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February 18, 2026

VIA Electronic Filing to the Office of Commission Clerk

Florida Public Service Commission
Office of Commission Clerk
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850
Attn: Daniel Dose, Senior Attorney

Re: Docket 20250043-WS – Petition for an acquisition adjustment for a non-viable utility, by CSWR-Florida Utility Operating Company, LLC.

Dear Mr. Dose:

CSWR-Florida Utility Operating Company, LLC (“CSWR-Florida”) submits the following responses to Staff’s January 27, 2026 First Data Request.

Please refer to CSWR-Florida Utility Operating Company, LLC (CSWR-FL or Utility) petition for an acquisition adjustment relating to its 2022 acquisition of the Aquarina Utilities, Inc. (Aquarina) water and wastewater facilities for the following questions (Document No. 01788-2025, filed on March 14, 2025):

1. Please explain, with specificity, the rationale for paying above net book value for the acquired utility.

Response: When evaluating a system for potential acquisition, CSWR-Florida consults publicly available documents, such as Commission annual reports and available information from health and environmental regulators. It also conducts site visits to get a better understanding of the plant configuration and the condition of the equipment. A final purchase price is determined through arms-length negotiations between the parties, with CSWR Florida's ultimate objective being to pay the least amount that a utility/seller will accept.

In practice, utility owners frequently have economic incentives to retain ownership rather than sell at net book value. One such incentive is the ability to compensate themselves or earn other financial benefits as a result of ownership. As a result, CSWR-Florida has not encountered a utility owner willing to sell a system at net book value absent extraordinary circumstances, such as receivership. This experience is

consistent with CSWR-Florida’s prior acquisitions in Florida, all of which were negotiated at prices above net book value.

In addition, CSWR-Florida believes that the net book values for many small utility systems may be artificially low due to the regulatory structure under which those systems operate. Specifically, under annual price index adjustment mechanisms, utility owners may have limited incentive to capitalize infrastructure investments that would otherwise be capitalized in a traditional rate case environment. Over time, this can result in systems with aging or inadequate infrastructure, significant deferred maintenance, and net book values that do not reflect the true replacement cost or operational condition of the assets used to provide service. Consequently, net book value may materially understate the economic value of the system as a going concern and does not serve as a reliable indicator of market value in an arm’s-length transaction.

Accordingly, CSWR-Florida’s acquisition prices are not based on net book value alone, but rather reflect system-specific factors, including physical condition, operational risks, anticipated capital investment requirements, and the outcome of arm’s-length negotiations between independent parties. This approach is consistent with CSWR-Florida’s prior acquisition filings and testimony before the Commission.

2. Please explain how the proposed acquisition, which reflects an acquisition premium over the net book value of the acquired utility, is reasonable and consistent with Section 366.03, Florida Statutes.

Response: Section 366.03, Florida Statutes, provides in part that “Each public utility shall furnish to each person applying therefore reasonably sufficient, adequate, and efficient service upon terms as required by the commission.” Prior to acquisition of the water and wastewater system by CSWR-Florida, the customers of the former Aquarina systems have not had service that is sufficient, adequate, or efficient. The Aquarina systems were non-viable at the time of acquisition and were unable to provide and maintain safe, adequate and, reliable service and facilities to customers. Both the water and wastewater systems were operated in such a technically deficient manner that they received citations from the FDEP for violations designed to ensure drinking water is safe for customers and wastewater is processed in a manner that satisfies applicable health, safety, and environmental laws. Aquarina's water and wastewater facilities exhibited numerous problems that were the result of inadequate investments in each system and poor management practices. CSWR-Florida’s need to replace the hydropneumatic tank immediately after closing is but one example of these shortcomings. As discussed in the Petition, many of the systems’ assets were at or near the end of its useful lives before CSWR-Florida acquired them. In addition, Aquarina’s annual reports to the Commission show many years of insufficient

investment and inadequate expenditures for repair and maintenance. CSWR-Florida is bringing sufficient, adequate, and efficient service to the customers.

Section 366.03 also provides that “All rates and charges . . . shall be fair and reasonable.” The customers have benefitted tremendously from this acquisition, and will continue to so benefit into the future. Section IV of the Petition lays out the range of benefits to customers, the most important of which is eliminating their dependence on the failing components of the Aquarina systems. In addition, because these systems would be part of the much larger CSWR-Florida water utility, through economies of scale and statewide rate consolidation the rate impact to customers is minimal as compared to the benefits and upgrades to their service. If the Commission grants the full acquisition adjustment requested, at the longest amortization to minimize rate impact as CSWR-Florida has requested, then the impact to customers of the acquisition adjustment is projected to be only \$0.73 per month if rates are consolidated by the Commission and \$4.99 per month if rates are not consolidated. The acquisition and proposed acquisition adjustment provide substantially more of a benefit to customers than just being baseline reasonable.

3. Please identify and discuss any internal or external concerns raised about paying in excess of book value for the acquired utility.

Response: Certainly, the acquisition of the system was thoroughly reviewed, vetted, and discussed prior to closing, and no internal or external concerns were raised regarding payment in excess of net book value. The Company’s mission is to acquire and rehabilitate small, distressed water and wastewater systems that lack the capital, scale, or technical resources necessary to provide safe and reliable service on a sustainable basis. CSWR Florida believed it could bring these and other benefits to the customers served by the Aquarina systems, and the Company’s performance since it acquired that system has proved those beliefs to be correct. In addition, based upon numerous acquisition transactions throughout the eleven-state footprint served by CSWR-affiliates, the Company knew that while regulators focus on the net book value of a system’s assets the owners of those systems oftentimes focus on the market value of those same assets, which is almost always significantly greater. Therefore, while CSWR’s utility affiliates always enter into negotiations with the objective of paying the least amount possible for the water and wastewater systems they acquire, many times sellers will not accept a final purchase price at or near the net book value of the assets being sold.

Recent changes to Florida’s regulatory framework—including the Commission’s adoption of fair market valuation concepts and updates to the acquisition adjustment rule applied in this docket—implicitly acknowledge the reality described above – i.e., that acquisitions may require a price above net book value. In addition, those policy changes demonstrate a clear preference for well-capitalized, professionally managed utilities to acquire and revitalize failing systems. These changes recognize that net

book value alone does not reflect the economic realities of small utility ownership and the price those owners are willing to accept for their systems. They also recognize that due to the condition of aging infrastructure, or the level of capital investment required to restore systems to long-term viability, a sale of those systems to utilities better able to upgrade and maintain the systems is in the long-term best interests of the customers served by those systems – even it that requires recognition of a purchase price above net book value.

Rather than focusing solely on the present net book value of assets that may be decades old, the Company takes a long-term view centered on system sustainability, service reliability, and environmental compliance. The Company believes Florida should welcome, encourage, and support substantial private capital investment by utilities willing and able to assume the risks associated with turning around distressed systems. Revitalizing these systems benefits customers, reduces the risk of service failures and environmental harm, and does so at reasonable rates and a reasonable return, consistent with the Commission’s stated policy objectives.

4. Regarding this acquisition in relation to the acquisition adjustment requests in Docket Nos. 20250038-WS, 20250047-WS, 2025130-WS, and 20250136-WS, please explain the variation in acquisition premiums among the five acquired utilities and what factors contributed to those differences.

Response: Acquisition adjustments vary among CSWR-Florida’s acquisition adjustment cases based on system-specific factors, including each utility’s net book value, physical condition, operational viability, and the circumstances of the arm’s-length negotiations with the seller. Each acquisition is evaluated on its own merits, and differences in these factors necessarily result in differences in purchase prices and associated acquisition premiums. Purchase price is not determined by net book value. CSWR-Florida has yet to encounter a system owner who will sell at net book value, when they have the alternative of continuing to run the system and defer maintenance and updates. Until the point of receivership or environmental disaster, the status quo and running down the system tends to be profitable.

With respect to the Aquarina systems, the Commission issued a Proposed Agency Action Order (PSC-2022-0115-PAA-WS) which established net book values of \$278,878, \$262,867, and \$82,768 for the potable water, non-potable water, and wastewater systems, respectively, as of August 16, 2021. The purchase price for the Aquarina systems was determined through arm’s-length negotiations between independent parties and reflects the specific characteristics and condition of that systems at the time of acquisition. Accordingly, any acquisition premium associated with the Aquarina systems is attributable to those system-specific factors and differs from other dockets involving different utilities.

5. Please explain why no appraisal was obtained as part of CSWR-Florida's acquisition of the acquired utility.

Response: Please see Attachment "DR 5 – Valuation", which includes the third-party valuation report and all supporting documentation related to the valuation of the Aquarina assets.

6. Please discuss if any lower-cost acquisition alternatives were considered.

Response: No, the Company did not consider purchasing a different system than this one as a lower-cost alternative, if that is the question. The Company has acquired a range of systems at a range of costs. The acquisition of this system was the product of arms-length negotiations. There was not a lower-cost alternative means to acquire this system.

7. Please indicate whether the Utility used or contemplated any risk-sharing mechanisms (e.g., seeking partial recovery of the premium, contingencies, etc.). If so, please discuss.

Response: No. CSWR-Florida did not use or contemplate any risk-sharing mechanisms, other than this acquisition adjustment recovery process. CSWR-Florida takes the risks of ownership when it acquires a system.

8. Please indicate whether the Utility considered voluntarily reducing the adjustment to mitigate ratepayer impact. If so, please discuss.

Response: No. CSWR-Florida believes the Aquarina system was non-viable and that customers have clearly benefited from this acquisition, as detailed in the Petition. To mitigate customer impact, CSWR-Florida has requested the maximum allowable amortization. CSWR-Florida's 5-year projected consolidated rate impact is \$0.73 per customer per month. As such, the Company believes that the benefits provided far outweigh the projected rate impact.

9. Please provide documentation showing whether the Utility sought to renegotiate terms based on any discovered risks of acquiring the utility.

Response: None. No renegotiation of terms occurred.

10. Please identify and explain whether any scenarios were considered where a portion of the acquisition premium could be disallowed.

Response: No, the Company has taken the risks associated with acquiring this system. The Company is aware that the Commission may Order a partial acquisition adjustment or deny an acquisition adjustment. This may impact the Company's willingness to continue to invest in Florida by acquiring other systems, but it does not impact the acquisition of this system, which has long since closed.

11. Please provide a full breakdown of any additional costs related to the acquisition incremental to purchase price (i.e., transactional and regulatory costs).

Response: Please see the attachment "DR 11 – Additional Costs."

12. Please identify any problems or concerns that were raised during the due diligence period that could have or did effect the purchase price.

Response: None. The Company's mission is to acquire failing and neglected systems. These systems are all rife with problems and concerns.

13. Please indicate whether the acquisition was subject to an independent audit or review. If so, please discuss the results of such review.

Response: No, it was not. The Company makes its own acquisition decisions.

14. Please provide accounting journal entries showing how the acquisition adjustment will be recorded on the utility's books.

Response: Please see the attachment "DR 14 – Journal Entries."

15. Please provide a detailed post-acquisition pro forma financial statement, including revenue requirement impact, of the acquired utility.

Response: Please see the attachment "DR 15 – Post Acquisition Pro Forma."

16. Please provide a comparison of the revenue requirement with and without the acquisition adjustment of the acquired utility.

Response: Please refer to the response provided in Data Request 15.

17. Please identify any regulatory assets or liabilities created as a result of this transaction, if any, and cite Florida Public Service Commission approval/Order No.

Response: There are none.

18. Please identify all parties to the transaction and their relationships to CSWR (if any).

Response: The seller of the system assets of Aquarina Utilities, Inc. was Kevin Burge, and his attorney for the transaction was Marin S. Friedman at Dean Mead Law Firm. CSWR-Florida's acquisition of the Aquarina system was an arms-length transaction. CSWR-Florida and Aquarina Utilities, Inc. are non-affiliated, independent parties. There was no prior relationship or influence between them, or their principals.

19. Please briefly explain how operations, staffing, and service quality have been affected post-acquisition.

Response: Please refer to Part IV "Basis for Granting this Petition," specifically section 3, included in the Petition.

20. Please explain what steps are or have been taken to ensure a seamless transition for customers.

Response: CSWR-Florida has implemented a comprehensive transition plan designed to ensure continuity of service, minimize customer disruption, and enhance the overall customer experience following the acquisition. These measures address customer communications, billing continuity, operational responsiveness, and emergency preparedness.

Upon closing, customers receive a Welcome Letter explaining the change in ownership, customer service and emergency contact information, and billing and payment options. The most current customer information available is used when onboarding the system into CSWR-Florida's billing platform to ensure accurate billing and uninterrupted service. Existing rates are adopted at the time of acquisition to mitigate rate impacts during the transition.

Customers gain access to CSWR-Florida's centralized 24/7 customer service call center for billing inquiries, service requests, and emergency calls. Licensed operations and maintenance personnel are on call at all times to respond to service interruptions or emergencies, supported by remote system and water quality monitoring that allows for prompt identification and resolution of operational issues. Customers also have access to electronic billing and an online customer portal, which improves

communication and reduces the potential for service or billing disruptions during the transition.

21. Please indicate whether any customer protections were included in the transaction. If so, please identify and discuss the specific customer protections.

Response: Customers benefit from the acquisition as extensively detailed in the Petition. The system rates were continued after acquisition. The Company has requested the maximum amortization of the acquisition adjustment to minimize impacts to customers. Customers are best protected by CSWR-Florida's delivery of sufficient, adequate, and efficient service as compared to the prior owner.

22. Please indicate whether CSWR LLC has sought similar acquisition adjustments in other jurisdictions. If so, provide the associated outcomes (e.g. acquisition adjustment approved in full, partial approval of the acquisition adjustment, or denial of the acquisition adjustment). Please provide the jurisdiction(s) and relevant order number(s).

Response: Yes, it has. Tennessee Rule 1220-04-14-.04 explicitly allows for the Commission to consider remediation of public health, safety, and welfare concerns when contemplating acquisition incentives. 16 Texas Administrative Code (“TAC”) § 24.41(d) ensure acquisition adjustments are tied to arm’s length transactions, improvements in service quality, and clear customer benefits. Partial acquisition adjustments were granted in Docket 24-00044.

Arizona Corporation Commission Decision No. 75626 (July 26, 2016) in Docket No. W-00000C-16-0151 (“Water Policy Order”). In its Water Policy Order, the Commission adopted a series of “Policy Statements for the Water and Wastewater Industries” in Arizona. In adopting the policies, the Commission recognized and explained that the “private water utility industry in Arizona is highly fragmented and problematic.” The Commission further explained that “encouraging consolidation will have direct and tangible benefits for small water utility customers.” Differences between Purchase Price and Net Book Value, identified as “deferred debits” in AZ, were granted in Order Number 81549.

Kentucky Rule KRS 278.295(2) codified the “Delta Test” which outlines the criteria a commission uses to determine the value of an acquired water or sewer asset for ratemaking. The commission sets the asset's value between its original cost and its acquisition price, regardless of how it was originally funded, if the acquiring utility demonstrates that the price was negotiated fairly, restoring the asset won't negatively affect overall costs or customer rates, the acquisition leads to operational efficiencies; purchase prices are clearly distinguished, and there are financial and service benefits from the acquisition. In Docket 2022-00432, the Commission granted approval of requested acquisition adjustments for 10 of the 12 systems found in its request.

TX 16 TAC § 24.41(d)(1) and (2) detail the recovery of positive acquisition adjustment. Specifically, the rule permits recovery when certain conditions are met, such as reasonable investments being made to comply with regulations, and the transaction benefiting customers or improving stability. The adjustment is only allowed if the buyer and seller are not affiliated, all related transactions are disclosed and conducted at arm's length, and the purchase price and impact on rates are reasonable. In the Final Order to Docket 54565, the Commission noted “The net positive acquisition adjustments for the systems CSWR-Texas acquired outside of the FMV process are reasonable and should be included in rate base.”

Mississippi Commission Rule 8.102 governs rate adjustments related to the approval of a sale and transfer of public utility property. Commission Rule 8.102 states “Unless specifically requested in the petition and clearly allowed by the Commission's order, the approval of any sale or transfer by the Commission shall not, in and of itself, provide a basis or justification for any subsequent adjustment to rate base or operating expenses. An acquisition adjustment shall not be implied or allowed except upon written request for same in the Petition for Sale and Transfer and only where expressly allowed by order of the Commission when it grants approval for the sale and transfer. If an acquisition adjustment is sought, all supporting documentation and legal authority must be attached to the Petition presented pursuant to this rule. Adjustments, if allowed, shall be by Order of the Commission.” Most recently, acquisition adjustments were granted to Great River in Docket Nos. 2020-UA-143, 2020-UA-144, 2021-UA-157, 2021-UA-158, 2022UA-37, 2022-UA-38, 2022-UA-144, 2022-UA-145, 2023-UA-35, and 2023-UA-36.

Overwhelmingly, various states are adopting rules that incentivize both the acquisition and, more importantly, the rehabilitation of small, distressed systems. In each of these states, recovery of acquisition adjustments (deferred debits) isn't just permitted — it's a deliberate tool to promote public health, infrastructure investment, and long-term service stability.

23. Assuming CSWR-FL's request to consolidate rates is not approved:

a. Please describe how the Utility would implement the resulting rate increases, including any measures proposed to mitigate customer bill impacts.

Response: CSWR-Florida has proposed consolidation in Docket 20250052 and will implement any rate increase or rate design as Ordered by the Florida PSC.

b. Please indicate whether the Utility would seek to phase-in rates.

Response: No. While CSWR has implemented phase in rates in other jurisdictions, these phase ins include carrying costs which would increase the rates in the long term.

24. Please provide any due diligence reports conducted by CSWR-Florida (or parent) associated with the acquisition.

Response: Please see the attachment “DR 24 – Aquarina Engineering Memo.”

25. Please provide all materials related to sensitivity analyses or stress tests on acquisition pricing, if any, that CSWR-Florida or any party retained to assist in acquisition pricing conducted.

Response: None.

26. With respect to the acquisition adjustment in this case, please provide copies, if any, of:
- a. Internal memos, board presentations, and management analyses supporting the adjustment.

Response: None.

- b. Any codified internal policies regarding acquiring utilities and seeking acquisition adjustments.

Response: None.

- c. Documented communications with investors or credit rating agencies regarding any acquisition-related impacts.

Response: None.

27. Please submit all internal emails, management meeting notes, and board presentations that mention concerns or debates over the acquisition price or expected regulatory treatment of the premium.

Response: As noted in item 3 above, there were not internal or external concerns over the excess of the purchase price over net book value. There was no “expected regulatory treatment.”



28. With respect to the acquisition adjustment in this case, please provide unredacted versions (if any) of:

a. Valuation reports related to the acquired utility.

Response: Please refer to the response provided in Data Request 5.

b. Copies of any internal rate impact modeling conducted by CSWR-Florida with respect to the acquired utility.

Response: Please refer to the response provided in Data Request 15.

29. Please submit any documented communications between Utility executives/Utility staff and the acquired utility regarding acquisition premium justification.

Response: None.

Thank you for the opportunity to provide additional information in support of the application. Please feel free to contact our office at your convenience with any additional questions or concerns.

Sincerely,

/s/ Thomas A. Crabb

Thomas A. Crabb
Attorney for CSWR-Florida

cc: Aaron Silas
Walt Trierweiler, Esq.
Austin Watrous, Esq.
Daniel Dose, Esq.
Jennifer Crawford, Esq.
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Data Request # 5

Valuation



Flinn Engineering, LLC
11216 Neumann Lane
Highland, Illinois 62249
618-550-8427
ksimpson@flinnengineering.com

December 24, 2021

Jacob Freeman, PE
Director, Engineering
Central States Water Resources
1650 Des Peres Rd., Suite 303
St. Louis, MO 63131

Re: Asset Valuation Report
Aquarina Utilities, Inc. – Aquarina Beach & Country Club Development Water and
Wastewater Systems

Dear Mr. Freeman:

Flinn Engineering, LLC has completed the valuation of the assets owned by Aquarina Utilities, Inc. for the Aquarina Beach & Country Club Development in Brevard County, Florida. The purpose of this report is to estimate the value of the assets at the time the system was placed in service and estimate the depreciated book value of the assets.

The original installation costs were not recorded by the developer. In order to establish the original cost, we estimated the cost to install the assets in 2021 dollars using a combination of an engineering opinion based on knowledge of other systems of similar size and correspondence from contractors and suppliers. The Handy-Whitman Index was used to adjust the estimated installation cost to the date the assets were placed in service. The original installation date is based on a variety of assumptions and available information that are described below.

A site visit was not conducted since this report is not evaluating the condition of the system. The following describes the information available, assumptions made, and methodology used to determine the installed value of the assets.

The Brevard County Property Appraiser placed a market value on the parcel that includes the water treatment plant and the wastewater treatment plant (Item 1 in **Appendix A**). The property value was added to the water assets. Additional property values could include easements for the collection system and distribution system.

Summary

The Aquarina development includes water and sewer customers. The water customers are supplied by two (2) wells, a water treatment plant, and a hydropneumatic tank. The sewer customers are served by an influent lift station, extended aeration wastewater treatment plant, an effluent pump station, and disposal absorption drain field.

Table 1 summarizes the estimated installation cost in 2021 dollars, the estimated original installation cost, and the estimated depreciated book value.

Table 1 – Water and Wastewater Systems Estimated Installation Cost and Depreciated Book Value

Description	Estimated Installation Cost 2021	Estimated Original Installation Cost	Estimated Depreciated Book Value
Water System	\$ 8,057,836.88	\$ 3,034,683.06	\$ 1,178,043.99
Wastewater System	\$ 3,468,100.00	\$ 1,069,743.08	\$ 111,721.72
Total	\$ 11,525,936.88	\$ 4,104,426.14	\$ 1,289,765.71

Available Information/Assumption

The following information/assumptions were used to determine the quantity, age, and estimated installation cost for the assets. The numbers are shown in **Tables 2 and 4** for easy reference. Unless otherwise noted, the items listed under “Available Information” are included in **Appendix A**. The items not included in **Appendix A** are on file in our office and can be provided if requested.

Available Information

1. Brevard County Property Appraisal.
2. 2020 Annual Report submitted to the Florida Public Service Commission (not included in **Appendix A** due to file size.)
3. Engineering Reports assessing water system and wastewater system prepared by Woodard & Curran dated July 2021 (Engineering Report-Water and Engineering Report-Wastewater). The Engineering Reports are not included in **Appendix A** due to file size.
4. Google Earth image showing assumed locations of pipes.
5. Quote for Reverse Osmosis (RO) system installed in 2016.
6. USEPA Fact Sheet on Package Plants dated September 2000.

Assumptions

7. If the installation date was not provided, we assumed the water distribution assets were installed 1981 when the wells were installed and the treatment equipment was installed in 2006 with the first RO system. We assumed the wastewater assets were installed in 1984 with the wastewater treatment plant.
8. The 2021 installed cost per foot for the wells is based on discussions with contractors and knowledge of similar projects.
9. The pump cost is based on the size of the pump and estimated from online catalogs (USA Bluebook and Grainger). We assumed the installation cost would be about half of the material cost.
10. The RO building appears to be a Concrete Masonry Unit (CMU) building. The approximate dimensions were measured using Google Earth. The 2021 installed cost of the building is based on recent projects and discussions with contractors. The Concrete Masonry Unit (CMU) building cost is estimated to be \$50 per square foot.
11. The 2021 installed cost of the chlorination equipment and aerator are estimated to be \$5,000 based on recent projects of similar size and online catalogs (USA Bluebook and Grainger).
12. The 2021 installed of the concrete tanks and fiberglass tank is based on recent projects and discussions with contractors.
13. The hydropneumatic tank cost is estimated from online catalogs (USA Bluebook and Grainger). We assumed the tank includes all accessories, controls, and plumbing and the installation is about half of the material cost.
14. The 2021 installed of the standby generator is based on recent projects and discussions with contractors.
15. The Engineering Report-Water (Item 3 in **Appendix A**) indicates that the water distribution system includes 4” to 8” PVC water main. Maps of the entire system were not available.

We assumed the location of pipes and measured using Google Earth (Item 4 in **Appendix A**). In order to estimate the 2021 installed cost, we used the unit cost for 6-inch water main since a breakdown by size was not available. We assumed the non-potable water main was all 12-inch PVC and the length was the same as the water main. We assumed the water main is installed approximately three (3) feet deep. The per foot estimate for water main installation includes design, excavation, material, installation, backfill, and restoration.

16. The water service and meter installation cost in 2021 is estimated to be \$1,750 based on recent conversations with contractors. This is an estimate of the average cost of “long” services and “short” services and includes excavation, boring, material, installation, backfill, and restoration.
17. The fire hydrant installation cost in 2021 is estimated to be \$4,000 based on recent conversations with contractors. This includes excavation, material, installation, backfill, and restoration.
18. The number of manholes was assumed to be the same as the number of fire hydrants. The manhole installation cost in 2021 is estimated to be \$4,000 based on recent conversations with contractors. This includes excavation, material, installation, backfill, and restoration.
19. The USEPA published a Technology Fact Sheet on Package Plants in September 2000 (Item 6 in **Appendix A**). The Fact Sheet estimates the capital costs for this type of WWTP, including filtration, to be around \$7 per treated gallon. We assumed this WWTP would be closer to \$10 per treated gallon since it includes the absorption drain field equipment and disinfection. The 2000 (H-W 351) per gallon cost was converted to 2021 (H-W 694). The estimated 2021 cost for the installation of the extended aeration package plant is \$20 per gallon treated.
20. The Engineering Report-Wastewater (Item 3 in **Appendix A**) indicates that the sewer collection system includes 6” and 8” gravity sewer pipe. Maps of the entire system were not available. Maps that were available show 8” PVC Sewer and show the sewer parallel to the water. We assumed the sewer pipe length was the same as the water main and used the unit cost for 8-inch since a breakdown by size was not available. We assumed the gravity sewer is approximately six (6) to eight (8) feet deep. The per foot estimate for sewer installation includes design, excavation, material, installation, backfill, and restoration.
21. The lift station cost is based on two (2) 5 horsepower submersible pumps and recent projects of similar size. The 2021 cost for each lift station is estimated to be \$25,000.
22. The sewer lateral installation cost in 2021 is estimated to be \$400 based on 4-inch PVC and recent conversations with contractors. This estimate includes excavation, material, installation, backfill, and restoration.

Water System

Based on the information available and the assumptions listed above the water system includes one (1) well; a water treatment plant; an emergency generator; a 5,000-gallon hydropneumatic tank; 20,700 feet of water main; and 306 water services. The non-potable water system includes one (1) well that can also be used for potable water; a 1.25-million gallon storage tank; 20,700 feet of water main; 41 fire hydrants; and 118 services.

Table 2 includes the asset description, quantity, information/assumption to determine quantity, date of installation, information/assumption to determine date of installation, unit cost, and information/assumption used to determine unit cost. The cost in **Table 2** is the estimated cost to install the water assets in 2021.

Table 2 – Estimated Installation Cost for Water Assets in 2021

Description	Quantity	Unit	Quantity Info/ Assumption ¹	Date Installed	Date Info/ Assumption ¹	Estimated Unit Cost 2021	Cost Info/ Assumption ¹	Estimated Installation Cost 2021 ²
Property	1	ea	1	1981	n/a	\$ 830,250.00	1	\$ 830,250.00
Well #1-18" Steel Casing 7.5 hp	595	ft	3	1981	3	\$ 250.00	8	\$ 148,750.00
Well #2-18" Steel Casing 7.5 hp	590	ft	3	1981	3	\$ 250.00	8	\$ 147,500.00
Well 2 Pump 1-7.5 hp	1	ea	3	2021	3	\$ 10,000.00	9	\$ 10,000.00
Well 2 Pump 2-7.5 hp	1	ea	3	2013	3	\$ 10,000.00	9	\$ 10,000.00
Transfeer Pumps 1.5 hp	2	ea	3	2013	3	\$ 2,500.00	9	\$ 5,000.00
High Service Pumps 15 hp	2	ea	3	2013	3	\$ 15,000.00	9	\$ 30,000.00
Fire & Irrigation Pumps 60 hp	2	ea	3	2003	3	\$ 40,000.00	9	\$ 80,000.00
RO Bldg	900	sq ft	10	2006	7	\$ 50.00	10	\$ 45,000.00
Reverse Osmosis 2006	1	ea	3	2006	3	\$ 72,243.44	5	\$ 72,243.44
Reverse Osmosis 2016	1	ea	3	2016	3	\$ -	5	\$ 72,243.44
Sodium Hypo Equipment	1	ea	3	2006	7	\$ 5,000.00	11	\$ 5,000.00
Aerator	1	ea	3	2006	7	\$ 5,000.00	11	\$ 5,000.00
Concrete Storage Tank	250,000	gal	3	1972	3	\$ 2.00	12	\$ 500,000.00
Fiberglass Clearwell	350	gal	3	1981	7	\$ 1.00	12	\$ 350.00
Hydropneumatic Tank 5,000-gallon	1	ea	3	1993	3	\$ 35,000.00	13	\$ 35,000.00
Fire & Irrigation Concrete Tank	1,250,000	gal	3	1981	7	\$ 2.00	12	\$ 2,500,000.00
Generator 475 kW	1	ea	3	1981	7	\$ 275,000.00	14	\$ 275,000.00
6" Water Main	20,700	ft	4	1981	7	\$ 50.00	15	\$ 1,035,000.00
12" Non-Potable Water Main	20,700	ft	4	1981	7	\$ 65.00	15	\$ 1,345,500.00
Water Services & Meters	306	ea	2	1981	7	\$ 1,750.00	16	\$ 535,500.00
Irrigation Services & Meters	118	ea	2	1981	7	\$ 1,750.00	16	\$ 206,500.00
Hydrants	41	ea	2	1981	7	\$ 4,000.00	17	\$ 164,000.00
Estimated Installation Cost 2021								\$ 8,057,836.88

Notes:

1 – Info/Assumption number refers to list above.

2 – The 2021 cost in the gray cell was converted from original cost shown in the Quote for RO System (Item 5 in **Appendix A**) using Handy-Whitman Indices.

Table 3 shows the calculation using the Handy-Whitman indices to convert the estimated installation cost in 2021 to the estimated original installation cost.

Table 3 – Water Assets Estimated Original Installation Cost

Description	Estimated Installation Cost 2021	Handy-Whitman Index Original Installation Date	Handy-Whitman Index 2021	Estimated Original Unit Cost	Estimated Original Installation Cost ¹
Property	\$ 830,250.00	n/a	n/a	\$ 830,250.00	\$ 830,250.00
Well #1-18" Steel Casing 7.5 hp	\$ 148,750.00	197	694	\$ 70.97	\$ 42,224.42
Well #2-18" Steel Casing 7.5 hp	\$ 147,500.00	197	694	\$ 70.97	\$ 41,869.60
Well 2 Pump 1-7.5 hp	\$ 10,000.00	1454	1454	\$ 10,000.00	\$ 10,000.00
Well 2 Pump 2-7.5 hp	\$ 10,000.00	844	1454	\$ 5,804.68	\$ 5,804.68
Transfeer Pumps 1.5 hp	\$ 5,000.00	844	1454	\$ 1,451.17	\$ 2,902.34
High Service Pumps 15 hp	\$ 30,000.00	844	1454	\$ 8,707.02	\$ 17,414.03
Fire & Irrigation Pumps 60 hp	\$ 80,000.00	543	1454	\$ 14,938.10	\$ 29,876.20
RO Bldg	\$ 45,000.00	458	694	\$ 33.00	\$ 29,697.41
Reverse Osmosis 2006	\$ 72,243.44	502	1009	\$ 35,942.72	\$ 35,942.72
Reverse Osmosis 2016	\$ 72,243.44	838	1009	\$ -	\$ 60,000.00
Sodium Hypo Equipment	\$ 5,000.00	502	1009	\$ 2,487.61	\$ 2,487.61
Aerator	\$ 5,000.00	502	1009	\$ 2,487.61	\$ 2,487.61
Concrete Storage Tank	\$ 500,000.00	92	694	\$ 0.27	\$ 66,282.42
Fiberglass Clearwell	\$ 350.00	197	694	\$ 0.28	\$ 99.35
Hydropneumatic Tank 5,000-gallon	\$ 35,000.00	281	694	\$ 14,171.47	\$ 14,171.47
Fire & Irrigation Concrete Tank	\$ 2,500,000.00	197	694	\$ 0.57	\$ 709,654.18
Generator 475 kW	\$ 275,000.00	245	1454	\$ 46,337.69	\$ 46,337.69
6" Water Main	\$ 1,035,000.00	138	395	\$ 17.47	\$ 361,594.94
12" Non-Potable Water Main	\$ 1,345,500.00	138	395	\$ 22.71	\$ 470,073.42
Water Services & Meters	\$ 535,500.00	187	628	\$ 521.10	\$ 159,456.21
Irrigation Services & Meters	\$ 206,500.00	187	628	\$ 521.10	\$ 61,489.65
Hydrants	\$ 164,000.00	223	1058	\$ 843.10	\$ 34,567.11
Estimated Original Installation Cost					\$ 3,034,683.06

Note 1: The gray cell represents the original cost shown in the Quote for RO System (Item 5 in **Appendix A**).

Wastewater System

Based on the information available and the assumptions listed above the wastewater system includes WWTP and absorption drain field; 20,700 feet of sewer collection; 2 lift stations; 41 manholes; and 339 service laterals.

Table 4 includes the asset description, quantity, information/assumption to determine quantity, date of installation, information/assumption to determine date of installation, unit cost, and information/assumption used to determine unit cost. The cost in **Table 4** is the estimated cost to install the wastewater assets in 2021.

Table 4 – Estimated Installation Cost for Wastewater Assets in 2021

Description	Quantity	Unit	Quantity Info/ Assumption ¹	Date Installed	Date Info/ Assumption ¹	Estimated Unit Cost 2021	Cost Info/ Assumption ¹	Estimated Installation Cost 2021
WWTP-Extended Aeration	99,000	gpd	3	1984	3	\$ 20.00	19	\$ 1,980,000.00
6" & 8" Sanitary Sewer	20,700	feet	4	1984	7	\$ 55.00	20	\$ 1,138,500.00
Lift Station-5 hp Pumps	2	ea	3	1984	7	\$ 25,000.00	21	\$ 50,000.00
Manholes	41	ea	18	1984	7	\$ 4,000.00	18	\$ 164,000.00
Service Laterals	339	ea	2	1984	7	\$ 400.00	22	\$ 135,600.00
Estimated Installation Cost 2021								\$ 3,468,100.00

Notes:

1 – Info/Assumption number refers to list above.

Table 5 shows the calculation using the Handy-Whitman index to convert the estimated installation cost in 2021 to the estimated original installation cost.

Table 5 - Wastewater Assets Estimated Original Installation Cost

Description	Estimated Installation Cost 2021	Handy-Whitman Index 1984	Handy-Whitman Index 2021	Estimated Original Unit Cost	Estimated Original Installation Cost
WWTP-Extended Aeration	\$ 1,980,000.00	221	694	\$ 6.37	\$ 630,518.73
6" & 8" Sanitary Sewer	\$ 1,138,500.00	241	819	\$ 16.18	\$ 335,016.48
Lift Station-5 hp Pumps	\$ 50,000.00	277	1454	\$ 4,762.72	\$ 9,525.45
Manholes	\$ 164,000.00	241	819	\$ 1,177.05	\$ 48,258.85
Service Laterals	\$ 135,600.00	215	628	\$ 136.94	\$ 46,423.57
Estimated Original Installation Cost					\$ 1,069,743.08

Depreciated Value

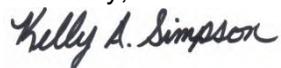
The estimated original cost was depreciated based on depreciation rates used by the Missouri Public Service Commission (PSC) during recent rate cases. It is reasonable to assume the depreciation rates approved by the Missouri PSC are typical of other states. The depreciation schedules from six (6) recent rate cases are included in **Appendix C**. Three (3) are from water systems and three (3) are from wastewater systems. The depreciation periods used are summarized in **Table 6**. The depreciation calculation is included in **Appendix D**.

Table 6 – Depreciation Periods

Asset	Depreciation Period (years)
Property	n/a
Well	55
Generator	20
Pumps	12
RO Building	44
Water Treatment Equipment	35
Tanks	42
Water Main	50
Services and Meters	35
Hydrants	50
WWTP - Equipment	22
Sanitary Sewer, Manholes, Laterals	50
Lift Station	10

We appreciate the opportunity to assist you on this project. If you have any questions, please let me know.

