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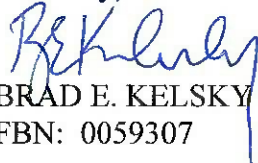
**Re: Docket No. 20200226-SU, Environmental Utilities, LLC
Pre-Filed Direct Examination of Stephen J. Suggs, P.E.**

Dear Clerk:

Enclosed please find Palm Island Estates Association, Inc.'s Pre-Filed Direct Examination of Stephen J. Suggs, P.E. A copy of the testimony has been served, this date, upon all parties of record.

Thank you.

Sincerely,


BRAD E. KELSKY
FBN: 0059307

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

IN RE: Application for certificate to provide
wastewater service in Charlotte County by
Environmental Utilities, LLC

Docket No.: 20200226-SU

DIRECT TESTIMONY

OF

STEPHEN J. SUGGS, P.E.

on behalf of

Palm Island Estates Association, Inc.

1 **Q. Please state your name, position and professional address.**

2 A. My name is Stephen J. Suggs, P.E. I am a professional engineer with the firm
3 of Weiler Engineering Corporation. My professional address is 6805 Overseas
4 Highway, Marathon, FL 33050.

5 **Q. State briefly your educational background and experience.**

6 A. I have a Bachelor of Science degree in Civil Engineer and a second Bachelor of
7 Science degree in Environmental Engineering from Florida Gulf Coast
8 University. I am a licensed professional engineer (# 85237). I have extensive
9 experience in wastewater treatment plant design, wastewater collection system
10 design, mechanical piping design and structural design, along with project
11 management during design and construction.

12 **Q. Are you providing testimony on behalf of Palm Island Estates Association,
13 Inc.?**

14 A. Yes.

15 **Q. What is the purpose of your direct testimony?**

16 A. The purpose of my direct testimony is to review the Giffels-Webster technical
17 memorandum entitled "Evaluation of Wastewater Collection Technologies"
18 dated April 2, 2021 and to provide opinions on the recommendations and costs
19 as stated in the memorandum.

20 **Q. Have you previously appeared and presented testimony before any
21 regulatory bodies?**

22 A. No.

23 **Q. Are you sponsoring any exhibits?**

24 A. Yes, I am sponsoring SS-1, Sewer Connection Memorandum, based upon my
25 review of the Giffels-Webster technical memorandum.

1 **Q. Does the report identified as SS-1 accurately reflect your opinions?**

2 A. It does.

3 **Q. Was this exhibit prepared by you?**

4 A. Yes, it was.

5 **Q. Does that conclude your direct testimony?**

6 A. Yes, it does.



November 18, 2021

Meryl Schaffer
President
Palm Island Estates, Inc.
P.O. Box 3151
Placida, FL 33946

Re: Sewer Connection Memo

Ms. Schaffer,

Summary of Report

The Weiler Engineering Corporation (WEC) has been contracted by the Palm Island Estates Association, Inc. (PIE) to review "Evaluation of Wastewater Collection Technologies" Technical Memorandum prepared by Giffels-Webster Engineers, Inc. dated April 2, 2021.

Topography and drainage studies were conducted to determine the soil types and ground level for Don Pedro and Knight Island. Both island soil types are determined to be a form of fine sand and seasonal high groundwater tables were determined with both islands having a SHWT in the range of twenty to thirty inches. The seasonal high groundwater tables for each island can be found in the in the topography section of the memorandum. A flood plain maps is provided in report and shows that both islands in the report are deemed to be barrier islands.

Two wastewater collection systems are described in the fourth section of the report, although the low-pressure sewer system (LPS) is written about in the greatest detail and the system technically does not operate at low pressure since the pumps are high head. The proposed system also appears to be a STEP system with a settling tank not a traditional grinder system. This should be clarified as FDEP views LPS, Grinder, and STEP systems differently for permitting. The report explains the advantages and disadvantages of the LPS being used rather than any other system. Four primary advantages are given for the LPS, ranging from the low cost of the system to the shallow elevations and cover that is needed for the system to run. Two disadvantages for this system were given stating the systems reliance on multiple generators and the maintenance cost that can remove any cost savings gained during the initial construction over the life of the system.

The Technical Memorandum also provides the design standards, design parameters, minimum cover, and the required components for LPS systems. It is worth noting that in both systems a master pump station would need to be incorporated. A detailed cost of that station was not provided and assumed would be installed by Charlotte County. A breakdown of the total unit costs for the two competing systems is provided in the sixth section of this report.

An engineering economics methodology and analysis was conduct and compiled in the memorandum breaking down the operations, maintenance, life cycle and layout of the potential sewer systems in Don Pedro / Knight Island area. Repairs and maintenance for the LPS was determined to be in the yearly range of five to ten years. A LPS base cost estimate is provided in the report detailing the expected cost of the two competing sewer system. The Memorandum has Concept maps for both locations along with existing sewer maps of other island with similar layouts. Total cost estimates were given that breaks down the base cost, the O&M, and the total expected cost. It is worth noting that annual maintenance cost for the LPS system was over double the cost of the vacuum system. Additionally, no hurricane or emergency operation cost were factored into these annual O&M which is more burdensome with LPS due to the need to pump each tank out individually as opposed to a Vacuum station which is central and more resilient during storm events. Another ongoing maintenance concern that was not addressed in consideration of LPS is that the proposed tank system allows for settling of solids and only moves water. This will result in periodic cleaning that will be needed of the basins as opposed to a traditional grinder pump system or Vacuum system which processes the

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solids to the wastewater facility. The additional cost of cleaning the basins should be factored into the O&M unless the burden falls to the homeowner.

