



PROCEDURE FOR GROUND WATER SAMPLING, PRESERVATION AND TRANSPORT

These are general guidelines for the collection of ground water (well water) samples. Project specific Sampling Plans take precedence over these guidelines as long as sample preservation requirements are maintained. Any deviations from the sample preservation requirements must be documented on the Chain-of-Custody submitted to the Laboratory.

Sample Collection: A general outline for the sampling procedure is provided here. Refer to the Project specific sampling procedures that have been approved by the Project Manager or Engineer for detailed guidance on sample collection.

- Wear disposable gloves while collecting samples or handling equipment that will contact the water sampled.
- Sample collection is typically performed using low-flow pumps, common bailer or dedicated bailers. Sampling equipment that is used on multiple wells must be de-contaminated before use and between each sample. Refer to sampling plan for appropriate decontamination procedure and Quality Control samples.

Purging a well is generally performed to remove stagnant water that may not be representative of the aquifer being sampled.

- The amount of water which should be removed is dependent upon certain factors: The ability of the well to recharge, the porosity of transmissibility of the strata, and the effect of well flushing on the chemical content of the well.
- Three well volumes of water, or until evacuated, are to be removed prior to sampling the well.
- The volume of water will be determined by measuring the height if the water in the well, given the total depth of the well using the following equations.

$$\text{Volume Purged (liters)} = V = (.0164 R^2h) \times 3$$

R = radius in inches

h = depth of water in inches

The purging of the well is accomplished using either a bailer peristaltic pump, or Middleburg pump depending upon the depth of the well. The peristaltic pump is ineffective for depths greater than 25 feet and cannot be used for the sampling of volatile organic constituents.



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Sampling Techniques: Samples can be obtained using either a bailer or pump. If the well has been purged using either of these two devices, then sampling will be accomplished with the same. If purging was completed with a peristaltic or air lift pump, then a bailer should be used to collect the samples.

The following precautions and techniques should be noted:

- The cleanliness of equipment entering the well is most important to prevent sample and/or well contamination
- Be very certain that any device lowered into the well is securely connected to prevent loss. Check all knots, fittings, etc.
- Use nylon or teflon coated stainless steel line. Avoid the use of woven lines, especially for more than one well.
- Peristaltic pump turned on before put in well.

Filling Sample Bottles should be done in accordance with the laboratories guideline on sample containers and preservation specific for the analyses performed.

- If sample containers do not already contain preservative, the bottle should be rinsed twice with the sample water before filling.
- Fill sample bottles so that the water level is not above the neck of the bottle or threads of the cap.
- For samples which require “No Headspace” including Alkalinity, VOCs, etc., fill the bottle until the surface of the water is above the lip of the bottle, carefully place the cap on top and screw on. Invert bottle and inspect for Air bubbles.
- If bottle contains preservative, and air bubbles are present, do NOT pour out. Simply remove cap, top off and replace cap

Sample Identification: Ensure the sample is clearly identifiable when delivered to the laboratory. Label the bottle with project name, location identification, name of sampler, date, and time of collection. At the minimum, ensure the sample bottle is uniquely traceable to the correct sample on the chain-of-custody.



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Chain-of-Custody and Sample Delivery: The Chain-of-Custody (CoC) is a legal document.

- It's accurate completion is necessary to validate the integrity of the samples.
- Write clearly so that the laboratory correctly enters the information on to the report; sample identification, collection dates and times, etc.
- Sample descriptions on the bottle should exactly match the sample description on the CoC.
- Document on the CoC any concerns that the laboratory should be aware of that may affect the data quality or ability to safely and accurately analyze the samples. For example: strong petroleum odor or lots of sediment, etc.
- Every person who takes custody of the samples, even for a short period of time, must sign the CoC.
- If shipping, the last person to have possession of the samples should indicate the means of delivery to the Laboratory.
- Once samples have been transferred to a cooler and the cooler is sealed, the courier service, etc. does not need to sign the CoC.
- Samples should be delivered to the laboratory as soon as possible. Sufficient ice, ice packs must be used to ensure the samples are less than 6 °C.