

Key Largo Wastewater Treatment District Board of Commissioners Meeting Agenda Item Summary

Meeting Date:
January 8, 2019

Agenda Item Number: L-2

Agenda Item Type:
Information / Presentation

Agenda Item Scope:
Review / Discussion

Recommended Action:
Discussion

Department:
Engineering

Sponsor:
Ed Castle

Subject:
Sludge Dewatering and Disposal Services

Summary of Discussion:

A Invitation to Bid for sludge dewatering and disposal services was in October with bids due no later than December 13, 2018. The scope of work includes providing dewatering and disposal of the District's sludge. Two bids were received. Synagro was found to be the lowest cost responsive and responsible bidder.

<u>Reviewed / Approved</u>	<u>Financial Impact</u>	<u>Attachments</u>
Operations: _____	\$ 495,000.00	1. Memo from WEC
Administration: _____	Expense	
Finance: _____	Funding Source:	
District Counsel: _____	Rate Revenue	
District Clerk: _____	Budgeted:	
Engineering: _____	Yes	

Approved By: _____
General Manager

Date: 1-3-19



MEMORANDUM

To: KLWTD Board
From: Ed Castle, PE
Date: January 2, 2019
Re: Sludge Dewatering Contract Discussion

At the October 2, 2018 Board meeting, the Board authorized publication of an Invitation to Bid for sludge dewatering and disposal services. WEC prepared the Invitation to Bid with a due date of December 13, 2018. Two bids were received, one from Synagro South LLC and one from Sweetwater Environmental, Inc. The table below presents a comparison of the bid prices from the two bidders.

Volume, Million Gallons	Sludge Concentration, % Solids	Dry Tons	Cost Using Synagro's Bid	Cost Using Sweetwater's Bid	Synagro's Cost per Dry Ton	Sweetwater's Cost per Dry Ton
1.5	1.0%	62.6	\$57,270.46	\$65,677.50	\$915.59	\$1,050.00
1.5	2.0%	125.1	\$103,813.91	\$131,355.00	\$829.85	\$1,050.00
1.5	3.0%	187.7	\$150,357.37	\$197,032.50	\$801.26	\$1,050.00
1.5	4.0%	250.2	\$196,900.82	\$262,710.00	\$786.97	\$1,050.00
1.5	5.0%	312.8	\$243,444.28	\$328,387.50	\$778.40	\$1,050.00

The KLWTD wastewater treatment plant is an activated sludge process. Raw sewage acts as “food” for the biological process. The KLWTD blowers provide air. The activated sludge is a collection of micro-organisms, mainly bacteria, that eat the “food” and reproduce. In order to have a healthy treatment process the amount of “food”, air and sludge must be balanced. As the sludge biomass eats and breathes, it reproduces, increasing the amount of sludge in the system. In order to keep the balance correct, a portion of the sludge is pumped to the digester each day, essentially removing the same amount of bacteria as was grown in the past 24 hours. The removal of excess sludge is called “wasting” and the removed sludge is called “waste activated sludge”, or “WAS”.

The WAS is kept in the digester under aerobic conditions but is not given any new “food”. Some of the WAS undergoes endogenous decay in which the bacteria dies and the cell walls burst, releasing the nutrients contained therein. These nutrients become food for the remaining live bacteria in the digester. This process reduces the volatile

solids content of the WAS, turning the cellular tissues and nutrients into carbon dioxide and water. In the meantime, the KLWTD staff draws off excess water from the digester and keeps putting in new WAS each day.

Eventually, the digester gets to the point where the WAS is as thick as it can get. At that point, the digester must be emptied. When we empty the digester, we remove 1.5 million gallons of water. If we hauled this liquid away for disposal, it would cost \$375,000 at the lowest bid price of \$0.25 per gallon. Instead, we have a centrifuge come in to “dewater” the sludge, thickening it from about 3% solids to about 20% solids. That means that the dewatered sludge that is hauled out is still 80% water, but it is still a large reduction in volume. The 1.5 million gallons of WAS contains 375,750 pounds of bacteria on a dry weight basis. That equals about 188 dry tons.

Using the lowest bid received, and paying on a mobilization plus dry tonnage basis, it would cost about \$150,360. That’s a savings of \$224,640 each time we dewater. And we dewater about 4 times per year, for an annual savings of almost \$900,000.

When we advertised for dewatering bids back in 2013, the low bidder was awarded the dewatering contract at a price of \$975 per dry ton. When the contractor proposed to change from landfill disposal to taking the dewatered sludge to a compost facility, the KLWTD staff negotiated a price reduction to \$865 per dry ton. Recently, the Board approved an interim increase to \$885.77 per dry ton.

The table below shows the comparison of Synagro’s proposed new pricing from the bid, to the current price of \$885.77 per dry ton.

Sludge Volume, Million Gallons	Sludge Concentration, % Solids	Dry Tons	Cost Using Synagro's New Bid	Synagro's Proposed Cost per Dry Ton	Synagro's Current Cost per Dry Ton
1.5	1.0%	62.6	\$57,270.46	\$915.59	\$885.77
1.5	2.0%	125.1	\$103,813.91	\$829.85	\$885.77
1.5	3.0%	187.7	\$150,357.37	\$801.26	\$885.77
1.5	4.0%	250.2	\$196,900.82	\$786.97	\$885.77
1.5	5.0%	312.8	\$243,444.28	\$778.40	\$885.77

Notice that the cost per dry ton goes down and the % solids of the liquid sludge increases. This is the effect of putting a one-time mobilization charge for each dewatering event. It ensures the contractor that they will recoup their costs for mobilizing to the plant if we stop them from dewatering sludge for some reason.

Jered currently thickens the digester to 3% to 3.5%, meaning that at the new bid price, the District will save approximately \$65,000 per year over current pricing.