

State of Maine
Department of Environmental Protection
Bureau of Remediation and Waste Management

MEMORANDUM

TO: Linda J. Butler; Solid Waste Project Manager - Technical Services
FROM: Stephen E. Farrar, P.E.; Environmental Engineer Specialist - Technical Services
DATE: February 22, 2018
SUBJ: Pine Tree Landfill
2016 Annual Post-Closure Operations Report
File No. 2103.5313

We have completed an engineering review of the following document:

2016 Annual Report - Pine Tree Landfill - Hampden, Maine prepared by Pine Tree Landfill and dated April 2017

The Pine Tree Landfill (PTL) facility is a closed commercial solid waste landfill located on approximately 51.3 acres of a 166 acre parcel of land adjacent to Interstate 95 in Hampden. Operations were initiated in 1975 and waste acceptance ceased on December 31, 2009. Final closure of all phases of the landfill was completed by the end of 2010.

During 2016 PTL pumped 7,677,509 gallons of leachate, or approximately 21,035 gallons per day, from their leachate storage tank to the City of Bangor Wastewater Treatment Facility. In addition, 2,615,975 gallons of leachate was recirculated back into the landfill as part of a program to enhance landfill gas production. All leachate analytical results are reported to have been well below discharge permit pretreatment standards. The Landfill Gas-to-Energy (LFGTE) plant and flare at the facility processed approximately 296,700,000 standard cubic feet of extracted landfill gas, equating to an average extraction rate of about 565 standard cubic feet per minute over the course of the year.

Among other items, attachments to the 2016 Annual Report include; a Leachate Recirculation Report¹, a Water Quality Monitoring Report², a Landfill Gas Monitoring Evaluation³, an Air Monitoring Evaluation⁴, a Geotechnical Monitoring Report⁵, a Compliance Self-Audit⁶, and an updated post-closure cost estimate. Our Geology Unit has previously provided an evaluation of the 2016 water quality monitoring results (see memorandum dated February 8, 2018).

We offer the following observations and recommendations:

I. Leachate Recirculation Report

1. As of the end of 2016 approximately 65% of the calculated available field capacity of the waste in the zone of influence of the recirculation trenches had been used. We note that, due to suspected short circuiting and leachate leakage through geomembrane defects, two of the four trenches (LRT1 and LRT4) were taken off line in 2016. There are no current plans to return the two trenches to service so annual recirculation through the trenches will decrease in the future.
2. Energy extracted from the zone of influence of the recirculation trenches, taken as a percentage of total energy extracted from the landfill, indicates that recirculation has a positive influence in terms of energy production.
3. Hydrogen sulfide (H₂S) concentrations at the Thiopaq® treatment system inlet showed a steady decrease during 2016 indicating that recirculation is not having a detrimental impact on H₂S production.

II. Landfill Gas Monitoring Report

1. Both the landfill gas flow rate and methane (CH₄) concentration, and subsequently energy production, continued a slow decline during 2016. This has been the case since the landfill closure was completed in 2010 and is to be expected.

III. Air Monitoring Report

1. There were no odors reported to the facility during 2016.

¹ *Pine Tree Landfill - 2016 Post-Closure Leachate Recirculation Report* Pine Tree Landfill

² *2016 Water Quality Report - Pine Tree Landfill - Hampden, Maine* Sevee & Maher Engineers, Inc., March 2017

³ *Pine Tree Landfill - 2016 Annual Gas Monitoring Evaluation* Pine Tree Landfill

⁴ *Pine Tree Landfill - 2016 Annual Air Monitoring Evaluation* Pine Tree Landfill

⁵ *2016 Post-Closure Geotechnical Monitoring Report - Pine Tree Landfill Facility - Hampden, Maine* Richard E. Wardwell, P.E., Ph.D., April 2017

⁶ *Pine Tree Landfill - Compliance Self-Audit Checklist - Report Year 2016* Pine Tree Landfill

2. Surface scans of the landfill cover system detected no elevated (greater than 500 parts per million) levels of CH₄.
3. We recommend continuation of the air monitoring program.

IV. Geotechnical Monitoring Report

1. Geotechnical monitoring of the landfill during 2016 did not indicate any significant displacement or settlement.
2. We recommend continuation of the geotechnical monitoring program.

V. Attachment G

1. Sample copies of facility inspection reports are included in Attachment G. The Report should also include a summary of any significant or ongoing problems observed and resolution of those problems.

cc: Richard Heath, C.G.