



Horizontal Landfill Drain

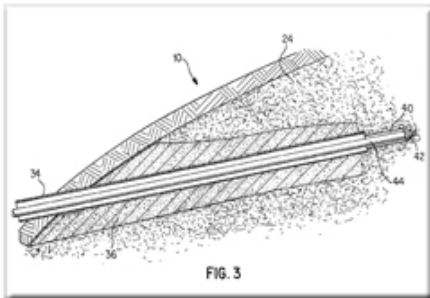
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Failed Collection System

Prompted by ongoing odor complaints by local residents, in 2005, the Rivanna Solid Waste Authority (RSWA) began to investigate the condition and operation of one of its closed waste disposal cells located at the Ivy Material Utilization Center near Charlottesville, Virginia. With the help of Environmental Standards, Inc. (Environmental Standards), the RSWA (our client) determined that liquid accumulations within the waste cell were impacting the collection efficiency of the site's active landfill gas (LFG) collection and control system. In order to mitigate this condition, Environmental Standards conducted a variety of characterization efforts, which culminated in the development of a computer model of the liquid within the cell.

Proposed Solutions

Using this conceptual model, Environmental Standards evaluated potential dewatering strategies that could result in the dewatering



of the accumulated liquids in a reasonable period of time (2 to 8 years). Both vertical well and "horizontal" well dewatering systems were evaluated through iterative computer modeling efforts. These modeling efforts

identified that a vertical well system of 101 vertical pumping wells pumped approximately every 2 to 3 weeks would be necessary to achieve the desired dewatering rates. Alternatively, a series of three horizontal wells that would allow accumulated liquids to gravity drain from the cells could be constructed. Once optimal systems were designed, Environmental Standards evaluated construction, operations, and maintenance costs of the two systems.

Cost Comparison

The initial capital cost for constructing either system was nearly identical (horizontal well construction was marginally less). The greatest difference identified was the annual cost of operating and maintaining the two systems. The vertical well system would require hundreds of thousands of dollars to maintain the many wells and would provide for, more or less, continuous pumping. The horizontal drain system, on the other hand, was expected to cost less than \$20,000 a year to operate and maintain because these wells would gravity drain. The cost benefit of implementing a horizontal draining system will further improve as energy prices rise.

Implementation

During the summer of 2008, Environmental Standards contracted with Directed Technologies Drilling, Inc. (DTD) to construct the horizontal drains. At present, the experimental drains have been successfully installed, tested to ensure function, and are operating as designed. An additional benefit of the installation of the drains is expected when the drains are connected to the existing

LFG collection system so that the dual-purpose of leachate removal and LFG collection is met - possibly providing green benefits for the community, as well.



Patent Pending

Environmental Standards believes that this is the first post-closure installation of a gravity leachate collection system into a closed landfill utilizing horizontal drilling techniques in the United States and globally, one of the first. So unique is the technology, the firm has applied for patent protection for the innovative process and solution.



Setting the Standards for Innovative Environmental Solutions

Environmental Standards, Inc., a privately held consulting firm, has established a reputation for excellence in providing technical environmental consulting services since 1987. We allow businesses to focus on their core operations by evaluating environmental program needs, and developing economical solutions to manage both short and long-term environmental liabilities.

To help our clients achieve their environmental program goals, we offer global services in the following markets:

- Environmental Chemistry
- Consulting Geosciences and Site Remediation
- Information Technologies and Data Management

Taking a client-based approach to consulting, we deliver services that are compatible with a client's unique business needs. From providing project updates on a convenient schedule to providing project deliverables in customized formats, we make it easy to do business with us. You save time and money while receiving top-quality professional services from experts who know how to guide you through complex environmental regulatory processes.

Our three distinct departments – Chemistry Quality Assurance, Consulting Geosciences, and Information Technologies – offer their specialty consulting services singly or support each other to deliver a more comprehensive package to the client. Our scientists and technical specialists rely on advanced technology and resources to provide accurate, on-time deliverables to clients. When you select us to solve an environmental business challenge, the benefits of our investments in state-of-the-art technologies and maintaining a highly qualified staff are obvious.

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