The Technical Memorandum provides potential disadvantages of each system that should be considered, such as Bridge connections, corrosion, erosion, and land acquisitions. A hydraulic analysis was conducted to determine the pipe sizes that would be needed for the sewer systems. The analysis was then broken down into a cost estimate that compares two scenarios to assess the need for Knight Island Flow. The pipe sizing for the mains was then given based on the two differing scenarios given. However, as can be seen in the calculation appendix table below the velocities are less than 2.0 ft/sec in several lines which is the recommended minimum scouring velocity.

PRELIMINARY LOW-PRESSURE SEWER SYSTEM PIPE SCHEDULE AND ZONE ANALYSIS OF BOCILLA / LITTLE GASPARILLA FUTURE SEWER																	
SCENARIO 1: Pipe Sizing Analysis With Flow from Knight Island																	
SECTION	CUMU. ERCs (BUILD OUT)	ACCUM. PUMPS IN SECTION	GAL/DAY PER CORE	MAX FLOW PER CORE	ASSUMED MAX SIMULTANEOUS PUMPS OPERATING	CUMU. MAX FLOW (gpm)	NOMINAL PIPE SIZE (in)	INNER PIPE DIAMETER (in)	MAX VELOCITY (FPS)	LENGTH OF MAIN THIS ZONE (ft)	FRICTION LOSS FACTOR (FT/100 FT)	FRICTION LOSS THIS SECTION	ACCUM. FRICTION LOSS (ft)	STATIC HEAD (ft)	MISC. LOSSES (ft) * Assumes 5% of friction loss	TOTAL DYNAMIC HEAD (ft)	PRESSURE (psi)
Knight Island Section 1						250	6	6.07	2.78	2000	0.42	8.4	41.6	2	2.1	45.6	16.8
Bocilla Section 1	540	540	200	12.5	21	262.5	8	7.98	1.68	2000	0.12	2.4	38.3	3	1.9	43.2	16.7
Bocilla Section 2	759	759	200	12.5	28	350	8	7.98	2.24	2035	0.21	4.2	33.1	2	1.7	36.8	15.9
Bocilla Section 3	816	816	200	12.5	30	375	8	7.98	2.40	2750	0.23	5.5	28.9	2	1.4	32.4	14.0
Bocilla Section 4	1032	1032	200	12.5	36	450	8	7.98	2.88	5120	0.33	16.9	22.5	2	1.1	25.6	11.1
Bocilla Section 5	1189	1189	200	12.5	41	512.5	10	10.02	2.09	4060	0.14	5.6	5.6	2	0.3	7.9	3.4
Little Gasparilla Section 1	40	40	200	12.5	6	75	4	4.03	1.89	2080	0.33	6.9	37.8	2	1.9	41.7	18.0
Little Gasparilla Section 2	295	295	200	12.5	14	175	6	6.07	1.94	2340	0.22	5.1	30.9	2	1.5	34.4	14.9
Little Gasparilla Section 3	660	660	200	12.5	25	312.5	8	7.98	2.00	6050	0.17	10.1	25.8	2	1.3	29.1	12.6
Little Gasparilla Section 4	700	700	200	12.5	26	325	8	7.98	2.08	5200	0.18	9.4	15.6	2	0.8	18.4	8.0
Section 11 - Wye to Future LS	1889	1889	200	12.5	62	775	12	11.94	2.22	4930	0.13	6.3	6.3	2	0.3	8.6	3.7

Another concern in the proposed system pipe sizes is the low total dynamic head on several of the lines. This will cause the pumps to operate inefficiently and possibly result in damage. It is suggested that either more appropriate pumps or pipe sizes be utilized in these areas.

The purpose of the Technical Memorandum by Giffels-Webster was to evaluate two methods of wastewater collection, specifically low-pressure sewer (LPS) and vacuum sewer. The Technical Memorandum provides conceptual layouts, quantity take offs, and a comparative cost estimate for both systems. The Technical Memorandum recommends the use of low-pressure sewer in this area due to bridge crossings and cost analysis performed.

It is the opinion of WEC, based solely on the Technical Memorandum, that connection via low-pressure sewer is not required or necessarily the best system for the application as presented. The purpose of the Technical Memorandum was simply to compare the two methods of wastewater collection and offer a recommendation. The Technical Memorandum does not state that the residences of PIE must connect via the recommended method.

The costs presented in the Technical Memorandum are not absolute and are for comparison purposes only. The Technical Memorandum states that the costs presented "cannot and should not be taken as the total project cost." The Technical Memorandum also states that some soft cost such as surveying, easements, funding, legal fees, engineering, connections fees, and other fees were not included in the cost estimate because these costs are generally equivalent between the two systems and were therefore intentionally neglected since the purpose of the cost estimate was for a comparative analysis. These neglected costs are significant and should be quantified before moving forward. It is worth noting that in the Vacuum Base cost estimate included a significant amount of additional engineering cost compared to the LPS system as seen below.

