YSI Multiparameter Instruments

Landfill Monitoring and Enhanced Intrinsic Bioremediation

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YSI Groundwater Monitoring
Application Note A518-02

Environmental Management in Tucson, Arizona, has used a YSI multiparameter water quality monitoring system for in situ profiling and discrete sampling at a variety of groundwater sites, including landfill monitoring and enhanced intrinsic bioremediation.

The Tucson staff monitors five closed landfill sites, one active landfill site, and one underground storage tank (UST) site. The water depths range from 100 to 350 feet below the land surface. The sites are monitored using a YSI sonde, flow cell and handheld display. The sonde simultaneously monitors dissolved oxygen, conductivity, temperature, pH, and oxidation-reduction potential (ORP). The flow cell attaches directly to the bottom of the sonde and allows complete submersion of the probes into the sample without the sample ever being exposed to the atmosphere. The handheld simultaneously displays all of the parameters, powers the sonde and offers a full-function keypad for calibration, diagnostics, programming, and data logging.

Discrete sampling is conducted quarterly and semi-annually at the landfill sites in accordance with the Arizona DEQ's Quality Assurance Project Plan (QAPP).

"The YSI sonde is easy to use, saves a lot of time, and increases our confidence because we know that we're improving the quality of our groundwater data."

– Daniel Samorano

The UST site was contaminated with petroleum hydrocarbons and the city used enhanced intrinsic bioremediation to remediate the groundwater. Monthly in situ profiling is conducted to help assess and manage the progress of the remediation. Data obtained from the YSI sonde is used to determine if nutrients need to be added to the groundwater, which stimulates the growth of the microbes that biodegrade the contaminants. Daniel Samorano, an Environmental Scientist for the City of Tuscon Office of Environmental Management, reports, "We're actually degrading compound in situ rather than transferring it to another media, which makes a lot of environmental sense."

YSI sondes are used in many groundwater applications.

Prior to using YSI's multiparameter water quality monitoring system, the Tucson staff had to transport a collection of single parameter meters and glass beakers for field sampling. This was cumbersome and inefficient. Now, one meter and one flow cell perform all the field monitoring needs and save time. "The YSI water quality monitoring system increases our confidence in the quality of the readings," adds Samorano. "We were never really sure of the accuracy of the old beaker system. Until we started monitoring with the sonde and flow cell, we didn't realize that the water was changing while it was sitting in the beaker." The Tucson staff employs the Purge to Stabilization technique to access formation well water. YSI's system allows them to see when the parameters have stabilized. "It is an extra level of comfort to know we're sampling formation water versus stagnant water," said Samorano.

For additional information on the Environmental Management in Tucson, AZ:
tucsonaz.gov/es/groundwater-remediation-comprehensive

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