

Toolkit for Greener Practices
Showcase of Ideas
Option 1-3: Constructed Wetland

Anoka Closed Landfill Groundwater Treatment

Site conditions:

Environmental cleanup at a closed municipal sanitary landfill includes a 2,400-foot-long groundwater plume contaminated with volatile organic compounds (VOCs) at depths of up to 100 feet below the surface. In 1991, two air-stripping towers were installed for two pump-out systems, including eight recovery and 12 barrier wells. This system discharges up to 300 million gallons of treated water into the Mississippi River annually, lowering the groundwater table and destroying wetlands on site. Additionally, the air-stripping towers were underperforming, calling for additional remedial action.

Preventive activity description:

A constructed cascade and wetland system was the preferred alternative. This consists of an all-season (covered) cascade, a settling pond for iron precipitation and a multi-cell wetland for the further removal of VOCs. With one of the pump-out systems diverted into this new system, the cleanup goals are being met at the settling pond. (Minnesota Water Quality Rules [NPDES] require that concentrations in treated water meet the promulgated Health Risk Limit prior to infiltration.) To prevent infiltration before this standard is met, the first two, of the three, wetland cells are lined. The remedy depends on filtration and biological activity. Discharge standards must be met in the third and final wetland/treatment cell. Monitoring points are located within each cell, slightly below the surface, and between each cell. The second pump-out system will be diverted soon and the air stripping system will be maintained as part of the contingency plan.

Benefits realized through the Pollution Prevention/Sustainability approach:

- Protection of natural resources by conserving water
- Potential lifetime energy and water savings are enormous.
- Enhanced habitat

Keys to Success

- Innovative Closed Landfill Program put the landfill under state control and in the hands of innovators among the regulatory staff.
- Acreage
- Comprehensive hydrogeologic characterization (hundreds of geoprobes and thorough pump tests)
- Departure from conventional cleanup remedies that tend to be more energy and water resource intensive

- Special attention to waterfowl management at the settling pond and trespassers from adjacent recreation fields.

Regulatory Administrative/Legal Tools:

- Closed Landfill Program statute
- Water Quality rules/NPDES discharge criteria on a non-permit basis

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