Sincerely,



Kelly A. Simpson, PE, LEED® AP
Owner

Enclosures:

- Appendix A – Available Information
- Appendix B – PSC Depreciation Rate Schedules
- Appendix C – Depreciation Calculation



Brevard County Property Appraiser

Titusville • Viera • Melbourne • Palm Bay

PROPERTY DETAILS

Phone: (321) 264-6700

<https://www.bcpao.us>

Account	2959961
Owners	AQUARINA UTILITIES INC
Mailing Address	PO BOX 1114 FELLSMERE FL 32948
Site Address	235 AQUARINA BLVD UNIT WTRPLT MELBOURNE BEACH FL 32951
Parcel ID	29-38-36-QO-*-1D
Property Use	9170 - WATER & SEWER SERVICE
Exemptions	None
Taxing District	3400 - UNINCORP DISTRICT 3
Total Acres	2.37
Subdivision	AQUARINA P.U.D. STAGE 1, TRACTS C & D, STAGE 2, TRACTS B, D & H, STAGE 3, STAGE 4, TRACTS B, I, & X,
Site Code	0001 - NO OTHER CODE APPL.
Plat Book/Page	0041/0088
Land Description	AQUARINA P.U.D. STAGE 1, TRACTS C & D, STAGE 2, TRACTS B, D & H, STAGE 3, STAGE 4, TRACTS B, I, & X, LOT 1D



VALUE SUMMARY

Category	2020	2019	2018
Market Value	\$830,250	\$743,520	\$771,270
Agricultural Land Value	\$0	\$0	\$0
Assessed Value Non-School	\$817,870	\$743,520	\$771,270
Assessed Value School	\$830,250	\$743,520	\$771,270
Homestead Exemption	\$0	\$0	\$0
Additional Homestead	\$0	\$0	\$0
Other Exemptions	\$0	\$0	\$0
Taxable Value Non-School	\$817,870	\$743,520	\$771,270
Taxable Value School	\$830,250	\$743,520	\$771,270

SALES/TRANSFERS

Date	Price	Type	Deed
02/17/2011	\$550,000	WD	6339/2535
04/15/2010	--	CT	6148/1799
12/01/1995	\$1,000	QC	3532/2148

No Data Found

ADDITIONAL EXTRA FEATURES

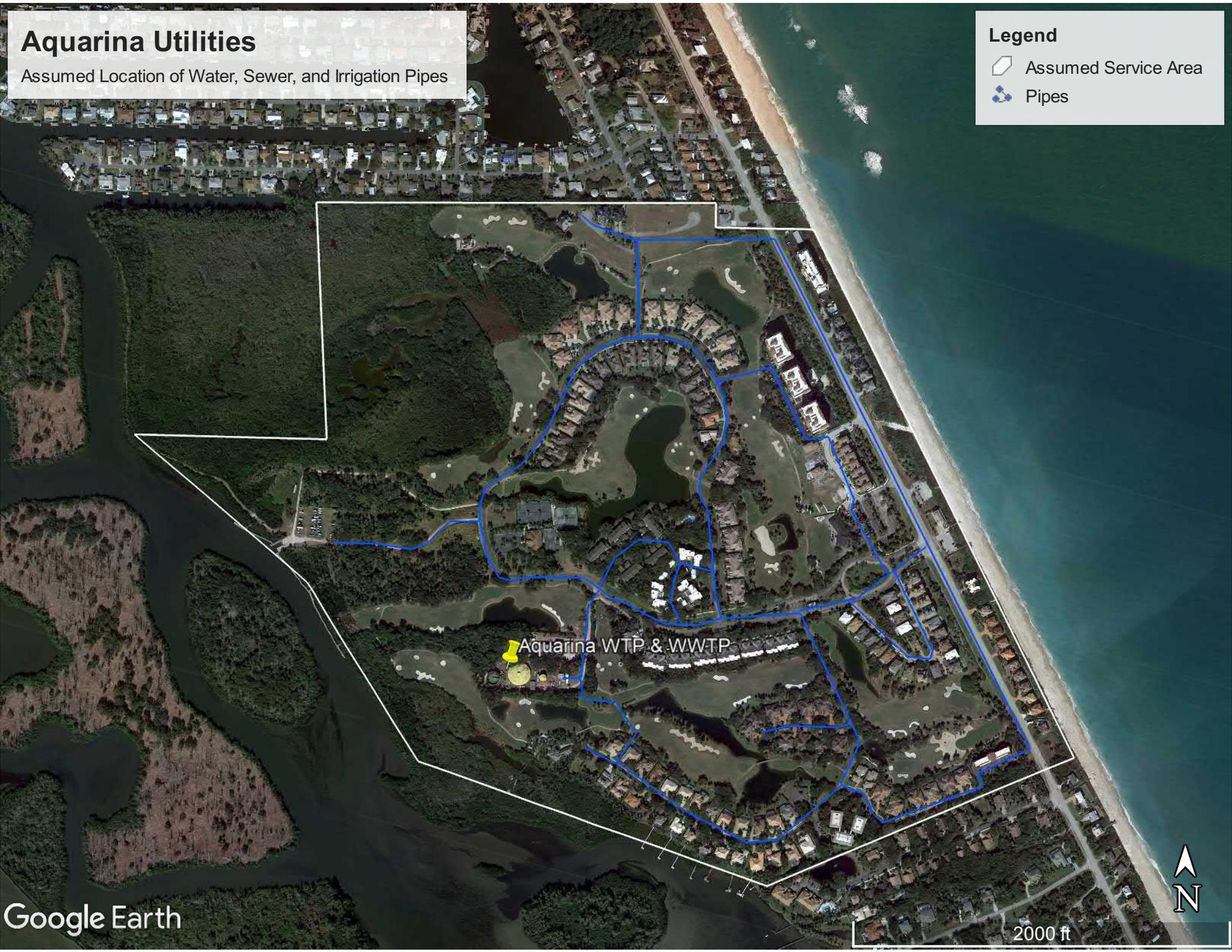
Description	Units
Water Treatment 0 To 500,000 Gpd	300,000
Treatment Plant - Wastewater Greater Than OR Equal To 100,000	300,000

Aquarina Utilities

Assumed Location of Water, Sewer, and Irrigation Pipes

Legend

-  Assumed Service Area
-  Pipes



Aquarina WTP & WWTP



State of Florida



Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: October 19, 2015
TO: Carlotta S. Stauffer, Commission Clerk, Office of Commission Clerk
FROM: Clayton Lewis, US Engineering Specialist, Division of Engineering *CKL*
RE: Docket No. 150010-WS- Application for staff-assisted rate case in Brevard County by Aquarina Utilities, Inc.

Please file the attached Aquarina Utilities Final Evoqua quote for the R/O system in the above mentioned Docket File.

Thank you.

Terri Jones

From: Clayton Lewis
Sent: Monday, October 19, 2015 8:49 AM
To: Terri Jones
Cc: Laura King; Stan Rieger
Subject: Quote for Evoqua Reverse Osmosis system - Aquarina Utilities, Inc. - Docket 150010
Attachments: Evoqua Reverse Osmosis Quote Final.pdf

Please file in Docket 150010 – Aquarina Utilities.

Thank you

From: Kevin Burge [<mailto:aquarinautilities@bellsouth.net>]
Sent: Friday, October 16, 2015 10:28 AM
To: Clayton Lewis
Subject: Aquarina Utilities, Inc.

Dear Clayton,

Please find attached the "final" Evoqua quote for the R/O system at Aquarina Utilities, Inc. for our SARC. It does NOT include the cost of installation- apparently we do that- plumbing and electrical- but we will handle that, if you can just get this in to finish up the rate case.

Thanks so much for your patience- the vendor finally told us (information we could have used several month ago) that they usually take 6 months to a year to do a comprehensive quote for a potable water system...

Let us know if we need anything else-

Holly Burge
Account Manager; Aquarina Utilities, Inc.



Proposal For: Aquarina Utilities, Inc.
 Kevin Burge
 7500 S Hwy A1A
 Melbourne Beach, FL 32951
 Phone: 772-708-8350
 aquarinautilities@bellsouth.net

Kevin Barnes
 Evoqua Water Technologies LLC
 4506 L.B McLeod Road, Suite C
 Orlando, FL 32811
 Phone: (407) 496-3877
 kevin.barnes@evoqua.com

Kevin:

Please see attached our firm quote for both the M83 RO and the associated preventative maintenance agreement for this machine only. Per our site visit last week on Friday, October 9 2015, my service manager and I discovered the following:

Current Situation:

You have a single 60 gpm US Filter Valuemax RO (purchased in 2006) being fed by well water to provide to the community. This RO permeate is blended with well water then treated to meet potable standards. The pretreatment consists of filtration and antiscalant feed to reduce scaling of the RO membranes. There have been no recorded issues with the RO or membranes and our evaluation is that the machine is making RO quality water with minimal backpressure. There is an old skid platform that was used for an RO that is no longer on site.

Desired Situation:

You wish to have an additional 90 gpm RO as primary and use the 60 gpm Valuemax as backup with rotation of the units as necessary. You wish to stage the new RO in the location of the previous RO. This quotation is to provide a new RO only to be added as primary.

ITEM PRICING

Item Number	Description	Reference Number	Qty	Unit Price	Extended Price
W3T85209	RO, M83 18-MEM ECONO ILEC DVRT 460V	M83R018ESYCD	1 EA	\$47,687.20	\$47,687.20
W3TSP4148	LABOR - SYSTEM INSTALLATION	LABOR-SYS INSTALL	32 H	\$142.00	\$4,544.00
				Subtotal:	\$52,231.20
				Total Price:	\$52,231.20

Payment Terms and Delivery

PO Terms

Purchaser acknowledges that Seller is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal and usage of the goods and/or services provided under the Contract, including any export license requirements. Purchaser agrees that such goods and/or services shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Seller of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. PURCHASER AGREES TO INDEMNIFY AND HOLD SELLER HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.

Shipping Information:

- Freight is FOB - Free on board, freight prepaid and add to invoice.
- Shipping Account Number:

Terms:

- This quote is valid until 12/14/2015
- Payment terms are N30 - Net 30 days with proper credit, and are subject to the attached Evoqua Water Technologies LLC Terms and Conditions
- Pricing listed does not include applicable sales tax.
- New customers are pre-approved to \$1,000. All others will need to fill out a credit application and submit a hardcopy PO (or a "No PO Form").
- We require hard documentation of your ordering for Evoqua to process your order. For your convenience, we can start processing your order by signing and returning:
 - Fax to: (407) 650-3565
 - or Email to: kevin.barnes@evoqua.com
- You may also mail this to:
 - Evoqua Water Technologies LLC
 - 4506 L.B McLeod Road, Suite C
 - Orlando, FL 32811

Project Scope and Responsibilities

SCOPE #	SCOPE DESCRIPTION	Aquarina	EVOQUA	APPLICABLE	NON-APPLICABLE
1	All plumbing utilities to and from the system connection points. RO permeate, concentrate and feed water to be plumbed and connected by others.	X		X	
2	All labor & materials to install interconnecting "control" wiring between skids and components within the boundaries of the system location.		X	X	
3	All labor and materials to install and terminate "full-load" electrical power to local panels and receptacles.	X		X	
4	Equipment off-loading.	X		X	
5	Equipment placement.	X		X	
6	Concrete slabs, structural work or housecleaning pads.	X		X	
7	Core drilling and wall penetrations.	X		X	
8	Heavy equipment such as crane, forklift, man-lift etc.	X		X	
9	Equipment to be installed on the ground floor with easy access.	X		X	
10	Estimate based on normal working hours 8:00am - 5:00pm, Monday - Friday and non-union labor.			X	
11	Revise project drawings to as-built status.				X
12	Pipe & conduit elevation estimated to be no higher than 10' feet above floor, is easily accessible and can be supported by existing structure.	X		X	
13	System Startup.		X	X	
14	Expendables such as membranes and pre-filters provided and loaded at start-up		X	X	

SCOPE #	SCOPE DESCRIPTION	Aquarina	EVOQUA	APPLICABLE	NON-APPLICABLE
15	Completion of Startup Data Documents.		X	X	
16	Operator Training. ___2___ hour (s).		X	X	
17	Standard OEM Manual: 1 copy (s).		X	X	
18	Formal Submittal: 1 copy (s).				X
19	Informal Submittals: _____ copy(s).				X
20	Off-site and/or special analytical testing.				X
21	Travel hours and mileage to and from the jobsite.		X	X	
22	Overnight Travel expenses.				X
23	Freight cost for equipment & materials.	X		X	
24	Demolition of existing equipment.				X
25	Disposal of equipment, medias or materials.				X
26	Unloading/loading of expendables in existing equipment.				X
27	Re-installation of existing equipment.				X
28	Startup of existing equipment.				X
29	Neutralization of waste water before discharge.				X
30	Insulation and heat tracing of piping.				X
31	Standard security requirements.				X
32	Special safety training requirements.				X
33	Component field tagging and identification.				X
34	Labeling of field installed piping and electrical components.	X			X
35	Validation and/or commissioning support.				X
36	Estimate good for 60 days.			X	

Standard Exclusions

The following is a list of items not normally included with our equipment or assembly and startup services. They are only included if specifically stated otherwise in writing:

- Permits, building inspections, taxes or duties.
- Indoor location for equipment with suitable heat, light and ventilation.
- Civil or concrete work.
- Core drilling or wall penetrations.
- Floor drains, adequately sized and located.
- Weekend or non-day shift work.
- Union or licensed plumbing labor or labor subject to prevailing wage determinations.
- Water main.
- Back-flow preventer(s).
- Electrical load center(s).
- Water heater(s).
- Insulation or heat tracing.
- Gas lines.
- Storage of equipment.
- Demolition, disposal or other work related to existing equipment.
- Field labeling of components or piping.
- Validation assistance or (IQ/OQ/PQ) services.
- Software licenses for programming by others of any supplied PLC or HMI components.

Standard Assumptions

The following is a list of items that apply to all Evoqua Water Technologies projects. These assumptions are in effect unless specifically stated otherwise in writing:

- Interconnecting piping can be supported from walls adjacent to the equipment. Free standing pipe or equipment supports are not required.
- Pipe elevation is no higher than 10 ft above finished floor and easily accessible.
- Equipment is to be installed on a ground floor location with free and clear access.
- All labor estimates are based on normal working hours from 8:00 am - 5:00 pm, Monday - Friday
- Travel time, expenses and mileage to and from customer job site are included in our estimates.

Evoqua Water Technologies Recommendations for Water Damage Prevention

Operator error and unexpected events such as fork-lift induced tank nozzle snap-off, etc. could create a room flooding event. In order to minimize water damage, please consider the recommendations below:

- Install the water treatment system in the basement.
- Properly slope the floor to sumps or floor drains.
- Coat the water treatment room with a water proof sealant.
- Contain the water treatment room (including the door entrance) with a four inch high curb.
- Install a sump pump with level controls to pump out an overflowing sump to a drainage ditch.

- Oversize the floor drains in the water treatment room.
- Set any sensitive equipment on the same floor as the water treatment room and floors below the water treatment room on housekeeping pads.
- If the water purification system must be located above other floors, install drip covers over sensitive equipment located on the floors below.
- Train all personnel where the water system isolation valve is so they can shut-off the feed water supply to the water purification system in an emergency.

EQUIPMENT SERVICES

Preventative Maintenance Agreement - RECOMMENDED

I am pleased to present this Preventative Maintenance Service Agreement proposal for the Evoqua Water Purification system.

This proposal includes a price quotation for the proposed services and a "**Preventative Maintenance Service Agreement**" document, which defines the terms of the maintenance services. In general, the Preventative Maintenance Agreement Program:

- Provides documentation of component operations
- Provides documentation on PM work instructions
- Reduces the likelihood of a major system failure.
- Allows you to schedule downtime for critical services and repairs at YOUR convenience.
- Provides savings through automatic discounts of 10% on Evoqua catalog replacement parts.
- Generally reduces repair costs and protects against unscheduled downtime.
- Provides an annual projected operations cost for services and expendables.
- Provides Priority Emergency Service.

Evoqua Preventative Maintenance Service Agreements provide our customers with:

- Enhanced sustainability and reliability of your water treatment system.
- Extends the life expectancy of your water treatment system.
- Reduces the overall operational costs of your water treatment system.

COVERED EQUIPMENT AND PRICING

The following is a list of the equipment and/or components covered under the service contract and the pricing for the services. Maintenance services in Contracted Services will be provided for the following equipment:

Equipment Order Number	Equipment Description	Qty
W3T85209	RO, M83 18-MEM ECONO ILEC DVRT 460V	1

Equipment Services Pricing

This Preventative Maintenance Service Agreement covers the period from **11/01/2015** to **10/31/2015**
The Annual Contract Value will be **\$4,652** billable semi-annually @ **\$2,326** on a net 30 days term. Optional billing frequencies are available.

Scheduled visits will be on a semi-annual basis. Catalog repair parts will be offered at a > 10% discount off Evoqua Water Technologies published list price. Contracted materials are already discounted at > 10%.

NOTE: Any Service or products that exceed the quantities listed will be billed at the current contract prices. Items not listed will be billed separately. If we are unable to service the site as prearranged, extra trip charges may be incurred.

NOTE: Water containment is the responsibility of the user and is not the responsibility of Evoqua Water Technologies LLC.

CUSTOMER CONTRACT INFORMATION

ACCEPTANCE:

Purchase Order No.
Date:

Tax Exempt No.
Date:

EVOQUA REPRESENTATIVE

By:
Authorized Signature
Title:

CUSTOMER

By:
Customer
Title:

CONTRACTED SERVICES

Detailed below is a list of maintenance services and frequencies to be provided on the equipment listed in COVERED EQUIPMENT

Reverse Osmosis System Vantage Series M83 - Model: M83R018ESYCD RO, M83 18-MEM ECONO ILEC DVRT 460V			
DESCRIPTION	PM ID	SMART PM ID	FREQUENCY
ADJUST FLOWS AND OR PRESSURES[Adjust flows as required and or pressures]	W3TSP4344	PM000-RO-AD-SOP	Semi-Annual
ROUNDS AND READINGS	W3TSP4349	PM000-RRD-SOP	Semi-Annual



CONTRACTED MATERIALS

The materials listed below, will be provided as part of the Preventative Maintenance Service Agreement. If additional catalog materials are required, they will be available at a 10% discount.

Reverse Osmosis System Vantage Series M83 - Model: M83R018ESYCD			
RO, M83 18-MEM ECONO ILEC DVRT 460V			
EWT PART No	DESCRIPTION	QTY PER EXCHANGE	TOTAL PER CONTRACT
W2T177355	ROUND HOUSE PREFILTERS-INSTALL PER PM	7	14

ADDITIONAL CONSUMABLES NOT INCLUDED IN CONTRACT

Changing of the pretreatment filters between maintenance visits will be the responsibility of the customer. The below consumables can be purchased on as needed basis.

Item Number	Description	Reference Number	Qty	Unit Price
W2T177355	ROUND HOUSE PREFILTERS		1	\$7.00 ea.
W2T127167	M83 MEMBRANES		1	\$615 ea.

ADDITIONAL SERVICES

Additional emergency or service visits are billed at the following rates:

Normal Business Hours: Monday through Friday 8:00 a.m. to 4:00 pm	\$142.00/hr	2 hour minimum
After Normal Business Hours	\$213.00/hr	2 hour minimum
Weekends:		
Saturdays:	\$213.00/hr	3 hour minimum
Sundays:	\$213.00/hr	3 hour minimum

The above rates include travel time to and from the system location. Additional time on site above the minimum will be billed in increments of full hours only.

CUSTOMER RESPONSIBILITY

Detailed below is a list of the customer's responsibilities for providing continual maintenance of the system.

1. Monitor the system daily and record the operating parameters as required in the O & M manual logs or the provided SOP Rounds and Readings Sheets.
2. Perform the Daily and Weekly Preventative Maintenance Tasks as required in the recommended maintenance per unit technology in the O&M manual.
3. Notify EVOQUA Water Technologies by the next business day of any malfunction or operation of the system outside normal operating conditions, as specified upon start-up.
4. Provide for and supply all necessary utilities. Notify EVOQUA Water Technologies by the next business day, of any change in feed water characteristics or the volume of water used.
5. The customer will either provide the labor and/or materials or issue a supplemental Purchase Order for:
 - a. To change expendable DI cartridges, service DI, and filter, if required between scheduled PM Service visits.
 - b. Any additional sanitizations, if required, between scheduled PM Service visits.
 - c. Any repairs that are not specifically covered under the CONTRACTED PREVENTATIVE MAINTENANCE SERVICES of this contract.
6. Provide a minimum of 4 hours down time of the system, for EVOQUA Water Technologies to perform each scheduled PM Service visit.
7. The Customer is suggested to have an inventory of spare parts that are considered typical ware parts. Please consult the manual for a list of suggested spare parts or contact our local EVOQUA Branch Aftermarket Parts Department for the recommend spares for your water treatment system.

Standard Terms :

Standard Terms of Sale

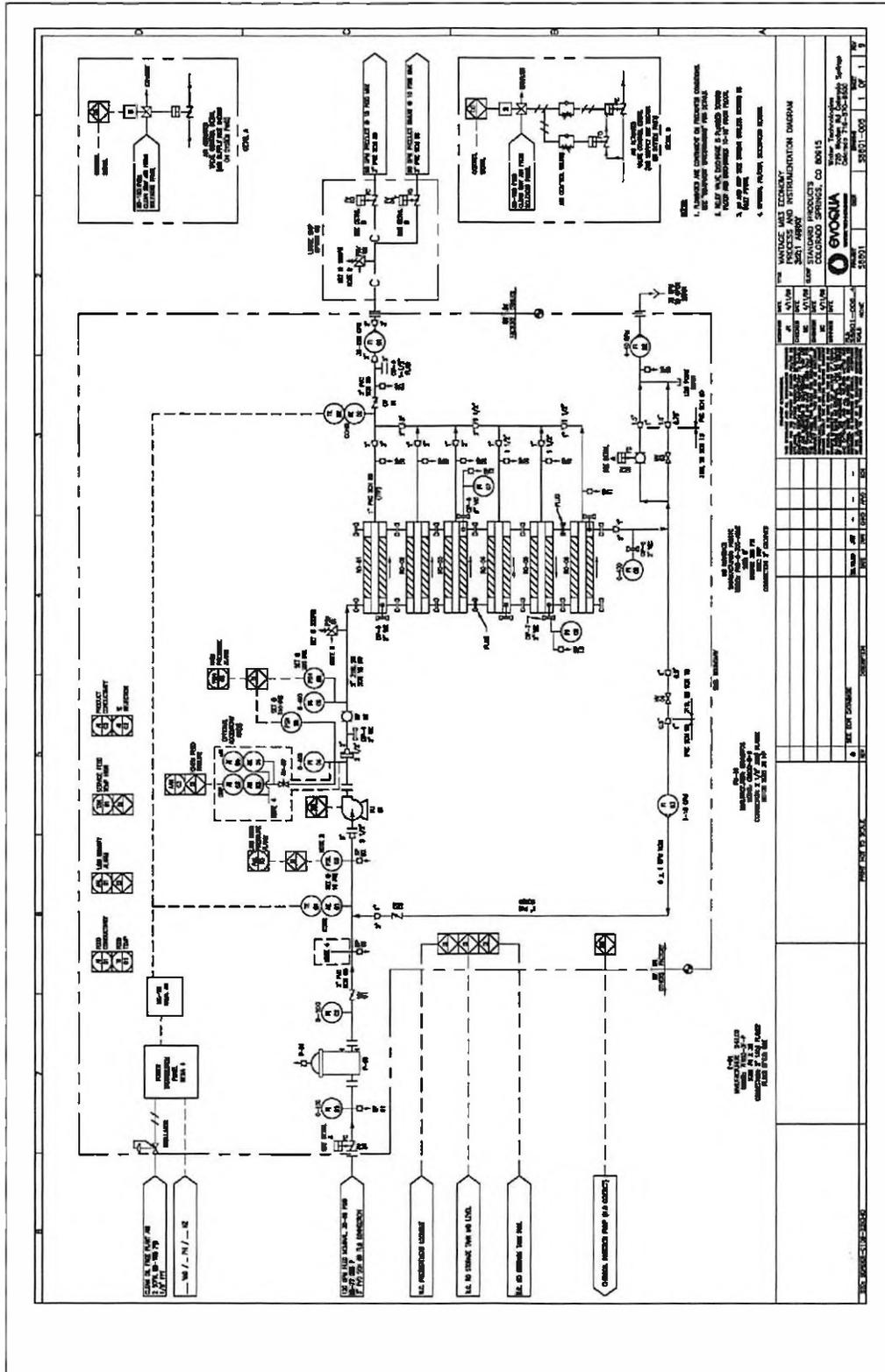
1. **Applicable Terms.** These terms govern the purchase and sale of equipment, products, related services, leased products, and media goods if any (collectively herein "Work"), referred to in Seller's proposal ("Seller's Documentation"). Whether these terms are included in an offer or an acceptance by Seller, such offer or acceptance is expressly conditioned on Buyer's assent to these terms. Seller rejects all additional or different terms in any of Buyer's forms or documents.
2. **Payment.** Buyer shall pay Seller the full purchase price as set forth in Seller's Documentation. Unless Seller's Documentation specifically provides otherwise, freight, storage, insurance and all taxes, levies, duties, tariffs, permits or license fees or other governmental charges relating to the Work or any incremental increases thereto shall be paid by Buyer. If Seller is required to pay any such charges, Buyer shall immediately reimburse Seller. If Buyer claims a tax or other exemption or direct payment permit, it shall provide Seller with a valid exemption certificate or permit and indemnify, defend and hold Seller harmless from any taxes, costs and penalties arising out of same. All payments are due within 30 days after receipt of invoice. Buyer shall be charged the lower of 1 ½% interest per month or the maximum legal rate on all amounts not received by the due date and shall pay all of Seller's reasonable costs (including attorneys' fees) of collecting amounts due but unpaid. All orders are subject to credit approval by Seller. Back charges without Seller's prior written approval shall not be accepted.
3. **Delivery.** Delivery of the Work shall be in material compliance with the schedule in Seller's Documentation. Unless Seller's Documentation provides otherwise, delivery terms are ExWorks Seller's factory (Incoterms 2010). Title to all Work shall pass upon receipt of payment for the Work under the respective invoice. Unless otherwise agreed to in writing by Seller, shipping dates are approximate only and Seller shall not be liable for any loss or expense (consequential or otherwise) incurred by Buyer or Buyer's customer if Seller fails to meet the specified delivery schedule.
4. **Ownership of Materials and Licenses.** All devices, designs (including drawings, plans and specifications), estimates, prices, notes, electronic data, software and other documents or information prepared or disclosed by Seller, and all related intellectual property rights, shall remain Seller's property. Seller grants Buyer a non-exclusive, non-transferable license to use any such material solely for Buyer's use of the Work. Buyer shall not disclose any such material to third parties without Seller's prior written consent. Buyer grants Seller a non-exclusive, non-transferable license to use Buyer's name and logo for marketing purposes, including but not limited to, press releases, marketing and promotional materials, and web site content.
5. **Changes.** Neither party shall implement any changes in the scope of Work described in Seller's Documentation without a mutually agreed upon change order. Any change to the scope of the Work, delivery schedule for the Work, any Force Majeure Event, any law, rule, regulation, order, code, standard or requirement which requires any change hereunder shall entitle Seller to an equitable adjustment in the price and time of performance.
6. **Force Majeure Event.** Neither Buyer nor Seller shall have any liability for any breach or delay (except for breach of payment obligations) caused by a Force Majeure Event. If a Force Majeure Event exceeds six (6) months in duration, the Seller shall have the right to terminate the Agreement without liability, upon fifteen (15) days written notice to Buyer, and shall be entitled to payment for work performed prior to the date of termination. "Force Majeure Event" shall mean events or circumstances that are beyond the affected party's control and could not reasonably have been easily avoided or overcome by the affected party and are not substantially attributable to the other party. Force Majeure Event may include, but is not limited to, the following circumstances or events: war, act of foreign enemies, terrorism, riot, strike, or lockout by persons other than by Seller or its sub-suppliers, natural catastrophes or (with respect to on-site work), unusual weather conditions.
7. **Warranty.** Subject to the following sentence, Seller warrants to Buyer that the (i) Work shall materially conform to the description in Seller's Documentation and shall be free from defects in material and workmanship and (ii) the Services shall be performed in a timely and workmanlike manner. Determination of suitability of treated water for any use by Buyer shall be the sole and exclusive responsibility of Buyer. The foregoing warranty shall not apply to any Work that is specified or otherwise demanded by Buyer and is not manufactured or selected by Seller, as to which (i) Seller hereby assigns to Buyer, to the extent assignable, any warranties made to Seller and (ii) Seller shall have no other liability to Buyer under warranty, tort or any other legal theory. The Seller warrants the Work, or any components thereof, through the earlier of (i) eighteen (18) months from delivery of the Work or (ii) twelve (12) months from initial operation of the Work or ninety (90) days from the performance of services (the "Warranty Period"). If Buyer gives Seller prompt written notice of breach of this warranty within the Warranty Period, Seller shall, at its sole option and as Buyer's sole and exclusive remedy, repair or replace the subject parts, re-perform the Service or refund the purchase price. Unless otherwise agreed to in writing by Seller, (i) Buyer shall be responsible for any labor required to gain access to the Work so that Seller can assess the available remedies and (ii) Buyer shall be responsible for all costs of installation of repaired or replaced Work. If Seller determines that any claimed breach is not, in fact, covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. Seller's warranty is conditioned on Buyer's (a) operating and maintaining the Work in accordance with Seller's instructions, (b) not making any unauthorized repairs or alterations, and (c) not being in default of any payment obligation to Seller. Seller's warranty does not cover (i) damage caused by chemical action or abrasive material, misuse or improper installation (unless installed by Seller) and (ii) media goods (such as, but not limited to, resin, membranes, or granular activated carbon media) once media goods are installed. THE WARRANTIES SET FORTH IN THIS SECTION 7 ARE THE SELLER'S SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO THE LIMITATION OF LIABILITY PROVISION BELOW. SELLER MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE.
8. **Indemnity.** Seller shall indemnify, defend and hold Buyer harmless from any claim, cause of action or liability incurred by Buyer as a result of third party claims for personal injury, death or damage to tangible property, to the extent caused by Seller's negligence. Seller shall have the sole authority to direct the defense of and settle any indemnified claim. Seller's indemnification is conditioned on Buyer (a) promptly, within the Warranty Period, notifying Seller of any claim, and (b) providing reasonable cooperation in the defense of any claim.

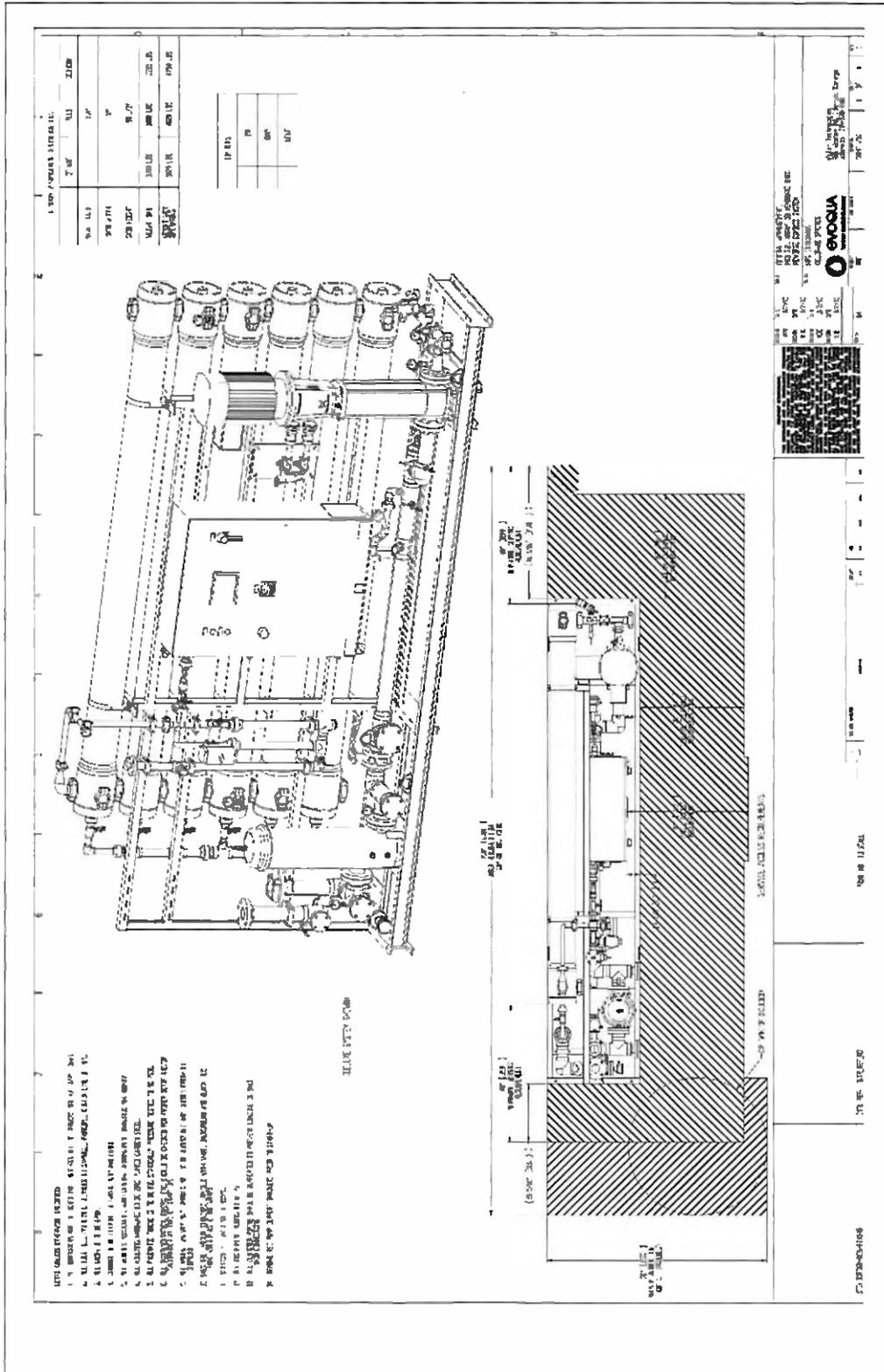
9. **Assignment.** Neither party may assign this Agreement, in whole or in part, nor any rights or obligations hereunder without the prior written consent of the other party; provided, however, the Seller may assign its rights and obligations under these terms to its affiliates or in connection with the sale or transfer of the Seller's business and Seller may grant a security interest in the Agreement and/or assign proceeds of the agreement without Buyer's consent.
10. **Termination.** Either party may terminate this agreement, upon issuance of a written notice of breach and a thirty (30) day cure period, for a material breach (including but not limited to, filing of bankruptcy, or failure to fulfill the material obligations of this agreement). If Buyer suspends an order without a change order for ninety (90) or more days, Seller may thereafter terminate this Agreement without liability, upon fifteen (15) days written notice to Buyer, and shall be entitled to payment for work performed, whether delivered or undelivered, prior to the date of termination.
11. **Dispute Resolution.** Seller and Buyer shall negotiate in good faith to resolve any dispute relating hereto. If, despite good faith efforts, the parties are unable to resolve a dispute or claim arising out of or relating to this Agreement or its breach, termination, enforcement, interpretation or validity, the parties will first seek to agree on a forum for mediation to be held in a mutually agreeable site. If the parties are unable to resolve the dispute through mediation, then *any dispute, claim or controversy arising out of or relating to this Agreement or the breach, termination, enforcement, interpretation or validity thereof, including the determination of the scope or applicability of this agreement to arbitrate, shall be determined by arbitration in Pittsburgh, Pennsylvania before three arbitrators who are lawyers experienced in the discipline that is the subject of the dispute and shall be jointly selected by Seller and Buyer. The arbitration shall be administered by JAMS pursuant to its Comprehensive Arbitration Rules and Procedures. The Arbitrators shall issue a reasoned decision of a majority of the arbitrators, which shall be the decision of the panel. Judgment may be entered upon the arbitrators' decision in any court of competent jurisdiction. The substantially prevailing party as determined by the arbitrators shall be reimbursed by the other party for all costs, expenses and charges, including without limitation reasonable attorneys' fees, incurred by the prevailing party in connection with the arbitration. For any order shipped outside of the United States, any dispute shall be referred to and finally determined by the International Center for Dispute Resolution in accordance with the provisions of its International Arbitration Rules, enforceable under the New York Convention (Convention on the Recognition and Enforcement of Foreign Arbitral Awards) and the governing language shall be English.*
12. **Export Compliance.** Buyer acknowledges that Seller is required to comply with applicable export laws and regulations relating to the sale, exportation, transfer, assignment, disposal and usage of the Work provided under this Agreement, including any export license requirements. Buyer agrees that such Work shall not at any time directly or indirectly be used, exported, sold, transferred, assigned or otherwise disposed of in a manner which will result in non-compliance with such applicable export laws and regulations. It shall be a condition of the continuing performance by Seller of its obligations hereunder that compliance with such export laws and regulations be maintained at all times. BUYER AGREES TO INDEMNIFY AND HOLD SELLER HARMLESS FROM ANY AND ALL COSTS, LIABILITIES, PENALTIES, SANCTIONS AND FINES RELATED TO NON-COMPLIANCE WITH APPLICABLE EXPORT LAWS AND REGULATIONS.
13. **LIMITATION OF LIABILITY.** NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES, AND SELLER'S TOTAL LIABILITY ARISING AT ANY TIME FROM THE SALE OR USE OF THE WORK, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR ALL WARRANTY CLAIMS OR FOR ANY BREACH OR FAILURE TO PERFORM ANY OBLIGATION UNDER THE CONTRACT, SHALL NOT EXCEED THE PURCHASE PRICE PAID FOR THE WORK. THESE LIMITATIONS APPLY WHETHER THE LIABILITY IS BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY.
14. **Rental Equipment / Services.** Any leased or rented equipment ("Leased Equipment") provided by Seller shall at all times be the property of Seller with the exception of certain miscellaneous installation materials purchased by the Buyer, and no right or property interest is transferred to the Buyer, except the right to use any such Leased Equipment as provided herein. Buyer agrees that it shall not pledge, lend, or create a security interest in, part with possession of, or relocate the Leased Equipment. Buyer shall be responsible to maintain the Leased Equipment in good and efficient working order. At the end of the initial term specified in the order, the terms shall automatically renew for the identical period unless canceled in writing by Buyer or Seller not sooner than three (3) months nor later than one (1) month from termination of the initial order or any renewal terms. Upon any renewal, Seller shall have the right to issue notice of increased pricing which shall be effective for any renewed terms unless Buyer objects in writing within fifteen (15) days of issuance of said notice. If Buyer timely cancels service in writing prior to the end of the initial or any renewal term this shall not relieve Buyer of its obligations under the order for the monthly rental service charge which shall continue to be due and owing. Upon the expiration or termination of this Agreement, Buyer shall promptly make any Leased Equipment available to Seller for removal. Buyer hereby agrees that it shall grant Seller access to the Leased Equipment location and shall permit Seller to take possession of and remove the Leased Equipment without resort to legal process and hereby releases Seller from any claim or right of action for trespass or damages caused by reason of such entry and removal.
15. **Miscellaneous.** These terms, together with any Contract Documents issued or signed by the Seller, comprise the complete and exclusive statement of the agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Seller. No part of the Agreement may be changed or cancelled except by a written document signed by Seller and Buyer. No course of dealing or performance, usage of trade or failure to enforce any term shall be used to modify the Agreement. To the extent the Agreement is considered a subcontract under Buyer's prime contract with an agency of the United States government, in case of Federal Acquisition Regulations (FARs) flow down terms, Seller will be in compliance with Section 44.403 of the FAR relating to commercial items and those additional clauses as specifically listed in 52.244-6, Subcontracts for Commercial Items (OCT 2014). If any of these terms is unenforceable, such term shall be limited only to the extent necessary to make it enforceable, and all other terms shall remain in full force and effect. The Agreement shall be governed by the laws of the Commonwealth of Pennsylvania without regard to its conflict of laws provisions. Both Buyer and Seller reject the applicability of the United Nations Convention on Contracts for the international sales of goods to the relationship between the parties and to all transactions arising from said relationship.

