CEDAR KEY WATER & SEWER DISTRICT
P.O. BOX 309 / 510 THIRD STREET
CEDAR KEY, FL 32625

Minutes of Special Meeting
Board of Commissioners
February 27, 2017

Board Members Present: Dottie Haldeman, Joe Hand, Leslie Sturmer (by phone).

Others Present: John McPherson, James McCain, Tim Norman, Greg Lang, Mac Cox, Steve Rosenthal, Frank Offerle, Jim Wortham.

1. Meeting called to order at 5:13 P.M.

2. Agenda adopted by consensus.

3. Review of Water Treatment Plant Pilot Test Results and Options: Tim Norman, Mittauer Associates, Engineers.

   Mr. Norman provided a history of the project and his conclusions as to the options for moving forward as shown on the attached. There was discussion among the Board members, meeting attendees, and Mr. Norman regarding the viability, time line, and costs for the various options. The Board accepted Mr. Norman's conclusion that, based on the results of the pilot testing, we would not be able to use membrane filtration with our current water supply, and that the District was therefore left with two options:

   A. Dig deep wells and find water more amenable to treatment with membranes; or

   B. Continue to use the current shallow wells and lime softening process with reverse osmosis available in reserve in case saltwater intrusion affects the wellfield.

   Mr. Norman noted that in either case at least one deep well on the site of the water treatment plant would be needed. In option A it would be needed as one of two deep production wells, and in Option B it would be needed as the disposal well for the RO discharge. It was his recommendation, therefore, that the next step be to dig a deep well at the water treatment facility. Depending on the nature of the water found at depth, the Board could then decide on whether the best option would be a membrane or lime softening plant. He noted that the cost of the deep well without pump would be about $200,000 and that this amount of money is available from the $450,000 legislative appropriation that is available to the District for pilot testing and construction costs. **Motion** by Joe Hand to accept this recommendation and proceed with funding, design and construction of the deep well on the site of the water treatment plant. **Second** by Leslie Sturmer. Passed by a vote of 3-0.

4. TwinOxide Issue.

John McPherson, General Manager, then presented the Board with proposals from TwinOxide and Mittauer and Associates to begin a 90-day test of using TwinOxide (chlorine dioxide) as the primary potable water disinfectant. The GM reviewed the costs and terms of the proposals and gave his opinion that there would be sufficient funds in the 2016-2017 fiscal year budget to cover the costs for the remainder of the fiscal year. He also noted that there would be substantial savings in other areas, such as chemicals for, and maintenance of, the Miex system, that would help cover the cost of the proposals. Mr. Norman noted that chlorine dioxide is widely used in Europe as the primary potable water disinfectant due to its effectiveness as a disinfectant and the fact that it does not create problem disinfectant byproducts. The GM reported that he had talked to a similar small utility in Florida, Magnolia, that is testing the product and getting very good results in terms of customer satisfaction and very low DBP readings.

The basic terms of the TwinOxide proposal were presented as:

- Initial setup fee of $2,500.
- Monthly equipment lease payments of $1,900 for the test period and two-year lease term if the test is successful.
- A cap of $78,287 on the annual cost of the TwinOxide chlorine dioxide product to be in effect for the test and lease periods.

The basic terms of the proposal by Mittauer to do the engineering for the permitting of the TwinOxide test was presented as being that, due to the uncertainty with regard to what would be required by DEP for the test, Mittauer would do the work on an hourly basis not to exceed $12,000 without consent of the District.

Motion by Joe Hand to accept the proposals by TwinOxide and Mittauer Associates for the TwinOxide test. **Second** by Leslie Sturmer. Passed by a vote of 3-0.

5. Public Input: Public input was requested but none was provided.

6. There being no further business to address, the meeting was adjourned at 6:25 p.m.

Dottie Haldeman, Chairperson

Leslie Sturmer, Commissioner &
Secretary of the Board

Date: 4/10/17

NEW WTP
CEDAR KEY WATER & SEWER DISTRICT
M&A PROJECT NO. 0605-18-1

A. PROJECT HISTORY SYNOPSIS

1. Lime softening plant was constructed in 1964.

2. MIEX system was added in 2006 to help remove organic precursors responsible for THM production.

3. Saltwater intrusion occurred in the summer of 2012.

4. Lime softening plant was not able to handle saltwater intrusion by itself. Water quality was unsuitable for consumption. Bottled water was utilized.

5. Reverse osmosis (RO) units purchased under emergency circumstances and put into service.

6. Tropical Storms Beryl and Debby alleviated drought conditions and eliminated saltwater intrusion problem.

7. RO units were run for a relatively brief period of time and began fouling.

8. RO units have not been needed since, although another episode of saltwater intrusion could occur again.

9. District began looking at building a new WTP in 2012 that could handle saltwater intrusion episodes.

10. District applied for and received funding from a variety of sources including Rural Development, State Revolving Fund, Suwannee River Water Management District, and Legislative Appropriations.

