# FIELD QUALITY CONTROL REQUIREMENTS

Use the following SOPs in conjunction with FQ 1000. Note that field quality control blanks are required when using other, specific DEP sampling SOPs to collect samples for certain analytes, as further discussed in this SOP:

* FA 1000 Regulatory Scope & Administration Procedures for Use of DEP SOPs
* FC 1000 Cleaning/Decontamination Procedures
* FD 1000 Documentation Procedures
* FM 1000 Field Planning and Mobilization

Field quality control measures monitor the sampling event to ensure that the collected samples are representative of the sample source.

##### Field-collected blanks must demonstrate that the collected samples have not been contaminated by:

###### The sampling environment

###### The sampling equipment

###### The sample container

###### The sampling preservatives

###### Sample transport

###### Sample storage

## Sample Containers

Sample containers must be free from contamination by the analytes of interest or any interfering constituents and must be compatible with the sample type.

## Sampling Operations

Sampling operations are monitored through the collection of quality control samples.

##### When collected, analyze all quality control samples for the same parameters as the associated samples. Table FA 1000-2 contains the list of tests in each group.

##### When collected, collect blanks for the following parameter groups and tests:

###### Volatile Organic Compounds (*e.g.,* volatile organic aromatics)

###### Extractable Organics (*e.g.,* PCBs and pesticides)

###### Metals

###### Ultra-trace Metals (metals collected by “clean-hands” sampling techniques for sub-ppb analyses)

###### Inorganic Non-metallics (*e.g.,* nutrients)

###### Radionuclides (total Alpha and Beta emitters)

###### Petroleum Hydrocarbons (*e.g.*, FL-PRO) and Oil & Grease

###### Volatile Inorganics (sulfide, hydrogen sulfide, or sulfite)

###### Aggregate Organics except Biochemical Oxygen Demand (*e.g.*,TOX, COD, TOC)

###### Per- and polyfluorinated alkyl substances (PFAS)

##### Blanks are not required for:

###### Microbiological - viruses

###### Microbiological-bacteria (*e.g.,* total and fecal coliform)

###### Microbiological-protozoa (*e.g.,* Giardia)

###### Toxicity (*e.g.*, Whole Effluent Toxicity)

###### Field parameters such as pH, Specific Conductance, Residual Chlorine, Temperature, Light Penetration, Dissolved Oxygen, ORP and Salinity

###### Radon

* Biologicals (*e.g.,* Chlorophyll)

###### Biological Community (*e.g*., Stream Condition Index)

###### Physical and Aggregate Properties (*e.g.,* color, hardness, turbidity)

###### Biochemical Oxygen Demand

##### Preserve, transport, document and handle all quality control samples as if they were samples. Once collected, they must remain with the sample set until the laboratory has received them.

##### Except for trip blanks, prepare all quality control samples **on-site in the field**.

##### Do not prepare precleaned equipment blanks in advance at the base of operations.

##### Do not prepare field-cleaned equipment blanks after leaving the sampling site.

##### Perform and document any field QC measures specified by the analytical method (such as trip blanks for volatile organics in each cooler).

### Quality Control Blanks

Collect field quality control blanks to monitor the sample collection process, decontamination procedures, quality of sample preservatives and sample storage and transport conditions, to help ensure that samples are representative of the sampling source and have not been artificially contaminated by the sample collection process. Blanks are collected with analyte-free water. Note that there are analytes where the analyte-free water may need to be provided by a laboratory.

#### Precleaned Equipment Blanks

##### Precleaned equipment blanks monitor the on-site sampling environment, sampling equipment decontamination, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions for water, waste, soil, or sediment samples.

##### Collect these blanks using sampling equipment that has been brought to the site precleaned and ready for use. The cleaning procedures used for the blank collection must be identical to those used for the field sample collection.

##### Collect these blanks before the equipment set has been used.

##### Prepare equipment blanks by rinsing the sampling equipment set with the appropriate type of analyte-free water and collecting the rinse water in appropriate sample containers (see FQ 1100).