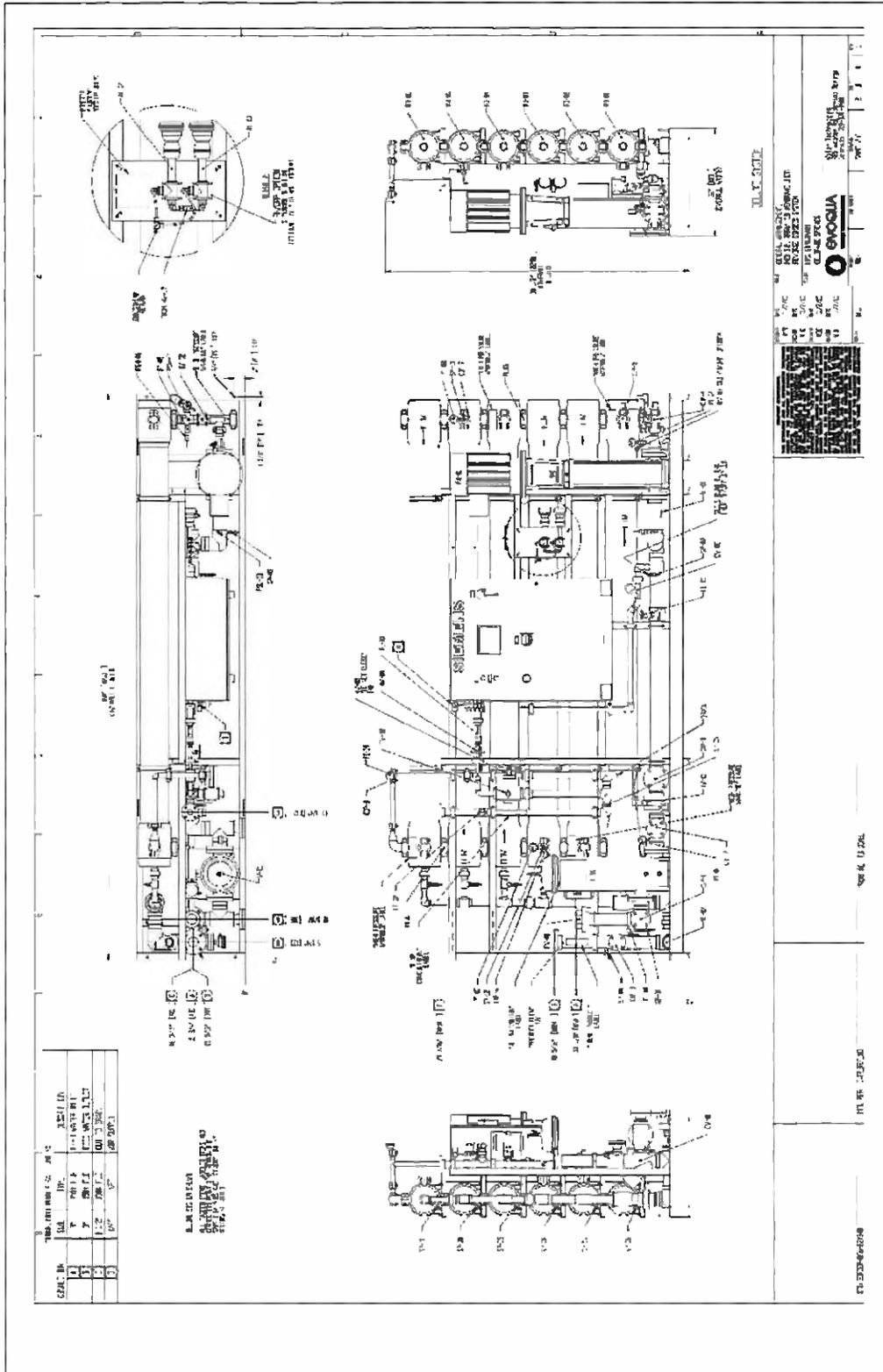
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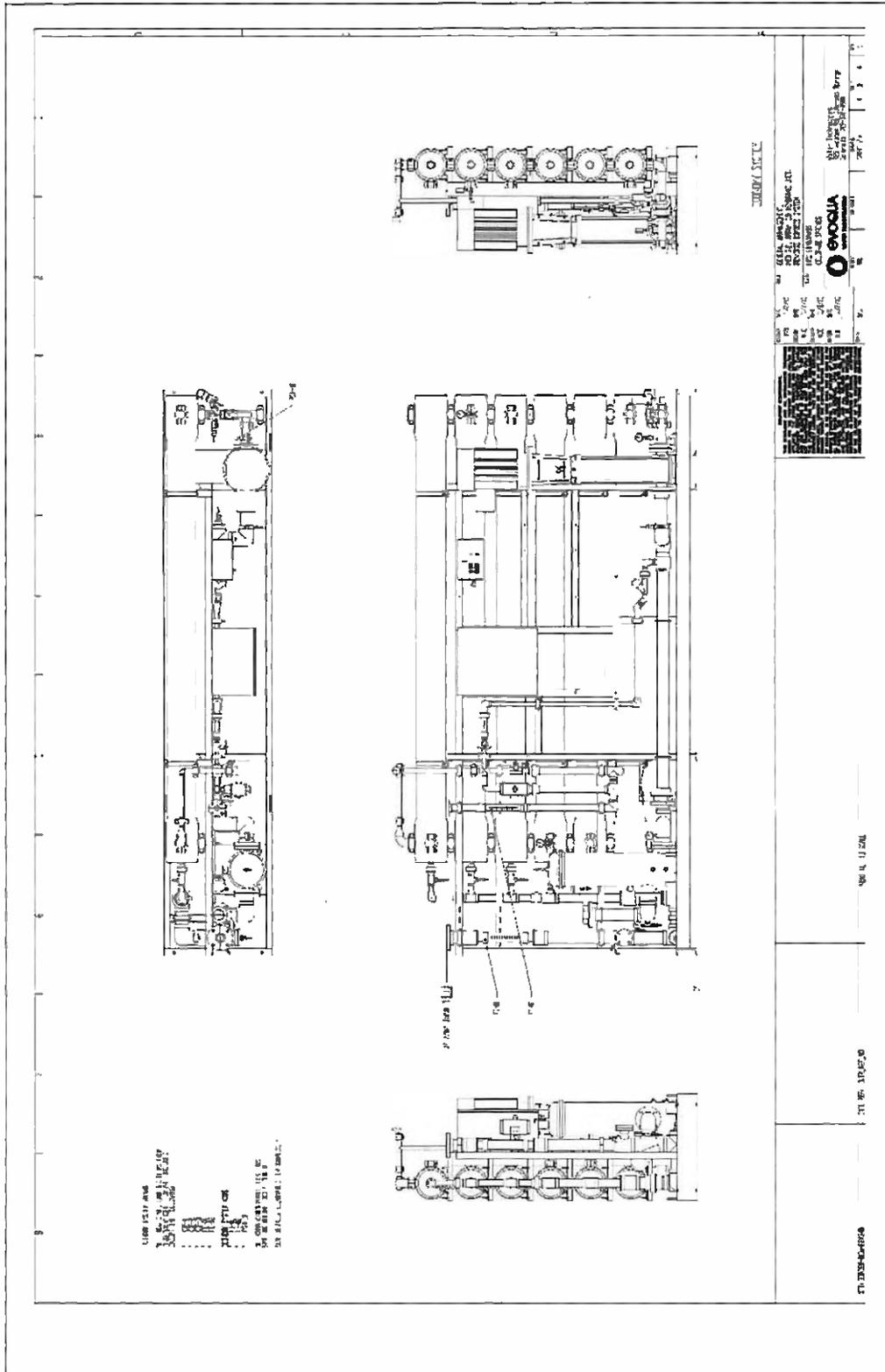
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Wastewater Technology Fact Sheet Package Plants

DESCRIPTION

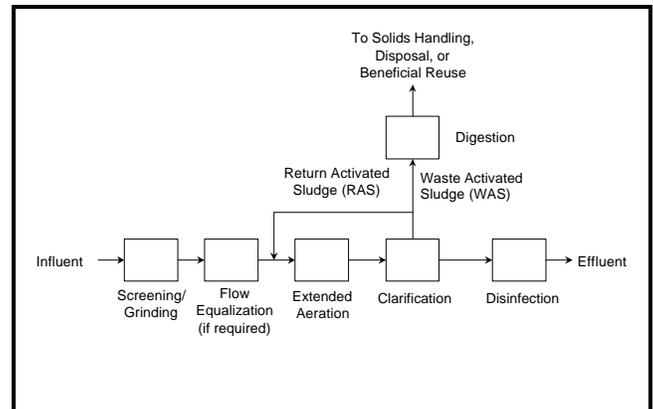
Package plants are pre-manufactured treatment facilities used to treat wastewater in small communities or on individual properties. According to manufacturers, package plants can be designed to treat flows as low as 0.002 MGD or as high as 0.5 MGD, although they more commonly treat flows between 0.01 and 0.25 MGD (Metcalf and Eddy, 1991).

The most common types of package plants are extended aeration plants, sequencing batch reactors, oxidation ditches, contact stabilization plants, rotating biological contactors, and physical/chemical processes (Metcalf and Eddy, 1991). This fact sheet focuses on the first three, all of which are biological aeration processes.

Extended aeration plants

The extended aeration process is one modification of the activated sludge process which provides biological treatment for the removal of biodegradable organic wastes under aerobic conditions. Air may be supplied by mechanical or diffused aeration to provide the oxygen required to sustain the aerobic biological process. Mixing must be provided by aeration or mechanical means to maintain the microbial organisms in contact with the dissolved organics. In addition, the pH must be controlled to optimize the biological process and essential nutrients must be present to facilitate biological growth and the continuation of biological degradation.

As depicted in Figure 1, wastewater enters the treatment system and is typically screened



Source: Parsons Engineering Science, 2000.

**FIGURE 1 PROCESS FLOW DIAGRAM
FOR A TYPICAL EXTENDED AERATION
PLANT**

immediately to remove large suspended, settleable, or floating solids that could interfere with or damage equipment downstream in the process. Wastewater may then pass through a grinder to reduce large particles that are not captured in the screening process. If the plant requires the flow to be regulated, the effluent will then flow into equalization basins which regulate peak wastewater flow rates. Wastewater then enters the aeration chamber, where it is mixed and oxygen is provided to the microorganisms. The mixed liquor then flows to a clarifier or settling chamber where most microorganisms settle to the bottom of the clarifier and a portion are pumped back to the incoming wastewater at the beginning of the plant. This returned material is the return activated sludge (RAS). The material that is not returned, the waste activated sludge (WAS), is removed for treatment and disposal. The clarified wastewater then flows over a weir and into a collection channel before being diverted to the disinfection system.

Extended aeration package plants consist of a steel tank that is compartmentalized into flow equalization, aeration, clarification, disinfection, and aerated sludge holding/digestion segments. Extended aeration systems are typically manufactured to treat wastewater flow rates between 0.002 to 0.1 MGD. Use of concrete tanks may be preferable for larger sizes (Sloan, 1999).

Extended aeration plants are usually started up using "seed sludge" from another sewage plant. It may take as many as two to four weeks from the time it is seeded for the plant to stabilize (Sloan, 1999).

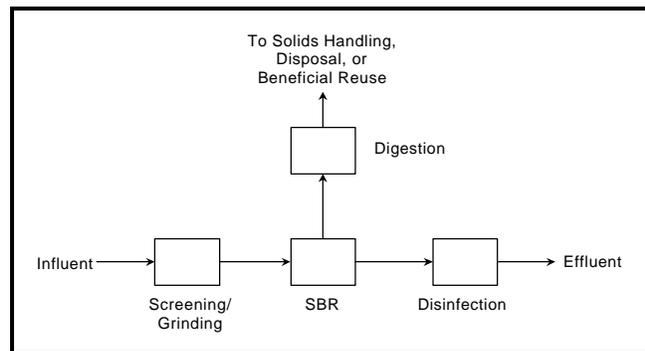
Sequencing batch reactors

A sequencing batch reactor (SBR) is a variation of the activated sludge process. As a fill and draw or batch process, all biological treatment phases occur in a single tank. This differs from the conventional flow through activated sludge process in that SBRs do not require separate tanks for aeration and sedimentation (Kappe, 1999). SBR systems contain either two or more reactor tanks that are operated in parallel, or one equalization tank and one reactor tank. The type of tank used depends on the wastewater flow characteristics (e.g. high or low volume). While this setup allows the system to accommodate continuous influent flow, it does not provide for disinfection or holding for aerated sludge.

There are many types of SBR systems, including continuous influent/time based, non-continuous influent/time based, volume based, an intermittent cycle system (a SBR that utilizes jet aeration), and various other system modifications based on different manufacturer designs. The type of SBR system used depends on site and wastewater characteristics as well as the needs of the area or community installing the unit. Package SBRs are typically manufactured to treat wastewater flow rates between 0.01 and 0.2 MGD; although flow rates can vary based on the system and manufacturer.

As seen in Figure 2, the influent flow first goes through a screening process before entering the SBR. The waste is then treated in a series of batch

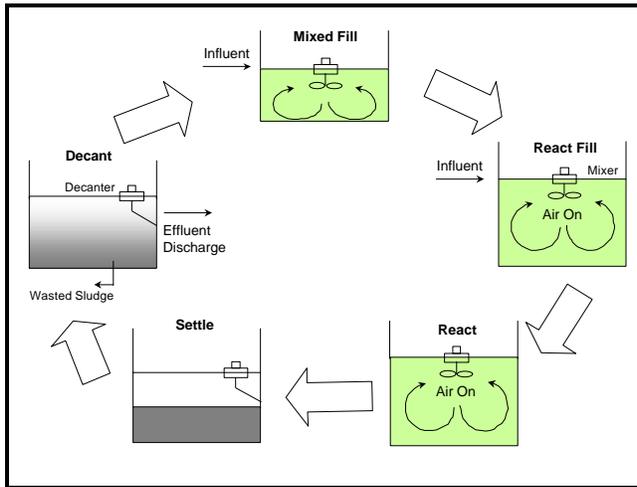
phases within the SBR to achieve the desired effluent concentration. The sludge that is wasted from the SBR moves on to digestion and eventually to solids handling, disposal, or beneficial reuse. The treated effluent then moves to disinfection. An equalization tank is typically needed before the disinfection unit in batch SBRs in order to store large volumes of water. If the flow is not equalized, a sizable filter may be necessary to accommodate the large flow of water entering the disinfection system. In addition, SBR systems typically have no primary or secondary clarifiers as settling takes place in the SBR.



Source: Parsons Engineering Science, 2000.

FIGURE 2 PROCESS FLOW DIAGRAM FOR A TYPICAL SBR

There are normally five phases in the SBR treatment cycle: fill, react, settle, decant, and idle. The length of time that each phase occurs is controlled by a programmable logic controller (PLC), which allows the system to be controlled from remote locations (Sloan, 1999). In the fill phase, raw wastewater enters the basin, where it is mixed with settled biomass from the previous cycle. Some aeration may occur during this phase. Then, in the react phase, the basin is aerated, allowing oxidation and nitrification to occur. During the settling phase, aeration and mixing are suspended and the solids are allowed to settle. The treated wastewater is then discharged from the basin in the decant phase. In the final phase, the basin is idle as it waits for the start of the next cycle. During this time, part of the solids are removed from the basin and disposed of as waste sludge (Kappe, 1999). Figure 3 shows this sequence of operation in an SBR.



Source: CASS Water Engineering, Inc., 2000.

FIGURE 3 SBR SEQUENCE OF OPERATION

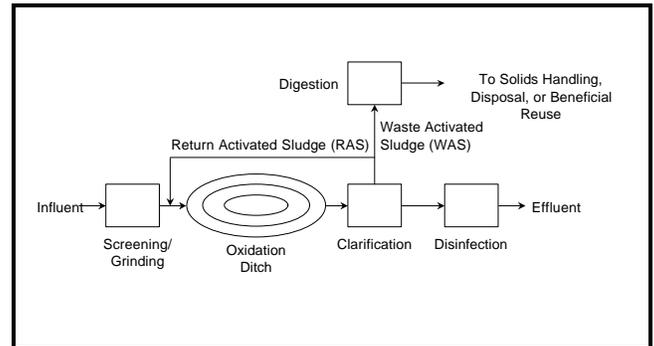
Sludge wasting is an important step in the SBR process and largely affects system performance. It is not considered a basic phase since the sludge is not wasted at a specific time period during the cycle. The quantity and rate of wasting is determined by performance requirements. An SBR system does not require an RAS system, as both aeration and settling occur in the same tank. This prevents any sludge from being lost during the react step and eliminates the need to return sludge from the clarifier to the aeration chamber (Metcalf and Eddy, 1991).

Oxidation ditches

An oxidation ditch, a modified form of the activated sludge process, is an aerated, long term, complete mix process. Many systems are designed to operate as extended aeration systems. Typical oxidation ditch treatment systems consist of a single or multi-channel configuration within a ring, oval, or horseshoe-shaped basin. Horizontally or vertically mounted aerators provide aeration, circulation, and oxygen transfer in the ditch.

Package oxidation ditches are typically manufactured in sizes that treat wastewater flow rates between 0.01 and 0.5 MGD. As seen in Figure 4, raw wastewater is first screened before entering the oxidation ditch. Depending on the system size and manufacturer type, a grit chamber may be required. Once inside the ditch, the

wastewater is aerated with mechanical surface or submersible aerators (depending on manufacturer design) that propel the mixed liquor around the channel at velocities high enough to prevent solids deposition. The aerator ensures that there is sufficient oxygen in the fluid for the microbes and adequate mixing to ensure constant contact between the organisms and the food supply (Lakeside, 1999).



Source: Parsons Engineering Science, 1999.

FIGURE 4 PROCESS FLOW DIAGRAM FOR A TYPICAL OXIDATION DITCH

Oxidation ditches tend to operate in an extended aeration mode consisting of long hydraulic and solids retention times which allow more organic matter to break down. Treated sewage moves to the settling tank or final clarifier, where the biosolids and water separate. Wastewater then moves to other treatment processes while sludge is removed. Part of it is returned to the ditch as RAS, while the rest is removed from the process as the waste activated sludge (WAS). WAS is wasted either continuously or daily and must be stabilized prior to disposal or beneficial reuse.

APPLICABILITY

In general, package treatment plants are applicable for areas with a limited number of people and small wastewater flows. They are most often used in remote locations such as trailer parks, highway rest areas, and rural areas.

Extended aeration plants

Extended aeration package plants are typically used in small municipalities, suburban subdivisions, apartment complexes, highway rest areas, trailer

parks, small institutions, and other sites where flow rates are below 0.1 MGD. These systems are also useful for areas requiring nitrification.

Sequencing batch reactors

Package plant SBRs are suitable for areas with little land, stringent treatment requirements, and small wastewater flows. More specifically, SBRs are appropriate for RV parks or mobile homes, campgrounds, construction sites, rural schools, hotels, and other small applications. These systems are also useful for treating pharmaceutical, brewery, dairy, pulp and paper, and chemical wastes. While constant cycles with time-fixed process phases are sufficient in most cases, phases should be individually adapted and optimized for each plant. SBRs are also suited for sites that need minimal operator attendance and that have a wide range of inflow and/or organic loadings.

Industries with high BOD loadings, such as chemical or food processing plants, will find SBRs useful for treating wastewater. These systems are also suitable for facilities requiring nitrification, denitrification, and phosphorous removal. Most significantly, SBRs are applicable for areas where effluent requirements can change frequently and become stricter, as these systems have tremendous flexibility to change treatment options. However, part of the economic advantage of the SBR process is lost when advanced treatment processes must be added downstream since intermediate equalization is normally required.

Oxidation ditches

Oxidation ditches are suitable for facilities that require nutrient removal, have limitations due to the nature of the site, or want a biological system that saves energy with limited use of chemicals unless required for further treatment. Oxidation ditch technology can be used to treat any type of wastewater that is responsive to aerobic degradation. In addition, systems can be designed for denitrification and phosphorous removal.

Types of industries utilizing oxidation ditches include: food processing, meat and poultry packing, breweries, pharmaceutical, milk processing,

petrochemical, and numerous other types. Oxidation ditches are particularly useful for schools, small industries, housing developments, and small communities. Ultimately, this technology is most applicable for places that have a large amount of land available.

ADVANTAGES AND DISADVANTAGES

Some advantages and disadvantages of package plants are listed below.

Extended aeration plants

Advantages

- C Plants are easy to operate, as many are manned for a maximum of two or three hours per day.
- C Extended aeration processes are often better at handling organic loading and flow fluctuations, as there is a greater detention time for the nutrients to be assimilated by microbes.
- C Systems are easy to install, as they are shipped in one or two pieces and then mounted on an onsite concrete pad, above or below grade.
- C Systems are odor free, can be installed in most locations, have a relatively small footprint, and can be landscaped to match the surrounding area.
- C Extended aeration systems have a relatively low sludge yield due to long sludge ages, can be designed to provide nitrification, and do not require a primary clarifier.

Disadvantages

- C Extended aeration plants do not achieve denitrification or phosphorus removal without additional unit processes.
- C Flexibility is limited to adapt to changing effluent requirements resulting from regulatory changes.
- C A longer aeration period requires more energy.

- C Systems require a larger amount of space and tankage than other "higher rate" processes, which have shorter aeration detention times.

Sequencing batch reactors

Advantages

- C SBRs can consistently perform nitrification as well as denitrification and phosphorous removal.
- C SBRs have large operational flexibility.
- C The ability to control substrate tension within the system allows for optimization of treatment efficiency and control over nitrogen removal, filamentous organisms, and the overall stability of the process.
- C Since all the unit processes are operated in a single tank, there is no need to optimize aeration and decanting to comply with power requirements and lower decant discharge rates.
- C Sludge bulking is not a problem.
- C Significant reductions in nitrate nitrogen can occur by incorporating an anoxic cycle in the system.
- C SBRs have little operation and maintenance problems.
- C Systems require less space than extended aeration plants of equal capacity.
- C SBRs can be manned part time from remote locations, and operational changes can be made easily.
- C The system allows for automatic and positive control of mixed liquor suspended solids (MLSS) concentration and solids retention time (SRT) through the use of sludge wasting.

Disadvantages

- C It is hard to adjust the cycle times for small communities.

- C Post equalization may be required where more treatment is needed.

- C Sludge must be disposed frequently.

- C Specific energy consumption is high.

Oxidation ditches

Advantages

- C Systems are well-suited for treating typical domestic waste, have moderate energy requirements, and work effectively under most types of weather.
- C Oxidation ditches provide an inexpensive wastewater treatment option with both low operation and maintenance costs and operational needs.
- C Systems can be used with or without clarifiers, which affects flexibility and cost.
- C Systems consistently provide high quality effluent in terms of TSS, BOD, and ammonia levels.
- C Oxidation ditches have a relatively low sludge yield, require a moderate amount of operator skill, and are capable of handling shock and hydraulic loadings.

Disadvantages

- C Oxidation ditches can be noisy due to mixer/aeration equipment, and tend to produce odors when not operated correctly.
- C Biological treatment is unable to treat highly toxic waste streams.
- C Systems have a relatively large footprint.
- C Systems have less flexibility should regulations for effluent requirements change.

DESIGN CRITERIA

Table 1 lists typical design parameters for extended aeration plants, SBRs, and oxidation ditches.

TABLE 1 TYPICAL DESIGN PARAMETERS FOR PACKAGE PLANTS

	Extended Aeration	SBR	Oxidation Ditch
BOD₅ loading (F:M) (lb BOD₅/ lb MLVSS)	0.05 - 0.15	0.05 - 0.30	0.05 - 0.30
Oxygen Required Avg. at 20EC (lb/lb BOD₅ applied)	2 - 3	2 - 3	2 - 3
Oxygen Required Peak at 20EC (value x avg. flow)	1.5 - 2.0	1.25 - 2.0	1.5 - 2.0
MLSS (mg/L)	3000 -6000	1500 -5000	3000 -6000
Detention Time (hours)	18 - 36	16 - 36	18 - 36
Volumetric Loading (lb BOD₅/d/ 10³ cu ft)	10 - 25	5 - 15	5 - 30

Source: Adapted from Metcalf and Eddy, 1991 and WEF, 1998.

Extended aeration plants

Package extended aeration plants are typically constructed from steel or concrete. If the system is small enough, the entire system will arrive as one unit that is ready to be installed. If the system is larger, the clarifier, aeration chamber, and chlorine tank are delivered as separate units, which are then assembled on-site (WEF, 1985).

Key internal components of extended aeration treatment plants consist of the following: transfer pumps to move wastewater between the equalization and aeration zones; a bar screen and/or grinder to decrease the size of large solids; an

aeration system consisting of blowers and diffusers for the equalization, aeration, and sludge holding zones; an airlift pump for returning sludge; a skimmer and effluent weir for the clarifier; and UV, liquid hypochlorite, or tablet modules used in the disinfection zone. Blowers and the control panel containing switches, lights, and motor starters are typically attached to either the top or one side of the package plant (Sloan, 1999).

Biological organisms within the system need sufficient contact time with the organic material in order to produce effluent of an acceptable quality. Typical contact time for extended aeration package plants is approximately 18-24 hours. The contact time, daily flow rate, influent parameters, and effluent parameters determine the size of the aeration tank where air is used to mix wastewater and to supply oxygen to promote biological growth. A package extended aeration system is sized based on the average volume of wastewater produced within a twenty-four hour period. Although provisions are made for some peaking factor, a flow equalization system may be necessary to prevent overloading of the system from inconsistent flow rates in the morning and evening. Equalization allows the wastewater to be delivered to the treatment plant at more manageable flow rates (WEF, 1985).

Systems should be installed at sites where wastewater collection is possible by gravity flow. In addition, the site should be stable, well drained, and not prone to flooding. The facility should be installed at least 30 meters (100 feet) from all residential areas and be in accordance with all health department regulations or zoning restrictions (WEF, 1985).

In order to ensure ease of operation and maintenance, extended aeration systems should be installed so that the tank walls extend nearly 0.15 meters (6 inches) above ground. This will supply insulation in the winter, prevent surface runoff from infiltrating the system, and allow the system to be serviced readily. If a plant is installed below ground, it must have distinct diversion ditching or extension walls in order to prevent surface water infiltration into the plant. When the plant is installed completely above ground, it may be

necessary to provide insulation for cold weather and walkways for easy maintenance (WEF, 1985).

Sequencing batch reactors

Important internal components include an aeration system, which typically consists of diffusers and a blower; a floating mixer; an effluent decanter; a pump for withdrawing sludge; and a sequence of liquid level floats. The PLC and the control panel are usually positioned within a nearby control building (Sloan, 1999).

When the wastewater flow rate at the site is less than 0.05 MGD, a single, prefabricated steel tank can be used. This tank is divided into one SBR basin, one aerobic sludge digester, and one influent pump well. Concrete tanks may also be used, but in North America are not as cost effective as steel for small systems. If the plant must be able to treat 0.1 to 1.5 MGD, multiple concrete SBR basins are commonly used (CASS, 1999).

The design of SBR systems can be based on carbonaceous BOD removal only or both carbonaceous and nitrogenous BOD removal. The system can be expanded to achieve optimum nitrification and carbonaceous removal by operating primarily in an oxic state with few anoxic periods such as during settle and decant.

Denitrification and biological phosphorous removal can be promoted by providing adequate anoxic periods after intense aerobic cycles. This allows DO to be dissipated and nitrate to be used by the consuming organism and released as elemental nitrogen. By introducing an anaerobic process after the anoxic process, bacteria conducive to excess phosphorous uptake will develop. Phosphorous will be released in the anaerobic phase, but additional phosphorous is incorporated into the cell mass during subsequent aerobic cycles. Since the excess phosphorous is incorporated in the cell mass, cell wastage must be practiced to achieve a net phosphorous removal. Anaerobic conditions should be avoided in treating the waste sludge since they may result in the release of the phosphorous.

A low food to microorganism (F:M) ratio SBR system designed for an average municipal flow

pattern will usually have an operating cycle duration of four hours, or six cycles per day. For a two reactor system, there will be twelve cycles per day and for a four reactor system, twenty-four cycles per day. The distribution and number of cycles per day can be adjusted based on specific treatment requirements or to accommodate alternate inflow patterns.

Cycle sequences are time controlled with sufficient volume provided to handle design flow rates. If incoming flow is significantly less than the design flow, only a portion of the reactor capacity is utilized and aeration time periods can be reduced to save energy and prevent over aeration. If flow rates are greater than usual resulting from storm runoff, the control system detects the high rise in the reactor and modifies the cycle to integrate peak flow rates. This will shorten the aeration, settle, and decant sequences, minimize the anoxic sequence (if supplied), and provide more cycles per day. As a result, hydraulic surges are incorporated and the diluted wastewater is processed in less time. In order to make the above optimizations, the logic control must be provided by the PLC (Kappe, 1999).

Small SBRs can experience a variety of problems associated with operation, maintenance, and loadings. Therefore, more conservative design criteria are typically used due to the wide range of organic and hydraulic loads generated from small communities. This type of design utilizes a lower F:M ratio and longer hydraulic retention time (HRT) and SRT (CASS, 1999).

Oxidation ditches

Key components of a typical oxidation ditch include a screening device, an influent distributor (with some systems), a basin or channel, aeration devices (mechanical aerators, jet mixers, or diffusers, depending on the manufacturer), a settling tank or final clarifier (with some systems), and an RAS system (with some systems). Typically, the basin and the clarifier are individually sized to meet the specific requirements of each facility. These components are often built to share a common wall in order to reduce costs and save space (Lakeside, 1999).

Concrete tanks are typically used when installing package plant oxidation ditches. This results in lower maintenance costs as concrete tanks do not require periodic repainting or sand blasting. Fabricated steel or a combination of steel and concrete can also be used for construction, depending on site conditions (Lakeside, 1999).

The volume of the oxidation ditch is determined based on influent wastewater characteristics, effluent discharge requirements, HRT, SRT, temperature, mixed liquor suspended solids (MLSS), and pH. It may be necessary to include other site specific parameters to design the oxidation ditch as well.

Some oxidation ditches do not initially require clarifiers, but can later be upgraded and expanded by adding clarifiers, changing the type of process used, or adding additional ditches (Kruger, 1999).

PERFORMANCE

The performance of package plants in general can be affected by various operational and design issues (Metcalf and Eddy, 1991).

- C Large and sudden temperature changes
- C Removal efficiency of grease and scum from the primary clarifier (except with oxidation ditches that do not use primary clarifiers)
- C Incredibly small flows that make designing self-cleansing conduits and channels difficult
- C Fluctuations in flow, BOD₅ loading, and other influent parameters
- C Hydraulic shock loads, or the large fluctuations in flow from small communities
- C Sufficient control of the air supply rate

Extended aeration plants

Extended aeration plants typically perform extremely well and achieve effluent quality as seen in Table 2. If chemical precipitation is used, total phosphorous (TP) can be < 2 mg/L. In some cases,

extended aeration systems result in effluent with < 15 mg/L BOD and < 10 mg/L TSS.

TABLE 2 EXTENDED AERATION PERFORMANCE

	Typical Effluent Quality	Aldie WWTP (monthly average)
BOD (mg/L)	< 30 or <10	5
TSS (mg/L)	< 30 or <10	17
TP (mg/L)	< 2*	**
NH₃-N (mg/L)	< 2	**

* May require chemicals to achieve.

** DEQ does not require monitoring of these parameters.

Source: Sloan, 1999 and Broderick, 1999.

Aldie Wastewater Treatment Plant

The Aldie Wastewater Treatment Plant, located in Aldie, Virginia, is an extended aeration facility which treats an average of 0.0031 MGD with a design flow of 0.015 MGD. This technology was chosen because it would allow the area to meet permit requirements while minimizing land use. The plant consists of an influent chamber which directs the flow to two parallel aeration basins, parallel clarifiers, and a UV disinfection system.

Sequencing batch reactors

The treatment performance of package plant SBRs is largely influenced by the plant operator. While the process requires little assistance, training programs are available to teach operators how to become skilled with small plant operations. SBRs perform well, often matching the removal efficiency of extended aeration processes. Systems can typically achieve the effluent limitations listed in Table 3.

In addition, SBR systems have demonstrated a greater removal efficiency of carbonaceous BOD than other systems due to optimization of microbial activity via anoxic stress and better utilization of applied oxygen in the cyclic system. The system can consistently provide carbonaceous BOD effluent levels of 10 mg/L.

TABLE 3 SBR PERFORMANCE

	Typical Effluent	Harrah WWTP	
		% Removal	Effluent
BOD (mg/L)	10	98	3
TSS (mg/L)	10	98	3
NH₃ (mg/L)	< 1	97	0.6

Source: Sloan, 1999 and Reynolds, 1999.

Harrah Wastewater Treatment Plant

The Harrah wastewater treatment plant in Oklahoma treats an average wastewater flow of 0.223 MGD. The SBR has achieved tertiary effluent quality without filtration from the time it was first installed. Pretreatment involves an aerated grit chamber and comminutor. Waste activated sludge is taken to a settling pond where the settled sludge is dredged annually. A nitrogen removal study performed for nine months confirmed that nitrification and denitrification occur consistently without special operator care.

Oxidation Ditches

Although the manufacturer's design may vary, most oxidation ditches typically achieve the effluent limitations listed in Table 4. With modifications, some oxidation ditches can achieve TN removal to # 5 mg/L and TP removal with biological means.

City of Ocoee Wastewater Treatment Plant

Currently, the wastewater treatment plant in Ocoee, Florida accepts an average flow of 1.1 to 1.2 MGD. The city chose to use an oxidation ditch because it was an easy technology for the plant staff to understand and implement. The facility is also designed for denitrification without the use of chemical additives. Nitrate levels consistently test at 0.8 to 1.0 mg/L with limits of 12 mg/L (Holland, 1999). Table 4 indicates how well the Ocoee oxidation ditch performs.

TABLE 4 OXIDATION DITCH PERFORMANCE

	Typical Effluent Quality		Ocoee WWTP	
	With 2° Clarifier	With Filter	% Removal	Effluent
CBOD (mg/L)	#10	5	> 97	4.8
TSS (mg/L)	#10	5	> 97	0.32
TP (mg/L)	2	1	NA	NA
N-NO₃ (mg/L)	NA	NA	> 95	0.25

Note: 2° = secondary. NA = not available.

Source: Kruger, 1999 and Holland, 1999.

OPERATION AND MAINTENANCE

Operation requirements will vary depending on state requirements for manning package treatment systems. Manning requirements for these systems may typically be less than eight hours a day. Each type of system has additional operational procedures that should be followed to keep the system running properly. Owners of these systems must be sure to follow all manufacturer's recommendations for routine and preventative maintenance requirements. Each owner should check with the manufacturer to determine essential operation and maintenance (O&M) requirements.

Depending on state requirements, most systems must submit regular reports to local agencies. In addition, system operators must make safety a primary concern. Wastewater treatment manuals and federal and state regulations should be checked to ensure safe operation of these systems.

Extended aeration plants

Operational procedures for these systems consist of performing fecal coliform tests on the effluent to ensure adequate disinfection and making periodic

inspections on dissolved oxygen levels (DO) and MLSS concentrations in the aeration compartment. Sludge-volume index (SVI) tests in the clarifier must also be performed to determine how well the sludge is settling. Other sampling and analyses will be required on the effluent in accordance with state regulations.

Typical maintenance steps for extended aeration systems include checking motors, gears, blowers, and pumps to ensure proper lubrication and operation. Routine inspection of equipment is also recommended to ensure proper operation. Check with the manufacturer for specific O&M requirements.

Sequencing batch reactors

To ensure proper functioning of the system, O&M must be provided for several pieces of equipment. Operational procedures include sampling and monitoring of DO, pH, and MLSS levels. Additional sampling and analyses on the effluent will be required based on state regulations.

Maintenance requirements include regular servicing of aeration blowers, which is usually performed when greasing is done, and monthly inspection of belts on the blowers to determine if they need to be adjusted or replaced. Submersible pumps require routine inspections and servicing as required by the manufacturer. The decanter will require monthly greasing. Additional O&M may be required depending on system requirements. Check with the manufacturer for specific maintenance requirements.

Oxidation ditches

Depending on the manufacturer's design, typical operational procedures for oxidation ditches include monitoring of DO, pH, MLSS, and various other types of sampling and analyses.

Maintenance steps include periodically inspecting the aerator, regularly greasing rotors, and following manufacturer recommendations for maintenance of the pumps. Operators should follow all manufacturer recommendations for operation and maintenance of the equipment.

COSTS

Costs are site specific and generally depend on flow rate, influent wastewater characteristics, effluent discharge requirements, additional required equipment, solids handling equipment, and other site specific conditions. Manufacturers should be contacted for specific cost information.

Extended aeration plants

As provided by Aeration Products, Inc., smaller extended aeration package plants designed to treat less than 0.02 MGD cost approximately \$4 to \$6 per gallon of water treated, based on capital costs. For larger plants, capital costs will be approximately between \$2 to \$2.50 per gallon of wastewater treated. Maintenance processes for these plants are labor-intensive and require semi-skilled personnel, and are usually completed through routine contract services. Maintenance cost averages \$350 per year.

Table 5 provides the cost estimates for various extended aeration packages. These costs include the entire package plant, as well as a filtration unit.

TABLE 5 COST ESTIMATES FOR EXTENDED AERATION

Flow (MGD)	Estimated Budget Cost per Gallon (\$)
0.015	9-11
0.04	7
1.0	1.3

Note: Larger flow rates are available from the manufacturer. Estimated cost per gallon was determined based on the mid-flow range.

Source: Parsons Engineering Science, 1999.

Sequencing batch reactors

The capital cost per capita for small SBR plants is greater than for large SBR plants. Approximate equipment costs disregarding concrete or steel tanks costs are provided in Table 6. Operation energy costs are likely to be higher for small SBR plants than for larger plants as a result of numerous loadings.

TABLE 6 COST ESTIMATES FOR SBRs

Flow (MGD)	Estimated Budget Cost per Gallon (\$)
0.01	4-5
0.05	2
0.2	0.7
1.0	0.25

Note: Larger flow rates are available from the manufacturer. Estimated cost per gallon was determined based on the mid-flow range.

Source: CASS, 1999.

System costs will vary, depending on the specific job. Factors influencing cost include average and peak flow, tank type, type of aeration system used, effluent requirements, and site constraints. Operation and maintenance costs are site specific and may range from \$800 to \$2,000 dollars per million gallons treated. Labor and maintenance requirements may be reduced in SBRs because clarifiers and RAS pumps may not be necessary. On the other hand, maintenance requirements for the more sophisticated valves and switches associated with SBRs may be more costly than for other systems.

Oxidation ditches

Table 7 lists budget cost estimates for various sizes of oxidation ditches. Operation and maintenance costs for oxidation ditches are significantly lower than other secondary treatment processes. In comparison to other treatment technologies, energy requirements are low, operator attention is minimal, and chemical addition is not required.

REFERENCES

Other Related Fact Sheets

Sequencing Batch Reactors
EPA 932-F-99-073
September 1999

TABLE 7 COST ESTIMATES FOR OXIDATION DITCHES

Flow Range (MGD)	Budget Price (\$)	Estimated Budget Cost per Gallon (\$)
0 - 0.03	80,000	5.33
0.03 - 0.06	91,000	2.02
0.06 - 1.1	97,500	0.17
1.1 - 1.7	106,000	0.08
1.7 - 2.5	114,700	0.05

Note: Larger flow rates are available from the manufacturer. Estimated cost per gallon was determined based on the mid-flow range.

Source: Lakeside, 1999.

Oxidation Ditches
EPA 832-F-00-013
September 2000

Aerobic Treatment
EPA 832-F-00-031
September 2000

Other EPA Fact Sheets can be found at the following web address:
<http://www.epa.gov/owmitnet/mtbfact.htm>

1. Broderick, T., 1999. Aldie Wastewater Treatment Plant, Aldie, Virginia. Personal communication with Dacia Mosso, Parsons Engineering Science, Inc.
2. CASS Water Engineering, Inc., 2000. Literature provided by manufacturer.
3. Crites, R. and G. Tchobanoglous, 1998. *Small and Decentralized Wastewater Management Systems*. WCB McGraw-Hill, Inc. Boston, Massachusetts.
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5. Hydro-Aerobics, July 1999. Literature provided by manufacturer.
6. Kappe Associates Engineered Systems, Frederick, Maryland, 1999. Literature provided by distributor.
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9. Metcalf & Eddy, Inc., 1991. *Wastewater Engineering: Treatment, Disposal, and Reuse*. 3rd ed. The McGraw-Hill Companies. New York, New York.
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11. Sloan Equipment, Owings Mills, Maryland, 1999. Literature provided by distributor and manufacturer (Aeration Products, Inc.).
12. Water Environment Federation (WEF), 1998. Design of Municipal Wastewater Treatment Plants. Manual of Practice No. 8. 4th ed. vol. 2. WEF. Alexandria, Virginia.
13. Water Environment Federation (WEF), 1985. Operation of Extended Aeration Package Plants. Manual of Practice No. OM-7. WEF. Alexandria, Virginia.

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The mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Environmental Protection Agency.

ADDITIONAL INFORMATION

Extended aeration plants

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Washington, D.C. 20460

Terre Du Lac Utility Company

DEPRECIATION RATES

(SEWER)

SR-2014-0105

ACCOUNT NUMBER	ACCOUNT DESCRIPTION	DEPRECIATION RATE	AVERAGE SERVICE LIFE (YEARS)	NET SALVAGE
300	Stipulated Plant	2.5%	40	0%
311	Structures and Improvements	2.5%	44	-10%
352.1	Collection Sewers (Force)	2.0%	50	0%
352.2	Collection Sewers (Gravity)	2.0%	50	0%
353	Services	2.0%	50	0%
354	Flow Measurement Devices	3.3%	30	0%
362	Receiving Wells	5.0%	26	-5%
363	Electric Pumping Equipment	10.0%	10	0%
371	Treatment Plant Shed	2.5%	44	-10%
372	Treatment & Disposal Equipment	5.0%	22	-10%
390	Structures & Improvements Office/Shop	2.5%	44	-10%
391	Office Furniture & Equipment	5.0%	20	0%
391.1	Electronic Office Equipment	0.0%	Excessively Accrued	
392	Transportation Equipment	13.0%	7	9%
393	Stores Equipment	4.0%	25	0%
394	Tools, Shop, and Garage Equipment	5.0%	18	10%
395	Laboratory Equipment	8.3%	12	0%
396	Power Operated Equipment	6.7%	13	13%
397	Communication Equipment	3.3%	Over Accrued	

Reviewed, 1/7/2014. The above are standard small company depreciation rates modified as a result of Staff's investigation of the Company's operation, records, and physical plant, and are dependent on the Company's implementation of the end of test year adjustments to the Company's plant in service and accumulated reserves as shown in the Staff accounting schedules.

