

L.C.R.S.

Linear Contaminant Remediation System Subsurface Groundwater Recovery



HSSI prepares a LINEAR CONTAMINANT REMEDIATION SYSTEM (LCRS) for installation. Shown is the vertical riser, the sand backfill chute, the Horizontal Well and the delivery mechanism. This installation was located at an EPA Superfund site.

For more Information Contact:
Horizontal Subsurface Systems
9 Del Prado Blvd N
Cape Coral, FL 33909
Phone 877-704-2281
Fax 239-574-2416
info@horizontal.com

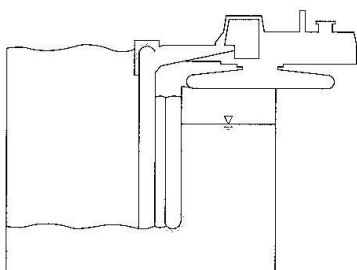
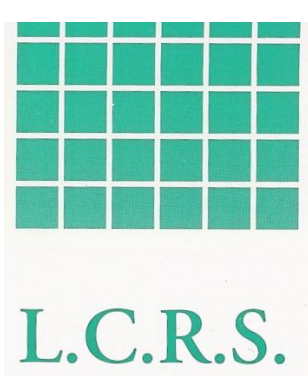
Horizontal Subsurface Systems' LINEAR CONTAMINANT REMEDIATION SYSTEM (LCRS) has been developed to enable timely, thorough, and cost-effective remediation of sites impacted by contaminated soil and groundwater.

The LCRS is comprised of single or multiple lines of multi-tiered, trenched Horizontal Wells that offer a superior alternative to vertically or directionally drilled wells. Each system is designed to meet site-specific needs. The tiered wells in the LCRS can be used to inject or extract fluids, including air and water with or without the addition of chemical and/or biological compounds. This ability to alter the operational configuration of the entire LCRS results in complete in situ dialysis of both the saturated and unsaturated zones.

Installation of the LCRS is rapid, efficient, and accomplished using a specialized machine that cuts a nominal 14 to 16-inch wide (36 to 41 cm) trench, sets a vertical riser connected to the Horizontal Well and backfills the trench with either cuttings or a high-hydraulic conductivity backfill or media, typically sand or gravel. The equipment can also be configured to install multiple lines at different depths. All of this is done in a single pass without the need for an open trench or dewatering. This procedure greatly reduces the generation of contaminated soil, groundwater handling requirements and personnel exposure to contamination.



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Overhead view of LCRS being installed with filter media. The one pass process excavates, lays the recovery pipe and backfills.

Case histories of soil and groundwater remediation projects have demonstrated that use of the LCRS results in significant benefits which include:

- greater and more focused contact area with subsurface materials
- interception of preferential flow paths in heterogeneous soils
- exceptional performance in low-permeability soils
- reduced remediation time due to more efficient injection/extraction of fluids within the contaminated medium
- reduced operation, maintenance, and monitoring costs
- depths up to 30 feet without benching

The LCRS installation is permanent and the components are extremely durable, even in hostile environments. LCRS can be reactivated anytime in the future for monitoring at the site, or to provide the means of quickly remediating any new spill. The result is the rapid return of the contaminated property to a useful and marketable condition.

The LCRS can be used for multiple purposes such as:

- groundwater extraction
- exfiltration of treated effluent
- leachate containment/collection
- free product recovery
- bioremediation, including bioventing
- soil flushing
- physical, chemical, and biological reactors
- soil vapor extraction
- air sparging
- water recycling



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