



NJDEP and GHR Consulting Services Groundwater Sampling Assistance Contract

The New Jersey Department of Environmental Protection (NJDEP) is responsible for many impacted sites within the state. These sites include EPA superfund sites, remediation sites, and contaminated sites with unknown sources. In November, 2002, GHR Consulting Services Inc. was awarded the NJDEP Sampling Assistance Contract, which entails assisting NJDEP with soil, sediment, surface water, monitoring well, and Geoprobe® sampling activities. A large portion of this contract includes groundwater sampling from existing monitoring wells for volatile organic compounds (VOCs), metals, and semi-VOCs. For many of these applications, the scope of work specifies that a low-flow sampling technique be utilized to purge the wells before sampling occurs.

Low-flow purging and sampling

The low-flow purging and sampling procedure is the EPA Region II (New Jersey) standard method for collecting low-flow groundwater samples from monitoring wells. Low-flow purging and sampling yield samples from monitoring wells that are representative of groundwater conditions in the geologic formation. Accurate samples are taken by minimizing stress on the geologic formation and minimizing disturbance of sediment that has collected in the well. The procedure is appropriate for collection of groundwater samples that will be analyzed for VOCs and semi-VOCs, pesticides, polychlorinated biphenyls (PCBs), metals, and other contaminants which GHR is targeting as part of its sampling programs with NJDEP.

YSI instruments meet criteria

Chris Glackin, Senior Project Manager, and Steve Mayhew, Project Engineer, attest that GHR relies exclusively on YSI products to complete the required low-flow sampling procedures. GHR uses the YSI 600XL multiparameter water quality monitoring sonde with the YSI 650 MDS (multiparameter display system), along with the appropriate flow-through cells to monitor groundwater temperature, dissolved oxygen, specific conductivity, and pH. The YSI instruments provide highly accurate measurements, as well as operational flexibility, while also limiting down-time in the field.

This project requires daily calibration of the instruments. Calibration must be fast and easy to facilitate daily operation by multiple users. YSI instruments meet this criteria. The units must also be mobile to allow for sampling numerous monitoring wells in a single day. Typically, more than eight wells can be purged and sampled in one day with two units. The assemblies must be durable to allow for long days that require many set-ups and breakdowns. The units are required to withstand inclement weather conditions including bitter cold, rain, snow, heat, and humidity. GHR has used YSI instruments to meet all of the requirements.

During operations, GHR has found YSI units to provide the accuracy, flexibility, and durability needed to complete this highly visible and fast-paced contract.

To learn more about the YSI 600XL, 650, flow cells, and ground water sampling, please contact YSI.



Figure 1. Typical groundwater monitoring configuration of the YSI 600XL, 650, and flow cell. Flow cell dismantling/disassembly simple for easy, accurate cleaning and disinfecting.

Low-flow sampling is conducted by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well casing. Sampling at the prescribed (low) flow rate has three primary benefits:

- It minimizes disturbance of sediment in the bottom of the well, thereby producing a sample with low turbidity. Typically, this saves time and analytical costs by eliminating the need for collecting and analyzing an additional filtered sample from the same well.
- This procedure minimizes aeration of the groundwater during sample collection, which improves the sample quality for VOCs.
- The procedure significantly reduces the volume of groundwater purged from a well and the costs associated with its proper treatment and disposal.