



One-pass trenching method used for Alberta sour gas plant groundwater remediation project

Not many environmental engineers have heard of one-pass trenching and even fewer have actually applied this cutting-edge technology to environmental control and clean-up. However, a growing number of companies are starting to use this technology, resulting

in decreased cost of installation and increased system efficiency.

One such company is WorleyParsons-Komex. With a worldwide employee base of over 23,000, its services run the gamut of energy and resource-related services and it maintains a significant profile in the area of

environmental control and remediation.

Recently, a large Canadian energy concern with a gas plant in Alberta discovered it had a plume of contamination moving outward from its primary processing facility. The plume contained sour gas sweetening chemicals and minor light end hydrocarbons dissolved in shal-

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low groundwater. Moving in suspension within a narrow corridor, the contaminated plume was traveling up gradient of other infrastructures. WorleyParsons was contracted to install an interception and collection system that would effectively capture the contaminants and allow for remediation of the contaminated water.

The stratigraphy of the Alberta facility comprised 4 to 5 metres of silty clay till overlaying weathered sedimentary bedrock. The majority of the plume transport was occurring near the bedrock overburden contact and in shallow fractured bedrock. A vertical well point system was considered but quickly dismissed due to the probability that significant portions of the plume would very likely escape through the gaps between the well points. If the goal was maximum certainty of capture, the solution must assure that the entire plume be interdicted. What was needed was a solution that would assure that. What was decided upon was a continuous wall concept. Only with this approach was it likely that the entire plume would meet face up with a continuous unbroken system of capture and recovery.

Due to site parameters the conventional approach to installing a continuous wall was viewed by WorleyParsons as simply unfeasible. Conventional excavation equipment such as a hydraulic excavator, front-end loaders, and bulldozers could not be employed within areas of the project where space became quite narrow. In addition, the large opening, standard with traditional trench excavation, would also come with the attendant problem of increased removal and remediation of a significant amount of spoils; both of these would add to the work requirements as well as the cost of this project.

What was feasible was the precision trench installation system known as DeWind One-Pass Trenching. One-pass trenching technology and processes were developed by Gregory DeWind starting in the early 1990s and have been continually improved. In this case, the technology allowed for a surgical 18' to 24" wide cut into the ground up to 35' below grade with laser-guided precision. There was no open excavation! And as the name suggests, in a single pass the trencher can install a

vertical well along with a horizontal slotted HDPE STR 11 Pipe set at 35' below grade and simultaneously back-fill the trench to grade with a permeable material like pea-stone.

Because one-pass trenching installs the collection pipe below the contamination, it eliminates the need for sheeting, pumping and treating of contaminated water and the removal of large amounts of often contaminated soil.


The project in Alberta was initiated in late October 2007, just prior to winter conditions setting in. Two trenches running 575 linear feet respectively were installed at a depth of 27 feet below grade with a width of 1.5 feet. Four-inch HDPE SDR 11 slotted pipe was placed along the bottom of each trench. At the beginning of each trench a 18" vertical well connected to a 4" horizontal pipe. Each trench was back-filled up to grade with washed pea-stone. The entire installation took three weeks.

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