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2014-0105&attach_id=2014014505

P.C.B., Inc.
SCHEDULE of DEPRECIATION RATES
(SEWER Class C & D)
SR-2014-0068 Attachment D

ACCOUNT NUMBER	ACCOUNT DESCRIPTION	DEPRECIATION RATE	AVERAGE SERVICE LIFE (YEARS)
COLLECTION PLANT			
311	Structures & Improvements	3.3%	33
352.2	Collection Sewers (Gravity)	2.0%	50
355	Flow Measurement Devices	3.3%	30
PUMPING PLANT			
362	Receiving Wells	4.0%	26
363	Electric Pumping Equipment	10.0%	10
TREATMENT & DISPOSAL PLANT			
372	Oxidation Lagoons	4.0%	40
373	Treatment & Disposal Facilities	5.0%	22
375	Outfall Sewer Lines	2.0%	50
GENERAL PLANT			
391	Office Furniture & Equipment	5.0%	20

Reviewed, 1/07/2014. The above are standard small company depreciation rates modified as a result of Staff's investigation of the Company's operation, records, and physical plant, and are dependent on the Company's implementation of the end of test year adjustments to the Company's plant in service and accumulated reserves as shown in the Staff accounting schedules.

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2014-0068&attach_id=2014016258

Rogue Creek Sewer
Interim Rate Case
SR-2013-0435
Test Year Ending 12-31-2012
Depreciation Expense - Sewer

Line Number	A Account Number	B Plant Account Description	C Adjusted Jurisdictional	D Depreciation Rate	E Depreciation Expense
1		INTANGIBLE PLANT			
2	301.000	Organization	\$135	0.00%	\$0
3	302.000	Franchises	\$1,127	0.00%	\$0
4	303.000	Miscellaneous Intangible Plant	\$0	0.00%	\$0
5		TOTAL INTANGIBLE PLANT	<u>\$1,262</u>		<u>\$0</u>
6		SOURCE OF SUPPLY PLANT			
7	310.000	Land & Land Rights	\$0	0.00%	\$0
8	311.000	Structures & Improvements	\$2,532	3.00%	\$76
9		TOTAL SOURCE OF SUPPLY PLANT	<u>\$2,532</u>		<u>\$76</u>
10		COLLECTION PLANT			
11	352.100	Collection Sewers - Force	\$12,827	2.00%	\$257
12	352.200	Collection Sewers - Gravity	\$105,094	2.00%	\$2,102
13	353.000	Other Collection Plant Facilities	\$0	0.00%	\$0
14	354.000	Services to Customers	\$18,120	2.00%	\$362
15	355.000	Flow Measuring Devices	\$0	0.00%	\$0
16		TOTAL COLLECTION PLANT	<u>\$136,041</u>		<u>\$2,721</u>
17		PUMPING PLANT			
18	362.000	Receiving Wells and Pump Pits	\$1,804	5.00%	\$90
19	363.000	Pumping Equipment (Elec., Diesel, other)	\$24,068	10.00%	\$2,407
20		TOTAL PUMPING PLANT	<u>\$25,872</u>		<u>\$2,497</u>
21		TREATMENT & DISPOSAL PLANT			
22	372.000	Oxidation Lagoon	\$0	0.00%	\$0
23	373.000	Treatment and Disposal Equipment	\$31,190	4.50%	\$1,404
24	374.000	Plant Sewers	\$0	0.00%	\$0
25	375.000	Outfall Sewer Lines	\$0	0.00%	\$0
26	376.000	Other Treatment & Disposal Plant Equip.	\$0	0.00%	\$0
27		TOTAL TREATMENT & DISPOSAL PLANT	<u>\$31,190</u>		<u>\$1,404</u>
28		GENERAL PLANT			
29	391.000	Office Furniture & Equipment	\$467	5.00%	\$23
30	391.100	Office Computer Equipment	\$371	20.00%	\$74
31	392.000	Transportation Equipment	\$228	13.00%	\$30
32	394.000	Tools Shop & Garage Equipment.	\$15	5.00%	\$1
33		TOTAL GENERAL PLANT	<u>\$1,081</u>		<u>\$128</u>
34		Total Depreciation	<u>\$197,978</u>		<u>\$6,826</u>

https://www.efis.psc.mo.gov/mpsc/commoncomponents/view_itemno_details.asp?caseno=SR-2013-0435&attach_id=2013018070

Aquarina Utilities, Inc.
Asset Value Report
Depreciated Value

Appendix C
December 24, 2021

Asset Description	Year Installed	Estimated Installation Cost	Age (2021)	Depreciation Period ¹	Depreciation ²	Depreciated Value ³
Property	1981	\$ 830,250.00	40	n/a	n/a	\$ 830,250.00
Well #1-18" Steel Casing 7.5 hp	1981	\$ 42,224.42	40	55	\$ 30,708.67	\$ 11,515.75
Well #2-18" Steel Casing 7.5 hp	1981	\$ 41,869.60	40	55	\$ 30,450.62	\$ 11,418.98
Well 2 Pump 1-7.5 hp	2021	\$ 10,000.00	0	12	\$ -	\$ 10,000.00
Well 2 Pump 2-7.5 hp	2013	\$ 5,804.68	8	12	\$ 3,869.78	\$ 1,934.89
Transfeer Pumps 1.5 hp	2013	\$ 2,902.34	8	12	\$ 1,934.89	\$ 967.45
High Service Pumps 15 hp	2013	\$ 17,414.03	8	12	\$ 11,609.35	\$ 5,804.68
Fire & Irrigation Pumps 60 hp	2003	\$ 29,876.20	18	12	\$ 44,814.31	\$ -
RO Bldg	2006	\$ 29,697.41	15	44	\$ 10,124.12	\$ 19,573.29
Reverse Osmosis 2006	2006	\$ 35,942.72	15	35	\$ 15,404.02	\$ 20,538.70
Reverse Osmosis 2016	2016	\$ 60,000.00	5	35	\$ 8,571.43	\$ 51,428.57
Sodium Hypo Equipment	2006	\$ 2,487.61	15	35	\$ 1,066.12	\$ 1,421.49
Aerator	2006	\$ 2,487.61	15	35	\$ 1,066.12	\$ 1,421.49
Concrete Storage Tank	1972	\$ 66,282.42	49	42	\$ 77,329.49	\$ -
Fiberglass Clearwell	1981	\$ 99.35	40	42	\$ 94.62	\$ 4.73
Hydropneumatic Tank 5,000-gallon	1993	\$ 14,171.47	28	42	\$ 9,447.65	\$ 4,723.82
Fire & Irrigation Concrete Tank	1981	\$ 709,654.18	40	42	\$ 675,861.12	\$ 33,793.06
Generator 475 kW	1981	\$ 46,337.69	40	20	\$ 92,675.38	\$ -
6" Water Main	1981	\$ 361,594.94	40	50	\$ 289,275.95	\$ 72,318.99
12" Non-Potable Water Main	1981	\$ 470,073.42	40	50	\$ 376,058.73	\$ 94,014.68
Water Services & Meters	1981	\$ 159,456.21	40	35	\$ 182,235.67	\$ -
Irrigation Services & Meters	1981	\$ 61,489.65	40	35	\$ 70,273.89	\$ -
Hydrants	1981	\$ 34,567.11	40	50	\$ 27,653.69	\$ 6,913.42
Total Water Assets		\$ 3,034,683.06				\$ 1,178,043.99
WWTP-Extended Aeration	1984	\$ 630,518.73	37	22	\$ 1,060,417.87	\$ -
6" & 8" Sanitary Sewer	1984	\$ 335,016.48	37	50	\$ 247,912.20	\$ 87,104.29
Lift Station-5 hp Pumps	1984	\$ 9,525.45	37	10	\$ 35,244.15	\$ -
Manholes	1984	\$ 48,258.85	37	50	\$ 35,711.55	\$ 12,547.30
Service Laterals	1984	\$ 46,423.57	37	50	\$ 34,353.44	\$ 12,070.13
Total Wastewater Assets		\$ 1,069,743.08				\$ 111,721.72

Note 1 - Based on Missouri PSC Rate Case Dockets WR-2015-0138 Village Greens Water Company; WR-2016-0169 Woodland Manor Water Company; WR-2015-0104 Spokane Highlands Water Company; SR-2014-0105 Terre Du Lac Utility Company; SR-2014-0068 P.C.B., Inc.; and SR-2013-0435 Rogue Creek Sewer.

Note 2 - Depreciation = Age/Depreciation Period X Estimated Installation Cost

Note 3 - Depreciated Value = Estimated Installation Cost - Depreciation

Data Request # 11

Additional Costs

CSWR Florida- Aquarina

Category	Vendor	Amount
Closing Costs		11,957.96
Acquired Assets (Staff Report)		95,760.00
Engineering - GIS	21 Design Group Inc.	17,987.50
Engineering - Survey	21 Design Group Inc.	63,884.25
Legal - Real Estate	Beckemeier LeMoine Law	31,005.30
Legal - Real Estate	Bryant Miller Olive	10,680.00
Legal - Real Estate	Trow & Dobbins, P.A.	275.00
Total		231,550.01

Data Request # 14
Journal Entries

Journal Entry to transfer In-Service assets post acquisition

Acct Name	Acct #	Debit	Credit	Note	Type
Utility Plant Purchased	104.000		2,835,488.60	Total closing consideration	W&S
Land & Land Rights	303.000		5,978.98	Closing Costs	Water
Land & Land Rights	353.000		5,978.98	Closing Costs	Sewer
Misc Liab	242.000		3,638.25	Real Estate Tax 1/1/22-5/16/22	W&S
CIAC Water	271.000		373,523.00	CIAC Potable Water	Water
Acc Amort-CIAC-Water	272.000	218,790.08		CIAC Accum Potable-Audit+1 month of May22	Water
Salvage Reserve for Services-Potable Organization	108.100		24,864.00	Negative Accum Depr Water Services-Potable	Water
Organization	301.000	397.00		Staff Report-Potable	Water
Structures & Improvements	304.000	30,660.00		Staff Report-Potable	Water
Wells & Springs	307.000	116,507.00		Staff Report-Potable	Water
Supply Mains	309.000	2,057.00		Staff Report-Potable	Water
Pumping Equipment	311.000	54,958.00		Staff Report-Potable	Water
Water Treatment	320.000	357,287.00		Staff Report-Potable	Water
Distribution Reservoirs & Standpipes	330.000	625,448.00		Staff Report-Potable	Water
Trans & Dist Mains	331.000	163,984.00		Staff Report-Potable	Water
Services	333.000	53,661.00		Staff Report-Potable	Water
Meters & Meter Installations	334.000	140,002.00		Staff Report-Potable	Water
Backflow Prevention Devices	336.000	4,408.00		Staff Report-Potable	Water
Other Plant & Misc Equip	339.000	1,530.00		Staff Report-Potable	Water
Transportation Equipment	341.000	40,596.00		Staff Report-Potable	Water
Tools, Shop, & Garage Equip	343.000	900.00		Staff Report-Potable	Water
Laboratory Equip	344.000	2,000.00		Staff Report-Potable	Water
Other Intangible Plant	348.000	1,261.00		Staff Report-Potable	Water
Land	303.000	37,582.00		Staff Report-Potable	Water
Accum Depr	108.000		1,247,443.80	Staff Report-Potable+ Calc	Water
Organization	301.000	653.00		Staff Report-Non-Potable	Water
Structures & Improvements	304.000	811.00		Staff Report-Non-Potable	Water
Wells & Springs	307.000	115,430.00		Staff Report-Non-Potable	Water
Supply Mains	309.000	23,143.00		Staff Report-Non-Potable	Water
Pumping Equipment	311.000	115,351.00		Staff Report-Non-Potable	Water
Water Treatment	320.000	39,669.00		Staff Report-Non-Potable	Water
Distribution Reservoirs & Standpipes	330.000	512,792.00		Staff Report-Non-Potable	Water
Trans & Dist Mains	331.000	153,779.00		Staff Report-Non-Potable	Water
Meters & Meter Installations	334.000	105,681.00		Staff Report-Non-Potable	Water
Hydrants	335.000	10,050.00		Staff Report-Non-Potable	Water
Other Plant & Misc Equip	339.000	631.00		Staff Report-Non-Potable	Water
Land	303.000	24,498.00		Staff Report-Non-Potable	Water
CIAC Water	271.000		47,636.00	CIAC Accum Non Potable-Audit+1 month of May22	Water
Acc Amort-CIAC-Water	272.000	30,730.90		Negative Accum Depr Water Services-Non Potable	Water
Accum Depr	108.000		840,915.24	Staff Report-Non-Potable+ Calc	Water
Organization	351.000	1,050.00		Staff Report-Wastewater	Sewer
Structures & Improvements	354.000	31,971.00		Staff Report-Wastewater	Sewer
Collection Sewers - Force	360.000	169,985.00		Staff Report-Wastewater	Sewer
Collection Sewers - Gravity	361.000	328,394.00		Staff Report-Wastewater	Sewer
Services to Customers	363.000	170,960.00		Staff Report-Wastewater	Sewer
Pumping Equipment	371.000	50,256.00		Staff Report-Wastewater	Sewer
Treatment & Disposal Equipment	380.000	709,777.00		Staff Report-Wastewater	Sewer
Outfall Sewer Lines	382.000	144,908.00		Staff Report-Wastewater	Sewer
Other Plant & Misc Equipment	389.000	3,333.00		Staff Report-Wastewater	Sewer
Transportation Equipment	391.000	20,298.00		Staff Report-Wastewater	Sewer
Laboratory Equipment	394.000	565.00		Staff Report-Wastewater	Sewer
Other Tangible Plant	398.000	3,449.00		Staff Report-Wastewater	Sewer
Land & Land Rights	353.000	33,680.00		Staff Report-Wastewater	Sewer
Accum Depr	108.000		1,476,195.87	Staff Report-Wastewater+ Calc	Sewer
CIAC Water	271.000		612,495.00	CIAC Accum Wastewater-Audit+1 month of May22	Sewer
Acc Amort-CIAC-Water	272.000	480,080.38		Negative Accum Depr Wastewater Services-Non Potable	Sewer
Acquisition Adjustment	114.000	1,035,041.23		Acq Adjustment-Potable	Water
Acquisition Adjustment	114.000	974,428.63		Acq Adjustment- Potable	Water
Acquisition Adjustment	114.000	306,818.59		Acq Adjustment-Wastewater	Sewer
		7,462,199.76	7,462,199.76		

Data Request # 15
Post Acquisition Pro Forma

Aquarina Utilities

	Aquarina	CSWR-Florida	CSWR-Florida	CSWR-Florida	CSWR-Florida	CSWR-Florida	CSWR-Florida
	2021	Y0	Y1	Y2	Y3	Y4	Y5
ERU's	1,043	1,043	1,043	1,043	1,043	1,043	1,043
Rate*	54.58	54.58	48.50	48.50	54.24	54.24	54.24
Revenue	703,989	710,724	607,026	607,026	678,868	678,868	678,868
Outside labor expenses	(559,534)	(185,005)	(191,480)	(198,182)	(205,119)	(212,298)	(219,728)
Administrative and office expense	0	(82,499)	(85,387)	(88,375)	(91,469)	(94,670)	(97,983)
Maintenance and repair expense	0	(51,342)	(53,139)	(54,999)	(56,924)	(58,916)	(60,978)
Purchased water	0	0	0	0	0	0	0
Purchased sewage treatment	0	0	0	0	0	0	0
Electric power expense (exclude office)	0	(53,796)	(55,678)	(57,627)	(59,644)	(61,732)	(63,892)
Chemicals expense	0	(14,374)	(14,877)	(15,398)	(15,937)	(16,494)	(17,072)
Testing fees	0	(5,035)	(5,212)	(5,394)	(5,583)	(5,778)	(5,980)
Transportation expense	0	0	0	0	0	0	0
Other operating expense	0	(456)	(472)	(488)	(505)	(523)	(541)
Total Operating Expense	(559,534)	(392,507)	(406,245)	(420,464)	(435,180)	(450,411)	(466,176)
Depreciation	(89,031)	(80,387)	(80,387)	(86,574)	(92,762)	(92,762)	(92,762)
Interest	(8,221)	0	(14,866)	(13,609)	(35,027)	(34,613)	(34,209)
Total Expenses	(656,786)	(472,894)	(501,498)	(520,647)	(562,969)	(577,786)	(593,146)
Operating Income	47,203	237,830	105,528	86,379	115,899	101,082	85,722
Income Tax	(80,884)	0	(27,965)	(22,890)	(30,713)	(26,787)	(22,716)
Net Income	(33,681)	237,830	77,563	63,488	85,186	74,295	63,005

*Rate reflects average bills per ERU assuming 3,500 gallons of usage per month

ASSUMPTIONS

Total FL ERU's	20,675	31,923	34,871	38,710	39,173	39,636
ERU's in Rate		20,971	20,971	32,740	32,740	32,740
Total FL Rate Base	0	29,581	29,581	90,030	90,030	90,030
Total FL Rev Req	0	12,205	12,205	21,310	21,310	21,310
Aquarina ERU's	1,043	1,043	1,043	1,043	1,043	1,043
Aquarina Acq Premium	0	1,875	1,875	1,875	1,875	1,875
Equity	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
ROE	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
Tax Rate	26.5%	26.5%	26.5%	26.5%	26.5%	26.5%
Rate with Acq Premium	0	48.50	48.50	54.24	54.24	54.24
Inflation Rate	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%
Amortization Years	30	30	30	30	30	30
Additional Plant Investment	0	0	247,500	247,500	0	0
Depreciation Rate	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Debt Issuance	0	7,000,000	7,000,000	20,000,000	20,000,000	20,000,000
Interest Rate	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%

CALCULATIONS

Additional Depreciation Expense	0	0	(6,188)	(6,188)	0	0
Interest Expense	0	(455,000)	(455,000)	(1,300,000)	(1,300,000)	(1,300,000)
Equity Return with Acq Premium	0	1,405	1,405	4,276	4,276	4,276
Equity Return w/o Acq Premium	0	1,316	1,316	4,187	4,187	4,187
Tax Return with Acq Premium	0	507	507	1,542	1,542	1,542
Tax Return w/o Acq Premium	0	474	474	1,510	1,510	1,510
Acq Premium Amortization	0	63	63	63	63	63
Total Net Impact of Acq Premium		184	184	184	184	184
Rate Adjustment		1.5%	1.5%	0.9%	0.9%	0.9%
Rate w/o Acq Premium		47.77	47.77	53.77	53.77	53.77

Revenue Requirement w/o Acq Premium 12,021 12,021 21,126 21,126 21,126

Data Request # 24



**AQUARINA
UTILITIES, INC.
WATER SYSTEM
ASSESSMENT**

**ENGINEERING
MEMORANDUM**

210 South Florida Avenue | Suite 220
Lakeland, Florida 33801
800.426.4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0233748.02
Central States Water
Resources
July 2021

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EXECUTIVE SUMMARY

An engineering evaluation for the Aquarina Utilities Water Treatment Plant in Melbourne Beach, FL was conducted by Woodard & Curran to provide feedback and guidance to Central States Water Resources on regulatory compliance, permitting, technical items and recommendations for repair or improvements. The evaluation herein is based on a site visit conducted on March 10, 2021, reports submitted by the utility to the Florida Department of Environmental Protection, and technical documents provided by Aquarina Utilities.

1. INTRODUCTION

1.1 General System Information

Aquarina Utilities owns and operates a private Water Treatment Plant (WTP) to service the Aquarina Beach and Country Club development. The Aquarina development consists of residential units, a country club and golf shop. The WTP and wastewater treatment plant (WWTP) are enclosed in a fenced in area. Please see Appendix A for a site map.

A summary of the main parameters for the wastewater system is included below in Table 1-1.

Table 1-1: Aquarina System Information

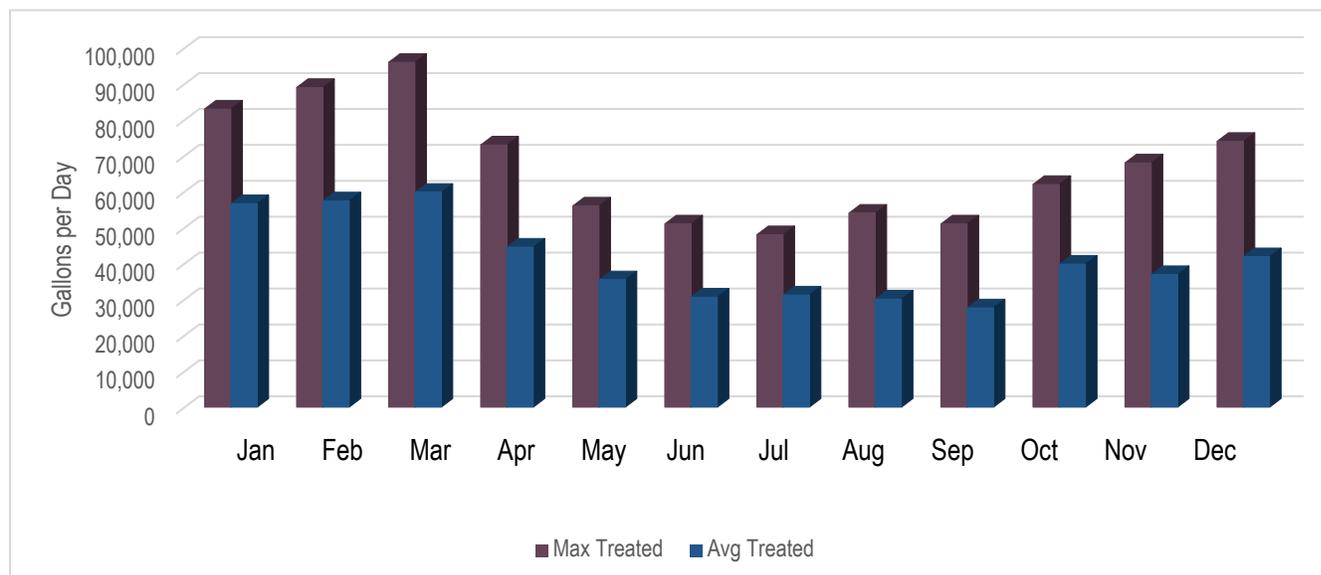
Water System Name	Aquarina Utilities
PWD ID Number	3054060
Classification	Community
Plant Category & Class	2C
Street Address	235 Aquarina Blvd.
City, State	Melbourne Beach, FL
County	Brevard
Owner	Kevin Burge
Contact	Kevin Burge
Population Served	750
Number of Service Connections	300
Pending Developments	Possibility of an additional 450 units to be built
Average Day Water Use (2019)	41,129 gpd
Maximum Day Water Use (2019)	96,000 gpd*
Max-Day Design Capacity (Permitted)	86,400 gpd
Water Source	Ground water well

*Owner attributed exceedance to design capacity to failures in meter reading process, which has since been updated. See Section 3-1 for more information.

1.2 Water Use

Monthly average day and maximum day water usage by the Aquarina development are shown in Figure 1-1.

Figure 1-1: Aquarina Average Water Use 2019



Source: 2019 Monthly Reporting

2. WATER TREATMENT FACILITY

2.1 Facility Description

There are two separate water systems for the Aquarina development. The fire and irrigation water system are separate from the potable water system that serves the residential community and golf course club house.

Well 1 provides water for the fire and irrigation system. Well 1 is an artesian well with a booster pump located at the well to supplement flow. Water is pumped from Well 1 to a 1.25-million-gallon storage tank. Two variable frequency drive booster pumps move water from this storage tank to distribution. The distribution network provides water to fire hydrants and irrigation systems.

Well 2 provides water for the potable system. Well 2 is an artesian well and has two booster pumps located inside the water treatment facility to supplement flow. Water is pumped from Well 2 to the treatment system, where it first passes through a cartridge filter.

The filtered water then splits, with 80% of the water going to a reverse osmosis (RO) treatment system and 20% bypassed. The water that is diverted to the RO treatment system is pre-treated with an anti-scalant. The water is treated by one of two RO systems on site, with the RO units operating in duty/standby mode and alternated by system operators periodically.

After RO treatment, the water combines with the untreated bypass water and passes through an aeration tower for hydrogen sulfide removal. After the aeration tower, treated water collects in a 350-gallon clear well where chlorine is injected for disinfection. From the clear well, two booster pumps transfer finished water to a 250,000-gallon concrete ground storage tank. Two high-service booster pumps then transfer finished water from atmospheric storage to a 5,000-gallon steel hydropneumatic tank that maintains pressure in the potable water distribution system.

The main components for the Aquarina WTP are outlined in Table 2-1.

Table 2-1: Main System Components

Purpose	Type	Details	Age (Source)	Condition
Source	Well 1	595 feet deep	1981 (Sanitary Survey)	Fair
Source	Well 2	590 feet deep	1981 (Sanitary Survey)	Fair
Treatment	Reverse Osmosis	US Filter, ValueMax, 80 gpm	2006 (Purchase Documents)	Fair
Treatment	Reverse Osmosis	Evoqua, Vantage M83, 60 gpm	2016 (Purchase Documents)	Good
Treatment	Aeration	Aeration Tower, 78 gpm	Unknown	Fair
Treatment	Disinfection	Sodium Hypochlorite	Unknown	Fair
Booster Pump	Booster Pump 1 & 2 - Well #2	End Suction, 7.5 HP	Pump 1 - 2021 (Site Photos) Pump 2 - 2013 (Sanitary Survey)	Fair
Booster Pump	ValueMax RO Pump	Vertical Turbine, 15 HP	2006 (Purchase Documents)	Fair
Booster Pump	Vantage M83 RO Pump	Vertical Turbine, 20 HP	2016 (Purchase Documents)	Fair
Booster Pump	Transfer Pump 1 & 2 - To Storage	End Suction, 1.5 HP	2013 (Sanitary Survey)	Fair
Booster Pump	High Service Pump 1 & 2 - To Distribution	End Suction, 15 HP	2013 (Sanitary Survey)	Fair
Booster Pump	Fire & Irrigation Pump 1 & 2	Vertical Turbine, 60 HP	2003 (Drawings in Panel)	Poor
Storage	Atmospheric Storage	Concrete - 250,000 gallons	1972 (Tank Inspection Report)	Fair
Storage	Clear well	350-gallons, fiberglass	Unknown	Fair
Storage	Pressurized Storage	5,000-gallons, steel	1993 (Tank Inspection Report)	Poor
Storage	Atmospheric Storage - Fire & Irrigation	1.25-million gallons, concrete	Unknown	Fair
Back-up Power	Generator	Baldor, diesel 475 kW	Unknown	Poor

2.1.1 Source

2.1.1.1 Well #1 – Irrigation and Fire Suppression Well

Well #1 provides water to the fire and irrigation system for Aquarina development that is separate from the potable system. The well is a true artesian well, therefore a submersible well pump is not necessary since groundwater pressure naturally conveys the well water to ground surface. An end-suction centrifugal pump is located at the well head to pump the water to storage. Water from Well #1 is pumped directly to a 1.25-million-gallon storage tank, bypassing any treatment. From the storage tank, water is pumped to a separate distribution network that supplies the fire hydrants and lawn irrigation systems.

Well #1 is considered a backup to the primary drinking water well (Well #2). Water from Well #1 can be diverted to the WTP by opening a valve located at the treatment plant entrance. This well is sampled monthly for bacteria.

The well is located just outside the fence that encloses the WTP and the WWTP. The well has its own separate fence that is kept locked. The well has an 18-inch diameter casing, is 595-feet deep, and has a reported yield of 600 gpm. The well is a true artisan well with an end-suction pump located at the well head to supplement flow.

The Aquarina WWTP is located within 1000-foot radius of the well and is listed as a low level of concern in the FL Source Water Assessment & Protection (SWAP) Program Results.

Figure 2-1: Well #1 Irrigation and Fire Suppression Well



2.1.1.2 Well #2 – Drinking Water Well

Well #2 is the system's primary source for drinking water. The well is located within the locked fenced that encloses the WTP and the WWTP, near the entrance. See layout map in Appendix A. The well was drilled in 1981, is 18-inches in diameter, 590-feet deep and has a reported yield of 600 gpm.

The well is a true artesian well, therefore a submersible well pump is not necessary since groundwater pressure naturally brings the well water to ground surface. A sample tap is locating on the well, however a vent is not present. There are two end-suction pumps located inside the treatment building that alternate pumping to supplement the flow provided by the well to move water through the subsequent treatment processes.

The Aquarina WWTP is located within 1000-foot radius of the well and is listed as a low level of concern in the FL SWAP Program Results. Refer to Appendix B for the Source Water Assessment & Protection (SWAP) Assessment.

Figure 2-2: Well #2 – Drinking Water Well



2.1.1.3 Well #3 – Not Used

There is a third well listed in the Sanitary Survey, which is in front of the Marlins Condominium Building. The owner of Aquarina Utilities noted that the well is not used or plumbed into the system. A photo of the well described is shown in Figure 2-3.

Figure 2-3: Abandoned Well 3



2.1.2 Treatment

2.1.2.1 Reverse Osmosis

After the well water is pretreated with a particulate filter, the water splits, with 80% treated through the RO system and 20% bypassing the RO system.

An anti-scalant is added as a pretreatment measure to prevent the membranes from fouling. Aquarina uses Pretreat Plus 0100 from King Lee Technologies, certified NSF/ANSI Standard 60. The anti-scalant is diluted to a ratio of 2 gallons of anti-scalant to 50 gallons of water and is stored in a 55-gallon day tank. The solution is pumped using a Pulsation 30 gpd peristaltic pump set at 35%.

There are two RO units in the treatment system: a ValueMax VL Series prepackaged system manufactured by US Filters and a Vantage M83 prepackaged system by Evoqua. Only the ValueMax vessel is typically active. The operators switch flow to the Evoqua vessel weekly for a few hours to exercise the system and keep the membrane saturated.

Reject from the RO process is conveyed to an on-site pump station, which pumps to the headworks of the WWTP. The FDEP has required that chlorides and sodium be included in the list of WWTP effluent parameters monitored and reported for compliance. Based on elevated levels of chlorides and sodium in the wastewater effluent, the FDEP will likely require a groundwater monitoring plan be implemented and incorporated into the WWTP permit. Based on the outcome of the groundwater monitoring plan, the FDEP may require that RO reject be managed and disposed of off-site in the future.

US Filter System

The ValueMax System is a low-pressure thin film composite (TFC) membrane system with 4 vessels and 3 membranes per vessel. The system is designed for a feed flow rate of 80 gpm and a recovery rate of 75% (60 gpm product water). The system was installed in 2006. The water is pretreated with a 5-micron vertical-wound cartridge filter. The water is pressurized with a 15 HP vertical turbine pump from 40 psi to 250 psi. Downstream of pumping, the RO treated water travels past a partially closed ball valve, reduced to 140 psi at the inlet to the membrane vessels.

It does not appear this unit is still in production and US Filter has been purchased by another company since 2006, when the system was originally installed.

Figure 2-4: ValueMax RO System



Evoqua System

The Evoqua prepackaged system is a Vantage M83 RO system, and was installed in 2016 for redundancy. The system was designed for a feed rate of 60 gpm and a recovery rate of 75% (45 gpm product water). There are 3 vessels with 3 membranes per vessel. The water is pretreated with a 5-micron vertical-wound cartridge filter. The water is pressurized prior to the membrane filtration with a 20 HP vertical turbine pump.

Figure 2-5: Vantage M83 RO System



2.1.2.2 Aeration

After the well water is treated by the RO system and blended with the untreated bypass water, the combined water flows into an aeration tower to remove hydrogen sulfide. The capacity of the system is 78 gpm. A Dayton belt drive fan and blower located inside the treatment building are used to blow air up the tower while water flow into the top of the tower and travels downward. The water then collects in a 350-gallon fiberglass clearwell.

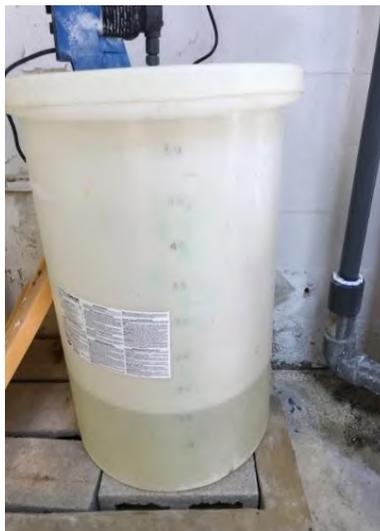
Figure 2-6: Aeration Tower and Clearwell



2.1.2.3 Disinfection

The water is disinfected within the 350-gallon fiberglass clearwell with liquid sodium hypochlorite. Chlorine is stored in a 55-gallon day tank located inside the water treatment building. There is a spare 100-gallon day tank on site. The chlorine is 12% strength and injected with a Pulastron 30 GPD peristaltic pump set at 30%. The average chlorine residual in 2019 was 0.6 mg/L.

Figure 2-7: Chlorine Treatment



2.1.3 Pumps

There are four pairs of pumps at the Aquarina site for the potable water system, as well as source and distribution pumps for the Fire and Irrigation system. The pumps are outlined below in Table 2-2.

Table 2-2: Pumps

Function	Type	Horsepower	Volts	Phase	Set Points	System Served
Well #1: Booster Pump	End Suction	No Name Plate	No Name Plate	No Name Plate	Not Known	Fire & Irrigation
Well #2: Booster Pump 1 & 2	End Suction	7.5	208-230/460	3	10/18 feet	Potable
U.S. Filer ValueMax RO Pump	Vertical Turbine	15	230/460	3	N/A	Potable
Evoqua Vantage M83 RO Pump	Vertical Turbine	20	230/460	3	N/A	Potable
Transfer Pump 1 & 2 – To Treated Water Storage	End suction	1.5	208-230/115V	1	Lead 14/24 – inches Lag 14/26 - inches	Potable
High Service Pump 1 & 2 – To Distribution	End Suction	15	208-230/450	3	Lead – 48/58 psi Lag – 44/55 psi	Potable
Fire & Irrigation Pumps 1 & 2	Vertical Turbine	60	460	3	65 psi - VFD	Fire & Irrigation

Potable System Pumps

Water enters the treatment system via two booster pumps in the water treatment building that pull water from Well #2, shown in Figure 2-8. The pumps alternate and turn on when the ground level storage tank reaches 10 feet and turn off when it is filled to 18 feet.

Figure 2-8: Well #2 Booster Pumps



Each RO prepacked skid includes a vertical turbine pump that increases the pressure to the membrane system. One skid is set to turn on when the well booster pump turns on and operates until the booster pump turns off.

After aeration treatment, the water collects in a 350-gallon clearwell. The transfer pumps move water from the clearwell to the ground level storage tank, shown in Figure 2-9. The transfer pumps turn on when the clearwell reaches a height of 24 inches and turn off when the level reaches 14 inches.

Figure 2-9: Transfer Pumps



The high service pumps convey water from the ground level storage tank to the potable water distribution system, shown in Figure 2-10. The pressure in the distribution system is maintained by a hydropneumatic tank, and the high service pump turns on when the pressure drops to 48 psi and turns off when the pressure increases to 58 psi.

Figure 2-10: High Service Pumps



Fire & Irrigation System Pumps

Well #1 provides water to the 1.25-million-gallon storage tank. An end-suction centrifugal pump is located at the well head to pump the water to storage.

The fire and irrigation pumps maintain pressure in a separate distribution system that supplies water to the fire hydrants and lawn irrigation systems. The pumps have VFDs and maintain system pressure at 65 psi. Untreated water is pumped from a 1.25-million-gallon storage tank to the distribution system. There is a third pump shown in Figure 2-11 that is not active or connected to the system.

Figure 2-11: Fire and Irrigation Pumps



2.1.4 Storage

2.1.4.1 Ground Level Storage Tank

Treated potable water is stored in a 250,000-gallon ground level concrete storage tank. The tank was built around 1972 and last inspected in July of 2018. The inspection report states the tank is in good condition, with screen vents and overflows on the roof, and a hatch that is in good condition. The tank level is shown on a PLC panel in the water treatment room, and there is a visual level indicator on the side of the tank. The tank is located approximately 60 feet West of the water treatment plant.

The tank has no bypass piping, and the Aquarina community cannot be supplied with water when the tank is offline.

Figure 2-12: Ground Level Storage Tank



2.1.4.2 Hydropneumatic Tank

The distribution system pressure is maintained by a steel 5,000-gallon hydropneumatic tank located next to the water treatment building. The tank is pressurized by the high service pumps. The tank is equipped with a sight tube and pressure gauge for quick reference.

The air compressor on top of the tank is not used and there is a portable air compressor in the water treatment building that is used periodically when the water level begins to get too high. The tank was last inspected in 2018. It was noted in the tank inspection report that the interior coating was beginning to deteriorate and there was corrosion on the weld seams.

It was also noted the tank saddles showed corrosion and metal loss. Refer to Appendix C for the Tank Inspection Report.

Figure 2-13: Hydropneumatic Tank



2.1.4.3 Fire and Irrigation Storage Tank

A 1.25-million-gallon concrete storage tank receives untreated water from Well #1, which is used to supply the fire hydrants and irrigation system. The tank inlet is located on the top and water passes through an aerator to release hydrogen sulfide prior to entering the tank. The storage tank is not considered part of the potable water system and is not regularly inspected.

Figure 2-14: Fire and Irrigation Storage Tank



2.1.5 Building

The water treatment system, electrical equipment, and potable water pumps are in a concrete masonry unit (CMU) building located near the entrance of the WTP and WWTP area. The building is approximately 29-feet by 31-feet.

There is an 8-foot opening in the front with a roll up garage door. A trough set within the floor and covered with a metal gate collects liquid from within the building interior. The owner did not know where the trough ultimately drains to.

There is limited chemical containment for the sodium hypochlorite located onsite with an approximate 8-inch-high concrete wall around the day tanks. This would hold roughly 40 gallons of chemical, however there are cinder blocks beneath one chemical drum reducing the capacity of the chemical containment.

The Recommended Standards for Water Works, Section 5.1.9 d-2, states there should be containment to prevent accidental discharge of the largest tank. As the sodium hypochlorite is stored in a 55-gallon drum, additional containment should be provided.

There is similar containment for the anti-scalant, however there is a floor drain within the containment area.

There is an emergency eyewash and shower onsite. The eyewash station was functional, but the overhead shower is shutoff, possibly due to leaks. There is no fire extinguisher in the building, however there is one located near the generator. There is a workspace for maintaining logbooks and a sink and lab site for residuals testing. The building appears to be in good condition; however, the door is typically left open, and wildlife was witnessed entering the building interior.

Figure 2-15: Water Treatment Building



Figure 2-16: Emergency Shower, Drains, and Chemical Containment



2.1.6 Back-Up Power

The treatment facility is equipped with a Baldor diesel generator to provide emergency power all the water pumps and treatment equipment for both the WTP and WWTP should the site lose primary distribution power. The generator size is 475 kW and is paired with an automatic transfer switch. There is a diesel storage tank onsite (500 gallons) and a fire extinguisher. The generated is exercised 6-8 hours a week and is thought to be original to the site.