#### Field-Cleaned Equipment Blanks

##### Field-cleaned equipment blanks monitor on-site sampling environment, sampling equipment decontamination, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions.

##### Collect these blanks using sampling equipment that has been cleaned in the field (i.e., between sampling points). The cleaning procedures used for the blank collection must be identical to those used for the field sample collection.

##### Prepare field-cleaned equipment blanks immediately after the equipment is cleaned in the field and before leaving the sampling site.

##### Prepare equipment blanks by rinsing the sampling equipment set with the appropriate type of analyte-free water and collecting the rinse water in appropriate sample containers (see FQ 1100).

##### For intermediate sampling devices or equipment, site-water rinsing is defined as the decontamination step, if this is the only cleaning that will be performed on the equipment prior to collecting the sample. In this case, after rinsing the intermediate device 3 times with analyte free water, collect the equipment blank with a subsequent rinse of the device using additional analyte-free water to collect sufficient blank volume.

#### Trip Blanks

##### Trip blanks monitor the sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions.

##### The organization that is providing the VOC vials must provide the trip blanks by filling two or more VOC vials with analyte-free water and preservatives (if needed).

##### To prevent degradation of the trip blank, long-term storage of prepared trip blanks is not recommended.

##### These aqueous matrix blanks are applicable if samples are to be analyzed for volatile constituents (volatile organics, methyl mercury, etc.) in water, waste, soils, or sediments.

##### Place a set of trip blanks in each transport container used to ship/store empty VOC vials. They must remain with the VOC vials during the sampling episode and must be transported to the analyzing laboratory in the same shipping or transport container(s) as the VOC samples.

##### When samples from more than one site are transported in the same ice chest, the same trip blank may be used for all of the samples, provided all samples and the trip blank are analyzed at the same lab.

##### Trip blanks must be opened **only** by the laboratory after the blank and associated samples have been received for analysis. The trip blank is aqueous and must be analyzed by water sample analytical techniques, even when the collected sample matrix is non-aqueous.

#### Field Blanks

##### Field blanks monitor the on-site sampling environment, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions for water, waste, soil or sediment samples.

##### Prepare field blanks by pouring analyte-free water into sample containers for each parameter set to be collected.

##### Field blanks are not required if equipment blanks (FQ 1211 or FQ 1212) are collected.

### Field Duplicates

##### Field duplicates are designed to measure the variability in the sampling process. Field duplicates shall be collected directly after the first samples.

##### General Considerations: Remember the following when collecting field duplicates.

##### Collect duplicates by **repeating** (simultaneously or in rapid succession) the sample acquisition technique that was used to obtain the first sample.

##### Collect, preserve, transport and document duplicates in the same manner as the samples. **These samples are not considered laboratory duplicates**.

##### When collected, analyze field duplicates for the same parameters as the associated samples.

##### If possible, collect duplicate samples from sampling locations where contamination is present.

##### Field duplicates must be collected if required by the analytical method and as required by a DEP program.

#### Water Duplicates

Collect water duplicates by sampling from successively collected volumes (i.e., samples from the next volume of sample water).

#### Soil Duplicates

Collect soil duplicates from the same sample source (i.e., soil from the same soil sampling device).

### Mandatory Field Quality Controls

##### The respondent, permittee or contractor and the sampling organization are responsible for ensuring that blanks (excluding trip blanks) are collected at a minimum of 5% of each reported test result/matrix combination for the life of a project. Note: Analytical methods or programs may have more stringent requirements for collection of QC samples including field blanks, equipment blanks, trip blanks and/or duplicates.

##### Collect at least one blank for each reported test result/matrix combination each year for each project.

##### If a party wishes to claim that a positive result is due to external contamination sources during sample collection, transport or analysis, then at least one field collected blank (excludes trip blanks) must have been collected at the same time the samples were collected and analyzed with the same sample set.

