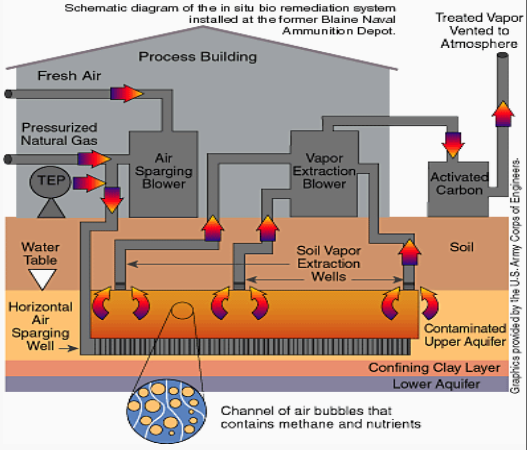
Remote Monitoring Systems Ensure Effective Cleanup of Leaking Underground Storage Tanks

PROBLEM

Remediation systems used to cleanup leaking underground storage sites are often operated in remote locations, functioning without operator assistance. Monitoring operations and scheduling maintenance becomes difficult as systems contain various operating components and complex functions that cannot be closely managed by an operator. In addition, regulatory rules may specify that qualified personnel must have immediate system access for review at any time. They may also require monthly reporting of site conditions.



Shown is a configuration of a typical remediation system used to clean up contaminated sites. A Soil Vapor Extraction process is used to reduce concentrations of volatile constituents in petroleum products adsorbed in soil.

During this process, a vacuum is applied through wells near the source of soil contamination, evaporating constituents of the contaminant mass. Vapors are drawn toward the extraction wells, then treated and released to the atmosphere. Integrated to sensors detecting various operating parameters, the Messenger provides real-time views via standard phone-line interface, cellular data or Ethernet.

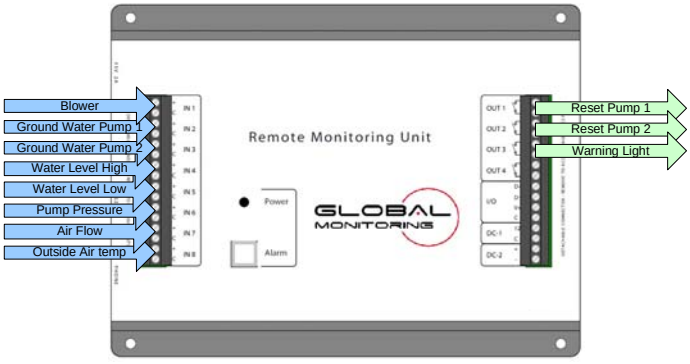
SOLUTION

Global Monitoring's Messenger Remote Monitoring Unit serves as an integrated telemetry, data logger and alarm system in providing status, trending and alerts on critical remediation system functions. Sensors attached to various points of the remediation system transmit parameters such as water levels, temperature, power and pump operation to the Messenger that, in turn, provides real-time data views via standard phone-line interface, cellular data or Ethernet.

The figure below shows how the Messenger Remote Monitoring and Control Module could be integrated into a remediation system to provide status of various parameters using industry standard 0-5V, 4-20mA or dry contact sensors. For example, when integrated with sensors detecting water levels, the Messenger monitors acceptable water levels and sends out alerts should parameters exceed or decrease beyond pre-programmed points. The Messenger can also monitor digital and analog signals from a programmable logic controller (PLC). These signals can include ground water pump status, blower state as well as the condition of the PLC pump control system itself. Outputs from the Messenger can be used to force the state of a pump or blower, or to reset the PLC in the event of a system failure.

IMPORTANT BENEFITS

As remediation systems run continuously for up to five years, operations must be monitored regularly to determine cleanup rate. Maintenance contractors can use the dial in/out capabilities of the Messenger for periodic system checks. Inputs and outputs can be queried via telephone using touch-tone phone commands. The Messenger can also be programmed to provide notifications when system components malfunction. Alarm notifications of equipment shutdown or anomalies reduce downtime and, in some cases, enable operators to diagnose equipment problems remotely. Using the remote control capabilities of the Messenger, users can start, stop or reset equipment, reducing the need to dispatch a technician. Various personnel can be assigned with limited password-protected access to verify operations simply by making a phone call.



A data logging feature of the Messenger also records system operations over time such as power outages or when personnel enter/leave an equipment area. Stored information can be retrieved remotely via modem or onsite utilizing a RS-232 port. Using the Messenger's data recorder to create a perpetual time-stamped record of all monitored conditions, data can be used as proof of compliance or to optimize the cleanup process. Data analysis can be used to create a proactive maintenance program based on recorded trends in flow rate, temperature or other parameters.