



February 3, 2022

Mr. Himanshu Mehta, PE
Managing Director
Indian River County Solid Waste Disposal District
1325 74th Avenue SW
Vero Beach, Florida 32968

RE: Leachate Storage Tank Mixer Selection

Dear Mr. Mehta:

Indian River County (County) Solid Waste Disposal District (SWDD) has undertaken the process of converting the County's existing centrate storage tank at the biosolids dewatering facility for the storage of leachate from the landfill operations. As part of the conversion, a mixer is proposed to be added to the tank to prevent stagnation and settling of solids in the tank.

Kimley-Horn prepared a computational fluid dynamics model of the tank to determine the optimum configuration of the mixer to be specified. Mixers evaluated included floor mounted and jet pump options. The jet mixing was the preferred option for ease of maintenance and longevity of the equipment, as all mechanical/pumping equipment is located outside of the tank. For other options, the equipment would need to be pulled from the tank for cleaning, maintenance and inspection. Since the roof access hatch is off center, routinely removing and reinstalling the equipment in the centered position (for optimum mixing) would be challenging.

Once the modeling and mixer type evaluation was completed, Kimley-Horn reached out to four vendors to obtain product information on the model of mixer that each vendor provides meeting the identified configuration. Each vendor provides slightly different equipment options, materials of construction, delivery times and pumping systems.

Given the highly corrosive nature of the leachate to be stored, the materials preference is for all equipment that comes in contact with the liquid to be HDPE or 316 stainless steel. No carbon steel pipe or fittings was permitted in the bids received.

Kimley-Horn reviewed each of the proposal received and recommends that SWDD proceed with procuring the Vaughn Rotamix System option provided by FJ Nugent. Pros and cons of each bid received are summarized below.

USGI-PAX Water Technologies – Tank Shark Mixing System

- Pros – Provided the least expensive mixing alternative and has the smallest energy consumption requirement. The system is also not fixed in place and can be pulled from the tank dome access hatch allowing for spray nozzle inspection and cleaning without placing the tank out of service.
- Cons – Imposed the smallest average fluid velocity to the bulk fluid of the tank out of all mixing alternatives and is therefore not recommended to be installed.

UET Mixers – XCEL-22 Mixer

- Pros – Provided moderate mixing capabilities.
- Cons – Installation and long-term operation of this mixing system was deemed to not be feasible due to the overall operating conditions of the mixing system. The mixer would need to be installed at the center of the topside of the dome with the motor and gear box at the highest point of the tank which presents both maintenance and operational hardships if installed and is therefore not recommended to be installed.

Fluidyne Corporation – Jet Mixing System

- Pros – Provided the highest performance compared to other mixing alternatives in terms of velocity imposed on the bulk fluid in the tank. Mixing header pipe and nozzles constructed of all 304 or 316 stainless steel. Jet mixing system allows all mechanical equipment to remain outside the tank interior at ground level for easy operation and maintenance.
- Cons – Held the highest capital cost of all mixing alternatives and is therefore not recommended to be installed.

Heward Gordon Group – Hydromix System

- Pros – Provided seconded highest performance compared to the Fluidyne Corp. Jet Mixing System. Mixing header pipe and nozzles constructed of all 304 or 316 stainless steel. Jet mixing system allows all mechanical equipment to remain outside the tank interior at ground level for easy operation and maintenance.
- Cons – Held the second highest capital cost of all mixing alternatives and is therefore not recommended to be installed.

FJ Nugent/Vaughn – Rotamix System

- Pros – Provided similar performance to the Heward Gordon Hydromix System. Jet mixing system allows all mechanical equipment to remain outside the tank interior at ground level for easy operation and maintenance. Capital cost of mixing system is less than that of Heward Gordon Group and provides equipment for turnkey installation.
- Cons – Mixing system will utilize HDPE pipe with stainless steel body and cast polyurethane barreled nozzles. While this material is acceptable to be used in a leachate environment, it is not as reliable as stainless steel.

For the reasons outlined in the above evaluation, Kimley-Horn's recommendation is that SWDD proceed with the purchase of the FJ Nugent/Vaughn Rotamix System. It is our opinion that the quotes

received, and the information reviewed to determine the best mixer technology for the intended purpose mimic that which would be received through an advertised bid process.

Please contact me at (772) 794-4146 or jill.grimaldi@kimley-horn.com should you have any questions or require additional information.

Sincerely,



Jill Grimaldi, BCES
Project Manager