

Barrier Containment Technologies For Environmental Remediation Applications

ISCORD 2013: Planning for Sustainable Cold Regions © ASCE 2013

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The Performance of Artificial Frozen Barriers

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ABSTRACT: Migration of aqueous phase contaminants from underground tanks, nuclear waste sites, and in situ waste treatment areas into the groundwater is of concern at many locations. There is a wide range of technologies to remediate contaminated sites. Some examples are: constructed wetlands, air sparging, bioremediation, and permeable reactive barriers. One technology that has not been widely used is frozen soil barriers. The barrier provides containment of liquid contaminants in order to prevent their migration to adjacent areas. This is a promising method that is environmentally friendly and offers a safe alternative to other methods. Frozen barriers can be formed using a series of subsurface freezing pipes or probes. The installation of frozen barriers disturbs the existing ground minimally and only existing in-situ material is used. An artificial frozen barrier using hybrid thermosyphons was installed in Fairbanks, Alaska using six thermosyphons placed at a distance of 1.5 m. The system ran actively for about 60 days and operated in a passive phase during the winter months. A detailed description of the thermal performance of the barrier in Fairbanks from March through September will be presented.

KEY WORDS: Thermosyphons, frozen barriers, containment, contaminants.

1 INTRODUCTION

Groundwater contaminants originate from sources such as above ground and below ground storage tanks, septic systems, hazardous waste sites, and landfills. Physical containment systems such as vertical engineered barriers can prevent or reduce the groundwater contaminants outside the contained area. Vertical barrier walls are used to divert and contain groundwater flow to limit the flow of contaminants off site and also restrict uncontaminated groundwater onto the site. They can also be used in the long term at sites undergoing cleanup to reduce residual contaminant migrations (Rumer and Ryan 1995).

1.1 Containment Techniques

Slurry walls, reactive barriers, sheet piling, and grouted barriers are some technologies that are currently being used for vertical barriers. Another containment technique is to use a frozen wall created by artificially freezing the in situ soil or rock. This technique is the

Description. Provides a comprehensive review and evaluation of waste containment technologies presently practiced in remediation applications. Covers the in book form by John Wiley & Sons, Inc. [Barrier Containment Technologies for Environmental Remediation Applications, edited by Rumer and Ryan, .]. Evaluates the cutting edge in containment technologies presently practiced in remediation applications. Designed to assess the advantages, limitations and. Assessment of Barrier Containment Technologies: A Comprehensive Treatment for Environmental Remediation Applications. Front Cover. Ralph R. Rumer. National Technical Information Service. Rumer, R. R., and M. E. Ryan, eds. Barriers Containment Technology for Environmental Remediation Applications. Barrier containment technologies for environmental remediation applications. Responsibility: edited by Ralph R. Rumer and Michael E. Ryan. Imprint: New York. Barrier Containment Technologies for the Environmental Remediation Applications by Michael E. Ryan, , available at Book Depository with free. Barrier Containment Technologies For Environmental Remediation Applications - In this site is not the same as a solution calendar you buy in a wedding album. barrier. United States. Solid Waste and. EPA R Environmental Protection. Emergency Field Applications of In Situ Remediation Technologies: policies and laws stress permanent remedies over simple containment methods. Barrier Containment Technologies for Environmental Remediation Applications by Ralph R Rumer (Editor), Michael E Ryan (Editor) starting at \$ Barrier. As interest shifted back toward containment in the s, the industry found itself Containment Technologies for Environmental Remediation Applications, and. Barriers Containment Technology for Environmental Remediation Applications. New York: J. Wiley & Sons, Inc. U.S. Department of Energy. The Barrier Containment Technologies for Environmental Remediation Applications. NTIS. Chapter 11, Smith, M.H.; J.A. Stinson; D. O'Sullivan; R.S. Wolf. ?8?31? Evaluates the cutting edge in containment technologies presently practiced in remediation applications. Designed to assess the advantages. Subsurface containment barrier technology refers to physical barriers Identify and quantify containment functional requirements for DOE site applications. Physical containment systems are constructed to isolate contaminated soil, . eds., Assessment of Barrier Containment Technologies: A Comprehensive Treatment for Environmental Remediation Applications, NTIS: PB , pp The most effective vertical configuration of slurry walls for site remediation or pollution () suggest that in order to promote the application of soil- bentonite walls .. In Assessment of Barrier Containment Technologies - A Comprehensive. Assessment of Barrier Containment Technologies: A Comprehensive Treatment for Environmental Remediation Applications. Prepared under the auspices of. In Assessment of Barrier Containment Technologies - A Comprehensive Treatment for Environmental Applications, U.S. Department of Energy, U.S. Environmental Protection Agency, "Geoenvironmental engineering for in situ remediation.

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