Figure 2-17: Emergency Generator



2.2 Permit Information

2.2.1 Water Quality and MCL Exceedances

There was no water quality or MCL exceedances reported in the WTP's annual drinking water quality reports for the previous three years. Please refer to Appendix D for the Draft 2020 Consumer Confidence Report. Additionally, there were no positive bacteria samples recorded during 2019 monthly bacteria samples. The average chlorine distribution residual in 2019 was 0.6 mg/L. The distribution chlorine residual is checked by an operator onsite with the monthly bacteria sampling being conducted by a certified lab for compliance reporting.

2.2.2 Compliance and Violation History

The most recent sanitary survey for the plant was conducted on December 18, 2020 and stated no deficiencies were noted during the inspection. There were a few violations listed in the Florida Department of Environmental Protection information portal in the last ten years. These violations are listed below and were generally related to failure to monitor for contaminants, and none are currently open. Please refer to Appendix E for the Sanitary Survey Report.

- In 2016 there was a violation for failure to monitor for bacteria and a failure to conduct assessment monitoring.
- In 2013 there was a violation for failure to monitor for nitrate.
- In 2012 there was a violation for failure to conduct assessment monitoring for bacteria.

2.3 Recommended Repairs and Improvements

2.3.1 General Plant

It is recommended remote monitoring be installed to alert operations staff of any issues and to continuously log information. Mission Monitoring would be suitable for achieving this and should be installed at this site. Prior to the installation of the Mission Monitoring System, a licensed electrical contractor should conduct a site visit to ensure that the monitoring system can be installed safely.

If any electrical code or safety items are identified, repairs should be made prior to the installation of the monitoring system.

Remote monitoring of the following parameters is recommended.

- Flow (instantaneous and totalized)
- Well 1 and 2 Pump Run Hours
- High Service Pump 1 and 2 Run Hours
- Well #1: Booster Pump fault
- Well #2: Booster Pump 1 & 2 fault
- U.S. Filer ValueMax RO Pump fault
- Evoqua Vantage M83 RO Pump fault
- Transfer Pump 1 & 2 fault– To Treated Water Storage
- High Service Pump 1 & 2 fault – To Distribution fault
- Fire & Irrigation Pumps 1 & 2 fault
- U.S. Filter ValueMax RO system general alarm/fault
- Evoqua Vantage M83 RO system general alarm/fault
- Potable Storage Tank Level
- Irrigation Storage Tank Level
- Chlorine Level
- Generator Active

2.3.1.1 Electrical Items

Vendors have indicated that they will not install their equipment in panels that do not meet code or that are significantly deteriorated. As such, it is recommended a licensed electrical contractor conduct a visit to the site to make a final recommendation based on national and local electrical codes and provide a detailed cost estimate for the work.

The generator is original to the site, shows signs of deterioration and passed it is expected life span. This should be replaced to ensure a reliable and safe backup power.

2.3.2 Water Treatment and Pumping

A continuous in-line chlorine analyzer should be installed to monitor the concentration of chlorine and report back to Mission Monitoring. This would allow the operations staff to track if the dose is lower or higher than the target range. Currently, onsite testing of chlorine is monitored by grab samples taken by the operator. There is a HACH CL-17 chlorine analyzer onsite, but it is not plumbed in or appear to be functioning.

There is a 4-inch Master meter on after the hydropneumatic tank, going out to the distribution system. This meter should be replaced with meters that has a 4-20 mA connection so that it can report flow back to the Mission Monitoring system.

The chemical containment at the site should be addressed to meet 10 State Standards. There is a 55-gallon and 100-gallon tank of chlorine onsite. The spare 100-gallon should be removed to reduce the amount of chemical storage and prevent degradation of chlorine strength over time. The cinderblocks within the chemical containment should be removed. A 55-gallon day tank for the anti-scalent is stored in an area with a floor drain. A secondary containment bin or pallet should be purchased for the anti-scalent tank.

It was noted in the hydropneumatic tank inspection report that the interior coating was beginning to deteriorate and there was corrosion on the weld seams. The tank interior should be sand blasted and re-coated with minimum of 5 mils DFT with epoxy to prevent further corrosion as noted in the tank inspection report. After the hydropneumatic tank has been rehabbed, it should be inspected, and pressure tested.

The Fire and Irrigation pumps are located outside without any protection. The pumps show signs of deterioration, as shown in Figure 2-18. The owner noted frequent degradation of equipment due to the corrosive environment near the ocean. A structure should be built around the pumps for protection.

Figure 2-18: Fire and Irrigation Pump Condition



3. WATER DISTRIBUTION SYSTEM

3.1 Distribution System Description

3.1.1 General Distribution

There are two distribution systems for Aquarina Utilities.

Non-Potable Distribution

There is a non-potable system that supplies the fire hydrants and residential lawn irrigation systems. The golf course on the site is not connected to Aquarina Utilities and they provide their own irrigation supply. The water mains for fire/irrigation are 12-14" in size and made of PVC. There are gate valves located throughout the system. The valve box covers are labeled "Reuse" and are painted green to distinguish from the potable system. There are approximately 25 fire hydrants on the non-potable system made from various manufacturers. Distribution system plans from various projects and expansions are located in the Aquarina office, however there are no digital copies of the plans nor is there a comprehensive distribution system map.

Potable Distribution

The potable system water mains are generally 4-8" in size and made of PVC. There are gate valves located throughout the system and are exercised yearly. The owner reported the system is mostly looped with dead ends at Osprey Village, River Oaks, Tidewater, and A1A South. There are six blow-off point, located at: Osprey village, River oaks, Beach Club, Blue Heron, A1A South, and Tidewater A1A.

The owner stated there has been discussions over the past few years to add about 450 units to the system which would double the number of services. There is no timeline for when this buildout may happen.

The Aquarina system provides water to eighteen sub-associations, listed below:

- Blue Heron
- Crane's Point
- Egret Trace Condo
- The Hammock Condo
- Hawks Nest
- Les Villas
- Maritime Hammocks
- The Marlin Condo
- Matanilla Reef
- Ocean Breeze
- Ocean Dunes Condo
- Osprey Villas
- Pelican Beach
- River Oaks
- Sandpiper Cove
- Sea Hawk
- Spoonbill
- Tidewater Condo

3.1.2 Services

In 2020 the system upgraded to Kamstrup smart meters which eliminated the need to manually read the service meters. The meters are in a lease-to-own contract and the owner pays approximately \$2,000 a month for 15 years. The owner stated there is a dual check-valve on all the service lines after the service meters. The mid-rise buildings have an RPZ after the service meter. The owner stated he does not test these backflow prevention devices because they are on the private side of the service meter.

3.2 Recommended Repairs and Improvements

None.

4. CAPITAL ESTIMATES

4.1 Triage Repairs

Repairs needed to address safety and liability hazards, as well as upgrades needed to bring Aquarina to normal operating conditions are summarized with cost estimates in Table 4-1. The total cost estimate for Triage Repairs at the Aquarina WTP is: **\$25,000**.

Table 4-1: General Plant Triage Repairs

Recommendation	Estimate
Upgrade Electrical	\$15,000
Mission Monitoring at Well	\$10,000
Total	\$25,000

4.2 Improvements and Other Repairs

Recommendations were provided to increase the reliability for Aquarina to supply consistent and safe drinking water, and for improved operation and maintenance. The recommendations and cost estimates are summarized in Table 4-2 through Table 4-3. The total cost estimate for Capital Improvements at the Aquarina WTP is: **\$245,500**.

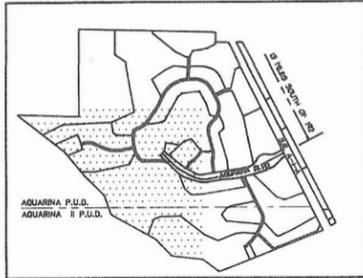
Table 4-2: General Plant Capital Improvements

Recommendation	Estimate
Replace Generator (serves both WTP and WWTP)	\$120,000
Total	\$120,000

Table 4-3: Water Treatment and Pumping Capital Improvements

Recommendation	Estimate
Address Chemical Containment	\$1,000
Continuous Chlorine Analyzer	\$7,000
Transmitters and Other Monitoring Equipment	\$5,500
Replace Distribution Flow Meter	\$4,000
Interior Hydropneumatic Tank Coating	\$8,000
Replace Fire and Irrigation Pumps	\$65,000
Install Structure around Fire and Irrigation Pumps to Prevent Corrosion	\$35,000
Total	\$125,500

APPENDIX A: SITE PLAN



INDEX MAP

AQUARINA P.U.D. AQUARINA II P.U.D.

LEGEND:

- CONTOUR LINE
 - - - - - EXISTING WATER LINE
 - - - - - EXISTING NON-POTABLE WATER
 - - - - - EXISTING SANITARY SEWER
 - - - - - PROPOSED WATER LINE
 - - - - - PROPOSED NON-POTABLE WATER
 - - - - - PROPOSED SANITARY SEWER
 - - - - - EXIST. STORM SEWER
 - - - - - PROPOSED STORM SEWER
 - - - - - TRACT LINE
 - - - - - JURISDICTIONAL WETLAND LINE
 - - - - - SHORE LINE
-
- ⊗ EXISTING FIRE HYDRANT
 - ⊗ PROPOSED FIRE HYDRANT
 - ⊗ SANITARY MANHOLE
 - ⊗ EXISTING SANITARY MANHOLE
 - ⊗ MITERED END SECTION
 - ⊗ CONTROL STRUCTURE
 - ⊗ STORM INLET
 - ⊗ EXIST. STORM INLET
 - ⊗ EXIST. STORM MANHOLE
 - ⊕ TEE
 - ⊕ BEND
 - ⊕ END CAP W/BLOW-OFF ASSEMBLY
 - ⊕ GATE VALVE
 - ⊕ REDUCER

APPROXIMATE LIMITS OF SHORE LINE APRIL 20, 1993

NORTH

SCALE: 1"=100'

AQUARINA DEVELOPMENTS, INC.
235 HAMMOCK SHORE DRIVE
MELBOURNE BEACH, FLORIDA 32951

AQUARINA/AQUARINA II P.U.D.

NO.	DATE	REVISION	REVISED PER COUNTY COMMENTS
1	1/17/94		
2			
3			
4			
5			
6			
7			

FLEIS ASSOCIATES

SOUTHEAST BANK BUILDING
1090 HIGHWAY A1A, SUITE 200
SATTELITE BEACH, FLORIDA 32957

ENGINEERS / PLANNERS / DEVELOPERS

EDWARD M. FLEIS
P.E. NO. 30632

DATE: 10/26/93

(407) 777-2701

THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED HERE:

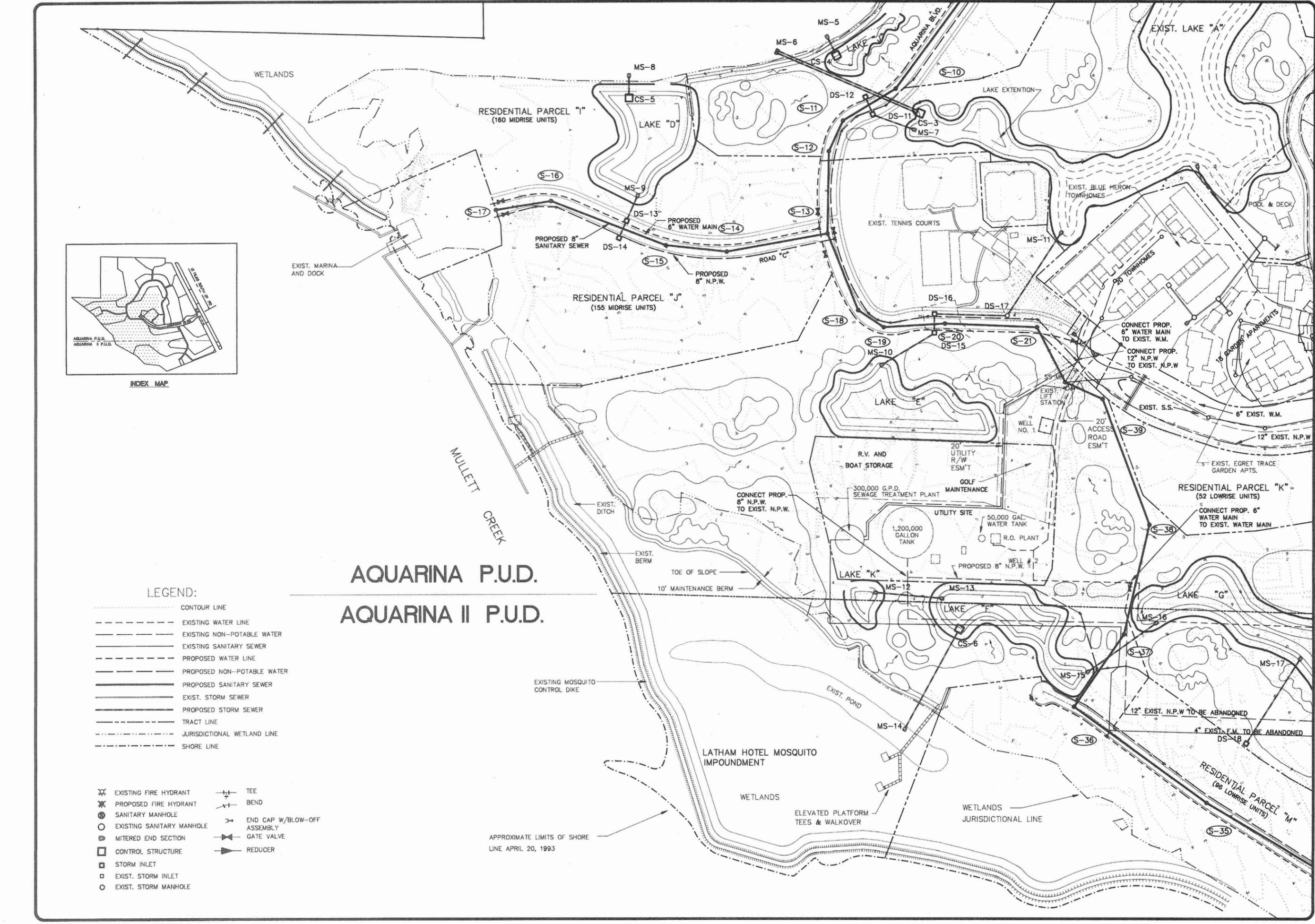
Edward M. Fleis
DATE: 10/26/93

DESIGNED BY:	DATE
RCR	10/26/93
DRAWN BY:	RR
CHECKED BY:	RCR
APPROVED BY:	EMF
ACAD CODE:	92573C12
PROJECT NO.:	92570

MASTER UTILITY PLAN III

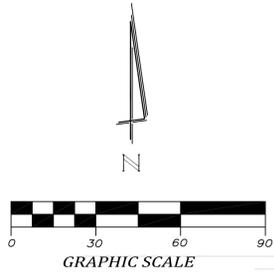
C-12

SHEET 12 OF 24



DESCRIPTION: MATANILLA REEF AT AQUARINA

PLAT BOOK 62, PAGES 32-33
 STAGE 3, TRACT 1, UNIT 2 OF THE PLAT OF "AQUARINA P.U.D. STAGE 1, TRACTS 3, TRACTS B, D, 4th, STAGE 3, STAGE 4, TRACTS B, I, 4th, STAGE 5" AS RECORDED IN PLAT BOOK 41, PAGES 88 THROUGH 92 OF THE PUBLIC RECORDS OF BREVARD COUNTY, FLORIDA BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS: BEGIN AT THE NORTHEASTERLY CORNER OF SAID STAGE 3, TRACT 1, UNIT 2 AND RUN S26°51'00"E ALONG THE EASTERLY LINE OF STAGE 3, TRACT 1, UNIT 2 A DISTANCE OF 396.00 FEET TO THE SOUTHEASTERLY CORNER OF STAGE 3, TRACT 1, UNIT 2; THENCE RUN S63°09'00"W ALONG THE SOUTHERLY LINE OF STAGE 3, TRACT 1, UNIT 2 A DISTANCE OF 290.45 FEET; THENCE S78°13'34"W 113.20 FEET TO THE SOUTHWESTERLY CORNER OF STAGE 3, TRACT 1, UNIT 2; THENCE RUN N11°46'26"W ALONG THE WESTERLY LINE OF STAGE 3, TRACT 1, UNIT 2 A DISTANCE OF 390.53 FEET TO THE NORTHWESTERLY CORNER OF STAGE 3, TRACT 1, UNIT 2; THENCE RUN N65°10'27"E ALONG THE NORTHERLY LINE OF STAGE 3, TRACT 1, UNIT 2 A DISTANCE OF 298.36 FEET TO THE POINT OF BEGINNING. CONTAINING 3.2181 ACRES MORE OR LESS.



STATE ROAD A-1-A
 SURVEY BOOK 2, PGS 75-79

NOTES:
 1. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHTS-OF-WAY AND/OR OWNERSHIP WERE FURNISHED TO THE SURVEYOR EXCEPT AS SET FORTH IN CHICAGO TITLE INSURANCE COMPANY PLAT CERTIFICATION REPORT DATED MARCH 20, 2014. NO TITLE OPINION IS EXPRESSED OR IMPLIED. THERE MAY BE ADDITIONAL RESTRICTIONS THAT ARE NOT DEPICTED BY THIS SURVEY THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY.
 2. THIS SURVEY IS NOT INTENDED TO LOCATE ANY UNDERGROUND FOUNDATIONS, UNDERGROUND ENCROACHMENTS OR UNDERGROUND IMPROVEMENTS, EXCEPT AT LOCATIONS SHOWN WITH HORIZONTAL OR VERTICAL TIES.
 3. BEARINGS ARE BASED ON THE WEST RIGHT OF WAY LINE OF STATE ROAD A-1-A BEING N28°51'00"W AS SHOWN ON THE RECORD PLAT.
 4. COORDINATES ARE BASED UPON AN ASSUMED DATUM.
 5. ALL BOUNDARY BEARINGS AND DISTANCES ARE PLAT AND MEASURED, UNLESS NOTED OTHERWISE.
 6. STATIONS AND OFFSETS ARE BASED ON A CONTROL LINE RUNNING FROM CENTER OF MANHOLE TO CENTER OF MANHOLE.
 7. DENOTES ABOVE GROUND LOCATIONS OF UNDERGROUND UTILITIES PROVIDED BY THE CLIENT. THE SURVEYOR WAS UNABLE TO VERIFY THE UNDERGROUND LOCATIONS.
 8. LOCATED IN ZONE X AS SCALED FROM FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP 12009C0711G, DATED MARCH 17, 2014, COMMUNITY 125092, FIRM INDEX DATE MARCH 17, 2014.
 9. SUBJECT PARCEL IS LOCATED IN SECTIONS 25 & 36, TOWNSHIP 29 SOUTH, RANGE 38 EAST.
 10. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 AS MEASURED IN FEET AND DECIMALS THEREOF.
 11. PROJECT BENCH MARKS ARE AS DEPICTED HEREON. ELEVATIONS DERIVED FROM UNITED STATES COAST & GEODETIC SURVEY BENCH MARK 0-304 1970.
 12. CERTAIN FEATURES DEPICTED HEREON HAVE NOT BEEN DRAWN TO SCALE DUE TO SCALE LIMITATIONS. THEY ARE PLOTTED TO THE CENTER OF THE FEATURE.

WATER LOCATION TABLE

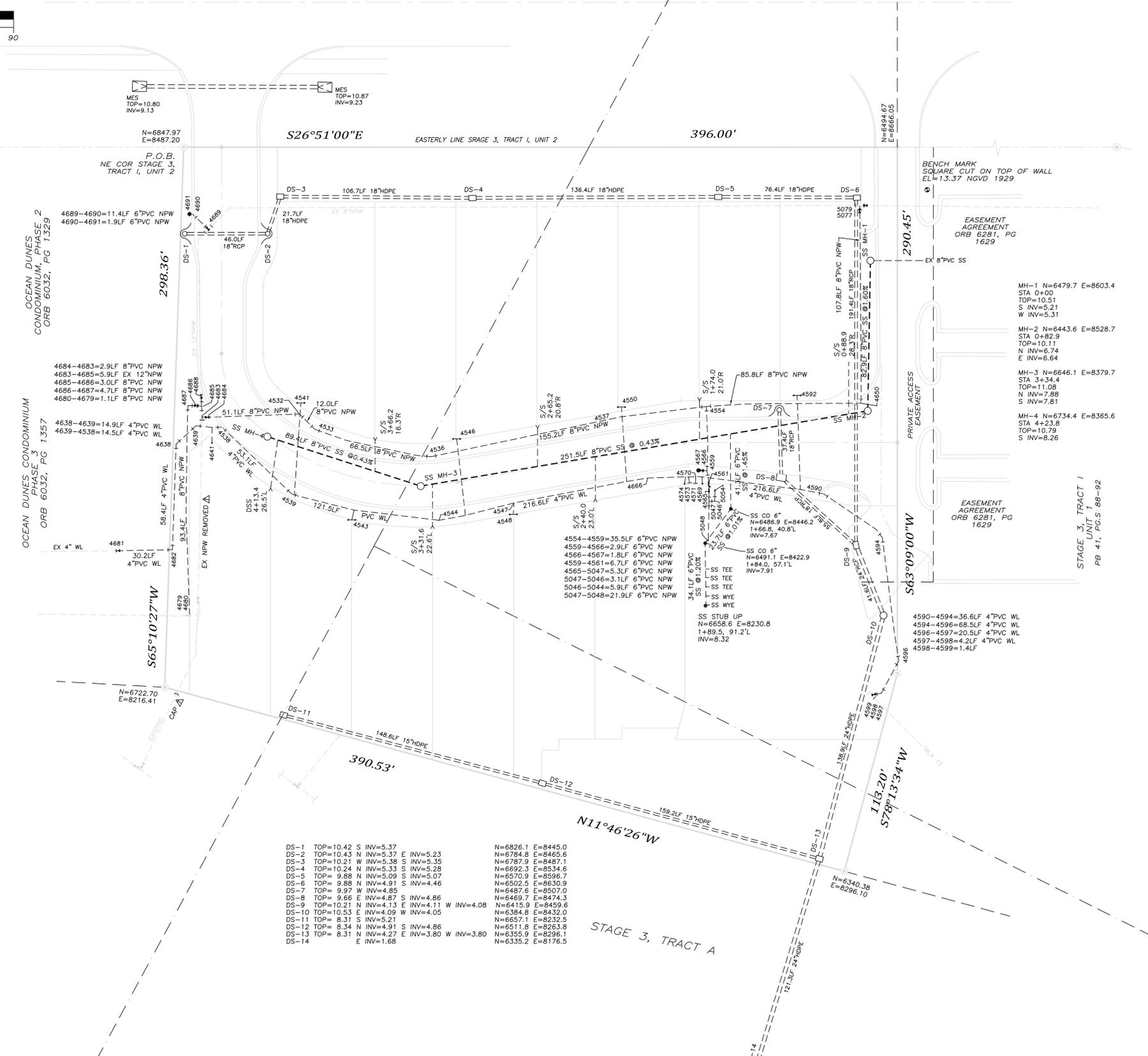
POINT	NORTH	EAST	EL	STA	O/S	DESC
4538	6759.1	8398.9	5.53	4+49.3	2.7'L	4" WS
4539	6708.3	8343.5	5.49	4+01.5	25.9'L	4" 22.5B
4541	6726.2	8390.8	x.xx	4+11.7	23.4'R	3/4" WS X2
4543	6671.8	8345.8	x.xx	3+65.1	29.5'L	3/4" WS X2
4544	6628.5	8367.5	6.67	3+27.4	20.3'L	4" 22.5B
4546	6640.1	8411.9	x.xx	3+10.4	22.4'R	3/4" WS X2
4547	6595.8	8394.8	5.95	2+84.9	17.7'L	3/4" WS
4548	6593.2	8388.9	x.xx	2+86.3	23.9'L	3/4" WS X2
4550	6566.5	8483.9	5.75	2+17.3	24.6'R	3/4" WS X2
4569	6507.3	8451.4	x.xx	1+80.0	24.5'L	2" WS
4570	6512.4	8453.4	7.00	1+83.0	19.9'L	1" SADDLE
4571	6510.8	8449.9	x.xx	1+83.9	23.7'L	3/4" WS X2
4573	6513.8	8448.8	x.xx	1+86.9	22.9'L	3/4" WS X2
4574	6516.1	8449.8	x.xx	1+89.8	22.9'L	3/4" WS
4592	6482.4	8518.6	x.xx	1+20.1	14.9'R	1" WS X2
4590	6444.6	8476.8	6.59	1+14.5	41.2'L	4" WS
4594	6404.7	8469.9	7.42	1+52.8	9.4'L	4" 45B
4596	6359.9	8413.5	6.66	2+20.5	19.7'L	4" 45B
4597	6366.5	8393.0	6.53	2+38.7	10.3'L	4" 45B
4598	6369.9	8390.6	7.28	2+39.4	6.2'L	4" WS
4599	6371.0	8389.8	6.44	2+39.6	4.8'L	4" x4" TEE & PLUG
4638	6777.7	8339.1	5.38	4+70.7	19.3'L	4" 45B
4639	6772.4	8333.1	5.36	4+83.3	6.4'L	4" 45B
4641	6760.2	8348.6	x.xx	4+52.0	12.7'L	3/4" WS
4666	6535.8	8440.5	5.83	2+09.5	16.4'L	4" WL
4682	6753.2	8286.1	6.34	4+54.9	75.5'L	4" 90B
4681	6779.9	8272.0	x.xx	(EXISTING)	4" WV	

NON-POTABLE WATER TABLE

POINT	NORTH	EAST	EL	STA	O/S	DESC
5079	6498.7	8627.9	7.00	-0+30.3	6.4'R	8" x8" TEE
5077	6497.5	8625.2	7.02	-0+27.4	6.5'R	8" NPW
4650	6448.9	8530.7	7.48	0+86.0	6.5'R	8" 90B
4554	6524.6	8490.4	5.99	1+70.9	17.1'R	8" x6" TEE
4569	6508.3	8459.0	6.38	1+76.4	17.9'L	6" x6" TEE
4566	6510.9	8457.8	7.42	1+79.2	17.3'L	6" NPW
4567	6512.6	8457.0	7.09	1+81.0	16.9'L	FH
4561	6504.4	8453.5	11.69	1+73.8	29.3'L	6" 90VB x 4" RED
4565	6502.0	8442.1	11.98	1+77.1	29.5'L	6" 90VB DDCV
5047	6492.6	8444.0	7.07	1+78.0	34.8'L	6" x6" TEE
5046	6496.9	8446.0	7.01	1+74.9	35.1'L	6" 90B
5044	6499.5	8451.3	11.69	1+73.8	29.3'L	6" 90VB x 4" RED
5048	6490.0	8424.7	7.14	1+82.0	56.3'L	6" NPW
4537	6563.9	8464.2	5.85	2+18.1	19.3'R	8" NPW
4536	6648.2	8396.8	6.13	3+26.0	15.0'R	8" 22.5B
4533	6712.7	8381.1	5.99	3+99.9	11.9'R	8" 22.5B
4532	6724.2	8384.8	5.28	4+10.7	17.3'R	8" 45B
4684	6768.9	8360.1	7.29	4+58.8	0.0'R	8" NPW
4683	6771.7	8359.0	5.97	4+61.6	0.6'L	12" x8" TEE & CAP
4685	6774.5	8364.2	6.22	4+63.6	9.9'R	12" x8" TEE
4688	6777.1	8368.9	8.24	4+65.4	10.0'R	12" NPW
4686	6773.3	8363.1	7.57	4+66.5	4.3'R	8" NPW
4687	6781.5	8361.0	6.20	4+71.0	2.9'R	8" 90B
4680	6728.4	8383.3	5.59	4+34.8	106.9'L	8" 90B
4679	6729.1	8257.5	6.80	4+35.6	107.6'L	8" NPW TIE TO EXISTING
4689	6815.8	8453.1	8.73	4+90.3	99.2'R	6" NPW TIE TO EXISTING
4690	6826.7	8456.4	7.79	5+00.6	104.2'R	6" 45B
4691	6828.4	8455.7	13.91	5+02.4	103.9'R	FH

LEGEND-ABBREVIATIONS:

- 90B = DEGREE OF PIPE BEND
- 90VB = DEGREE OF VERTICAL PIPE BEND
- A = ARC
- A/C = AIR CONDITIONER
- AD = AIR DUCT
- ASPH = ASPHALT
- BC = BACK OF CURB
- BM = BENCHMARK
- BST = BELL SOUTH TELEPHONE
- BUL = BRUSH LINE
- C&G = CURB AND GUTTER
- C/S = CONCRETE SLAB
- CAV = CABLE TELEVISION
- CB = CATCH BASIN
- CBS = CONCRETE BLOCK AND STUCCO
- CCCL = COASTAL CONSTRUCTION CONTROL LINE
- CH = CHORD
- CH BRG = CHORD BEARING
- CLF = CENTERLINE
- CMP = CHAIN LINK FENCE
- CMP = CONCRETE MONUMENT
- CMP = CORRUGATED METAL PIPE
- CO = CLEAN OUT
- COLLUM = COLUMN
- COM = COMMERCIAL
- CONC = CONCRETE
- CORNER = CORNER
- DELTA = DELTA
- DRIVWAY = DRIVEWAY
- DR = DRAINAGE EASEMENT
- DESC = DESCRIPTION
- DI = DUCTILE IRON PIPE
- DIRP = DRIP LINE
- DT = DEPARTMENT OF TRANSPORTATION
- DS = DRIVEWAY STRUCTURE
- DYL = DOUBLE YELLOW LINE
- EL = ELEVATION
- EL = ELEVATION BOX
- ELEC = ELECTRIC
- ELEC = ELECTRIC METER
- EDGE = EDGE OF PAVEMENT
- EDGE = EDGE OF WATER
- EASEMENT = EASEMENT
- EXIST = EXISTING
- EXIST = FINISHED FLOOR
- FH = FIRE HYDRANT
- FENCE = FENCE
- FOUND = FOUND
- FL & L = FLORIDA POWER AND LIGHT
- GL = GUY ANGLE
- GOVT = GOVERNMENT LOT
- GATE = GATE VALVE
- IRRI = IRRIGATION CONTROL VALVE
- INVERT = INVERT
- IRON = IRON PIPE
- IRON = IRON ROD
- IRON = IRON REBAR AND CAP
- ISLAND = ISLAND
- LEFT = LEFT
- LINEAR = LINEAR FEET
- LIGUSTRUM = LIGUSTRUM
- LANDSCAPING = LANDSCAPING
- LIGHT = LIGHT POLE
- MEAS = MEASURED
- MISC = MISCELLANEOUS
- MLP = METAL LIGHT POLE
- N&D = NAIL AND DISK
- NAVD = NORTH AMERICAN VERTICAL DATUM
- NGVD = NORTH AMERICAN VERTICAL DATUM
- NPW = NON-POTABLE WATER
- NPWS = NON-POTABLE WATER SERVICE
- NPWV = NON-POTABLE WATER VALVE
- NPWV = NON-RADIAL
- OFFSET = OFFSET
- OVER-HANG = OVER-HANG
- OVERHEAD = OVERHEAD WIRE
- OFFICIAL = OFFICIAL RECORDS BOOK
- PLAT = PLAT
- P.O.B. = POINT OF BEGINNING
- P.U.D. = PLANNED UNIT DEVELOPMENT
- PC = PLAT BOOK
- PC = POINT OF CURVATURE
- PC = POINT OF COMPOUND CURVATURE
- PERM = PERMANENT CONTROL POINT
- PAGE = PAGE
- PRM = PERMANENT PREFERENCE MONUMENT
- PREV = PREVIOUS
- PT&D = POINT OF TANGENCY
- PUB = PUBLIC UTILITY & DRAINAGE
- PVC = POLYVINYL CHLORIDE PIPE
- PWNT = PAVEMENT
- PW = POTABLE WATER
- R = RADIUS
- R = RIGHT
- RIGHT-OF-WAY = RIGHT-OF-WAY
- RADIAL = RADIAL
- RCP = REINFORCED CONCRETE PIPE
- REDUCER = REDUCER
- RES = RESIDENCE
- RANGE = RANGE
- RED PAINT MARK = RED PAINT MARK
- S/S = SANITARY SEWER SERVICE
- S/S = SIDEWALK
- S/S = SILVER BUTTWOOD
- SD = STORM DRAIN
- SECTION = SECTION
- SPRINKLER = SPRINKLER HEAD
- SPOT = SPOT LIGHT
- SAHM = SANITARY MANHOLE
- STATE = STATE PLANE COORDINATES
- SS = SANITARY SEWER
- STATION = STATION
- STORY = STORY
- SOLID WHITE LINE = SOLID WHITE LINE
- SOLID YELLOW LINE = SOLID YELLOW LINE
- TOP = TOP OF BANK
- TRANS = TRANSFORMER
- TWP = TOWNSHIP
- TYPICAL = TYPICAL
- UB = UTILITY BOX
- UE = UTILITY EASEMENT
- VEGETATION = VEGETATION LINE
- W = WITH
- WOOD = WOOD
- WL = WATERLINE
- WM = WATER METER
- WPP = WOOD POWER POLE
- WS = WATER SERVICE
- WS = WATER VALVE



Certified as to meeting the Minimum Technical Standards, Chapter 50, F.S. and Chapter 50, F.A.C., set forth by the Board of Professional Surveyors and Mapmakers, pursuant to Section 472.027, Florida Statutes.
 ROBERT R. BRIEL, Florida Professional Surveyor & Mapper, No. 3699
 This survey is prepared and certified for the exclusive use of the client named herein. Not valid without the signature and original raised seal of a Florida licensed surveyor or other than the signing party is prohibited.

PLAT OF SURVEY FOR:
MATANILLA REEF AT AQUARINA
 for: **COMMERCIAL BUILDING CORP.**

BRIEL & ASSOCIATES
 Land Surveyors, Inc.
 1790 Hwy. A1A, Suite 208 • Satellite Bch., Florida 32937 • (321) 773-7775
 LB 3669

TYPE: UTILITY AS-BUILT SURVEY
 FIELD SURVEY DATE: JUNE 27, 2016
 PROJECT NO.: 13044AB
 DRAWN BY: RRB
 CHECKED BY: RRB
 SCALE: 1" = 30'
 SHEET 1 OF 1

APPENDIX B: SOURCE WATER ASSESSMENT & PROTECTION PROGRAM RESULTS



- » SWAPP Homepage
- » Search By County
- » Search by PWS Name or Number
- » How to Help?

Definitions

- » Aquifers
- » Public Water Systems
- » Assessment
- » Potential Contaminants
- » Susceptibility
- » Prevention

Contact Us

- » Email
- » Mailing Address
- » Source Water Protection Workshop

EPA Source Water Protection website



Source Water Assessment & Protection Program

Results for: 2019

AQUARINA UTILITIES
235 AQUARINA BLVD
MELBOURNE BEACH, FL 32951

Public Water System ID: 3054060

Previously Known As:
AQUARINA DEVELOPMENT
SERVICE MANAGEMENT SYSTEMS, INC

County: BREVARD
DEP Regulatory Office: DEP Central District
3319 Maguire Blvd, Suite 232
Orlando, FL 32803
407-897-4100

Public Water System Type : COMMUNITY
Public Water System Source : GROUND

Primary Use: SUBDIVISION

Population Served: 750

Size of Assessment Area:

GROUND: For this system, a 1000-foot radius circle around each well was used to define the assessment area.

Number of Wells: 2

Well ID	Owner ID	FLUWID Status	Well Depth(ft)	Aquifer
4207	WELL#1 BACKUP 450'/595'350GPM	AAC2808 ACTIVE	595	Floridan Aquifer
4209	WELL#3 FLOWING 400'/590'	AAH7648 ACTIVE	Not Available	Floridan Aquifer

Results:

GROUND WATER:

Number of Unique Potential Contaminant Sources: 2

Facility Type	Facility Class	Status	Name	Affected Well	Susceptibility Score	Concern Level
DOMESTIC WASTEWATER	WASTEWATER SITE	A	Aquarina Beach Community WWTF	4209	<u>0.01</u>	<u>LOW</u>
DOMESTIC WASTEWATER	WASTEWATER SITE	A	Aquarina Beach Community WWTF	4207	<u>0.01</u>	<u>LOW</u>
DOMESTIC WASTEWATER	WASTEWATER FACILITY	A	Aquarina Beach Community WWTF	4209	<u>0.01</u>	<u>LOW</u>
DOMESTIC WASTEWATER	WASTEWATER FACILITY	A	Aquarina Beach Community WWTF	4207	<u>0.01</u>	<u>LOW</u>

Last updated: February 19, 2020



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M.S. 49 Tallahassee, Florida
32399 850-245-2118 (phone) /
850-245-2128 (fax)

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APPENDIX C: TANK INSPECTIONS REPORTS



5,000 Gallon Aquarina Pressure Vessel Inspection Report

Melbourne, Florida

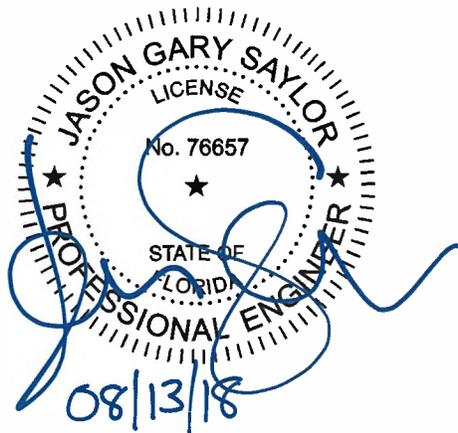
Prepared For:
Kevin Burge
Aquarina Utilities

Prepared By:
Tim McDaniel
Water System Consultant

Date: July 17, 2018

Reviewed By:
Jason G. Saylor, P.E.
Director, Engineering
Utility Service Co., Inc.

Date: August 13, 2018



General Information

INTRODUCTION

On July 17, 2018, Utility Service Co., Inc. conducted a washout inspection of the 5,000-gallon Aquarina Blvd. pressure vessel. The purpose of the inspection was to determine the condition of the coatings and structure and evaluate the tank for compliance with current sanitation, safety & security regulations and guidelines in accordance AWWA, OSHA, Florida Department of Environmental Protection, US EPA and the US Dept. of Homeland Security.

In this report, you will find a description of the current condition of this tank along with photographs to support the recommendations.

The determinations and recommendations made within this report with respect to the condition, integrity, or appearance of the structure are based upon visual observations and did not include any evaluation of the structural design, structural integrity, or structural tolerances of the tank or any components. Extensive testing or investigation of the structure to determine the extent of material damage, deterioration, or degradation was not completed.

TANK DETAILS

CAPACITY:	5,000 Gallons	DESIGN:	Pressure Vessel
INSPECTION DATE:	July 17, 2018	INSPECTOR:	Garrett DuPree Stephen Yeomans
CONSTRUCTION STYLE:	Welded	CONSTRUCTION DATE:	1993
BUILDER:	Dixie Southern	HEIGHT/ DIMENSION:	22ft x 5ft dia.
LADDER GATE:	N/A	SAFETY CLIMB EQUIPMENT:	N/A
EXTERIOR COATING:	Alkyd	EXTERIOR LEAD/ CHROMIUM PRESENCE:	BDL
INTERIOR COATING:	Epoxy	INTERIOR LEAD/CHROMIUM PRESENCE:	BDL

ESTIMATED REPLACEMENT VALUE

The replacement cost is estimated at \$40,000.00, to \$50,000.00 for the tank alone.

Exterior Coatings Conditions

TANK SHELL

Exterior shell coating is in good condition. No corrosion was noted, and the coating continues to protect the substrate. Some algae is present on the underside of the tank.