##### A project will be defined by the organization responsible for collecting the samples for the project.

##### When applicable, define the scope of the project in conjunction with the appropriate DEP authority.

##### When collecting a set of blanks, use the following criteria:

##### Equipment Blanks:

##### Collect field-cleaned equipment blanks if any sample equipment decontamination is performed in the field.

##### If no decontamination is performed in the field, collect precleaned equipment blanks.

##### Equipment blanks are not required for volatile organic compounds.

##### Collect equipment blanks for autosampler tubing after installing, or, prior to installation in sampler, including bulk tubing lengths later installed in multiple samplers. If tubing is changed during every sampling event, collect equipment blanks for 5% of the tubing changes. If tubing is not changed at every event, collect a blank at each tubing change.

##### If a sample container is used as an intermediate sample collection device, collect an equipment blank with that sample container before collecting samples as if it were pre-cleaned equipment.

##### Field Blanks:

##### Collect field blanks if no intermediate device is used to collect the samples.

##### Field blanks are not required for volatile organic compounds.

##### Trip Blanks:

##### These blanks are applicable if samples are to be analyzed for volatile organic compounds. See FQ 1213 for frequency, preparation and handling requirements.

##### Optional Quality Control Measures

##### The method or project may require collection of additional quality control measures as outlined in FQ 1210 (Blanks), FQ 1220 (Duplicates) and FQ 1240 (Split Samples).

### Split Samples

The DEP or the client may require split samples as a means of determining compliance or as an added measure of quality control. Unlike duplicate samples that measure the variability of both the sample collection and laboratory procedures, split samples measure only the variability **between** laboratories. Therefore, the laboratory samples must be subsamples of the same parent sample and every attempt must be made to ensure sample homogeneity.

Collect, preserve, transport and document split samples using the same protocols as the related samples. In addition, attempt to use the same preservatives (if required).

If split samples are incorporated as an added quality control measure, the DEP recommends that all involved parties agree on the logistics of collecting the samples, the supplier(s) of the preservatives and containers, the analytical method(s), and the statistics that will be used to evaluate the data.

#### Soils, Sediments, Chemical Wastes and Sludges

Collecting split samples for these matrices is not recommended because a true split sample in these matrices is not possible.

#### Water

Collect split samples for water in one of two ways:

##### Mix the sample in a large, appropriately precleaned, intermediate vessel (a churn splitter is recommended). This method shall not be used if volatile or extractable organics, oil and grease or total petroleum hydrocarbons are of interest. While continuing to thoroughly mix the sample, pour aliquots of the sample into the appropriate sample containers. Alternatively:

##### Fill the sample containers from consecutive sample volumes **from the same sampling device**. If the sampling device does not hold enough sample to fill the sample containers, use the following procedure:

##### Fill the first container with half of the sample, and pour the remaining sample into the second container.

##### Obtain an additional sample, pour the first half into the **second** container, and pour the remaining portion into the first container.

##### Continue with steps described in sections 2.1 and 2.2 above until both containers are filled.

### Quality Control Documentation

##### Document all field quality control samples in the permanent field records.

##### At a minimum, record the following information:

###### The type, time, date and location that the quality control sample was collected; and

###### The preservative(s) (premeasured or added amount) and preservation checks performed.

##### If blanks are collected/prepared by the field organization, maintain records of the following:

###### Type of analyte-free water used;

###### Source of analyte-free water (include lot number if commercially purchased);

###### A list of the sampling equipment used to prepare the blank.

If items above are specified in an internal SOP, you may reference the SOP number and revision date in the field notes. Note any deviations to the procedure in the field notes.

##### For trip blanks, record the following:

* Date and time of preparation;
* Storage conditions prior to release to the sample collecting organization;
* Type of analyte-free water used;
* Source and lot number (if applicable) of analyte-free water;
* Specific transport container (e.g., ice chest, cooler) used to transport empty VOC vials and field samples;
* Include trip blank information in the sampling kit documentation per FD 2000, section 2.

##### For split samples, identify the method used to collect the samples and the source(s) of the sample containers and preservatives.