

# ENHANCED PUMP AND TREAT SYSTEM

FORMER PETROLEUM REFINERY PLANT

Case History, No. 23

October, 1999

## Problem

The former Texaco refinery in Casper, Wyoming ceased its operations in 1982. Starting in mid-1996, Texaco worked with the Wyoming Department of Environmental Quality and EPA to install a state-of-the-art subsurface barrier wall to accelerate the implementation of the corrective action goals at the site. The barrier wall was designed as an essential component of a remediation system to contain and remove the residual groundwater hydrocarbon contaminants that were migrating into the North Platte River, Figure 1. The river forms the northern, down gradient border of the refinery site and is a source of municipal, agricultural, and industrial water supplies. The design required a wall that has low permeability (10<sup>-7</sup> cm/sec), structural load bearing capacity, and high quality assurance for the installation process.



Figure 1: Cutoff Wall and Pump and Treat System



Figure 2: Typical Grout Process

## Solution

The Waterloo Barrier<sup>®</sup> was selected after a feasibility study involving a technical evaluation of various barrier technologies was conducted. The overall length of the cutoff wall was approximately 3,400 lineal feet, which included 2,800 lineal feet installed along the bank of the river. The cutoff wall fully penetrated the alluvial aquifer and keyed into bedrock that was at depths of 10 to 40 feet. A tremmie

pipe and packer assembly was then used to force the grout through the foot plates along the base of the piling to seal the wall where it keys into the bedrock, Figure 2.

The barrier also acted as a structural shoring system that consisted of walers, tie rods and rock anchors, Figure 3. Upon completing the pile driving and joint flushing of the barrier, a submersible fibre optic camera was used to inspect the integrity of the joints prior to the sealing process, Figure 4.

Operations and monitoring data gathered during 2000 indicated that the barrier met all its performance criteria. Also, the monitoring program has indicated the absence of any measurable adverse influence on surface water quality over the last three years.



**Figure 3: Installation of Tie Rods**



**Figure 4: Typical Video Inspection**

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### SITE SUMMARY

**Barrier:** 85,000 square feet of Waterloo Barrier<sup>®</sup> WEZ95  
**Depth:** Between 10 & 40 feet of Piling

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