TANK ROOF

Exterior coating on the roof appeared to be in good condition as well.

RECOMMENDATIONS

- Pressure washing to remove algae from the bottom of the tank and remove the salt because of environment would help keep the coating intact.

Interior Conditions

ROOF AND AREA ABOVE HIGH WATER LEVEL

Interior coating is starting break down and corrosion is present on most of the weld seams. The end caps are showing surface rust across a five-foot by one-foot area. The roof panels in between the weld seams are in good condition.

SIDEWALLS

Coating in the middle area of the tank is beginning to break down. Areas below the water level appear to be in good condition. However, corrosion is present along the entire area around the tank at the waterline. Some of the coating has broken down and steel is showing. The inside area of the manway had tuberculation around the perimeter. When washed it showed the coating is compromised in those areas.

FLOOR

The floor had sediment the entire length of the tank however it was only 1/4 inch deep. The openings, drain, and fill line all had tuberculation. These areas around the weld seams are starting to pit.

RECOMMENDATIONS

- Power tool cleaning of the corroded areas should be completed and repairs to areas of metal loss (pitting) and recoating utilizing a 100% solids epoxy to minimize the cure time.
- Abrasive blasting of the interior of this tank at this time is not cost efficient or recommended, however waiting to do any repairs to the coating in a pressure vessel will allow corrosion and pitting to continue, which may compromise the pressure capacity of the vessel (due to metal thickness losses). Therefore, completion of the interior coating repairs is strongly recommended within the next year.

SAFETY

Access Hatch

This tank is equipped with one access opening that is in good condition.

SANITATION

Roof Openings

The only roof openings are for the pressure relief and air control valves. No issues noted.

STRUCTURE

Foundation and Saddles

The tank is supported by three steel saddles on concrete piers. All three saddles are corroded in various areas near the bottom plates. Metal loss is evident. The tank is also secured to the foundation by a steel braided cables attached to bolts in the foundation.

Tank Shell

The tank shell appears to be in good condition with no visible metal loss.

SECURITY

Site: Tank is located within a protected area.

RECOMMENDATIONS

- **Complete repairs to corroded areas of tank saddles as soon as possible to ensure tank is properly supported.**

5,000 Gallon Pressure Vessel Aquarina Utilities Melbourne, Florida





Photo #1



Photo #2



Photo #3



Photo #4



Photo #5



Photo #6



Photo #7

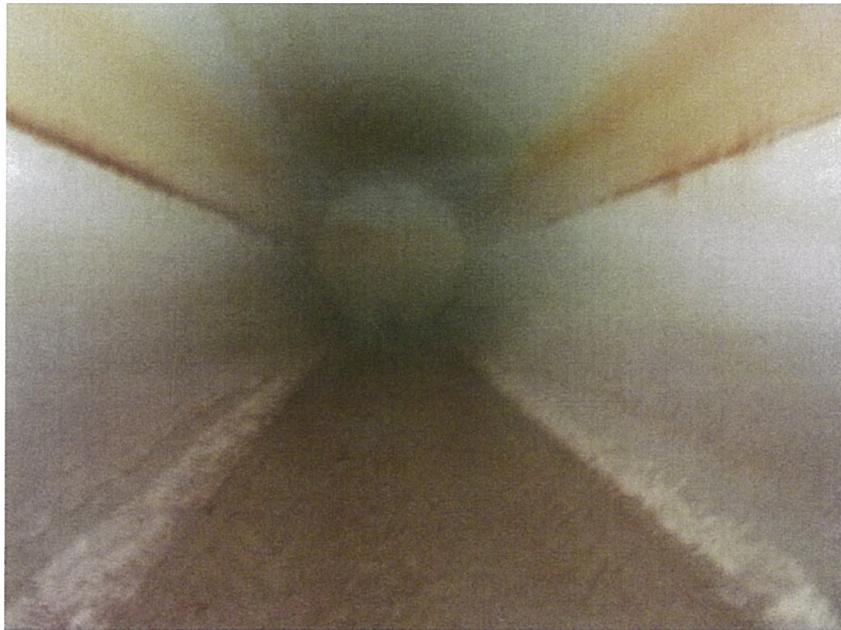


Photo #8



Photo #9

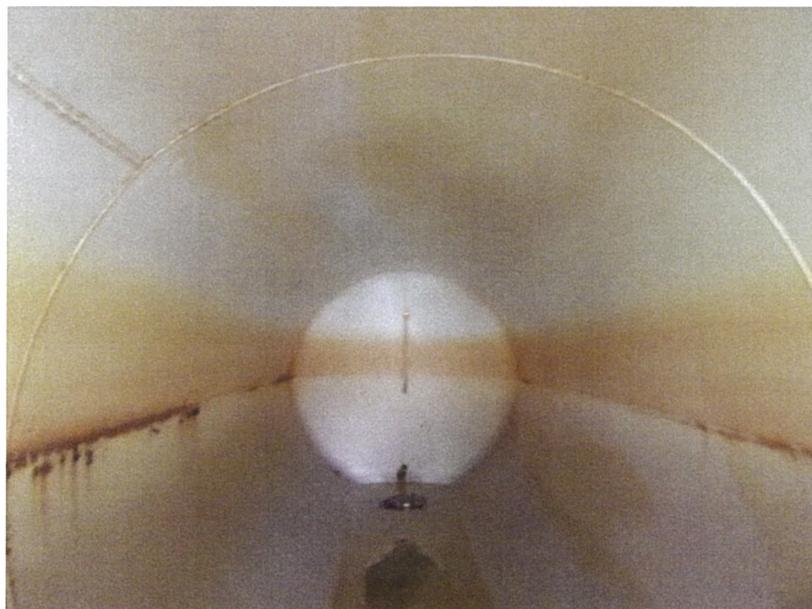


Photo #10



Photo #11

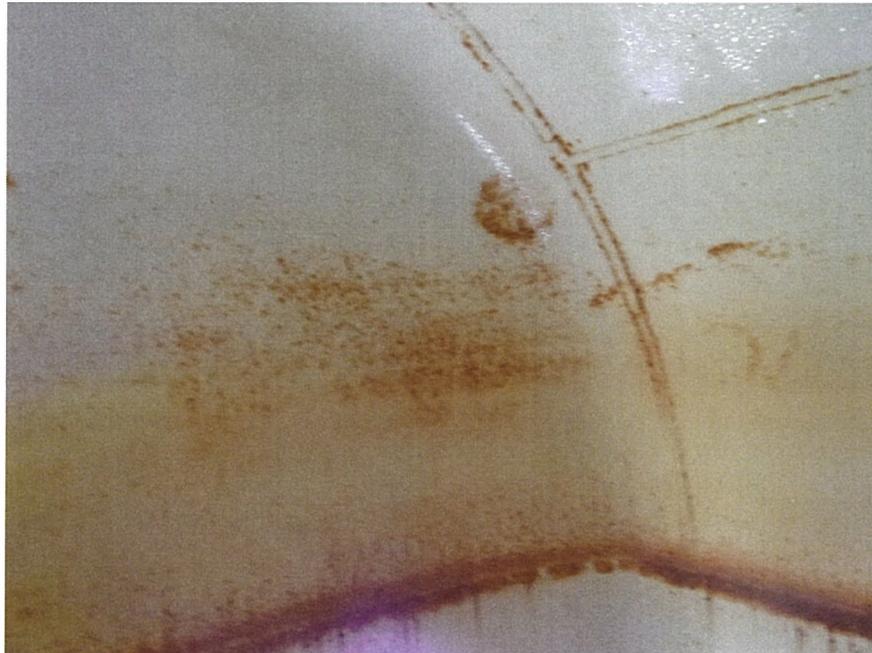


Photo #12

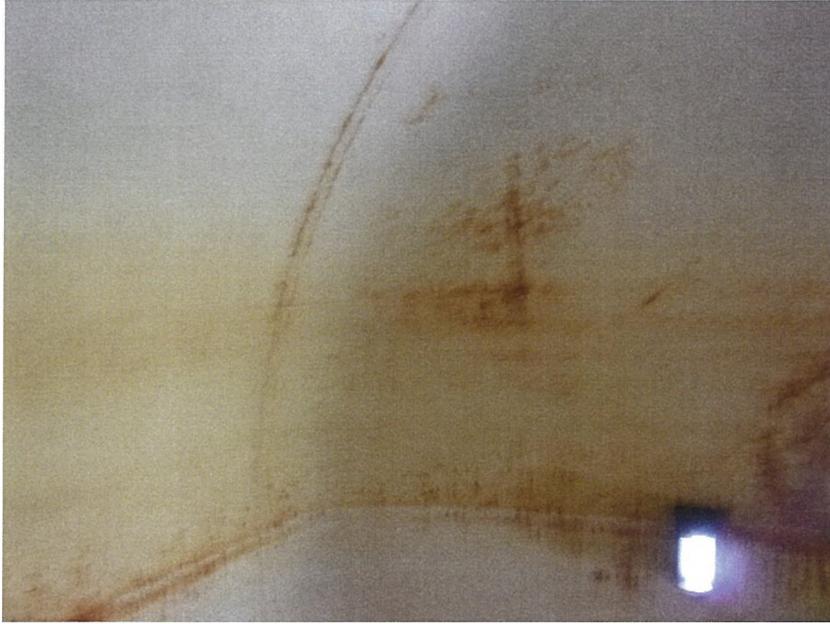


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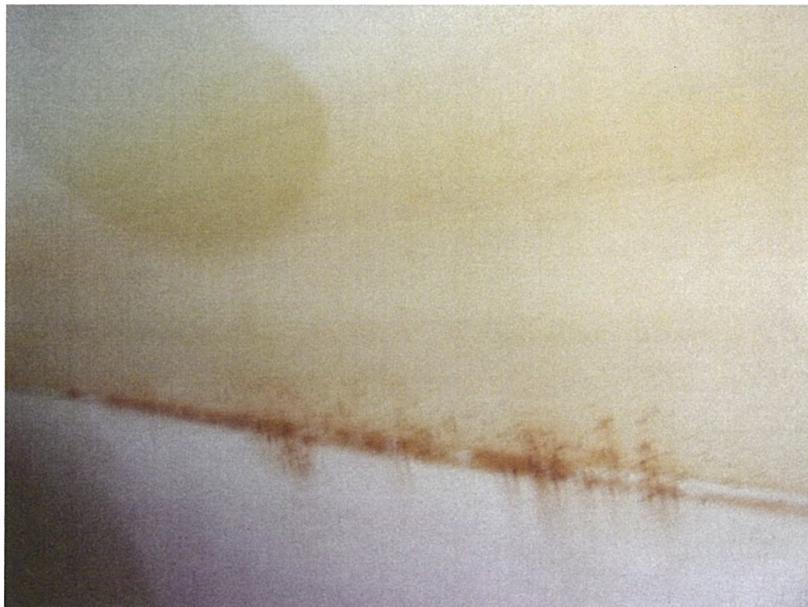


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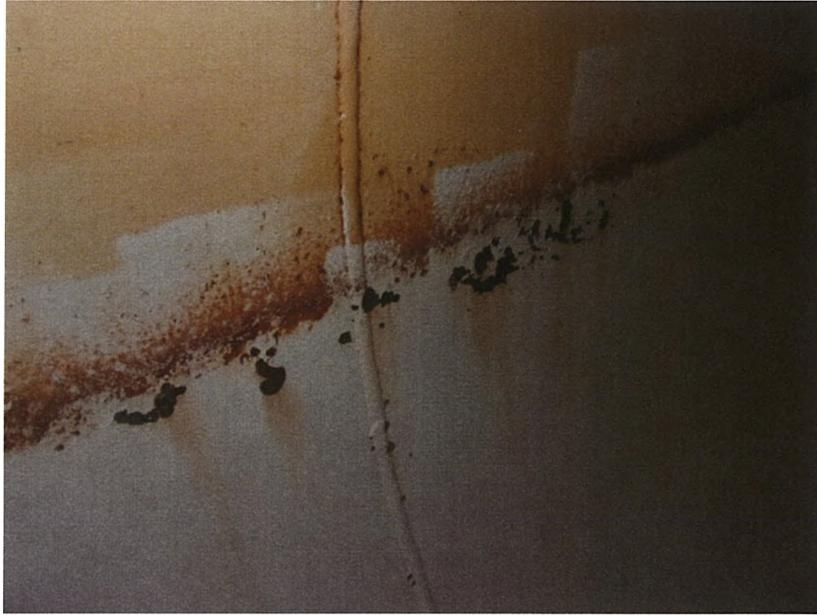


Photo #15



Photo #16

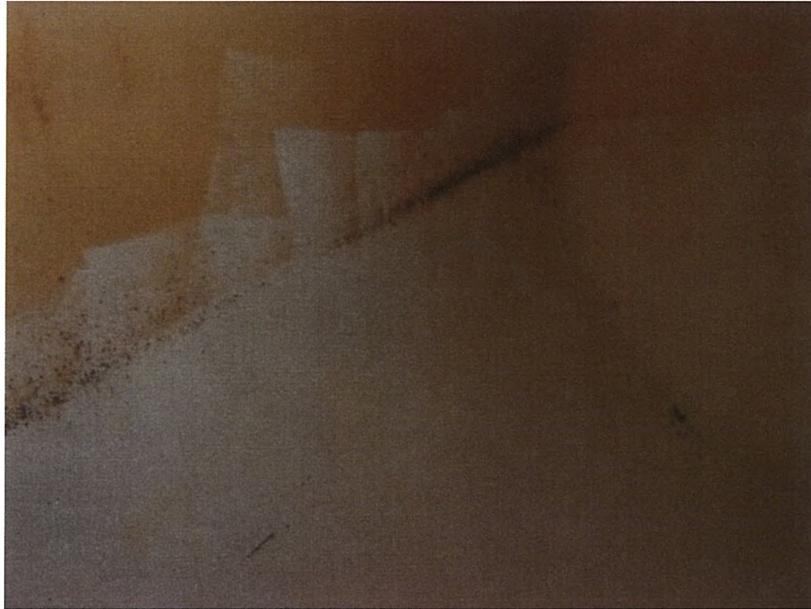


Photo #17



Photo #18



Photo #19



Photo #20

250,000 Gallon Plant Ground Storage Tank Inspection Report

Melbourne, Florida

Prepared for:
Kevin Burge
Aquarina Utility

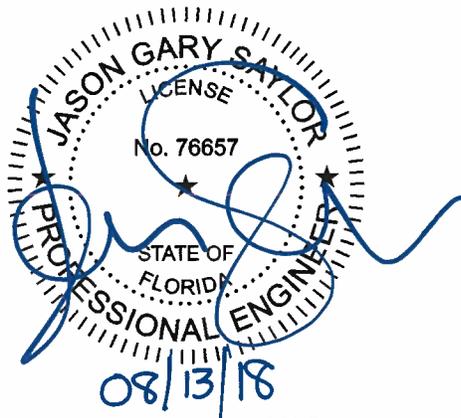
Prepared by:
Tim McDaniel
Water System Consultant

Date:
July 17, 2018

Reviewed by:
Jason G. Saylor, P.E.
Director, Engineering
Utility Service Company, Inc.



Date:
August 13, 2018



General Information

INTRODUCTION

On July 17, 2018, Utility Service Co., Inc. conducted a washout inspection of the 250,000-gallon Ground Storage Tank located at 435 Aquarina Blvd. in Melbourne, FL. The purpose of the inspection was to determine the condition of the coatings and structure, and evaluate the tank for compliance with current sanitation, safety & security guidelines and regulations published by AWWA, OSHA, Florida Department of Environmental Protection, US EPA, and the US Dept. of Homeland Security.

In this report, you will find a description of the current condition of this tank along with photographs to support the recommendations.

The determinations and recommendations made within this report with respect to the condition, integrity, or appearance of the structure are based upon visual observations made during the condition assessment. The condition assessment did not include an evaluation of the structural design, structural integrity, or structural tolerances of the tank or any components. Extensive testing or investigation of the structure to determine the extent of material damage, deterioration, or degradation was not completed.

TANK DETAILS

CAPACITY:	250,000 Gallons	DESIGN:	Concrete Ground Storage Tank
INSPECTION DATE:	7-17-2018	INSPECTOR:	Garrett DuFree
CONSTRUCTION STYLE:	Concrete	CONSTRUCTION DATE:	Estimated 1972
BUILDER:	Crom	HEIGHT/ DIMENSION:	22ft x 44ft dia.
LADDER GATE:	N/A	SAFETY CLIMB EQUIPMENT:	Rigid Rail
EXTERIOR COATING:	Acrylic	EXTERIOR LEAD/ CHROMIUM PRESENCE:	N/A
INTERIOR COATING:	N/A	INTERIOR LEAD/CHROMIUM PRESENCE:	N/A

ESTIMATED REPLACEMENT VALUE

The replacement cost of this tank is estimated at \$190,000 to \$225,000.

Exterior Coatings Conditions

TANK SHELL

The exterior coating is in good condition, with minor cracks only showing in a couple of areas. Overall the coating is protecting the substrate.

TANK ROOF

Coating on tank roof is in good condition and continues to protect the substrate.

RECOMMENDATIONS

- **None at this time.**
-

Interior Conditions

ROOF AND AREA ABOVE HIGH WATER LEVEL

There is no coating on the interior of the tank. The concrete appears to be in good condition. There are small areas in the roof where the reinforcement support is visible and some corrosion is occurring.

FLOOR AND SIDEWALLS

The floor appears to be in good condition, with very little sediment present. Sediment was removed with pressure washing.

Minor cracking and iron staining is present on the sidewalls. Overall, the sidewalls appeared to be in good condition.

Following the cleaning, the entire tank was disinfected per AWWA "Spray Method #2".

RECOMMENDATIONS

- **None at this time.**
-

Safety/Sanitation/Structure/Security

SAFETY

Ladders

Ladders were found to be in good condition.

Shell Access Hatch

Tank is equipped with a one standard Crom shell access manway that was found to be in good condition.

Secondary Roof Access Hatch

Tank is equipped with a roof hatch access hatch that was found to be in good condition. Hatch cover seals with gasket to frame.

Aviation Warning Lights

N/A

SANITATION

Roof Hatch

Hatch cover seals with gasket to frame. Gasket in good condition.

Center Roof Vent

Center venter screens were intact and in good condition.

Overflow

This tank is equipped with four (4) overflow outlets at edge of tank roof. All screens were intact.

STRUCTURE

Foundation

Foundation was not visible for inspection, with grass growing directly up to tank base.
No issues noted at tank base.

SECURITY

Site

The tank is located within a fenced area.

SUMMARY AND RECOMMENDATIONS

SUMMARY

Overall the tank is in good condition with no significant deficiencies to report.

RECOMMENDATIONS

- **No recommendations at this time.**

250,000 Gallon Aquarina GST Tank Melbourne, Florida



Photo #1



Photo #2



Photo #3



Photo #4



Photo #5

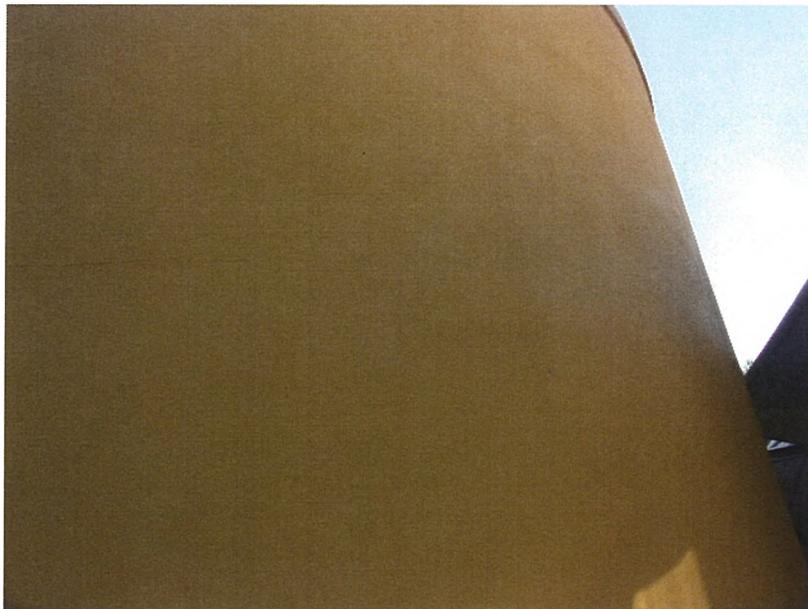


Photo #6

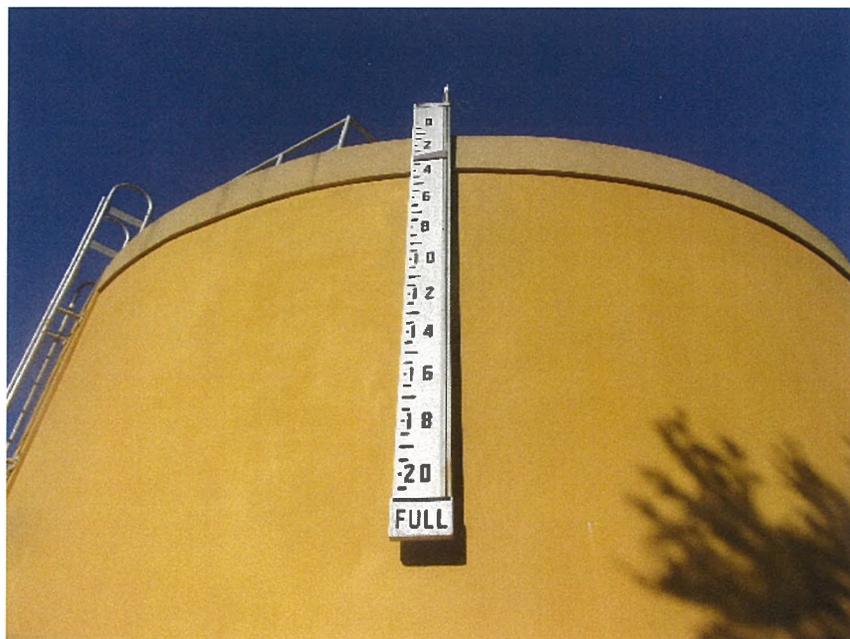


Photo #7



Photo #8



Photo #9



Photo #10



Photo #11



Photo #12



Photo #13



Photo #14



Photo #15



Photo #16



Photo #17



Photo #18



Photo #19



Photo #20



Photo #21



Photo #22



Photo #23

APPENDIX D: CONSUMER CONFIDENCE REPORT

2020 Water Quality Report

Aquarina Utilities, Inc.



We are pleased to present to you an Annual Water Quality Report for the year 2020. This report is designed to inform you about the quality water and services provided to you under Aquarina Utilities, Inc. during the past year.

Aquarina Utilities, Inc. is a family owned and operated Florida business committed to providing you with quality water in the year to come. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. Your drinking water is drawn from two potable wells (drawing from 595 feet deep into the Floridan Aquifer), located within the Aquarina development, and treated with a completely updated system, including purification by a reverse-osmosis system and chlorine disinfection, before delivery to your home. We monitor the system closely and employ the added security of remote notification by a computer should any change be needed to ensure that our water processing is proceeding smoothly. We continue to make improvements to both our facility and process, working to achieve our goal of the best quality water service for you, our valued customers.

This report shows the 2020 water quality results and what they mean.

If you have any questions about this report or concerning your water utility, or you want to obtain a copy of this report, please contact Aquarina Utilities, Inc. by email at aquarinautilities@bellsouth.net or call (772) 708-8350. Questions pertaining to the actual test results will be answered by our "A" certified chief operator and superintendent, Kevin Burge, at (772) 708-7946. Additional information may be obtained from the EPA at their Safe drinking Water Hotline (800-426-4791).

In compliance with state and federal laws, rules, regulations and guidelines, the owners and operators of public water systems are required to routinely monitor for contaminants in your drinking water. This monitoring includes comprehensive, regularly scheduled and reported testing of water samples by an outside laboratory and is strictly regulated by state and federal agencies. The results included in this report reflect the testing conducted Aquarina Utilities, Inc. during the period from 1 January 2020 to 31 December 2020. These results are compiled and distributed to you by Aquarina Utilities, Inc. Also included in these results are test results from earlier years for contaminants sampled less often than annually. The state allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. For contaminants not required to be tested for in the year 2020, the test results indicated are for the most recent testing done in accordance with regulations set forth by the state and approved by the United States Environmental Protection Agency (EPA). The schedule for all testing is established by the state.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- (A) **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- (C) **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- (D) **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- (E) **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

In 2020 the Florida Department of Environmental Protection performed a Source Water Assessment of our system. The assessment was conducted to provide information about any potential sources of contamination in the vicinity of our wells. The only potential source of contamination identified in the assessment is domestic wastewater, with a 0.01 susceptibility level. This means that there is a very **low** level of concern for any contamination from this source to affect our drinking water **before** it is treated. The assessment results

are available on the FDEP Source Water Assessment and Protection Program website at www.dep.state.fl.us/swapp (search “Aquarina Utilities”) or they can be obtained by emailing aquarinautilities@bellsouth.net and requesting the information.

In the table below, you may find unfamiliar terms and abbreviations. To help you better understand these terms we've provided a list of definitions below:

** Results in the Level Detected column for radioactive contaminants, inorganic contaminants, synthetic organic contaminants including pesticides and herbicides, and volatile organic contaminants are the highest average at any of the sampling points or the highest detected level at any sampling point, depending on the sampling frequency.

INORGANIC CONTAMINANTS							
Contaminant & Unit of Measurement	Dates of Sampling (mo. / yr.)	MCL Violation Y / N	Level Detected	Range of Results	MCLG	MCL	Likely Source of Contamination
Barium (ppm)	11/2018	N	0.012	0.0046	2.0	2.0	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
Fluoride (ppm)	11/2018	N	0.23	0.094	4.0	4.0	Erosion of natural deposits; discharge from fertilizer and aluminum factories. Water additive which promotes strong teeth when at the optimum level of 0.7 ppm
Sodium (ppm)	11/2018	N	21.8	34.0	N / A	160	Salt water intrusion, leaching from soil.

TTHMs and Stage 2 Disinfection / Disinfection By-Product (D/DBP) Contaminant and Disinfectant Residuals							
For the following contaminants monitored under Stage 1 D/DBP regulations, the level is the annual average of the quarterly averages: Bromate, Chloramines, Chlorine, Haloacetic Acids, and / or TTHM (MCL ppb). Range of Results is the range of results (lowest to highest) at the individual sampling sites.							
Contaminant & Unit of Measurement	Dates of Sampling (mo. / yr.)	MCL Violation Y / N	Level Detected	Range of Results	MCLG or MRDLG	MCL or MRDL	Likely Source of Contamination
TTHM (Total Trihalomethanes) (ppb)	12/2020	N	0.47 U	N/A	N/A	MCL = 80	By-product of drinking water disinfection.
HAA5 (Haloacetic Acid) (ppb)	12/2020	N	0.90 U	N/A	N/A	MCL = 60	By-product of drinking water disinfection.
Chlorine (ppm)	1/2020 - 12/2020	N	0.5	0.3 - 0.8	MRDLG = 4	MRDL = 4.0	Water additive used to control microbes.

LEAD AND COPPER (TAP WATER)							
Contaminant & Unit of Measurement	Dates of Sampling (mo. / yr.)	AI Violation Y / N	90th Percentile Result	No. of sampling sites exceeding the AI	MCLG	AL	Likely Source of Contamination
Copper (tap water) (ppm)	10/2018	N	0.198	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (tap water) (ppb)	10/2018	N	0.002	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Initial Distribution System Evaluation (IDSE): An important part of the Stage 2 Disinfection Byproducts Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of **trihalomethanes (THMs) and haloacetic acids (HAAs)**. Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum residual disinfectant level goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

“ND” means **not detected** and indicates that the substance was not found by laboratory analysis.

Picocurie per liter (pCi/L): measure of the radioactivity in water

Parts per billion (ppb) or Micrograms per liter (µg/l): one part by weight of analyte to 1 billion parts by weight of the water sample.

Parts per million (ppm) or Milligrams per liter (mg/l): one part by weight of analyte to 1 million parts by weight of the water sample.

The Environmental Protection Agency (EPA) requires monitoring of over 80 drinking water contaminants. Those contaminants listed in the table above are the only contaminants detected in your drinking water. As you can see by the table, our system had no water quality violations. We're proud that your drinking water meets or exceeds all Federal and State requirements.

Lead. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Aquarina Utilities, Inc. is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care

providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

We at Aquarina Utilities, Inc. would like you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. If you have any questions or concerns about the information provided, please feel free to call any of the numbers listed.

View Your Account Balances Online!!

Visit www.ub-pay.com to set up your online account using your Aquarina Utilities account number and the municipal code AquarinaFL to be able to see your water, sewer, and irrigation account balances and payment histories.

Make Credit Card Payments:

To make a credit card payment on your water/sewer/irrigation account, access your bill online at www.ub-pay.com. Set up your account login using your Aquarina Utilities account number(s) and the municipality code **AquarinaFL**. For the small fee detailed on the website, you can enjoy the convenience of paying by credit card.

Direct Debit from Checking Accounts:

We now offer direct debit from your checking account for payment of your water and sewer bills. If the convenience of this option- never having to think about whether you changed your billing address or when your payment is due while you are traveling- seems the right fit for you, please give Holly a call at (772) 708-8350 or email her at aquarinautilities@bellsouth.net for more details. All renters are required to pay by direct debit.

Payment by Check or Money Order:

Of course, property owners may always pay by personal check or money order, mailed to **Aquarina Utilities, Inc.; P.O.Box 628733; Orlando, FL 32862-8733**. Your prompt payments on or before the due date indicated on your bill are very much appreciated!

Receive your Bill by Email:

Save yourself that call for your account balance or that unpleasant late notice because you never received your bill!

We strongly encourage all our customers who regularly use email to send us an email requesting that their bills be sent electronically. As regular "snail" mail continues to become more uncertain, we ask that everyone who is computer-capable please provide an email address so we can send your bill to your email account rather than to your regular billing address. Email billing customers will not receive a paper bill in the mail.

Late Fees:

Due to the large number of late-paying accounts and delinquencies among our customers, the Florida Public Service Commission has approved a late fee of \$7.00 for every late account. We encourage everyone to make an effort to get their payments into us by the due date indicated on your billing to avoid this fee. We sure appreciate those wonderful customers who pay promptly! For those paying using the "Bill-pay" option in your online banking package, we request that you to make those payment requests before the 15th of the month to avoid late payments. It might take longer than expected for your bank to disburse the payment and for the mail to deliver it.

Public Alert:

Please take a moment to update your contact information on the **Public Alert** system. This system is designed to provide immediate notification by telephone and email in the event of a boil water notice or other emergency issue. Only by logging into the Public Alert website and providing your contact information will you be notified in the event of a boil water notice or emergency. Please take the time to complete this vital process to ensure that you receive proper notification in the event of an emergency. www.public-alert.com

Website:

www.aquarinautilities.com is now up and running. We will post boil water notices and other public notices on this site. It also has links to related websites such as the Florida Public Service Commission and the Florida Department of Environmental Protection.



Welcome to Aquarina Utilities, Inc!

Aquarina Utilities, Inc. is a family owned and operated Florida business dedicated to the provision of quality water and wastewater service. Our Service Team is made up of a number of qualified and experienced people who strive to improve our facilities at Aquarina and ensure that the water and service we supply are of the best quality. Kevin Burge heads the team with experience, education, and ingenuity. Kevin holds a double “A” certification in both water and wastewater operations. This double certification is fairly rare and is only held by the highest level administrators and chief operators in large municipal systems. Kevin earned a Master’s Degree in Environmental Toxicology and is only a course or two short of a second Master’s in Civil and Environmental Engineering. He has a Bachelor of Science in Biology and an Associate’s Degree in Marine Biology. He holds state licenses for water distribution systems and the inspection and repair of backflow prevention equipment, and he continues his education in water and wastewater operations and maintenance to ensure that the plant is state-of-the-art and running smoothly. Kevin manages all the complicated sampling schedules and compliance issues required by state and federal agencies like the Florida Department of Environmental Protection. He is the man who makes it his business to provide water that meets all the state and federal safety standards in the industry. Kevin has been working in this field since 1987, when he began with his father Reg and their first treatment plant in Jensen Beach, Florida.

The second member of our Service Team is Mrs. Holly Burge, wife of Kevin Burge and mother of their two children. An experienced cartographer, Holly is a military veteran and holds a Bachelor of Science in Geology and Geophysics. She is responsible for all accounting and customer relations. Holly is our connection with the Florida Public Service Commission and all of our valued customers. In addition to her duties for Aquarina Utilities, she facilitates the education of her two teenage children and is a key element in the smooth operation of our family and church affairs. Holly is a double “C” certified water and wastewater operator and also contributes to the plant operations and maintenance. She is the force that fills the gaps and keeps us on our toes.

Finally, Aquarina Utilities, Inc. values the services of the fine employees who are instrumental in the daily operation and care of the facility at Aquarina. Mr. Ronald Chupka of Satellite Beach has been our daily operator for the past ten years and was responsible for the general operations of the plant during the week. Mr. Chupka has been in the business a long time and has been a very dependable asset to our team. He has elected to retire in 2021, and our daily operations will then be managed by US Water. Mr. James Sullivan has been our most important link to the Aquarina undergrounds in maintenance and we have recently added Mr. Kenny Evans to our maintenance team as an operator trainee. This group of dedicated individuals has been working hard to serve the water and wastewater needs of the Aquarina Community. We look forward to plant improvements and the influx of new customers that will come with additional development. We look forward to working with the builders and developers to improve our community.

We absolutely encourage all our customers to call or email us with inquiries and concerns about any issue you might have regarding your water and sewer service. We’d love to hear from you. Kevin is happy to discuss any questions you might have about treatment, and Holly is pleased to have the opportunity to talk to many of you regarding your billing concerns. Kevin is available 24 hrs a day at (772) 708-7946. Holly is available to answer billing questions Monday through Friday, 9am to 1pm at (772) 708-8350 (cell). We urge you to email us at aquarinautilities@bellsouth.net for the best response to your needs. If your call is not answered immediately, it will be returned as soon as possible. Thank you for letting us serve you!

We Love the New Meters!!

During the summer of 2020, all of the water meters in the Aquarina system were replaced with electronically read meters. These meters have already proven invaluable in their ability to maintain usage records on a daily basis and to monitor flow and help identify leaks. Their 99.9% accuracy for the next 20 years will continue to help us accurately assess the volume of leaks and are helping us maintain our water budget for the St. John’s River Water Management District.

Did you know?

Did you know that a little maintenance on the part of our customers helps us save you money?

Your sewer clean-out:

For most of the residents of Aquarina and the neighborhoods we service, this very important access to your sewer line is located in the front yard somewhere. This access is critical to clearing any blockages in your sewer lateral!!



Some tips for keeping your sewer line in good condition:

- **Locate your clean out and be sure it is in good condition.**
Broken clean-outs and caps allow surface water, dirt, debris and RATS into the sewer system, increasing your rates through increased treatment costs and expensive equipment repairs. It is an important responsibility of each customer to keep his lateral and cleanout in good condition so the system remains intact and free from unwanted infiltration for maximum efficiency in treatment. Keeping this access in good repair helps save you money!
- **Keep the area of your sewer (and water!!) lines free from threatening plants such as trees and shrubs.**
The entire length of both sewer and water lines should be completely clear of trees and shrubs. These plants generate strong root systems which easily crush, crack and damage your lines. The utility's responsibility for repairs ends at the meter box for water and at the main for sewer, so the burden of paying a plumber for other repairs falls to the homeowner. Homeowners and associations can also be held responsible for plantings that damage utility property, so be careful what you plant and where! Removing plants that might damage your water and sewer lines will surely save you money!

Meter Boxes and Meters:



Did you know that the homeowner is responsible for keeping the area in and around his/her meter box clear of plants and debris?

- The area at least three feet above and one foot on each side, all around the meter box should be cleared of plantings. This provides access to read the meter and service it if necessary. Meters with restricted access can be denied service or have their reads estimated until proper access is restored.
- Keep the interior of the meter box clear of debris and dirt. The meter should be fully exposed and accessible, with dirt completely cleared away from the sides and bottom. You should be able to pass a hand easily under both the water line and the meter. Again, uncleared meters can be denied service or have their reads estimated until proper access is restored.
- The top of the meter box should be easily and completely visible to a reader. It is a good idea to have your landscape personnel trim around the lids to keep them fully exposed and discourage them from running over the lids with mowers, as damage to the boxes can be billed to the homeowner.

FOR CORRESPONDENCE ONLY:

Aquarina Utilities, Inc.
P.O. Box 1114
Fellsmere, FL 32948
aquarinautilities@bellsouth.net

FOR PAYMENTS ONLY:

Aquarina Utilities, Inc.
P.O. Box 628733
Orlando, FL 62862-8733

24hr Emergency only:

(772) 708-7946 (Kevin's Cell)

Billing Questions (Holly):

Onsite Office Hours 9am -1pm M-F
(772) 708-8350 (cell)

General Information and Updates for Breaks and Outages: try our website at *aquarinautilities.com*

Pay by check through the mail or your bank, direct debit of your checking account, or pay with a credit card at **www.ub-pay.com**. Set up your login with the municipality code **AquarinaFL**, your account number and email address.

Be sure to disable your browser's pop-up blocker before your attempt to use the website to pay.

Email is the **BEST** way to get in touch with us. Calls will be returned as soon as possible.

APPENDIX E: SANITARY SURVEY REPORT



FLORIDA DEPARTMENT OF Environmental Protection

CENTRAL DISTRICT OFFICE
3319 MAGUIRE BLVD., SUITE 232
ORLANDO, FLORIDA 32803

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

January 14, 2020

Kevin R. Burge, Manager
Aquarina Utilities, Inc.
235 Aquarina Boulevard
Melbourne beach, FL 32941
AquarinaUtilities@bellsouth.net

Re: Aquarina Utilities
PW Facility ID #3054060
Brevard County

Dear Mr. Burge:

Department personnel conducted an inspection of the above-referenced facility on November 1, 2019. Based on the information provided following the inspection, the facility was determined to be in compliance with the Department's rules and regulations. A copy of the inspection report is attached for your records.

The Department appreciates your efforts to maintain this facility in compliance with state and federal rules. Should you have any questions or comments, please contact Manuel F. Cardona at 407-897-4134 or via e-mail at Manuel.Cardona@FloridDEP.gov

Sincerely,

David Smicherko

David Smicherko, Manager
Central District
Florida Department of Environmental Protection

Enclosure: Inspection Report

cc: David Smicherko, Manuel Cardona, Central District

State of Florida
Department of Environmental Protection
Central District

SANITARY SURVEY REPORT

Plant Name AQUARINA UTILITIES County Brevard PWS ID # 3054060
Plant Location 235 Aquarina Blvd., Melbourne Beach, FL 32951 Phone 321/327-2930
Owner Name Aquarina Utilities, Inc. Phone 321/327-2930
Owner Address P.O. Box 308, Jensen Beach, FL 34958
Contact Person Kevin Burge Title Director Phone 772/708-7946
This Survey Date 11/1/19 Last Survey Date 7/26/17 Last Compliance Inspection Date 4/30/09

PWS TYPE: Community

PLANT CATEGORY & CLASS: (2C)

MAX-DAY DESIGN CAPACITY: 86,400 gpd

PWS STATUS: Approved

RAW WATER SOURCE

GROUND; Number of Wells 2
 PURCHASED from PWS ID # _____
 Emergency Water Source _____
Emergency Water Capacity _____

STANDBY POWER SOURCE: Yes

Source Baldor diesel
Capacity of Standby (kW) 475
Switchover: Automatic Manual
Hrs Operated Under Load 1 hr/wk.
What equipment does it operate?
 Well Pumps All
 High Service Pumps All
 Treatment Equipment All
Satisfy avg. daily demand? Yes No Unknown
Audio-visual alarm? Yes No
Comments A/V alarm installed 3/21/18.

