

Pneumatic Fracturing Technology

PELA is working on a site in north Alabama where heavy fraction organics have been delineated in the groundwater system above fractured bedrock. Project work has included the installation of borings and wells, collection and analysis of soil and groundwater samples, completion of hydropunch installations, development of a degradation model, definition of the hydrogeologic setting and site history, and design and development of technical reports and corrective action plan.

Pneumatic Fracturing Technology was applied to enhance permeability of the shallow zone in wells constructed especially for that purpose and later converted to piezometers. A remediation system was designed to pump water from the shallow zone, at locations of highest concentration of the Volatile Organic Compounds (VOCs), using pumps operated by compressed air, a shallow-tray air stripper, and a refrigerated automatic VOC sampler. The system was installed upon approval by ADEM. The water is pumped into a holding tank with level controls that switch the air stripper on and off. A digital flow meter on the discharge side of the air stripper triggers the refrigerated automatic VOC sampler. A pH analyzer/recorder was also installed on the effluent side. An air compressor was installed to provide compressed air to the pumps.



Geoprobe rig at the facility

Water levels in pumping wells and background piezometers are measured on a continuous basis using pressure transducers and data loggers. All the equipment was housed in a treatment center with proper ventilation, lighting, and heating to prevent any freezing. Lines (compressed air, transducer cables, and discharge lines) leading to and from pumping wells were constructed as an underground system to prevent freezing and to protect against heavy traffic. A digital rain gauge was installed to collect and record precipitation data on a continuous basis.

A remote control telemetry system was designed to collect data of the water levels in the wells, water levels in the holding tank, sampler, flowmeter, pH analyzer/recorder, and rain gauge. The telemetry system provided commands (on and off) to the air stripper, air compressor, and VOC sampler. The system provided emergency alerts of operational status.