Sampling Source:

Submitted by:

Date: mm/dd/yy

Time: ____ a.m. ____ p.m.

Special Instructions/Comments:

FOR LABORATORY USE ONLY

Mode of Delivery	Condition Received				Category of Sample	Payment
☐ Walk - In ☐ EMB ☐ PENRO/CENRO ☐ Courier ☐ Others ____	☐ Frozen ☐ Cold ☐ Ambient ☐ Preserved ☐ Others, ____	☐ Y ☐ Y ☐ Y	☐ N ☐ N ☐ N	Sealed Container Intact # of sples match COC	☐ Private ☐ Regional ☐ Project ☐ EMB ☐ Other	OP NO: Amount:

Received by: (Signature & Printed Name)

Date: mm/dd/yy

Time: ___AM ___PM

Total # of Samples Received: ____

Samples Relinquished To

Lab. Sample No.	Station No./Pt.	Sample identification	Sample Type	Date/ Time Sampled mm/dd/yy	am	pm	Analyses Requested	Field Preservation	Container #	Container Type	Quantity Received
		IWSI 01	EF	10/8/2007	8:30		BOD	Ice		G (B)	
		IWSI 02	EF	10/8/2007	9:00					G (B)	
		IWSI 03	EF	10/8/2007	9:30					G (B)	
		IWSI 04	EF	10/8/2007	10:00					G (B)	

Lab Unit Concerned:

Date: mm/dd/yr

Time: ____a.m. ____p.m.

Name/Initial of Lab Personnel:

Remarks:

Sample Type

A (A)-ambient air A (S)- Source emission
B- Brook Creek- Creek Falls - Falls F- fishpond L-lake RW-river water SW-sea water S-spring water
C - Crustacean Fish - Fish SG- sea grass Sed - Sedimer SF - Shellfish
DW- deep well TW- treated water
IN- influent EF - effluent MW - mining waste OF- outfall WW - wastewater
QC-QC/PT sample LF- landfill SE- sewage Rain-rainwater Sludge- sludge oil- oil others ____

Container Type

Al-aluminum foil G-glass P-plastic G(B) glass borosilicate Al(S)-aluminum foil, solvent, rinsed G(E)-Glass Sterile
G(S) glass solvent rinsed G (A)or (PA)- glass or plastic, acid washed O- others, specify ____

Sample Source

☐ Air
■ Surface water
☐ Ground/ drinking water
☐ Biota/sediments
☐ Industries
☐ Other

Sample Disposal

☐ Laboratory Procedure
☐ Other procedure, specify ____
Total Quantity Disposed:
☐ ____ milliliters ☐ ____ grams
Disposed by: Date:
(Signature and Printed Name)

Other Comments:

Field Quality Control

Equipment Calibration and Maintenance

✔ All equipment used in the field must be maintained and calibrated according to the manufacturer's recommendations.

✔ Each of the field instruments must be checked and examined before sampling to ensure that the equipment works properly

✔ Spare parts such as batteries, probes, standard solutions, glassware, etc. should be kept on hand.

Field Quality Control

Quality Control Checks

1) Field Blank (FB)

2) Field Duplicates (FD)

3) Quality control standards for field parameters

Field Quality Control

Prevention of Sample Contamination

- ✓ The quality of data generated in a laboratory depends primarily on the integrity of the samples that arrive at the laboratory.
- ✓ The field personnel must take the necessary precautions to protect samples from contamination and deterioration

Common mistakes in sampling

While collecting sample, we do some common mistakes, which should be taken care of:

- Not following the sampling instruction properly defined in the SOP.
- Field personnel often do mistakes in labeling the samples correctly
- The quantity of sample taken for test is not sufficient to conduct the test.
- Proper container isn't used to preserve the sample.
- Lids of sample containers or other sample collection devices are often loosened resulting in leakage and/or contamination of sample.
- Sample is often stored at inappropriate temperature resulting in the degradation in the quality of sample.

Why is Effluent Monitoring Important?

The effluent monitoring is the policeman at the end of the treatment process.

A change in the effluent conditions can indicate a process that is starting to fail, providing an early warning

An effluent monitor can pick up high levels of residual dosing chemicals that are not being used correctly, this indicates an overdosing condition

Effluent directly discharged without proper treatment, testing and monitoring can be dangerous to the aquatic environment as well as surrounding environment.