



OPERATIONS COMMITTEE

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Agenda Report

File #: 2021-1736

Agenda Date: 7/7/2021

Agenda Item No: 15.

FROM: James D. Herberg, General Manager
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SUBJECT:

SUPER CRITICAL WATER OXIDATION RESEARCH OPPORTUNITY

GENERAL MANAGER'S RECOMMENDATION

RECOMMENDATION:

Information Item.

BACKGROUND

The Orange County Sanitation District (OC San) collects and processes 185 million gallons of wastewater every day. Cleaning this water results in concentrated solids called sludge and scum. These energy rich solids are processed through anaerobic digestion to create methane rich gas and biosolids. The methane rich gas is cleaned and used in the treatment plants to make electricity and heat. Biosolids are the residual material used in the agricultural industry as a soil amendment.

Anaerobic digestion is a standard biological treatment technology in the wastewater industry. It is safe and effective at converting organic material to useful gas and killing pathogens in the sludge. Anaerobic digestion is not an effective technology for converting microplastics, PFAS, and other constituents of emerging concern.

Staff has been following a new technology for solids treatment for a number of years that takes advantage of a unique property of water at high temperature and pressure. The technology presents an opportunity to convert all complex organic material (including plastics and PFAS) to more basic and benign compounds like nitrogen, water, carbon dioxide, and mineral salts.

A new company, 374 Water, with a novel, simpler process design is moving to scale up their process technology from a one-ton-per-day unit operating at Duke University in North Carolina. Rob Thompson witnessed the operation of the unit in North Carolina in May. Staff are in discussions with 374 Water to engage in a research program to scale up and operate a six-ton-per-day unit, and, if successful, potentially a thirty-ton-per-day unit. These first of their kind units at these flow rates are demonstration units and will no doubt require some adjustment and optimization, but staff believes they have a good probability of success due to their process and mechanical simplicity.

It is also important to note that this process will only treat concentrated solids streams, not the entire water flow. Part of the research process will be to document the ability of the system to destroy

plastics, PFAS type compounds, and other constituent of emerging concerns that can be concentrated in sludge streams. The proposed research/demonstration program would be capable of treating raw primary and secondary sludge, biosolids, and food waste.

RELEVANT STANDARDS

- Provide technology leadership to the wastewater industry
- Search for technology solutions to neutralize constituents of emerging concern
- Maintain a culture of improving efficiency

ATTACHMENT

The following attachment(s) may be viewed on-line at the OC San website (www.ocsan.gov) with the complete agenda package:

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