11. A Preliminary Engineering Report was prepared to obtain Rural Development grant/loan funding. Two alternatives involving membrane treatment were evaluated: shallow wells and deep wells.

12. The shallow well alternative was selected due to the known (but extremely poor) water quality. Deep well water quality is essentially unknown to this day.

13. Preliminary design of the new membrane treatment plant was begun along with pilot testing various pre-treatment options ahead of the membranes.

14. Several pre-treatment schemes were evaluated including Greensand filters, pressure sand filters followed by Greensand filters, and diatomaceous earth filters. All the pilot pre-treatment methods failed due to the variability of the raw water quality and its high levels of iron, organics, and small particulates.

15. It has been determined that treatment of the shallow well water using membranes is not feasible due to the inability to adequately pre-treat the raw water.

16. This leaves the District with two basic alternatives: (1) deep wells followed by membrane treatment; (2) lime softening followed by membranes (when required).

B. PATH FORWARD

1. In order to properly evaluate the deep well alternative, we need to have actual water quality data from a deep well at the WTP site.

2. A concentrate disposal well will have to be constructed for either alternative. Therefore, recommend constructing the concentrate disposal well as permitted using Legislative Appropriation money and check water quality to see if pre-treatment ahead of the membrane will be required.

3. If deep well water quality is suitable, we can convert the concentrate disposal well to a raw water production well, construct a second production well at the site, construct a concentrate well at the existing well site, and use the existing 6" raw water main to convey concentrate to the existing well site.

4. If deep well water quality is not suitable for membrane treatment without elaborate pre-treatment, the only remaining alternative is to build a new modern lime softening plant which incorporates the two existing membrane skids for use during times of saltwater intrusion.

5. Any new WTP must be constructed above the 100-year flood elevation. Site is very space limited and is surrounded by wetlands on three sides. This limited available area and the need to construct above the 100-year flood elevation will drive up construction costs.

OPINION OF PROBABLE CONSTRUCTION COST DEEP WELL ALTERNATIVE	
CONSTRUCTION COSTS	
1. Mobilization & General Conditions	$240,000
2. Work at Wellfield	
a. Concentrate Injection Well	$200,000
b. Yard Piping	$25,000
c. Electrical/Instrumentation	$25,000
d. Miscellaneous	$5,000
3. Treatment Plant Work	
a. Selective Demolition - Existing WTP	$50,000
b. Reverse Osmosis Equipment	$680,000
c. Chemical Feed Systems	$250,000
d. Packed Tower Degasifier and Odor Control	$275,000
e. Ground Storage Tank	$250,000
f. High Service Pumps	$125,000
g. Concentrate Storage Tank	$125,000
h. Concentrate Pumps	$50,000
I. Two Raw Water Production Wells and Pumps	$600,000
j. Operations Building	$500,000
k. Yard Piping	$200,000
l. Electrical/Instrumentation	$400,000
m. Miscellaneous	$75,000
4. Sitework	
a. Retaining Walls	$250,000
b. Concrete Paving	$150,000
c. Fill	$50,000
d. Lime Sludge Removal	$50,000
e. Stormwater Pond	$25,000
CONSTRUCTION TOTAL	**$4,600,000**

OPINION OF PROBABLE CONSTRUCTION COST LIME SOFTENING WITH REVERSE OSMOSIS	
CONSTRUCTION COSTS	
1. Mobilization & General Conditions	$300,000
2. Work at Wellfield	
a. Sitework	$25,000
b. New Well Pump for Well No. 4	$50,000
c. Electrical/Emergency Generator	$100,000
3. Treatment Plant Work	
a. Selective Demolition of Existing WTP	$50,000
b. Two 175 gpm Accelators in Stainless Steel Tanks	$600,000
c. Recarbonization Tank and CO_2 Feed System	$400,000
d. Gravity Sand Filters in Stainless Steel Tank	$650,000
e. RO Transfer Tank and Pumps	$150,000
f. Chemical Feed Systems	$250,000
g. Ground Storage Tank	$250,000
h. High Service Pumps	$125,000
I. Backwash Water Pumps	$100,000
j. Concentrate Storage Tank	$75,000
k. Concentrate Pumps	$50,000
l. Concentrate Injection Well	$150,000
m. Backwash Water Recovery Tank	$200,000
n. Backwash Water Recovery Pumps	$50,000
o. Solids Dewatering Box	$75,000
p. Operations Building	$500,000
q. Yard Piping	$300,000
r. Electrical/Instrumentation	$500,000
s. Miscellaneous	$125,000
4. Sitework	
a. Retaining Walls	$250,000
b. Concrete Paving	$150,000
c. Fill	$50,000
d. Lime Sludge Removal	$50,000
e. Stormwater Pond	$25,000
CONSTRUCTION TOTAL	**$5,600,000**