

FS 2000 Audit Checklist

To use this field audit checklist effectively, the auditor must be familiar with FS 2000 (General Aqueous Sampling) in “DEP Standard Operating Procedures for Field Activities”, (DEP-SOP-001/01)

Contamination prevention and equipment rinsing

Samples were collected starting at the downstream location and progressed to the upstream location, if applicable.

Intermediate collection devices were rinsed with ample amounts of site water prior to collecting the sample.

Rinse water from intermediate devices was discarded away from and downstream of the sampling location.

Sample containers containing premeasured preservatives were not rinsed with sample prior to collection.

Sample containers for oil & grease or TPH samples were not rinsed with sample prior to collection.

Sample preservation and preservation verification

All samples requiring pH adjustment were tested for proper pH preservation during first-time sampling for the project.

One sample per analyte group requiring pH adjustment was tested for proper pH preservation during repeat sampling for the project.

One sample per analyte group requiring pH adjustment was tested for proper pH preservation once per month for sampling projects repeated weekly.

One sample per analyte group requiring pH adjustment was tested for proper pH preservation once per week for sampling projects repeated daily.

pH paper was not inserted into sample containers.

VOC samples were dechlorinated, if applicable, with chemical preservative added to the VOC vial prior to addition of the sample.

Dechlorinated VOC samples were preserved with acid after dechlorination and prior to complete filling to convex meniscus.

All composite samples collected with automatic samplers were preserved within 15 minutes of collection of the last composite subsample.

Applicable samples collected with automatic samplers were chilled on wet ice or refrigerated at $\leq 6^{\circ}\text{C}$ or to the required preservation temperature.

Sample filtration

Applicable samples were filtered within 15 minutes of collection, before addition of chemical preservatives.

Unless otherwise specified by the sampling plan, applicable samples were filtered using a 0.45 μm pore size for the filter.

Collection of VOC samples

Bubbles present in the VOC sample comprised a combined volume of less than 5mm in diameter (pea-sized).

Unacidified VOC samples were collected where effervescence or large bubbles were observed after addition of acid.

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Collection of bacteriological samples

Unless specified otherwise in the sampling plan, all samples were collected as grab samples.

All samples were collected in properly sterilized containers.

Sterilized caps were used with all bottles and vials used to contain samples.

All sterilized containers remained sealed until just prior to filling with sample and remained sealed after filling with sample.

Sample containers were not prerinsed with sample.

At least 125 ml of volume was collected for each sample.

Caution was taken to avoid contacting the opening (mouth) of sample containers or cap interiors.

Where applicable, samples were collected with rigid containers using standard surface water grab-sample techniques.

Where applicable, samples were collected with Whirlpak bags from surface water by immersing the closed Whirlpak and opening the bag underwater.

Where applicable, samples were collected with Whirlpak bags from surface water by immersing the closed Whirlpak upstream of the hands and fingers and opening the bag into (facing) the current.

Where applicable, samples were collected with Whirlpak bags from surface water by opening the Whirlpak before attaching it to an extension pole, plunging the bag opening downward below the surface (and towards the current) in a continuous sweeping arc before returning to the surface.

Where applicable, samples were collected from taps, spigots and faucets without interruption of flow from the plumbing.

Where applicable, samples were collected with an intermediate device without interruption of flow as the sample was poured or drained from the device.

Bacteriological samples were collected as the last analyte group in the collection sequence in order to maximize available holding time.

Headspace was left in each sample container after sample collection.

Where applicable, samples were dechlorinated by addition of sodium thiosulfate to the sample container to achieve a final sodium thiosulfate concentration of 100 mg/L.

Collection of Oil & Grease or TPH samples

All oil & grease samples were collected as discrete grab samples.

Unless specified otherwise by the sampling plan, samplers avoided surface skimming when collecting oil & grease or TPH samples.

The sample containers or intermediate sampling device were not pre-rinsed with sample water.

Automatic samplers were not used for sample collection.

Collection of Cyanide Samples

Cyanide samples were tested for the presence of sulfides and pretreated, if necessary, before preservation with sodium hydroxide.

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Untested or untreated cyanide samples are designated with a holding time of 24 hours.

Contamination prevention, selection of sampling location and general cautions

Samples were collected starting at the downstream location and progressed to the upstream location, where applicable.

The bow of the motorized watercraft was pointed upstream, where applicable.

Samples were collected at or near the bow of the watercraft, away and upwind from the watercraft engine and any other fuel or oil sources.

When wading, samples were collected upstream and away from the body.

Care was exercised to not disturb bottom sediments during sample collection.

Water samples were collected prior to sediment sampling at the same location or sample source.

Representative sampling locations and depths were selected to account for homogeneous and heterogeneous conditions in the water body.

Unless directed by permit or other regulation, samples were collected away from artificial structures such as bridges, docks, weirs, dams, etc.

Manual sampling using sample containers as the collection device

Sample containers were submerged neck first, inverted into the oncoming direction of flow where applicable, slowly filled leaving headspace and returned to the surface for preservation, if appropriate.

Pole samplers were used in a fashion similar to that described above, as practical.

Use of intermediate vessels as the collection device

The use of intermediate collection devices was avoided when sampling for oil & grease or microbiologicals, where practical.

Intermediate collection devices were constructed of material appropriate for the analytes to be measured.

Intermediate collection devices were rinsed with ample amounts of site water prior to collecting the sample.

Rinse water from intermediate devices was discarded away from and downstream of the sampling location.

For depth sampling, the following procedures were performed:

- The water column was measured for maximum depth or was otherwise determined from reference information.
- The sampling point depth was accurately determined and recorded.
- Care was exercised to keep bottom sediments undisturbed during the depth-sampling procedure.

If double-valve bailers were used, care was taken to determine the appropriateness of use for the sampling application and discrete depth samples were not required.

Bailers were slowly lowered through the water column to allow maximum flushing of the bailer during descent.

FS 2100 Audit Checklist

To use this field audit checklist effectively, the auditor must be familiar with FS 2100 (Surface Water Sampling) in "DEP Standard Operating Procedures for Field Activities", (DEP-SOP-001/01)

Use of pumps as sample collection devices

Collection of volatile organic compound (VOC) samples with peristaltic pumps either employed the "straw technique" for collection from the well or was conducted through no more than one foot of silicone tubing installed in the pump roller head, according to the requirements and restrictions for tubing and flow rate specified in FS 2200. Oil & grease, FL-PRO and TRPH samples were not collected with pumps.

The pump and tubing assembly was flushed with site water to allow at least 3 volumes of the pump and tubing to pass through the system prior to collecting the sample.

For surface collection, the pump tubing intake was placed 6-12 inches below the water surface.

For depth sampling, the following procedures were performed:

- The water column depth was measured or determined from reference sources.
- The sample collection depth was determined and recorded.
- The pump or tubing intake placement at the required depth was accomplished by appropriate weighting or anchoring with non-contaminating materials to ensure unobstructed flow at the intake.