

## MEMORANDUM

**TO:** Mr. David Prunty  
Public Works Director  
Flathead County Solid Waste

**DATE:** May 5, 2023

**FROM:** Michael A. Cullinane, P.E.

**RE:** Anaerobic Digester at the Flathead County Landfill

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### Executive Summary

*The Flathead County Landfill is not a practicable site for an anaerobic digestion, septage treatment, or biosolids composting facility based on the following reasons:*

- *Existing Solid Waste Permit restrictions.*
- *No on-site liquid treatment facilities.*
- *No current ability to manage additional off gas.*
- *The majority of the property is slated for solid waste operations.*

In review of the memorandum titled, 'Resources About Energy Production from Biosolids and Wastewater (Septic and Sewer) 4-2023', from the Citizens for a Better Flathead to the Flathead County Commissioners and the Flathead City/County Health Department, I would like to offer the following information as it relates to siting these types of facilities at the Flathead County Landfill.

Although I recognize the significance of the new technologies affiliated with production of Biogas from Anaerobic Digestors, many of these technologies are best suited for Wastewater Treatment Plants and not Solid Waste Disposal sites. It should be noted that even the referenced studies within the memorandum are in affiliation with research being conducted at wastewater treatment plants. As an example, there is a reference regarding a study being conducted by Birgitte Ahring, a professor with the Bioproducts, Sciences and Engineering Laboratory at Washington State University Tri-Cities, is developing a way to drastically improve energy production (biogas) at wastewater treatment plants. This would be done by applying a specialized upfront pre-treatment process using heat and oxygen-based agents before the wastewater treatment plant's anaerobic digestion process. This technology is still in the research stage as of a more current article dated November 21, 2022. The researchers are now scaling up the work in their pilot facility, see link below.

<https://tricitities.wsu.edu/novel-waste-treatment-efficiently-converts-sewage-to-biogas/>.

The Flathead County Landfill does not have a wastewater treatment facility nor is permitted through Montana Department of Environmental Quality for wastewater treatment. The management of wastewater and raw sewage sludge is handled by facilities that are properly permitted, equipped, and staff accordingly to manage this type of waste.

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The addition of an Anaerobic Digester and receipt of raw septage material at the Flathead County Landfill are obstacles for such a siting at the landfill. Although I believe there are many topics of concern regarding many issues that could be listed, the following are few key topics as it primarily relates to the landfill.

### Biosolids

Biosolids are divided into specified "Class" designations based on treatment methods. The different classes have specified treatment requirements for pollutants, pathogens and vector attraction reduction, as well as general requirements and management practices. Requirements for meeting Class designated biosolids are determined by the federal regulation 40 CFR Part 50 and the State of Montana may have more stringent requirements and additional criteria. Additionally, most states require permits to apply biosolids and a site evaluation might need to be conducted. Biosolids may emit a distinctive odor depending on the treatment process and methods used.

SWT provides engineering services for numerous composting facilities and very few incorporate biosolids into the process (due to lack of odor control systems, along with end use restrictions). Composting is the biological degradation of organic materials under controlled aerobic conditions. The process can be used to stabilize wastewater solids prior to their use as a soil amendment or mulch in landscaping, horticulture, and agriculture. Stabilization of wastewater solids prior to use destroys pathogens (disease causing organisms), minimizes odors, and reduces vector (e.g., flies) attraction potential. The process of composting with biosolids stabilizes the material to create an end-product that is easy to handle, store, and use as a soil amendment. The biosolids are typically a byproduct of the wastewater treatment plant, not raw septage material. The current state of the industry is composting facilities, are indoor or have implemented aerated static piles system (or a combination) to control odor which is a significant increase to cost of constructing the facilities and operations.

Composting facilities require a significant footprint for the various steps associated with the operations. In addition significant amount of storage area is usually necessary to maintain finished compost until needed for end use. The Flathead County landfill does not have significant non dedicated (refuse disposal, daily cover borrow or material handling operations) property to accommodate a composting facility.

### Leachate

Sewage sludge is defined as any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. The Flathead County Landfill has a Subtitle D liner system; however, septage waste is not permitted for disposal as the free liquid content is too high. Dried septage sludge can be accepted for disposal at Subtitle D lined landfills, however, many facilities do not accept sludge due to odor issues. The only liquid allowed to be disposed of/recirculated in the waste prism is leachate generated from the existing landfill.

*"The liquid restrictions in Subpart C of Part 258 only allows leachate recirculation in MSWLFs that are constructed with a composite liner and leachate recirculation system as described in 40 CFR 258.28(a)(2)."*

The current Leachate Collection and Recovery System (LCRS) is sized to only manage leachate flows affiliated with the solid waste within the waste prism. Any changes that increase or produce more leachate, may require modifications to the existing.

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### Landfill Gas

The management of landfill gas is a complex issue and is routinely monitored to ensure that the levels of the gas are not exceeding regulated levels as permitted. Climate conditions in the Flathead Valley have impacted the existing system and disrupt the ability to convey the gases to the gas-to-energy facility or flare. Adding additional biosolids to increase the production of gas also greatly increases the probability of the landfill being out of compliance with regulatory requirements if that gas cannot be properly extracted in a timely manner.

The Flathead County Landfill has a landfill gas-to-energy facility (two engines), that produces green electricity for the citizens of Flathead County. The expansion facility will be near capacity when it is brought fully online this year. Therefore, the energy facility does not have capacity for any additional fuel. It is anticipated that in a few years, the landfill will be producing surplus landfill gas and the flare will have to be brought back online in conjunction with the engines.

### Stormwater Management

The Flathead County Landfill is comprised of a complex stormwater management system and possesses a Multi-Sector General Permit (MSGP) for stormwater discharges associated with Industrial Activities. To the extent reasonable and appropriate, all significant pollutant source materials are handled and stored in storm resistant shelters to prevent exposure to rain, snow, snowmelt and runoff. The current stormwater management system and applicable permits are not designated to manage any runoff with potential pollutants from septage management activities.

In my 30 years as an engineer in the solid waste industry for hundreds of facilities, the only locations where septage is handled at solid waste disposals (landfills), has been at two landfills located in the desert in a very rural location without any nearby residents. With an extremely arid climate, the client still struggles with drying back the sludge so it can be disposed of in the landfill. I would not recommend septage handling at the Flathead County Landfill because of the reasons listed above.

It is my professional opinion that the Flathead County Landfill is not a practicable site for an anaerobic digestion, septage treatment, or biosolids composting facility. As landfill has permit restrictions, no liquid treatment facilities, no current ability to manage additional off gas and limited area to properly manage these types of facilities.

SWT Engineering, Inc.



Michael A. Cullinane, P.E.  
Principal Engineer