

Medora Corporation

Wastewater Treatment Plant

USMIWW-LOC759.001

Topics: wastewater, energy savings, sludge reduction, facultative, partial mix



SolarBee deployed in cell, with one of the solar panels flipped toward the sun for maximum exposure.

Customer: Contact Information is available upon request from Medora Corporation.
866-437-8076 info@medoraco.com

Overview: The municipal WWTP consists of three cells at 32.4 surface acres. Cell one is controlled discharge, partial mix, and 7.23 surface acres with an operating depth of 6.0 ft. Cell two is controlled discharge, facultative, 7.5 surface acres with an operating depth of 10.0 ft. Cell three is controlled discharge, facultative, 17.70 surface acres with an operating depth of 14.0 ft. Total system detention time is 180.92 days.

Conditions / Objectives: Prior to the SolarBee deployment, there were eleven 10 hp aerators in cell one. The county experienced high energy costs, as the aerators utilized 110 hp, 24 hours per day, year-round. Sludge buildup and algae problems plagued cells two and three. The plant also applied ferric chloride at an average rate of 40 gallons per day to precipitate phosphorus, in order to meet discharge permit levels of 0.6 mg/L. Primary objectives for this deployment are to provide long-distance circulation to reduce the need to operate the current aeration system, maintain or improve treatment throughout the system, and enhance organic sludge digestion.

Solution: Seven (7) dual-mix SolarBee SB10000DMv18 mixers; three in cell one, two in cell two, and two in cell three. Three years later, two (2) additional SolarBee mixers were purchased and added to this system, one in cell one and one in cell three.

Deployment Dates: September 2010, 2013

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Results: Since the deployment of the SolarBees the reduction in aeration has been dramatic. Currently the county runs only one aerator 24/7 during the winter months, and two aerators 24/7 during the summer months. The county conducted a cost savings project over a specific time period. Annualized savings totaled \$59,200, calculated at a cost of \$0.08/KW (see chart below).

Also since the SolarBee deployments, ferric chloride is dispersed for only two weeks prior to seasonal discharge. It is dispersed through one of the SolarBees in cell three at a rate of 80 to 100 gallons per day. The SolarBee provides better distribution and mixing for the ferric chloride. By injecting ferric chloride directly through their SolarBee, the county has reduced spending for the chemical from \$27,000 per year to \$11,000 per year. The phosphorus level in cell three is maintained under the 0.6 mg/L permit limit, resulting in a substantial savings for the county. The county and community have been happy with the SolarBee deployment and it's positive results. They are happy to serve as a positive reference for Medora Corporation.

Average Solar Energy Savings

KWH Saved	Description	Cost Savings Assumes \$0.08/KWH
QUARTERLY		
115,000	KWH (Saved)/Quarter Cell 1	\$9,200.00
70,000	KWH (Saved)/Quarter for Cells 2 and 3*	\$5,600.00
185,000	Total Average Quarterly KWH Savings	\$14,800.00
MONTHLY		
	Monthly savings for Cell 1	\$3,066.67
	Monthly savings for Cell 2 & 3	\$1,866.67
	Total Avg Monthly Savings all three Cells	\$4,933.33
ANNUALLY		
	Total Avg Annual Savings all three Cells	\$59,200.00

* Assumes 5,700 KWH savings / mixer / quarter, if four electric mixers would have been deployed in cells two and three for treatment purposes.