

# Innovative Technology Helps PA Landfill Manage Leachate and Landfill Gas for Beneficial Reuse

*Heartland Water Technology provides operational flexibility to work with variable gas flow, energy flow and evaporation rates from thermal energy obtained from landfill gas to treat leachate*



*Figure 1 Heartland Water Technology Concentrator in operation at Brunner Landfill.*

## Customer

Joseph J. Brunner, Inc. Landfill  
New Sewickley Township, PA

## Case Study Value

- Improved operations and sustained operational uptime
- Lower operating expenses
- Process flexibility to address variable leachate flow rates

## Case Study Overview

The Joseph J. Brunner landfill receives approximately 70,000 tons of municipal solid waste per year and generates approximately 6.5 million gallons of landfill leachate per year.

For more than a decade, the landfill has managed its leachate treatment process using thermal evaporation. Brunner Landfill upgraded its treatment strategy to better address their current and future needs using the Heartland Concentrator.

The strategy utilizes the combustion of landfill gas to fuel the Heartland Concentrator, resulting in greater than 95% volume reduction of the leachate and high operational uptime, while maintaining operational flexibility to accommodate variable landfill gas and leachate flow rates.

## **Background**

Joseph J. Brunner, Inc. operates a landfill in New Sewickley Township, PA, and provides disposal services for approximately 70,000 tons per year of municipal solid waste to commercial and residential customers. The landfill generates, on average, approximately 20,000 gallons per day (GPD) of leachate.

A submerged combustion evaporator was installed in 2005 to manage leachate treatment. This unit presented numerous reliability challenges over its operational lifetime. By January 2015, the unit had exceeded its useful life due to stress corrosion cracking, and much of the landfill gas destruction equipment required replacement due to intermittent use.

After researching alternative technologies and touring two sites operating Heartland Concentrators, Brunner Landfill opted to replace its existing unit with a Heartland LM-HT® Concentrator.

## **Challenge**

The Brunner landfill faced several important challenges:

1. It was very important to the landfill owner to operate a single landfill gas combustion device which would function independent of the Heartland Concentrator™ for continuous landfill gas management

during planned or unplanned Concentrator downtime.

2. Due to the observed failure of the previous leachate treatment system, corrosion of wet parts was a major site concern.
3. While the landfill typically generates 350 standard cubic feet per minute (scfm) of landfill gas, the Heartland Concentrator needed operational flexibility to work with variable gas flow from seasonal changes as well as future increases.
4. The landfill gas combustion and leachate treatment systems must function in automated synergy to ensure safe and efficient operations 100% of the time.
5. With only a single operator during normal weekly operations, the treatment system must be fully automated with remote monitoring and alarm notifications.
6. Since this is an operating site, interruption had to be minimized during removal of existing equipment and installation of new equipment.

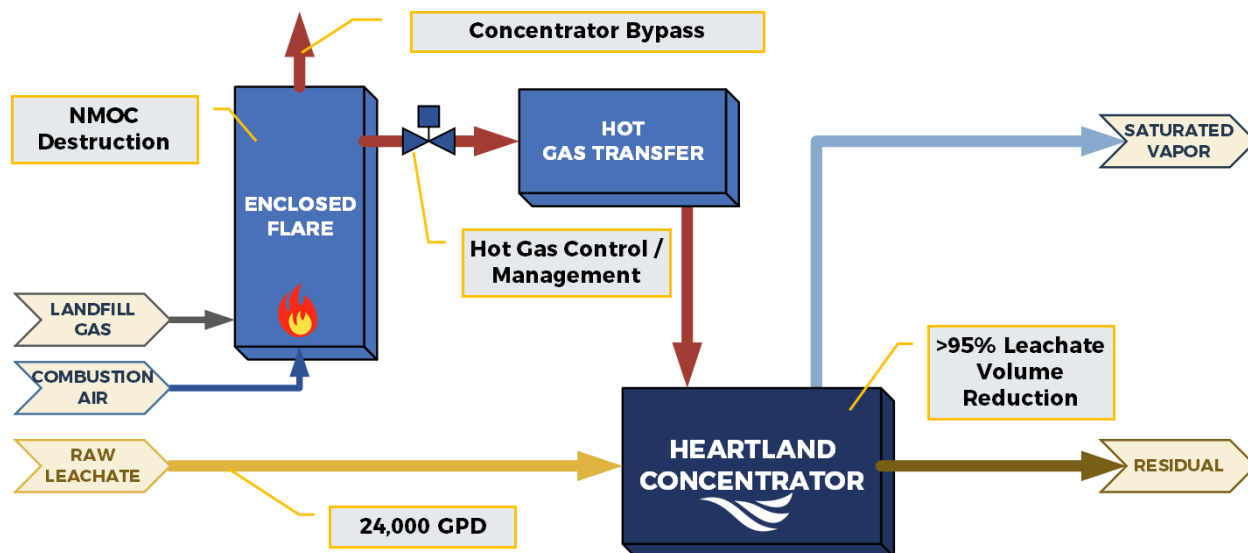


Figure 2- Simplified process flow schematic of the Heartland Concentrator at Brunner Landfill.

## Results

Heartland Water Technology installed a LM-HT® Concentrator with 24,000 GPD capacity to meet Brunner Landfill’s leachate management needs. The Heartland Concentrator was designed with a landfill gas flare system to provide the flexibility required for this specific application.

With products constructed from robust and corrosion resistant materials, Heartland Water Technology eliminated corrosion concerns.

By incorporating a simple, hot-gas, isolation valve equipped with automated control, the flare safely operates independently from the Heartland Concentrator to guarantee continuous landfill gas processing and destruction of non-methane organic content (NMOC) to comply with regulatory standards.

The inherent processing flexibility of the Heartland Concentrator’s design absorbs the site’s fluctuations in landfill gas flow without impacting reliability or performance.



Figure 3- A hot gas isolation valve provides a simple and effective automated protection of downstream equipment, allowing the landfill gas flare to run continuously and independently from the leachate management process.

The Heartland Concentrator operates continuously for an average of two weeks between required outages for cleaning. One person operates the Concentrator while also responsible for numerous other landfill duties.

Downtime for installation was short. Removal of the existing equipment and installation of new equipment was completed in 3 weeks, with full system operation in 4 weeks.

Heartland Water Technology's automation and controls package provided an intuitive, process-flow based HMI equipped with automated monitoring and controls for remote process operation. This control package includes a remote alarm with e-mail notification system that alerts operations personnel of issues during unmanned operation. In addition, equipment operations are monitored through a secure web browser, allowing site personnel to view process conditions and adjust process parameters remotely. An automatically generated daily report monitors this data and provides total gallons processed and uptime data, as well as historical analysis of all critical process parameters.

Brunner Landfill personnel have extensive experience with leachate evaporation. They provided key input on

optimizing integration of the Heartland Concentrator onto their site, maximizing use of existing equipment and ideas for minimizing downtime for routine maintenance activities.

### **Conclusion**

Since commissioning in December 2015, this combined landfill gas and leachate management system has operated successfully without major issue. The Heartland Concentrator has demonstrated both >95% volume reduction of landfill leachate and >95% availability; Heartland continues to work closely with site personnel to identify cost-effective improvements to achieve even better performance. This close customer relationship is a hallmark of Heartland Water Technology's core company values, as it strives for mutually beneficial continuous improvement.



*Figure 4- A Brunner Landfill engineering manager discusses the operations and controls of the Heartland Concentrator.*