

Applying HTI's Forward Osmosis Technology to Landfill Leachate Treatment

Landfill Leachate is the liquid waste stream that results from water passing through a solid waste landfill or dump. As water, typically from rain or overspray from dust mitigation, passes through the solid waste in the landfill, it extracts solutes, suspended solids and heavy metals resulting in a difficult to treat leachate that cannot be discharged to a public water way or municipal wastewater treatment plant without treatment.

HTI's unique and proprietary OsMem™ Forward Osmosis (FO) membranes are used to dewater the toxic landfill leachate while meeting tough government discharge permit regulations, including the US NPDES requirements. The Forward Osmosis treatment process concentrates the liquid waste stream for disposal thereby allowing a much lower cost and environmentally friendly alternative to conventional treatment while also recovering over 90% of the water for reuse.

HTI's hybrid system consists of Forward Osmosis (FO) primary pretreatment driven by 9% Sodium Chloride osmotic draw solution, diluted by FO to 5%, then polished and re-concentrated in a closed loop by Reverse Osmosis (RO). The concentrated retentate can be treated using conventional methods or can be solidified with Portland cement and returned to the landfill. The clean permeate can be discharged to a public waterway or diverted for reuse.

By implementing HTI's proprietary Forward Osmosis system in the landfill leachate market, operators are able to:

- Meet NPDES discharge requirements
- Reduce environmental impact of waste streams
- Increase landfill capacity
- Reduce overall treatment costs vs. conventional treatment
- Provides a "green technology" reducing environmental impact



Forward Osmosis Filtration System



Case Study: Coffin Butte Landfill:

The HTI Closed Loop Hybrid FO Wastewater System was created using plate and frame cassettes of HTI's proprietary OsMem FO membrane. The system has 2500 square meters of FO membrane and produces a flux rate of 25,000 gallons per day. Prefiltration to 100 microns is accomplished using a bag filter system. The FO system is cleaned on a weekly basis. The RO system uses high pressure seawater spiral wound elements with a

nano-membrane brine booster. To achieve permeate discharge conductivities of less than 10 micro Siemens, RO polishing is used. HTI's system treats leachate for \$0.5 per gallon and meets tough NPDES discharge regulation. In addition, the system facilitated the Coffin Butte facility in tripling the size of the landfill operation.



Coffin Butte Regional Landfill



*Reverse Osmosis
Brine Concentration*



*Solidified
Concentrate
(Dewatered)
Leachate*



AnyWater AnyWhere®

HTI Authorized Distributor

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