Additional Design Engineering - Vacuum Station	EA	\$	150,000	2	\$	300,000
Additional Design Engineering - Profiles	EA	\$	100,000	2	\$	200,000
Additional CEI - Vacuum Station	EA	\$	25,000	2	\$	50,000
Additional CEI - Profiles and As-Builts	EA	\$	50,000	2	\$	100,000

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While there is some additional effort required in ensuring a proper vacuum sewer system is installed correctly, these costs seem disproportionate higher than what an LPS system would require. Much of the scope such as profiles and engineering would be similar. As-built cost would also be similar in nature between the two systems.

Some environmental considerations, such as protected species were not taken into account in the Technical Memorandum. These types of environmental considerations will result in an equivalent cost for both systems if protected species are present. Before an estimated cost for protected species mitigation or relocation can be ascertained, a protected species assessment for the entire area should be performed. The presence of protected species can add a significant cost to the project in regard to permitting, construction, and mitigation/relocation fees. The presence of protected species may affect the design of the entire system.

As mentioned previously, if low pressure sewer tanks are installed at each residence, maintenance will be required. The solids that settle to the bottom of the tank will be required to be removed periodically. The solids must be removed typically every 5 to 7 years depending on the size of the tanks and the flow through the tanks. The Technical Memorandum is unclear whether that cost will be incurred by the individual homeowner or by the utility. The cost of electrical power is another expense that will be required to operate the low-pressure sewer pumps. The Technical Memorandum is unclear whether that cost will be incurred by the individual homeowner or by the utility. This cost would likely range from \$300-\$500 per basin cleaning every 5-7 years.

The Technical Memorandum states that the low-pressure sewer pumps will pump wastewater to a master lift station provided by Charlotte County. According to the Technical Memorandum, it seems that the cost of this lift station will be completely covered by Charlotte County. This should be confirmed with the County before moving forward as it will impact the project price significantly.

While the Technical Memorandum recommends the use of low-pressure sewer, a vacuum sewer collection system should not be discounted. The valve pits that are part of a vacuum system do not require electrical power and require very little maintenance for the homeowner. Vacuum sewer systems also perform better in an emergency situation, such as a hurricane, compared to low pressure sewer. A vacuum sewer system will need power restored at one point to operate, rather than restore power to the low-pressure sewer pump at each residence since the valve pits do not require power to operate. Vacuum sewer systems can cross at bridges if needed and WEC has worked on several systems in the FL Keys where this occurs.

It is recommended that a further analysis be undertaken during the system design phase to determine the best approach. WEC has identified several areas where cost could be reduced on the LPS system as well as a Vacuum system. One potential option would be to connect multiple residences to a single LPS station located in the ROW. Just like a vacuum pit, this would allow for less equipment and overall cost. Additionally, a traditional grinder system without the sediment collection configuration would lessen the overall maintenance cost. Lastly, reduced pipe sizes more appropriate for the system head conditions would reduce installation cost. For vacuum a potential savings is in the bridge crossings. A split mini station such as the one utilized in Key Largo's "F Station" would reduce cost if crossing with a main in the traditional manner was not feasible.

As for the total project cost estimates between the two options, the reasoning behind the unit cost is sound. This would likely have been an accurate estimate of cost with the exception of the items mentioned previously and due to the current supply shortages and supply chain issues. Due to the current economic climate actual cost of the system has likely increased since April 2021 when this report was written. Certain materials have increased upwards of 50% over the past year in WEC's experience with active construction projects. This additional cost should be factored in when deciding which system is most appropriate.

Conclusion

The purpose of "Evaluation of Wastewater Collection Technologies" Technical Memorandum prepared by Giffels-Webster Engineers, Inc. was to compare two methods of wastewater collection and to compare estimated costs only.

The Technical Memorandum does not state that the residences of PIE must connect via low-pressure sewer, nor does

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it give an absolute estimate of construction costs. In WEC's opinion the report does leave certain cost related items out such as O&M cost related to the LPS which should be factored in for a more complete picture. The report also has several design constraints related to vacuum systems such as the max line length that are implied as absolutes when they are not. The report also shows some issues in scouring velocities and head pressures of the proposed LPS system and does not adequately address each system's benefits or drawbacks related to hurricanes. Additionally, further evaluation is needed to ascertain what other environmental or permitting conditions might impact this project such as the Charlotte County comprehensive plan, CC SMP, State of Florida land trust, USACE SWFWMD, etc. or any other possible considerations needed before a realistic estimate can be given.

If you have any other questions, or require additional information, please do not hesitate to contact me at (941) 505-1700 or electronically at ssuggs@weilerengineering.org.

Sincerely,



Stephen
J Suggs

Digitally signed by
Stephen J Suggs
Date: 2021.11.18
15:03:16 -05'00'

Stephen J. Suggs
Professional Engineer
State of Florida
Registration No. 85237