



Application Note #D2

Coal Tar Recovery

"Coal tar sites are among those that require the greatest attention of all environmentally contaminated locations," says Allen Hatheway, Professor at the University of Missouri, Center for Coal Tar Site Remediation

Xitech has developed a new remediation system for recovery of coal tar DNAPL. Dr. Hatheway also said "Virtually all brownfield (formerly industrialized) sites are blanket suspects of harboring coal tar residues." There could be up to 50,000 sites in the US. The key to our success in recovery such a high viscosity fluid is the ADJ1100 Smart Pump. This pump was designed to create a large vacuum at the inlet of the pump which greatly assists in getting the sticky fluid into an internal pumping chamber. Air pressure is used to push this Coal tar up to the surface and into a holding tank. A special timing controller is also used to operate the ADJ1100 intermittently to minimize the recovery of water.

Current Coal Tar Projects

EA Engineering is successfully recovering coal tar on a daily basis at two Baltimore Gas & Electric sites.

Arcadis Geraghty & Miller is successfully recovering coal tar as a pilot study at a Wheeling Pittsburgh Steel site.

Northeast Utilities personnel are successfully recovering coal tar on a daily basis at one of their Northeast Utilities sites.

Xitech's Well Design for Recovering Coal Tar

I. Change Well Annulus Material

Changing the well annulus material to medium size pea gravel would provide better conductivity between the formation and the well casing, thus increasing the DNAPL migration rate into the well. This can be accomplished because the removal rate of DNAPL out of a well is much lower than water removal, therefore, the migration of suspended solids into the well are greatly reduced or eliminated. Also, the sands currently being used as well annulus fill material have lower conductivity than other materials for DNAPL. This design resembles a French drain approach except we are using a vertical conduit instead of a horizontal trench.

II. Reduce The Well Boring Diameter

Reducing the well boring diameter will make it easier to clear away the mudded up (smeared) well boring and lower drilling costs.

III. Use Continuous Wire Wrap Stainless Steel Well Casing for the DNAPL Collection Zone

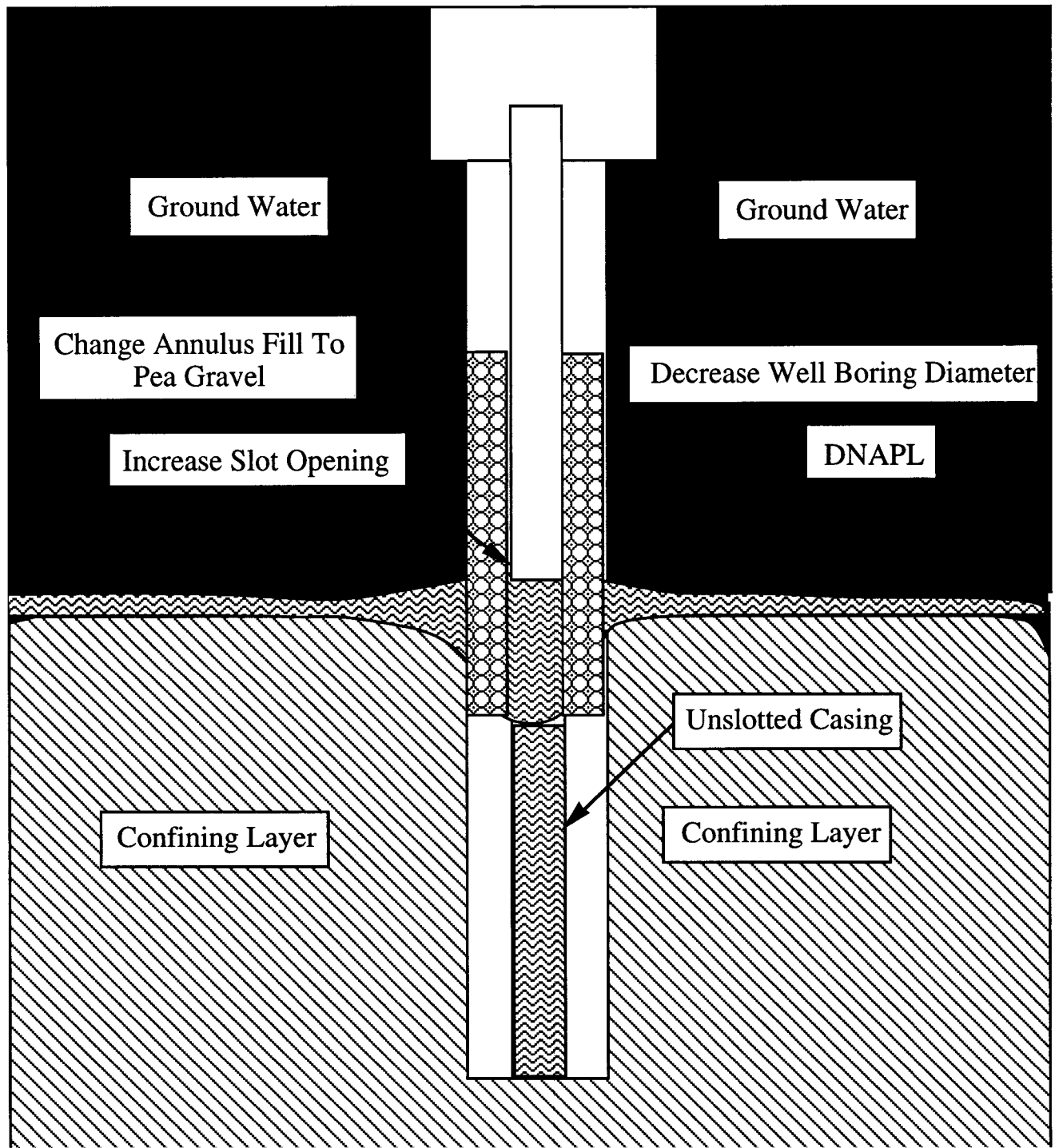
The typical slotted well casing material used for most Free Product recovery is Schedule 40 PVC pipe with 10 or 20 slot size. The wall thickness of the casing (1/4" wide) and the small slot height create a high surface tension barrier for the DNAPL to migrate through. A better choice would be continuous wire wrap stainless steel with 50 thousandths slot width to lower the surface tension barrier.

IV. Create Sumps at the Bottom of Your Wells

Try to extend the bottom of the well below the confining layer or bedrock by 3 feet to create a place in which the DNAPL can collect.

See page 3 for more details.

Xitech Coal Tar Well Design



Xitech's Enhanced Recovery of Coal Tar Using Localized Heat

Xitech has developed an optional compact heat source which lowers the viscosity of the Coal Tar entering the extraction well. Maintaining a lower viscosity increases the rate of recovery and allows for recovery in the winter time. Xitech has attached a small 30 watt finger heater to its Coal Tar pump (ADJ1110) so the heater is always in water. The 30 watt heater maintains a 60-70 degree water temperature in the well casing and boring. The warmer water lowers the viscosity of the Coal Tar entering the boring.

See page 5 for more detail.

Heated DNAPL Pumping System Using AC Power

