

THE POTENTIAL USE OF DEEP AQUIFER REMEDIATION TOOLS (DARTS) TO PASSIVELY REMOVE ARSENIC FROM GROUND WATER.

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ABSTRACT

The U.S. Geological Survey (USGS) has developed an in situ, non-intrusive "tool" to take advantage of the natural horizontal ground-water gradient to channel ground water into highly permeable reactive material(s). These Deep Aquifer Remediation Tools (DARTs) are used in conjunction with nonpumping wells and offer a low cost and low maintenance alternative to traditional pump and treat methods and trenching installations of permeable reactive barriers (PRBs).

The DARTs are deployed into an aquifer and corresponding contaminant plume through a series of non-pumping wells. Each well intercepts ground water in an area of the upgradient aquifer approximately twice the inside diameter of the well.

The USGS has tested three DART materials for the removal of uranium at an abandoned ore upgrader facility at Fry Canyon, Utah, and at the Christensen in situ uranium mine, Wyoming. These materials include amorphous ferric oxyhydroxide (AFO), zero-valent iron (ZVI), and phosphate. Laboratory tests by McRae and others [1999] have indicated that basic oxygen furnace oxide, ZVI, as well as activated alumina, can be used to effectively remove arsenic (III) and arsenic (V) from ground water. DARTs offer a potentially cost-effective and versatile method to remediate contaminated aquifers by using these reactive materials.

REFERENCES

McRae, C.W.T., Blowes, D.W., Ptacek, C.J., In situ removal of arsenic from groundwater using permeable reactive barriers; a laboratory study, in: Goldsack, D., Belzile-Nelson, Yearwood, P., Hall, G.J., eds., Sudbury '99; mining and the environment II; Volume 2, Conference proceedings, p. 601-609.