TREATMENT PROCESSES IN USE

Hypochlorination, reverse osmosis, cartridge filtration,
packed tower aeration, and corrosion control(antiscalant)

SERVICE AREA CHARACTERISTICS

Subdivision _____
Food Service: Yes No N/A
Number of Service Connections 300
Population Served 750 Basis MOR

OPERATION & MAINTENANCE LOG: Yes

Location Water treatment plant
Comments _____

CERTIFIED OPERATOR: Yes

Operator(s) & Certification Class-Number:
Kevin Burge A-16321. Refer to the MOR for a
complete list of operators.

Hrs/day: Required 1 Actual 1
Days/wk: Required 5+2 Actual 5+2
Non-consecutive Days? Yes No N/A
Comments _____

MONTHLY OPERATION REPORTS (MORs)

MORs submitted regularly? Yes No N/A
Data missing from MORs? No Yes N/A
Average Day (from MORs) 41,129 gpd
Maximum Day (from MORs) 96,000 gpd 03/19
Comments The permitted max-day design capacity was
exceeded during 02/19 and 03/19. Explanation by facility
attributes this to the meter reading procedures which have
since been updated.

Flow Measuring Device Flow Meter
Meter Size & Type Sensus
Date Last Calibrated 9/8/17

PLANS AND MAPS

Coliform Sampling Plan Yes No N/A
D/DBP Monitoring Plan Yes No N/A
Lead and Copper Plan Yes No N/A
Distribution System Map Yes No N/A
Emergency Response Plan Yes No N/A
Comments _____

PREVENTIVE MAINTENANCE/O&M

Operation & Maintenance Manual Yes No
Preventive Maintenance Program Yes No
Flushing Program Yes No N/A
Records Yes No N/A
Isolation Valve Exercise Yes No N/A
Records Yes No N/A
Comments _____

CROSS CONNECTION CONTROL

BFPAs None observed # Tested Unknown
WWTP RPZ N/A Date Tested N/A
Written Plan Yes Date 10/17
Comments _____

GROUND WATER SOURCE

Well Number (Florida Unique Well ID #)	1 (AAC2808) North	2 (AAC2807)	3 (AAH7648) South	
Year Drilled	1981	1981	Unknown	
Depth Drilled	595'	590'	Unknown	
Drilling Method	Cable tool	Cable tool	Unknown	
Type of Grout	Neat cement	Neat cement	Unknown	
Static Water Level	39'	39'	Unknown	
Pumping Water Level	Artesian	Artesian	Unknown	
Design Well Yield	Unknown	Unknown	Unknown	
Test Yield	Unknown	Unknown	Unknown	
Actual Yield (if different than rated capacity)	600 gpm	600 gpm	Unknown	
Strainer	Unknown	Unknown	Unknown	
Length (outside casing)	400'	400'	Unknown	
Diameter (outside casing)	18"	18"	18"	
Material (outside casing)	Black steel	Black steel	Black steel	
Well Contamination History	None	None	None	
Is inundation of well possible?	No	Unknown	No	
6' X 6' X 4" Concrete Pad	Yes	Unknown	Yes	
SET BACKS	Septic Tank	>100'	Unknown	>100'
	Reuse Water	>100'	Unknown	>100'
	WW Plumbing	>100'	Unknown	>100'
	Other Sanitary Hazard	None observed	Unknown	None observed
PUMP	Type	Artesian	Artesian	Artesian
	Manufacturer Name	N/A	N/A	N/A
	Model Number	N/A	N/A	N/A
	Rated Capacity (gpm)	N/A	N/A	N/A
	Motor Horsepower	N/A	N/A	N/A
Well casing 12" above grade?	Yes	Unknown	Yes	
Well Casing Sanitary Seal	OK	Unknown	OK	
Raw Water Sampling Tap	Yes	Unknown	Yes	
Above Ground Check Valve	Yes	Unknown	Yes	
Security	Yes	Unknown	Yes	
Well Vent Protection	N/A	N/A	N/A	

COMMENTS Well #1 flows to the GST. Well #2 used for fire protection and irrigation, Well #3 flows to the RO system.

CHLORINATION (Disinfection)

Type: Gas Hypo
 Make Pulsatron Capacity 30 gpd
 Chlorine Feed Rate 30% stroke, 50 spm
 Avg. Amount of Cl₂ gas used N/A
 Chlorine Residuals: Plant 0.88 Remote 0.21
 Remote tap location Tennis Court restroom
 DPD Test Kit: On-site With operator
 None Not Used Daily
 Injection Points Into aerator catchment tank
 Booster Pump Info N/A
 Comments _____

AERATION (Gases, Fe, & Mn Removal)

Type Forced draft Capacity 78 gpm
 Aerator Condition Good
 Visible Algae Growth None
 Protective Screen Condition Good
 Frequency of Cleaning Every 2 years
 Date Last Inspected/Cleaned 09/19
 Comments _____

FILTRATION (Suspended Solids Removal)

Type Hytrex Cartridge Filters
 Size 5 micron No. of Units 2
 Length of Filter Runs 4-6 months
 Type of Filter Media Vertical wound cartridge
 Is media visible? No Clean after BW? N/A
 Filter Rate 80 gpm BW Rate N/A
 Filter Capacity 80 gpm
 Cracks/Cementation/Channeling None observed
 Effluent Stability OK Algae Growth None observed
 Turbidity in clearwell? No
 Head Loss Gauge Yes
 Comments Filters changed in lieu of backwash.

REVERSE OSMOSIS (Dissolved Solids Removal)

Make Codeline (2 stage) Pressure 230 psi
 No. of Modules 4 Permeate Cap. 55 gpm
 Blend Rate (GPM) 14
 Chemicals Used AF 600
 Waste-to-product Ratio 1:3
 Pre-treatment Filtration, antiscalant
 Effluent Quality: TDS (mg/L) N/A
 Waste Disposal Site WWTP
 IW Permit # & Expir. Date N/A
 Comments _____

STORAGE FACILITIES

(G) Ground (C) Clearwell (E) Elevated
 (B) Bladder (H) Hydropneumatic / flow-through

Tank Type/Number	G	H	C
Capacity (gal)	150,000	3,000	350
Material	Concrete	Steel	Fiberglass
Gravity Drain	Yes	Yes	Yes
By-Pass Piping	No	Yes	No
Protected Openings	Yes	Yes	Yes
Sight Glass or Level Indicator	Yes	Yes	No
PRV/ARV	N/A	PRV	N/A
Pressure Gauge	N/A	Yes	N/A
On/Off Pressure	8'/12'	45/52	N/A
Access Secured	Yes	Yes	Yes
Access Manhole	Yes	Yes	Yes
Tank Sample Tap Location	Discharge piping	On tank	Discharge piping
Date of Inspection	2018/07	2018/07	N/A
Date of Cleaning	2018/07	2018/07	2018

Comments _____

HIGH SERVICE PUMPS

Pump #	H1/H2	T1/T2	B1/B2	RO Feed
Type	Centrifugal	Centrifugal	Centrifugal	Vertical turbine
Make	Ampco	Sta-Rite	Ampco	Grundfos
Model	2x1/2ZC2	Unknown	2X1	Unknown
Capacity (gpm)	175	Unknown	Unknown	Unknown
Motor HP	15	1	7.5	15
Date Installed	6/13	6/13	6/13	6/13

Comments _____

ANTISCALANT

Meets NSF 60 & 61 AF600 - Yes
 Comments _____

DEFICIENCIES:

No deficiencies were noted at the time of the inspection.

MONITORING REMINDER:

- Nitrate and nitrite samples are required to be collected from the point of entry (POE) to the distribution system annually. The 2019 results have been received.
- Ensure that all results are submitted in a timely manner. Reports are due within the first ten days following the end of the required monitoring period, or the first ten days following the month in which the sample results were received, whichever time is shortest. [62-550.730(1)(a), F.A.C.]
- Monitoring schedules are available on the Central District's FTP site: <https://floridadep.gov/central/cd-compliance-assurance/content/resources-drinking-water-facilities-and-operators-central>

COMMENTS:

- **Contact FRWA (Florida Rural Water Association) at 850-668-2746, or frwa@frwa.net**, for free technical assistance with your system. FRWA has extended benefits offered to members.
- Provide documentation that the finished-drinking-water meter has been calibrated at least every 5 years.
Checking the calibration of finished-drinking-water meters at treatment plants shall be performed in accordance with the equipment manufacturer's recommendations or in accordance with a written preventive maintenance program established by the supplier of water. [Rule 62-555.350(2), F.A.C.]
- Suppliers of water shall submit written notification to the Department before beginning work or alterations to the public water system. Each notification shall be submitted to the appropriate Department of Environmental Protection District Office or Approved County Health Department and shall include the following: a description of the scope, purpose, and location of the work or alterations; and assurance that the work or alterations will comply with applicable requirements listed in Rule 62-555.330, F.A.C. Suppliers of water may begin such work or alterations 14 days after providing notification to the Department unless they are advised by the Department that the notification is incomplete or that a construction permit is required.
- Suppliers of water shall telephone the SWO at 1-800-320-0519 immediately (i.e., within two hours) after discovery of any actual or suspected sabotage or security breach, or any suspicious incident, involving a public water system. [Rule 62-555.350(10)(a), F.A.C.]
- Suppliers of water shall telephone, and speak directly to a person at, the appropriate DEP District Office as soon as possible, but never later than noon of the next business day, in the event of any of the following emergency or abnormal operating conditions:
 - The occurrence of any abnormal color, odor, or taste in a public water system's raw or finished water;
 - The failure of a public water system to comply with applicable disinfection requirements; or
The breakdown of any water treatment or pumping facilities, or the break of any water main, in a public water system if the breakdown or break is expected to adversely affect finished-water quality, interrupt water service to 150 or more service connections or 350 or more people, interrupt water service to any one service connection for more than eight hours, or necessitate the issuance of a precautionary "boil water" notice in accordance with the Department of Health's "Guidelines for the Issuance of Precautionary Boil Water Notices" as adopted in Rule 62-555.335, F.A.C. [Rule 62-555.350(10)(b), F.A.C.]

COMMENTS (continued):

- Suppliers of water shall notify affected water customers in writing or via telephone, newspaper, radio, or television; and telephone, and speak directly to a person at, the appropriate DEP District Office by no later than the previous business day before taking PWS components out of operation for planned maintenance or repair work if the work is expected to adversely affect finished-water quality, interrupt water service to 150 or more service connections or 350 or more people, interrupt water service to any one service connection for more than eight hours, or necessitate the issuance of a precautionary "boil water" notice in accordance with the Department of Health's "Guidelines for the Issuance of Precautionary Boil Water Notices" as adopted in Rule 62-555.335, F.A.C. [Rule 62-555.350(10)(d), F.A.C.]
- Suppliers of water shall issue precautionary "boil water" notices as required or recommended in the Department of Health's "Guidelines for the Issuance of Precautionary Boil Water Notices" as adopted in Rule 62-555.335, F.A.C. [Rule 62-555.350(11), F.A.C.]



Inspector Signature

Manuel F. Cardona

Printed Name

Environmental Consultant

Title

12/30/19

Date



Reviewer Signature

David Smicherko

Printed Name

Environmental Manager

Title

1/13/2020

Date

APPENDIX F: VENDOR RECOMMENDATIONS

**Aquarina Water Treatment Plant
Vendor Options**

Vendor Specialty	Vendor Name	Status	Vendor Contact Information	
Operation and Maintenance Company	U.S. Water Services Corp.	Current Vendor	727-848-8292	4939 Cross Bayou Boulevard, New Port Richey, FL 34652
Labs or Testing Companies	Pace Analytical	Current Vendor	813-855-1844	110 South Bayview Blvd, Oldsmar, FL 34677
	Advanced Environmental Labs	Potential Vendor	407-937-1594	380 North Lake Blvd., Suite 1048 Altamonte Springs, FL 32701
General Contractors	Wharton Smith	Potential Vendor	352-323-1374	608 N Canal St, Leesburg, FL 34748
Well Drillers	Florida Well Drilling, Inc.	Potential Vendor	321-725-1809	1729 Agora Cir, Palm Bay, FL 32909
	Drilling and Irrigation Services	Potential Vendor	321-508-3999	303 Arcadia Court West, Melbourne, FL 32901
Electricians	ACF Standby Systems (Generator Repair)	Current Vendor	800-282-5359	9311 Solar Drive, Tampa, FL 33619
Gas/Propane Supplier	Glover Oil	Current Vendor	321-723-3953	3109 S. Main Street, Melbourne, FL 32901
Pipe Supplier	Florida Well Drilling, Inc.	Potential Vendor	321-725-1809	1729 Agora Cir, Palm Bay, FL 32909
	Drilling and Irrigation Services	Potential Vendor	321-508-3999	303 Arcadia Court West, Melbourne, FL 32901
Pump Supplier	Barney's Pump	Current Vendor	863-557-6298	2965 Barneys Pumps Pl, Lakeland, FL 33812
	R.C. Beach & Assoc, Inc.	Potential Vendor	727-216-3240	625 Grand Central St., Clearwater, FL 33756
Chemical Treatment Supplier	Hawkins, Inc.	Current Vendor	800-330-1369	381 S Central Ave, Oviedo, FL, 32765



woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS



**AQUARINA
UTILITIES, INC.
WASTEWATER
TREATMENT
SYSTEM
ASSESSMENT**

**ENGINEERING
MEMORANDUM**

210 S. Florida Avenue, Suite 220
Lakeland, FL 33801
800.426.4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0233748.02
Central States Water
Resources
July 2021

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Appendix E:	Collection System Maps
Appendix F:	March 2021 Services Sold Report
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EXECUTIVE SUMMARY

An engineering evaluation for the Aquarina Utilities Wastewater Treatment Plant in Melbourne Beach, FL was conducted by Woodard & Curran to provide feedback and guidance to Central States Water Resources on regulatory compliance, permitting, technical items and recommendations for repair or improvements. The evaluation herein is based on a site visit conducted on March 10, 2021, reports submitted by the utility to the Florida Department of Environmental Protection, and technical documents provided by Aquarina Utilities.

1. INTRODUCTION

1.1 General System Information

Aquarina Utilities owns and operates a private Wastewater Treatment Plant (WWTP) to service the Aquarina Beach and Country Club development. The development consists of residential units, a country club and golf shop.

A summary of the main parameters for the wastewater system is included below in Table 1-1.

Table 1-1: Aquarina Wastewater Treatment Plant Information

Subdivision(s) Served	Aquarina Beach and Country Club
Current Owner (Seller)	Aquarina Utilities, Inc.
Customer Count and Type	301 Connections – Residential
Street Address	235 Hammock Shore Drive
City, State	Melbourne Beach, FL
County	Brevard
Pending Developments	Possibility of an additional 450 units to be built
Permitted Facility Name	Aquarina Utilities WWTP
Permit Type	NPDES
Permit Number and Agency Interest Number	FLA010352
Permitted Capacity	0.099 MGD (Permitted Maximum)

2. WASTEWATER TREATMENT FACILITY

2.1 Facility Description

2.1.1 Facility Type

Aquarina Utilities is a 0.099 million gallons per day (MGD) Annual Average Daily Flow (AADF) extended aeration domestic wastewater treatment plant (WWTP). Effluent from the treatment process is disposed of using absorption drain field located near the WWTP.

2.1.2 Approximate Age of Facility and Source Used to Age Facility

On May 25, 1984, Post, Buckley, Schuh, and Jernigan, Inc. submitted a letter to Florida Department Environmental Protection (FDEP) stating that construction of the Aquarina WWTP was completed.

2.1.3 Structural Condition of Tankage and Equipment

Based on a visual inspection of the outside of the tankage, the facility tankage appears to be in fair structural condition. No large cracks, missing sections of concrete, or exposed rebar was observed on the exterior of the tanks. A visual inspection of the interior of the tanks was not feasible, as the tanks are in service.

2.2 Treatment Process

2.2.1 Description of Treatment Process Utilized

Aquarina Utilities WWTP is a 0.099 MGD Annual Average Daily Flow (AADF) extended aeration domestic wastewater treatment plant (WWTP). The plant consists of influent screening, aeration, secondary clarification, filtration, hypochlorite disinfection, and aerobic digestion of biosolids. The plant utilizes a 0.099 MGD AADF absorption field system (R-001) which consists of two drainfields with a total wetted area of 0.114 acres (0.057 acres each).

A process flow diagram for the facility is included in Appendix A.

2.2.2 Description of Process Flow

Wastewater is pumped to the headworks of the WWTP from a pump station and flows through a single ½-inch bar screen. The screen is manually raked daily, and the screenings are dropped into a disposal shoot to a dumpster which is taken to the landfill.

Figure 2-1: Headworks Influent Screen



The biological treatment takes place in a concrete extended aeration basin. The plant has a circular ring aeration basin with a center clarifier. Air is supplied to the basin via three blowers, two of which were recently installed in 2018. The blowers are Howden ROOTS™ Universal RAI Rotary Positive Blowers Frame 56.

The aeration basin has a volume of 267,126 gallons with a detention time of 21.4 hours. The aeration basin is designed to have an operating mixed liquor suspended solids (MLSS) concentration of 6,000 mg/L and a food to microorganism (F/M) ratio of 0.05. The MLSS and F/M ratio are within the standard operating values for extended aeration facilities.

Figure 2-2: Extended Aeration Basin



Figure 2-3: Aeration Basin Blowers



Wastewater flows from the extended aeration basin into the central clarifier. The concrete clarifier is circular and is equipped with a rake arm to at the bottom of the tank to collect sludge that has settled to the bottom of the clarifier. The settled sludge is either returned to the aeration basis as Return Activated Sludge (RAS) or wasted to the adjacent sludge holding tank as Waste Activated Sludge (WAS). Two pumps operate as dual-purpose RAS/WAS pumps. When the MLSS in the aeration basin increased, operators pump sludge to the sludge storage tank that sits adjacent to the extended aeration/clarifier tank.

Figure 2-4: RAS/WAS Pumps



Water in the clarifier flows over the weir and for effluent filtration and disinfection. Aquarina staff add chlorine tablets to water in the effluent weir to control algae growth within the tank. The clarifier is 46-foot diameter and 16-foot side water depth.

The clarifier is designed to have a hydraulic loading rate of 180.5 gallons per day per square foot at average daily flow with 14.7-hour detention time. The extended aeration system is designed to produce effluent with BOD₅, TSS, and Total N lower than 15, 15, and 10 mg/L, respectively.

The sludge storage tank that holds WAS from the extended aeration process has a diameter of 18 feet, side water depth of 14 feet, and a volume of 28,000 gallons. Sludge from the tank is hauled offsite periodically for treatment and disposal elsewhere.

Figure 2-5: Center Clarifier



Figure 2-6: Sludge Holding Tank



Effluent from the clarifier flows through a filtration system comprising of two sand filters with continuous backwash. The sand filters are two DynaSand[®] upflow filters with a total area of 77 square feet. The design criteria for the filters are 2.74 gallons per minute per square foot at average daily flow and 6.8 gallons per minute per square foot at peak.

The filters are designed to reduce the effluent TSS to 5 mg/l or less.

Figure 2-7: Sand Filters



Following filtration, effluent flows through disinfection contact chambers for disinfection prior to discharge to the drainfield. Sodium hypochlorite tables are used for effluent disinfection.

Figure 2-8: Hypochlorite Disinfection



Following secondary filtration and disinfection into, effluent flows by gravity to one of the WWTP's absorption fields. The plant has two drainfields with a total wetted area of 0.114 acres (0.057 acres each.) The facility's permit states that

the drainfields should be cycled so that the fields are loaded for 7 days and then rested for 7 days to allow times for the fields to dry while resting.

Figure 2-9: Drainfields



2.2.3 Effectiveness of Treatment Process at Time of Site Visit

The headworks were free of any major debris or blockages. The aeration basin chambers were brown in color and appeared to be adequately mixed. The clarifier appeared to be working properly but has a layer of algae across the entire surface of the clarifier. The weirs appeared level and no algae was present past the weir.

During the site visit, the sand filters were out of operation and had been out of service for multiple weeks after a failed repair. The sand filters inoperability was causing effluent to overflow to an onsite pump station situated next to the WWTP.

This pump station typically contains R.O. reject from the water treatment plant and wastewater from the onsite operations trailer and nearby golf course gift shop, which is typically pumped to the head works of the WWTP.

However, with overflow from the inoperable sand filters overwhelming the submersible pumps in the onsite pump station, a temporary pump is installed, which is pumping the contents of the pump station directly to the drainfield. This arrangement would not be acceptable to DEP, as a portion of the flow to the onsite pump station is wastewater, which should be treated by the WWTP before being pumped to the drainfield.

If temporary pumping is required, FDEP should be notified, and the contents of the onsite pump station should be pumped to the head of the WWTP for treatment.

Figure 2-10: Onsite Pump Station and Temporary Pump



Effluent was originally treated with chlorine gas, but Aquarina Utilities requested to change the disinfection chemical to sodium hypochlorite during a permit application to FDEP on January 13, 2018.

The permit application describes the disinfection system as a 150-gallon sodium hypochlorite storage tank with dual metering pumps within secondary containment and a shaded covering to prevent exposure to direct sunlight and dissipation of chlorine. The installed disinfection system does not match the sodium hypochlorite disinfection system described in the January 13, 2018 permit application approved by FDEP.

For disinfection, water is currently pumped through a chamber containing sodium hypochlorite tablets.

2.2.4 Analysis of Sludge Buildup

CSWR advised Woodard & Curran that collection of sludge samples or utilizing a sludge judge to measure sludge depth in the tanks was not necessary. As such, no samples were collected or sludge depth measurements taken.

2.2.5 Outfall Location and Distance from Facility

The outfall for the WWTP is a 0.099 MGD AADF absorption field system, which consists of two drainfields with a total wetted area of 0.114 acres (0.057 acres each). The outfall is approximately 60 feet from the wastewater treatment plant. Effluent from the wastewater treatment plant is gravity fed to the drainfields. The outfall location is currently owned by the Aquarina Golf Course and the Aquarina WWTP has a 100-year lease to use the land as their absorption field system. The current owners of the Aquarina Utilities do not have a copy of this lease agreement.

According to the most recent permit issued on March 24, 2018, the drainfield loading rate is over 31 inches per day, which is considered very high by current 62-610 FAC standards (the rate should not exceed 9 inches per day). However, the loading rate for the drainfield was grandfathered into the permit and predated the rule.

Based on the language in the existing DEP permit, the loading rate is subject to reconsideration if the facility makes any significant changes to the plant, the land application system, or in the event of non-compliance associated with the system.

2.3 Permit Information

2.3.1 Permit Status

The Aquarina Utilities WWTP operates under State of Florida Domestic Wastewater Facility permit number FLA010352, issued by the Florida Department of Environmental Protection (FDEP). The permit was issued on March 24, 2018 and expires on March 23, 2023.

DEP permits are typically issued for a 5-year period. The facility's current operating permit is included in Appendix B.

The Aquarina Utilities WWTP is currently in compliance with their NPDES permit.

2.3.2 Permitted Flow vs. Actual/Estimated Flow

The flow into the wastewater plant comes from the collection system that serves the Aquarina development and demineralization concentrate from the Aquarina water treatment plant. The flow from pump stations and demineralization concentrate are both monitored and reported separately. The permitted maximum annual average flow to the WWTP is 0.099 MGD. According to the plant's monthly DMR data, the maximum flow since January 2019 was 0.11 MGD and the average flow is 0.065 MGD.

2.3.3 Brief Compliance Review Narrative

The facility's most recent DEP inspection was on February 20, 2020 and was determined to be in compliance with FDEP rules and regulations. The last noncompliance letter that was issued to Aquarina Utilities WWTP was on January 11, 2011 and was brought back into compliance on February 16, 2011. The most recent FDEP inspection report is included in Appendix C.

Woodard & Curran conducted a meeting with FDEP on April 13, 2021 to discuss the current operating permit and the impact of an ownership transfer. The discussion focused on three major topics: WWTP owner transfer procedure, the high permitted loading rate on the drainfield and the requirement for quarterly sampling of sodium and chlorides.

To transfer ownership from one entity to another, FL DEP Form 62-620.910(11) would need to be filled out, with a fee of \$50.

The permitted loading rate for the drainfields is 31 inches per day, which is very high by FDEP standards, but the rate was grandfathered and predates FDEP standards. Woodard & Curran inquired if FDEP would continue to allow the drainfield to operate at the grandfathered rate if there was a transfer of ownership. FDEP stated that the application rate is permissible if the drainfields continue to operate properly.

The most recent permit added a condition that required Aquarina to conduct quarterly sampling events to monitor chlorides and sodium on a quarterly basis. The permit states that: "the permittee will submit a report after 8 valid quarterly sampling events, which will include a data and trending analysis of the parameters nitrate, chloride, and sodium in the reclaimed water. Upon review of the report, a Ground Water Monitoring Plan (GWMP) may be needed."

Aquarina has been conducting the quarterly sampling for chlorides and sodium beyond the 8 valid quarterly sampling events but has not submitted a report to FDEP for their review. Nitrate (Total Nitrogen, Nitrate as N) is already reported on the monthly DMRs.

Woodard & Curran reviewed the quarterly sampling events with FDEP during the April 13, 2021 meeting. During this meeting, the FDEP stated that the report summarizing the data is past due and that a GWMP will be required for the

site based on the sampling results. FDEP advised that a likely scenario for the Aquarina WWTP would be the installation of 3 monitoring wells (one background, one intermediary, and one in the drainfield) at a depth of 12-15 feet with a 2-inch diameter and to conduct quarterly sampling from the wells.

Based on the chloride and sodium values in the monitoring wells, an alternative means of disposing of concentrate from the water treatment plant's R.O. system may be required in the future by FDEP.

2.3.3.1 NOVs

According to the FDEP Oculus database, the facility has received no NOVs in the past 10 years.

2.3.3.2 DMR Data and Exceedances

The facility submits DMR information on a monthly and quarterly basis for the effluent limit criteria shown in Section 2.3.4. Please refer to Table 2-1 for the monthly DMR data and Table 2-2 for quarterly DMR data reported since 2019.

Table 2-1: 2019-2021 Monthly DMR Data

Date	Flow (Pump Station) (MGD)	Flow (RO Concentrate) (MGD)	CBOD Influent (mg/L)	TSS Influent (mg/L)	CBOD Effluent (mg/L)	TSS Effluent (mg/L)	Fecal Coliform (#/100 mL)	Total Nitrogen, Nitrate (As N) (mg/L)	Total N (mg/L)	Chlorine Total Residual (mg/L)	Total P (mg/L)	pH
1/19	0.074	0.019	208.0	46.6	1.0	1.8	1.0	6.1	6.2	0.6	0.8	7.4
2/19	0.051	0.018	143.0	49.8	1.0	2.5	1.0	3.7	3.9	0.6	0.9	7.4
3/19	0.052	0.02	66.4	150.0	1.0	1.0	0.5	4.3	4.7	0.6	0.9	7.4
4/19	0.044	0.014	246.0	239.0	1.0	3.9	0.5	1.9	2.4	0.6	0.8	7.3
5/19	0.035	0.01	79.0	42.3	1.0	1.2	0.5	4.4	4.4	0.6	1.8	7.3
6/19	0.035	0.013	153.0	71.0	1.0	1.9	1.0	3.0	3.7	0.8	1.1	7.3
7/19	0.043	0.009	182.0	90.8	1.0	1.0	0.5	3.4	4.7	0.7	2.1	7.4
8/19	0.040	0.009	90.8	118.0	1.0	1.6	0.5	6.4	7.2	0.6	1.9	7.5
9/19	0.031	0.012	369.0	530.0	1.0	1.0	1.0	5.8	5.8	0.6	1.2	7.5
10/19	0.041	0.013	168.0	785.0	1.0	1.0	1.0	5.8	5.8	0.7	1.0	7.4

Date	Flow (Pump Station) (MGD)	Flow (RO Concentrate) (MGD)	CBOD Influent (mg/L)	TSS Influent (mg/L)	CBOD Effluent (mg/L)	TSS Effluent (mg/L)	Fecal Coliform (#/100 mL)	Total Nitrogen, Nitrate (As N) (mg/L)	Total N (mg/L)	Chlorine Total Residual (mg/L)	Total P (mg/L)	pH
11/19	0.034	0.011	218.0	91.2	1.0	1.9	1.0	7.7	7.80	0.7	1.1	7.5
12/19	0.045	0.013	293.0	208.0	1.0	2.3	1.0	4.2	5.1	0.6	0.9	7.5
1/20	0.042	0.013	225.0	336.0	1.0	1.0	1.0	6.1	6.5	0.7	1.1	7.7
2/20	0.045	0.015	277.0	358.0	1.0	1.0	1.0	3.0	3.6	0.7	0.1	7.6
3/20	0.054	0.011	267.0	332.0	1.0	1.0	1.0	5.9	6.6	0.7	1.6	7.6
4/20	0.061	0.018	265.0	224.0	1.0	1.0	1.0	2.9	0.9	0.6	1.2	7.6
5/20	0.089	0.021	288.0	150.0	1.0	1.0	1.0	0.37	4.5	0.6	0.7	7.5
6/20	0.063	0.015	132.0	180.0	1.0	1.0	1.0	0.6	2.0	0.6	1.0	7.5
7/20	0.043	0.015	111.0	376.0	1.0	1.3	1.0	0.4	6.2	0.6	1.0	7.4
8/20	0.044	0.013	122.0	123.0	1.0	1.0	1.0	0.65	1.3	0.6	0.6	7.5
9/20	0.048	0.010	146.0	93.0	1.0	1.0	1.0	6.1	6.4	0.6	1.4	7.5
10/20	0.054	0.010	260.0	216.0	1.0	1.0	1.0	7.8	8.5	0.6	1.6	7.5
11/20	0.063	0.013	213.0	192.0	1.0	1.0	1.0	6.3	7.6	0.6	1.5	7.5
12/20	0.065	0.014	278.0	58.0	1.0	1.0	1.0	4.1	4.60	0.6	0.8	7.5
1/21	0.063	0.015	38.1	68.0	1.0	2.0	1.0	2.5	3.5	0.6	1.5	7.5
2/21	0.061	0.014	<15.6	747.0	<2.0	<5.0	<1.0	8.9	9.9	0.5	2.8	7.5

Table 2-2: Quarterly DMR Data

Date	Chloride (as Cl) (mg/L)	Sodium, Total Recoverable (mg/L)
Q1 2019	444.0	360.0
Q2 2019	DNP	DNP
Q3 2019	433.0	173.0
Q4 2019	102.0	77.9
Q1 2020	423.0	314.0
Q2 2020	405.0	269.0
Q3 2020	406.0	335.0
Q4 2020	442.0	374.0

2.3.3.3 ECHO Non-Compliance Status, Etc.

The Aquarina Site (FRS ID#: 110027967207) has not been inspected by EPA and currently does not submit compliance monitoring data to EPA, as it is not required. The facility has had no formal or informal enforcement actions within the last 5 years, and there have been no compliance issues on the EPA ECHO database.

2.3.3.4 Any Other Relevant Sources

None.

2.3.4 Copy of Effluent Limits from Permit

The most recent operating permit issued to the facility added two new reporting parameters, chloride and total recoverable sodium. These parameters were added to the permit to monitor reclaimed water and verify that the water meets the Maximum Contaminant Levels (MCLs). The permit states that the permittee will submit a report after 8 valid quarterly sampling events which includes a data and trending analysis of the nitrate, chloride, and sodium parameters in the reclaimed water to determine if the facility needs a Ground Water Monitoring Plan (GWMP). To date, Aquarina Utilities has not submitted any reports to FDEP as required in the permit but have continued to perform the quarterly chloride and sodium sampling.

Treated effluent limits from the Aquarina WWTP is summarized in Table 2-3, below:

Table 2-3: Aquarina WWTP Permitted Effluent Limits

Parameter	Statistical Basis	Limit
Flow (Drainfield)	Annual Average	0.099 MGD
CBOD ₅	Annual Average	20.0 mg/L
	Monthly Average	30.0 mg/L
	Weekly Average	45.0 mg/L
	Single Sample	60.0 mg/L
TSS	Single Sample	10.0 mg/L
Fecal Coliform	Monthly Geometric Mean	200# / 100 mL
	Annual Average	200# / 100 mL
	Single Sample	800# / 100 mL
pH	Single Sample	6.0 (Min)

Parameter	Statistical Basis	Limit
		8.5 (Max)
Total Residual Chlorine	Single Sample	0.5 mg/L
Total Nitrogen, Nitrate (as N)	Single Sample	12.0 mg/L
Total Nitrogen (as N)	Single Sample	Report Max
Total Phosphorous (as P)	Single Sample	Report Max
Chloride (as Cl)	Single Sample	Report Max
Total Sodium Recoverable	Single Sample	Report Max

2.3.5 Requirements Regarding Facility Capacity/Expansions

Woodard & Curran conducted a meeting on April 13, 2021 with FDEP and discussed requirements regarding facility expansions. FDEP stated that if the plant were to be expanded in the future, FDEP would require hydrogeologic testing of the additional, new drainfield area and the application rate of the new drainfield would be in the typical range of 3-9 inches per day, based on the result of the hydrogeo testing.

This would require the plant's drainfield to expand significantly to comply with FDEP application rate limits to dispose of additional effluent. The existing drainfield site has some area available for expansion. The amount of treated effluent that could be disposed of by installing additional drainfields on the existing site would be determined based on the results of the hydrogeological testing.

Additionally, any expansion to the plant would require the facility to be upgraded to meet a minimum of Class III Reliability requirements, as defined in the EPA's Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability manual.

2.4 Recommended Repairs and Improvements Summary

The items outlined below are recommended for repair, replacement, or additional evaluation:

- Replace RAS/WAS Pumps.
- Repair or replace sand filters.
- Install sodium hypochlorite disinfection system, as defined in the permit.
- Onsite pump station capacity evaluation

2.4.1 Triage Repairs

The recommended repairs should be performed by O&M designated contractor upon facility acquisition:

- **RAS/WAS Pumps:** The two existing RAS/WAS pumps are in poor condition and should be replaced. The pump manufacturer, Cornell Pumps, was contacted for new pump replacement costs.
- **Disinfection System:** The installed system (effluent pumped through a pool tablet system) should be replaced with a system that includes liquid sodium hypochlorite in a drum or tote, with secondary containment. To inject the sodium hypochlorite upstream of the disinfection chambers for mixing and contact time, small chemical metering/dosing pumps should be used.

- **Onsite Pump Station:** The onsite pumps station typically receives flow from the operations trailer, golf shop, and R.O. reject from the water treatment plant. The flow to this pump station is typically pumped to the headworks of the WWTP by submersible pumps.

During Woodard & Curran's site visit, overflow from the inoperable sand filters was conveyed to this pump station, overwhelming the pump station, which does not have the capacity to pump overflow from the sand filters. As such, Aquarina installed a temporary pump. Aquarina indicated that the submersible pumps can typically manage flow under normal operation conditions. However, it was not possible to verify this. The submersible pumps in this pump station may need to be repaired or replaced and should be tested after the issue with the sand filters are resolved. Since it is not possible to make a recommendation as to whether the pumps need to be repaired or replaced until the filter issue is resolved, no improvements cost for the onsite pump station is included herein.

Vendor quotes are included in Appendix D.

2.4.1.1 Measures to Return Plant to Operations

The major item that requires attention to return the plant to normal operation conditions is the inoperable sand filters. The two Parkson DynaSand® Filter are utilized to remove solids from clarified effluent ahead of disinfection. The sand filters are inoperable and need to be repaired or replaced, as they are an important component of the treatment process and required by the FDEP permit.

Options include rehabilitation of the filters (if determined possible by the manufacturer, Parkson) or replacement with another sand filter or different type of filter, as approved by FDEP. Parkson proposed to conduct a site visit for \$600 to assess the condition of the filters and make a recommendation on repair costs or replacement. This site visit should be conducted to compare the cost of filter rehabilitation (if feasible) vs. complete replacement. See Appendix D for quotes from Parkson.

As an alternative to the Parkson sand filter, cloth media filters are an option, which offer a lower capital cost. See Appendix D for a media filter quote from Nexom.

The WWTP is not equipped for remote monitoring and recording. Mission Monitoring would be suitable for achieving this and should be installed at the site. Remote monitoring of the following parameters is recommended:

- Influent Wet Well
 - Run Status
 - Low Level Float
 - High Level Float
 - Lead Pump on
 - Lag Pump On
- Aeration Blowers
 - Run Status
 - Blower Fault

- RAS/WAS Pumps
 - Run Status
 - Pump Fault
- Chemical Metering Pumps for Disinfection
 - Run Status
 - Pump Fault
- Clarifier
 - Drive Fault
- Disinfection Contact Chambers
 - High Level Alarm (add level instrument to chamber to monitor level)
- Plant Drain Wet Well (On Site)
 - Run Status
 - Low Level Float
 - High Level Float
 - Lead Pump on
 - Lag Pump On
- Sludge Holding Tank
 - High Level Alarm (add level instrument to chamber to monitor level)
- Sand Filters
 - High Level Alarm (add level instrument to chamber to monitor level)

2.4.1.2 Electrical Items

Vendors have indicated that they will not install their equipment in panels that do not meet code or that are significantly deteriorated. As such, it is recommended a licensed electrical contractor conduct a visit to the site to make a final recommendation based on national and local electrical codes and provide a detailed cost estimate for the work.

The generator is original to the site, shows signs of deterioration and passed its expected life span. This should be replaced to ensure a reliable and safe backup power. The generator serves both the water and wastewater sites. The cost of a new generator is included in the water treatment plant assessment report.

2.4.1.3 Resolve Safety Hazards

A safety hazard noted during the inspection was the use of chlorine tables to reduce alga growth in the overflow weir of the clarifier. To reduce algae growth, Aquarina Utilities operators periodically walk along the circumference of the clarifiers to drop in chlorine tables. This is a health and safety risk, as an operator may fall into the tank because there are no handrails or fall protection devices.

Figure 2-11: Clarifier Weir and Launder



An alternative to reducing algae growth is the installation of a clarifier launder cover, such as the cover shown in Figure 2-12, below.

Figure 2-12: Clarifier Launder Cover Example



2.4.1.4 Additional Equipment or Processes

The existing screen for the WWTP is a manual bar screen. This screen is cleaned daily with a rake to remove debris. Manual bar screens are often installed in small, packaged treatment system. To reduce operator labor to clean the manual screen and improve the quality of the wastewater to the treatment system, the manual screen should be replaced with an automated, self-cleaning screen.

3. WASTEWATER COLLECTION SYSTEM

3.1 Collection System Description

The original collection system was built when the Aquarina development was built and has had one major expansion in 2014, to include the Matanilla Reef Way development.

The collection system consists of 6-inch and 8-inch wastewater piping. Please refer to Appendix E for maps of the collection system. Wastewater from the collection system flows by gravity to a pump station that pumps wastewater to the WWTP.

Aquarina Utilities stated that there have been no modifications made to the wastewater collection system besides the inclusion of the Manilla Reef Way development. The system currently has 301 sewer connections based off the Aquarina Services Sold reports. Refer to Appendix F for the March 2021 Services Sold Report.

3.1.1 Description of Type, Material, Size, Footages, Age, Etc.

The gravity collection system for the Aquarina development connects to a precast concrete pump station that is 8 feet wide and 22.5 feet deep. The pump station has two 5 horsepower Xylem pumps, and they operate on a lead/lag system based on the level of wastewater in the wetwell.

The pump station was built in 1984 and Aquarina Utilities stated that no modifications to the system have been made to date. Please refer to Appendix G for pump station details.

Table 3-1: Table of Pump Stations (if applicable)

Name	Location	Pump Information	Backup	General Condition
Influent Pump Station	Northeast of WWTP	Two 5 HP Xylem submersible pumps	None	Good
Onsite Pump Station	Onsite next to packaged WWTP	Unknown	None	Poor

3.1.2 General Flow Description

Wastewater from the Aquarina development is pumped from the pump station to the treatment facility with lead/lag 5 HP Xylem pumps.

3.1.3 Triage Repairs

During the site visit, the onsite pump station was overflowing due to the addition of the flow from the inoperable sand filters. A temporary pump was in place to provide additional pumping capacity. Due to the excessive flow, the condition of the onsite pump station during normal operating conditions is not known. After the sand filters are repaired and no longer flowing to this pump station, it will be possible to discern if the onsite pump station has adequate pumping capacity if no more overflows occur.

3.1.3.1 Necessary Measures for Normal Operating Conditions

No repairs or replacement measures are required for the influent pump station.

Repair or replace sand filters to prevent overflow from overwhelming the onsite pump station.

3.1.3.2 Resolve Safety Hazards

The influent lift station does not have safety grating installed. To prevent the possibility of an operator falling into the lift station, it is recommended that safety grating be installed beneath the cover, similar to what is shown in the example photo below.

Figure 3-1: Pump Station Safety Grating Example



4. CAPITAL ESTIMATE

4.1 Triage Repairs

Repairs needed to address safety and liability hazards, as well as upgrades needed to bring Aquarina WWTP to normal operating conditions are summarized with cost estimates in Tables 4-1 and 4-2. The total cost estimate for Triage Repairs at the Aquarina WWTP is: **\$205,000**.

Table 4-1: General Plant Triage Repairs

Recommendation	Estimate
Install Flood Lights	\$1,000
Pump Station Safety Grating	\$2,000
Upgrade Electrical	\$15,000
Mission Monitoring and Instrumentation for two Lift Stations	\$15,000
Mission Monitoring and Instrumentation for WWTP	\$10,000
Total	\$43,000

Table 4-2: Water Treatment and Pumping Triage Repairs

Recommendation	Estimate
RAS/WAS Pump Replacements	\$50,000
Disinfection System (Tote, Secondary Containment, Chemical Metering Pump)	\$6,000
Repair Effluent Filters	\$100,000
Install Monitoring Wells for DEP Groundwater Monitoring Compliance ¹⁾	\$6,000
Total	\$162,000

- 1) Capital cost estimate for the installation of well pumps using a local driller, assuming temporary pumps utilized to collect quarterly samples (no permanent pump installed).

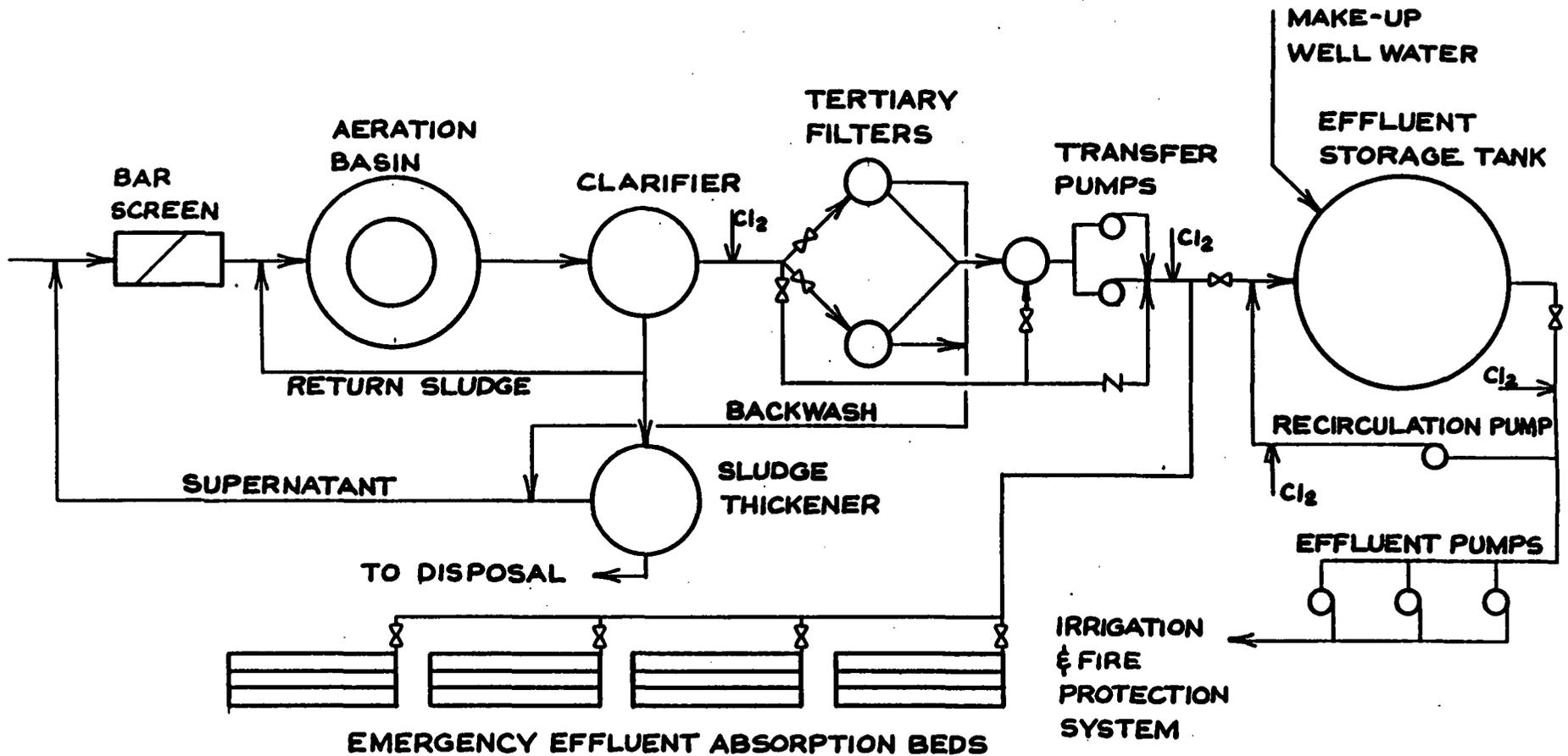
4.2 Improvements and Other Repairs

Recommendations were provided to increase the reliability of the Aquarina WWTP. The recommendations and cost estimates are summarized in Tables 4-3 and Table 4-4. The total cost estimate for improvements and other repairs at the Aquarina WWTP is: **\$120,000**.

Table 4-5: Additional Improvements

Recommendation	Estimate
Headworks Screen	\$100,000
Clarifier Launder Cover	\$20,000
Total	\$120,000

APPENDIX A: PROCESS FLOW DIAGRAM



Post, Buckley, Schuh & Jernigan, Inc.
CONSULTING ENGINEERS and PLANNERS

**AQUARINA BEACH
WASTEWATER TREATMENT PLANT
SCHEMATIC**

APPENDIX B: FDEP OPERATING PERMIT



Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

NOTICE OF PERMIT ISSUANCE

Burge Kevin, President
Aquarina Utilities, Inc.
1726 NE Darlich Avenue
Jensen Beach, FL 34057
AquarinaUtilities@bellsouth.net

Brevard County - DW
Aquarina Utilities WWTF

NOTICE OF PERMIT ISSUANCE

Enclosed is Permit Number FLA010352 to operate the Aquarina Utilities WWTF, issued under Chapter 403, Florida Statutes.

Monitoring requirements under this permit are effective May 1, 2018. Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements.

The Department's proposed agency action shall become final unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, Florida Statutes, within fourteen days of receipt of notice. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Under Rule 62-110.106(4), Florida Administrative Code, a person may request an extension of the time for filing a petition for an administrative hearing. The request must be filed (received by the Clerk) in the Office of General Counsel before the end of the time period for filing a petition for an administrative hearing.

Petitions by the applicant or any of the persons listed below must be filed within fourteen days of receipt of this written notice. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), Florida Statutes, must be filed within fourteen days of publication of the notice or within fourteen days of receipt of the written notice, whichever occurs first. Section 120.60(3), Florida Statutes, however, also allows that any person who has asked the Department in writing for notice of agency action may file a petition within fourteen days of receipt of such notice, regardless of the date of publication.

The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition or request for an extension of time within fourteen days of receipt of notice shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, Florida Statutes. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information, as indicated in Rule 28-106.201, Florida Administrative Code:

- (a) The name and address of each agency affected and each agency's file or identification number, if known;
- (b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the determination;
- (c) A statement of when and how the petitioner received notice of the Department's decision;
- (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
- (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the Department's proposed action;
- (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's proposed action.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation under Section 120.573, Florida Statutes, is not available for this proceeding.

This permit action is final and effective on the date filed with the Clerk of the Department unless a

petition (or request for an extension of time) is filed in accordance with the above. Upon the timely filing of a petition (or request for an extension of time), this permit will not be effective until further order of the Department.

Any party to the permit has the right to seek judicial review of the permit action under Section 120.68, Florida Statutes, by the filing of a notice of appeal under Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when this permit action is filed with the Clerk of the Department.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



Wanda Parker-Garvin
Environmental Manager
Permitting and Waste Cleanup Program - Wastewater

WPG/ee

Enclosures: Permit, DMR and SOB

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this document and all attachments were sent on the filing date below to the following listed persons:

David Smicherko, DEP, david.smicherko@dep.state.fl.us
Mary Ann Kraus, DEP, mary.kraus@dep.state.fl.us
Shabbir Rizvi, DEP, shabbir.rizvi@dep.state.fl.us
Gene Elliott, DEP, gene.elliott@dep.state.fl.us
Mark Cadenhead, P.E., Cadenhead Environmental Engineering Services, Inc.,
mark_cadenhead@bellsouth.net
Reggie Phillips, DEP, reggie.phillips@dep.state.fl.us

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.



Clerk

February 1, 2018
Date



Florida Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

STATE OF FLORIDA DOMESTIC WASTEWATER FACILITY PERMIT

PERMITTEE:
Aquarina Utilities, Inc.

RESPONSIBLE OFFICIAL:
Burge Kevin, President
1726 NE Darlich Avenue
Jensen Beach, Florida 34957
(772) 405-8090

PERMIT NUMBER: FLA010352
FILE NUMBER: FLA010352-006-DW3P
EFFECTIVE DATE: **March 24, 2018**
EXPIRATION DATE: **March 23, 2023**

FACILITY:

Aquarina Utilities WWTF
235 Hammock Shore Drive
Melbourne Beach, FL 32951-3941
Brevard County
Latitude: 27°55' 14.6139" N Longitude: 80°29' 24.3537" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and applicable rules of the Florida Administrative Code (F.A.C.). This permit does not constitute authorization to discharge wastewater other than as expressly stated in this permit. The above-named permittee is hereby authorized to operate the facilities in accordance with the documents attached hereto and specifically described as follows:

WASTEWATER TREATMENT:

An existing 0.099 million gallon per day(MGD) annual average daily flow (AADF) permitted capacity extended aeration domestic wastewater treatment plant consisting of influent screening, aeration, secondary clarification, filtration, hypochlorite chlorination, and aerobic digestion of biosolids.

REUSE OR DISPOSAL:

Land Application R-001: An existing 0.099 MGD annual average daily flow permitted capacity absorption field system. R-001 is a reuse system which consists of two (2) drainfields with a total wetted area of 0.114 acres (0.057 acres each). System R-001 is located approximately at latitude 27°55' 16" N, longitude 80°29' 24" W.

IN ACCORDANCE WITH: The limitations, monitoring requirements, and other conditions set forth in this cover sheet and Part I through Part IX on pages 1 through 16 of this permit.

PERMITTEE: Aquarina Utilities, Inc.
 FACILITY: Aquarina Utilities WWTF

PERMIT NUMBER: FLA010352
 EXPIRATION DATE: March 23, 2023

I. RECLAIMED WATER AND EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Reuse and Land Application Systems

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the permittee is authorized to direct reclaimed water to Reuse System R-001. Such reclaimed water shall be limited and monitored by the permittee as specified below and reported in accordance with Permit Condition I.B.7.:

Parameter	Units	Max/Min	Reclaimed Water Limitations		Monitoring Requirements			Notes
			Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	
Flow (Drainfield)	MGD	Max Max	0.099 Report	Annual Average Monthly Average	5 Days/Week	Calculated	FLW-3	See I.A.3
BOD, Carbonaceous 5 day, 20C	mg/L	Max Max Max Max	20.0 30.0 45.0 60.0	Annual Average Monthly Average Weekly Average Single Sample	Monthly	Grab	EFA-1	
Solids, Total Suspended	mg/L	Max	10.0	Single Sample	Monthly	Grab	EFA-1	
Coliform, Fecal	#/100mL	Max Max Max	200 200 800	Monthly Geometric Mean Annual Average Single Sample	Monthly	Grab	EFA-1	See I.A.4
pH	s.u.	Min Max	6.0 8.5	Single Sample Single Sample	5 Days/Week	Grab	EFA-1	
Chlorine, Total Residual (For Disinfection)	mg/L	Min	0.5	Single Sample	5 Days/Week	Grab	EFA-1	See I.A.5
Nitrogen, Nitrate, Total (as N)	mg/L	Max	12.0	Single Sample	Monthly	Grab	EFA-1	
Nitrogen, Total	mg/L	Max	Report	Single Sample	Monthly	Grab	EFA-1	
Phosphorus, Total (as P)	mg/L	Max	Report	Single Sample	Monthly	Grab	EFA-1	
Chloride (as Cl)	mg/L	Max	Report	Single Sample	Quarterly	Grab	EFA-1	See I.A.6
Sodium, Total Recoverable	mg/L	Max	Report	Single Sample	Quarterly	Grab	EFA-1	See I.A.6

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2. Reclaimed water samples shall be taken at the monitoring site locations listed in Permit Condition I.A.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-3	Total to Drainfield (FLW-1 plus FLW-2)
EFA-1	Chlorine contact chamber effluent.

3. A meter shall be utilized to measure flow and calibrated at least once every 12 months. *[62-600.200(25)]*
4. The effluent limitation for the monthly geometric mean for fecal coliform is only applicable if 10 or more values are reported. If fewer than 10 values are reported, the monthly geometric mean shall be calculated and reported on the Discharge Monitoring Report to be used to calculate the annual average. *[62-600.440(5)(b)]*
5. Total residual chlorine must be maintained for a minimum contact time of 15 minutes based on peak hourly flow. *[62-610.510][62-600.440(5)(c) and (6)(b)]*
6. The permittee may request that monitoring for this parameter be eliminated after eight (8) valid sampling events showing that the reclaimed water meets the Maximum Contaminant Levels (MCLs). *[62-4.070] [BPJ]*

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B. Other Limitations and Monitoring and Reporting Requirements

1. During the period beginning on the effective date and lasting through the expiration date of this permit, the treatment facility shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.B.7.:

Parameter	Units	Max/Min	Limitations		Monitoring Requirements			Notes
			Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number	
Flow (Total through facility)	MGD	Max Max Max	0.099 Report Report	Annual Average Monthly Average Quarterly Average	5 Days/Week	Calculated	FLW-3	See I.B.4
Flow (Demineralization Concentrate)	MGD	Max Max	Report Report	Annual Average Monthly Average	5 Days/Week	Meter	FLW-2	See I.B.4
Flow (Wastewater Influent)	MGD	Max Max	Report Report	Annual Average Monthly Average	5 Days/Week	Meter	FLW-1	See I.B.4
Percent Capacity, (TMADF/Permitted Capacity) x 100	percent	Max	Report	Monthly Average	Monthly	Calculated	CAL-1	
BOD, Carbonaceous 5 day, 20C (Influent)	mg/L	Max	Report	Single Sample	Monthly	Grab	INF-1	See I.B.3
Solids, Total Suspended (Influent)	mg/L	Max	Report	Single Sample	Monthly	Grab	INF-1	See I.B.3

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2. Samples shall be taken at the monitoring site locations listed in Permit Condition I.B.1. and as described below:

Monitoring Site Number	Description of Monitoring Site
FLW-3	Total flow through plant, sum of FLW-1 and FLW-2.
FLW-2	Elapsed time meters on RO reject pump station.
FLW-1	Elapsed time meters on influent lift station pumps.
CAL-1	Calculated using FLW-3
INF-1	Raw influent at the influent bar screen.

3. Influent samples shall be collected so that they do not contain digester supernatant or return activated sludge, or any other plant process recycled waters. *[62-600.660(4)(a)]*
4. A meter shall be utilized to measure flow and calibrated at least once every 12 months. *[62-600.200(25)]*
5. The sample collection, analytical test methods, and method detection limits (MDLs) applicable to this permit shall be conducted using a sufficiently sensitive method to ensure compliance with applicable water quality standards and effluent limitations and shall be in accordance with Rule 62-4.246, Chapters 62-160 and 62-600, F.A.C., and 40 CFR 136, as appropriate. The list of Department established analytical methods, and corresponding MDLs (method detection limits) and PQLs (practical quantitation limits), which is titled "FAC 62-4 MDL/PQL Table (April 26, 2006)" is available at <http://www.dep.state.fl.us/labs/library/index.htm>. The MDLs and PQLs as described in this list shall constitute the minimum acceptable MDL/PQL values and the Department shall not accept results for which the laboratory's MDLs or PQLs are greater than those described above unless alternate MDLs and/or PQLs have been specifically approved by the Department for this permit. Any method included in the list may be used for reporting as long as it meets the following requirements:
- The laboratory's reported MDL and PQL values for the particular method must be equal or less than the corresponding method values specified in the Department's approved MDL and PQL list;
 - The laboratory reported MDL for the specific parameter is less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Parameters that are listed as "report only" in the permit shall use methods that provide an MDL, which is equal to or less than the applicable water quality criteria stated in 62-302, F.A.C.; and
 - If the MDLs for all methods available in the approved list are above the stated permit limit or applicable water quality criteria for that parameter, then the method with the lowest stated MDL shall be used.

When the analytical results are below method detection or practical quantitation limits, the permittee shall report the actual laboratory MDL and/or PQL values for the analyses that were performed following the instructions on the applicable discharge monitoring report.

Where necessary, the permittee may request approval of alternate methods or for alternative MDLs or PQLs for any approved analytical method. Approval of alternate laboratory MDLs or PQLs are not necessary if the laboratory reported MDLs and PQLs are less than or equal to the permit limit or the applicable water quality criteria, if any, stated in Chapter 62-302, F.A.C. Approval of an analytical method not included in the above-referenced list is not necessary if the analytical method is approved in accordance with 40 CFR 136 or deemed acceptable by the Department. *[62-4.246, 62-160]*

6. The permittee shall provide safe access points for obtaining representative samples which are required by this permit. *[62-600.650(2)]*
7. **Monitoring requirements under this permit are effective on May 1, 2018.** Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements. During the period of operation authorized by this permit, the permittee shall complete and submit to the Department Discharge Monitoring Reports (DMRs) in accordance with the frequencies specified by the REPORT type (i.e. monthly, quarterly, semiannual, annual, etc.) indicated on the DMR forms attached to this permit. Unless specified otherwise in this permit, monitoring results for each monitoring period shall be submitted in accordance with the associated DMR due dates below. DMRs shall be submitted for each required monitoring period including periods of no discharge.

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REPORT Type on DMR	Monitoring Period	Submit by
Monthly	first day of month - last day of month	28 th day of following month
Quarterly	January 1 - March 31 April 1 - June 30 July 1 - September 30 October 1 - December 31	April 28 July 28 October 28 January 28
Semiannual	January 1 - June 30 July 1 - December 31	July 28 January 28
Annual	January 1 - December 31	January 28

The permittee may submit either paper or electronic DMR forms. If submitting electronic DMR forms, the permittee shall use the electronic DMR system approved by the Department (EzDMR) and shall electronically submit the completed DMR forms using the DEP Business Portal at <http://www.fldepportal.com/go/>. Reports shall be submitted to the Department by the twenty-eighth (28th) of the month following the month of operation. Data submitted in electronic format is equivalent to data submitted on signed and certified paper DMR forms.

If submitting paper DMR forms, the permittee shall make copies of the attached DMR forms, without altering the original format or content unless approved by the Department, and shall mail the completed DMR forms to the Department's Central District Office at the address specified in Permit Condition I.B.8. by the twenty-eighth (28th) of the month following the month of operation.

[62-620.610(18)][62-600.680(1)]

- Unless specified otherwise in this permit, all reports and other information required by this permit, including 24-hour notifications, shall be submitted to or reported to, as appropriate, the Department's Central District Office at the address specified below:

Electronic submittal is preferred, by sending to DEP_CD@dep.state.fl.us.

Florida Department of Environmental Protection
 Central District
 3319 Maguire Blvd, Suite 232
 Orlando, Florida 32803-3767

Phone Number - (407)897-4100
 FAX Number - (850)412-0467
 (All FAX copies and e-mails shall be followed by original copies.)
 [62-620.305]

- All reports and other information shall be signed in accordance with the requirements of Rule 62-620.305, F.A.C. [62-620.305]

II. BIOSOLIDS MANAGEMENT REQUIREMENTS

A. Basic Requirements

- Biosolids generated by this facility may be transferred to BCUD/South Beaches WRF or disposed of in a Class I solid waste landfill. Transferring biosolids to an alternative biosolids treatment facility does not require a permit modification. However, use of an alternative biosolids treatment facility requires submittal of a copy of the agreement pursuant to Rule 62-640.880(1)(c), F.A.C., along with a written notification to the Department at least 30 days before transport of the biosolids. [62-620.320(6), 62-640.880(1)]
- The permittee shall monitor and keep records of the quantities of biosolids generated, received from source facilities, treated, distributed and marketed, land applied, used as a biofuel or for bioenergy, transferred to another facility, or landfilled. These records shall be kept for a minimum of five years. [62-640.650(4)(a)]
- Biosolids quantities shall be monitored by the permittee as specified below. Results shall be reported on the permittee's Discharge Monitoring Report for Monitoring Group RMP-Q in accordance with Condition I.B.7.

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Parameter	Units	Max/Min	Biosolids Limitations		Monitoring Requirements		
			Limit	Statistical Basis	Frequency of Analysis	Sample Type	Monitoring Site Number
Biosolids Quantity (Transferred)	dry tons	Max	Report	Monthly Total	Monthly	Calculated	RMP-1
Biosolids Quantity (Landfilled)	dry tons	Max	Report	Monthly Total	Monthly	Calculated	RMP-1

[62-640.650(5)(a)1]

4. Biosolids quantities shall be calculated as listed in Permit Condition II.3 and as described below:

Monitoring Site Number	Description of Monitoring Site Calculations
RMP-1	Calculated (based on volume and estimated percent solids).

5. The treatment, management, transportation, use, land application, or disposal of biosolids shall not cause a violation of the odor prohibition in subsection 62-296.320(2), F.A.C. [62-640.400(6)]
6. Storage of biosolids or other solids at this facility shall be in accordance with the Facility Biosolids Storage Plan. [62-640.300(4)]
7. Biosolids shall not be spilled from or tracked off the treatment facility site by the hauling vehicle. [62-640.400(9)]

B. Disposal

8. Disposal of biosolids, septage, and "other solids" in a solid waste disposal facility, or disposal by placement on land for purposes other than soil conditioning or fertilization, such as at a monofill, surface impoundment, waste pile, or dedicated site, shall be in accordance with Chapter 62-701, F.A.C. [62-640.100(6)(b) & (c)]

C. Transfer

9. The permittee shall not be held responsible for treatment and management violations that occur after its biosolids have been accepted by a permitted biosolids treatment facility with which the source facility has an agreement in accordance with subsection 62-640.880(1)(c), F.A.C., for further treatment, management, or disposal. [62-640.880(1)(b)]
10. The permittee shall keep hauling records to track the transport of biosolids between the facilities. The hauling records shall contain the following information:

Source Facility	Biosolids Treatment Facility or Treatment Facility
1. Date and time shipped	1. Date and time received
2. Amount of biosolids shipped	2. Amount of biosolids received
3. Degree of treatment (if applicable)	3. Name and ID number of source facility
4. Name and ID Number of treatment facility	4. Signature of hauler
5. Signature of responsible party at source facility	5. Signature of responsible party at treatment facility
6. Signature of hauler and name of hauling firm	

A copy of the source facility hauling records for each shipment shall be provided upon delivery of the biosolids to the biosolids treatment facility or treatment facility. The treatment facility permittee shall report to the Department within 24 hours of discovery any discrepancy in the quantity of biosolids leaving the source facility and arriving at the biosolids treatment facility or treatment facility.

[62-640.880(4)]

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D. Receipt

11. If the permittee intends to accept biosolids from other facilities, a permit revision is required pursuant to paragraph 62-640.880(2)(d), F.A.C. [62-640.880(2)(d)]

III. GROUND WATER REQUIREMENTS

1. Chloride and sodium have been added to the list of parameters that are to be monitored for reclaimed water in Section I.A.1. The permittee will submit a report after eight (8) valid quarterly sampling events, which will include a data and trending analysis of the parameters nitrate, chloride, and sodium in the reclaimed water. Upon review of the report, a GWMP may be needed.

IV. ADDITIONAL REUSE AND LAND APPLICATION REQUIREMENTS

A. Part IV Absorption Field System(s)

1. Advisory signs shall be posted around the site boundaries to designate the nature of the project area. [62-610.518]
2. The permittee may allow public access to the absorption field sites. [62-610.518]
3. The absorption field shall be operated to preclude saturated conditions from developing at the ground surface. [62-610.500(2)]
4. The maximum annual average loading rate to the absorption fields shall be limited to 31.7 inches per day (as applied to the entire bottom area of the absorption field trenches or spreading areas). [62-610.523(3)]
5. The drainfields normally shall be loaded for 7 days and shall be rested for 7 days. Absorption fields shall be allowed to dry during the resting portion of the cycle. [62-610.523(4)]
6. Routine aquatic weed control and regular maintenance of storage pond embankments and access areas are required. [62-610.414 and 62-610.514]
7. Overflows from absorption fields or from emergency discharge facilities on storage ponds shall be reported as abnormal events in accordance with Permit Condition IX.20. [62-610.800(9)]

V. OPERATION AND MAINTENANCE REQUIREMENTS

A. Staffing Requirements

1. During the period of operation authorized by this permit, the wastewater facilities shall be operated under the supervision of one or more operators certified in accordance with Chapter 62-602, F.A.C. In accordance with Chapter 62-699, F.A.C., this facility is a Category III, Class C facility and, at a minimum, operators with appropriate certification must be on the site as follows:

A Class C or higher operator 1/2 hour/day for 5 days/week and one visit each weekend. The lead/chief operator must be a Class C operator, or higher.

2. An operator meeting the lead/chief operator class for the plant shall be available during all periods of plant operation. "Available" means able to be contacted as needed to initiate the appropriate action in a timely manner. [62-699.311(1)]

B. Capacity Analysis Report and Operation and Maintenance Performance Report Requirements

1. The application to renew this permit shall include an updated capacity analysis report prepared in accordance with Rule 62-600.405, F.A.C. [62-600.405(5)]

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2. The application to renew this permit shall include a detailed operation and maintenance performance report prepared in accordance with Rule 62-600.735, F.A.C. [62-600.735(1)]

C. Recordkeeping Requirements

1. The permittee shall maintain the following records and make them available for inspection on the site of the permitted facility.
 - a. Records of all compliance monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, including, if applicable, a copy of the laboratory certification showing the certification number of the laboratory, for at least three years from the date the sample or measurement was taken;
 - b. Copies of all reports required by the permit for at least three years from the date the report was prepared;
 - c. Records of all data, including reports and documents, used to complete the application for the permit for at least three years from the date the application was filed;
 - d. Monitoring information, including a copy of the laboratory certification showing the laboratory certification number, related to the residuals use and disposal activities for the time period set forth in Chapter 62-640, F.A.C., for at least three years from the date of sampling or measurement;
 - e. A copy of the current permit;
 - f. A copy of the current operation and maintenance manual as required by Chapter 62-600, F.A.C.;
 - g. A copy of any required record drawings;
 - h. Copies of the licenses of the current certified operators;
 - i. Copies of the logs and schedules showing plant operations and equipment maintenance for three years from the date of the logs or schedules. The logs shall, at a minimum, include identification of the plant; the signature and license number of the operator(s) and the signature of the person(s) making any entries; date and time in and out; specific operation and maintenance activities, including any preventive maintenance or repairs made or requested; results of tests performed and samples taken, unless documented on a laboratory sheet; and notation of any notification or reporting completed in accordance with Rule 62-602.650(3), F.A.C. The logs shall be maintained on-site in a location accessible to 24-hour inspection, protected from weather damage, and current to the last operation and maintenance performed; and
 - j. Records of biosolids quantities, treatment, monitoring, and hauling for at least five years.

[62-620.350, 62-602.650, 62-640.650(4)]

VI. SCHEDULES

1. The following improvement actions shall be completed according to the schedule shown, unless approval to extend the completion date is requested, and given, in writing:

Improvement Action	Anticipated Final Completion Date
Implement corrective actions as stated in the Operation and Maintenance Performance Report (OMPR) with designated action due dates.	07/01/2018

[62-620.320(6)]

2. The permittee is not authorized to discharge to waters of the state after the expiration date of this permit, unless:
 - a. The permittee has applied for renewal of this permit at least 180 days before the expiration date of this permit using the appropriate forms listed in Rule 62-620.910, F.A.C., and in the manner established in the Department of Environmental Protection Guide to Permitting Wastewater Facilities or Activities Under Chapter 62-620, F.A.C., including submittal of the appropriate processing fee set forth in Rule 62-4.050, F.A.C.; or

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- b. The permittee has made complete the application for renewal of this permit before the permit expiration date.

[62-620.335(1) - (4)]

VII. INDUSTRIAL PRETREATMENT PROGRAM REQUIREMENTS

1. This facility is not required to have a pretreatment program at this time. *[62-625.500]*

VIII. OTHER SPECIFIC CONDITIONS

1. The permittee shall comply with all conditions and requirements for reuse contained in their consumptive use permit issued by the Water Management District, if such requirements are consistent with Department rules. *[62-610.800(10)]*
2. In the event that the treatment facilities or equipment no longer function as intended, are no longer safe in terms of public health and safety, or odor, noise, aerosol drift, or lighting adversely affects neighboring developed areas at the levels prohibited by Rule 62-600.400(2)(a), F.A.C., corrective action (which may include additional maintenance or modifications of the permitted facilities) shall be taken by the permittee. Other corrective action may be required to ensure compliance with rules of the Department. Additionally, the treatment, management, use or land application of residuals shall not cause a violation of the odor prohibition in Rule 62-296.320(2), F.A.C. *[62-600.410(5) and 62-640.400(6)]*
3. The deliberate introduction of stormwater in any amount into collection/transmission systems designed solely for the introduction (and conveyance) of domestic/industrial wastewater; or the deliberate introduction of stormwater into collection/transmission systems designed for the introduction or conveyance of combinations of storm and domestic/industrial wastewater in amounts which may reduce the efficiency of pollutant removal by the treatment plant is prohibited, except as provided by Rule 62-610.472, F.A.C. *[62-604.130(3)]*
4. Collection/transmission system overflows shall be reported to the Department in accordance with Permit Condition IX. 20. *[62-604.550] [62-620.610(20)]*
5. The operating authority of a collection/transmission system and the permittee of a treatment plant are prohibited from accepting connections of wastewater discharges which have not received necessary pretreatment or which contain materials or pollutants (other than normal domestic wastewater constituents):
 - a. Which may cause fire or explosion hazards; or
 - b. Which may cause excessive corrosion or other deterioration of wastewater facilities due to chemical action or pH levels; or
 - c. Which are solid or viscous and obstruct flow or otherwise interfere with wastewater facility operations or treatment; or
 - d. Which result in the wastewater temperature at the introduction of the treatment plant exceeding 40°C or otherwise inhibiting treatment; or
 - e. Which result in the presence of toxic gases, vapors, or fumes that may cause worker health and safety problems.

[62-604.130(5)]

6. The treatment facility, storage ponds for Part II systems, rapid infiltration basins, and/or infiltration trenches shall be enclosed with a fence or otherwise provided with features to discourage the entry of animals and unauthorized persons. *[62-610.518(1) and 62-600.400(2)(b)]*
7. Screenings and grit removed from the wastewater facilities shall be collected in suitable containers and hauled to a Department approved Class I landfill or to a landfill approved by the Department for receipt/disposal of screenings and grit. *[62-701.300(1)(a)]*

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FACILITY: Aquarina Utilities WWTF

PERMIT NUMBER: FLA010352
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8. Where required by Chapter 471 or Chapter 492, F.S., applicable portions of reports that must be submitted under this permit shall be signed and sealed by a professional engineer or a professional geologist, as appropriate. *[62-620.310(4)]*
9. The permittee shall provide verbal notice to the Department's Central District Office as soon as practical after discovery of a sinkhole or other karst feature within an area for the management or application of wastewater, wastewater residuals (sludges), or reclaimed water. The permittee shall immediately implement measures appropriate to control the entry of contaminants, and shall detail these measures to the Department's Central District Office in a written report within 7 days of the sinkhole discovery. *[62-620.320(6)]*
10. The permittee shall provide notice to the Department of the following:
 - a. Any new introduction of pollutants into the facility from an industrial discharger which would be subject to Chapter 403, F.S., and the requirements of Chapter 62-620, F.A.C., if it were directly discharging those pollutants; and
 - b. Any substantial change in the volume or character of pollutants being introduced into that facility by a source which was identified in the permit application and known to be discharging at the time the permit was issued.

Notice shall include information on the quality and quantity of effluent introduced into the facility and any anticipated impact of the change on the quantity or quality of effluent or reclaimed water to be discharged from the facility.

[62-620.625(2)]

IX. GENERAL CONDITIONS

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are binding and enforceable pursuant to Chapter 403, Florida Statutes. Any permit noncompliance constitutes a violation of Chapter 403, Florida Statutes, and is grounds for enforcement action, permit termination, permit revocation and reissuance, or permit revision. *[62-620.610(1)]*
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviations from the approved drawings, exhibits, specifications, or conditions of this permit constitutes grounds for revocation and enforcement action by the Department. *[62-620.610(2)]*
3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor authorize any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit or authorization that may be required for other aspects of the total project which are not addressed in this permit. *[62-620.610(3)]*
4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. *[62-620.610(4)]*
5. This permit does not relieve the permittee from liability and penalties for harm or injury to human health or welfare, animal or plant life, or property caused by the construction or operation of this permitted source; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. The permittee shall take all reasonable steps to minimize or prevent any discharge, reuse of reclaimed water, or residuals use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. *[62-620.610(5)]*

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FACILITY: Aquarina Utilities WWTF

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6. If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee shall apply for and obtain a new permit. *[62-620.610(6)]*
7. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control, and related appurtenances, that are installed and used by the permittee to achieve compliance with the conditions of this permit. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to maintain or achieve compliance with the conditions of the permit. *[62-620.610(7)]*
8. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit revision, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. *[62-620.610(8)]*
9. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, including an authorized representative of the Department and authorized EPA personnel, when applicable, upon presentation of credentials or other documents as may be required by law, and at reasonable times, depending upon the nature of the concern being investigated, to:
 - a. Enter upon the permittee's premises where a regulated facility, system, or activity is located or conducted, or where records shall be kept under the conditions of this permit;
 - b. Have access to and copy any records that shall be kept under the conditions of this permit;
 - c. Inspect the facilities, equipment, practices, or operations regulated or required under this permit; and
 - d. Sample or monitor any substances or parameters at any location necessary to assure compliance with this permit or Department rules.

[62-620.610(9)]
10. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data, and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except as such use is proscribed by Section 403.111, F.S., or Rule 62-620.302, F.A.C. Such evidence shall only be used to the extent that it is consistent with the Florida Rules of Civil Procedure and applicable evidentiary rules. *[62-620.610(10)]*
11. When requested by the Department, the permittee shall within a reasonable time provide any information required by law which is needed to determine whether there is cause for revising, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also provide to the Department upon request copies of records required by this permit to be kept. If the permittee becomes aware of relevant facts that were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be promptly submitted or corrections promptly reported to the Department. *[62-620.610(11)]*
12. Unless specifically stated otherwise in Department rules, the permittee, in accepting this permit, agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard. *[62-620.610(12)]*
13. The permittee, in accepting this permit, agrees to pay the applicable regulatory program and surveillance fee in accordance with Rule 62-4.052, F.A.C. *[62-620.610(13)]*
14. This permit is transferable only upon Department approval in accordance with Rule 62-620.340, F.A.C. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department. *[62-620.610(14)]*

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15. The permittee shall give the Department written notice at least 60 days before inactivation or abandonment of a wastewater facility or activity and shall specify what steps will be taken to safeguard public health and safety during and following inactivation or abandonment. *[62-620.610(15)]*
16. The permittee shall apply for a revision to the Department permit in accordance with Rules 62-620.300, F.A.C., and the Department of Environmental Protection Guide to Permitting Wastewater Facilities or Activities Under Chapter 62-620, F.A.C., at least 90 days before construction of any planned substantial modifications to the permitted facility is to commence or with Rule 62-620.325(2), F.A.C., for minor modifications to the permitted facility. A revised permit shall be obtained before construction begins except as provided in Rule 62-620.300, F.A.C. *[62-620.610(16)]*
17. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The permittee shall be responsible for any and all damages which may result from the changes and may be subject to enforcement action by the Department for penalties or revocation of this permit. The notice shall include the following information:
 - a. A description of the anticipated noncompliance;
 - b. The period of the anticipated noncompliance, including dates and times; and
 - c. Steps being taken to prevent future occurrence of the noncompliance.

[62-620.610(17)]

18. Sampling and monitoring data shall be collected and analyzed in accordance with Rule 62-4.246 and Chapters 62-160, 62-600, and 62-610, F.A.C., and 40 CFR 136, as appropriate.
 - a. Monitoring results shall be reported at the intervals specified elsewhere in this permit and shall be reported on a Discharge Monitoring Report (DMR), DEP Form 62-620.910(10), or as specified elsewhere in the permit.
 - b. If the permittee monitors any contaminant more frequently than required by the permit, using Department approved test procedures, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
 - c. Calculations for all limitations which require averaging of measurements shall use an arithmetic mean unless otherwise specified in this permit.
 - d. Except as specifically provided in Rule 62-160.300, F.A.C., any laboratory test required by this permit shall be performed by a laboratory that has been certified by the Department of Health Environmental Laboratory Certification Program (DOH ELCP). Such certification shall be for the matrix, test method and analyte(s) being measured to comply with this permit. For domestic wastewater facilities, testing for parameters listed in Rule 62-160.300(4), F.A.C., shall be conducted under the direction of a certified operator.
 - e. Field activities including on-site tests and sample collection shall follow the applicable standard operating procedures described in DEP-SOP-001/01 adopted by reference in Chapter 62-160, F.A.C.
 - f. Alternate field procedures and laboratory methods may be used where they have been approved in accordance with Rules 62-160.220, and 62-160.330, F.A.C.

[62-620.610(18)]

19. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule detailed elsewhere in this permit shall be submitted no later than 14 days following each schedule date. *[62-620.610(19)]*
20. The permittee shall report to the Department's Central District Office any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance including exact dates and time, and if the

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noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

- a. The following shall be included as information which must be reported within 24 hours under this condition:
 - (1) Any unanticipated bypass which causes any reclaimed water or effluent to exceed any permit limitation or results in an unpermitted discharge,
 - (2) Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,
 - (3) Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and
 - (4) Any unauthorized discharge to surface or ground waters.
- b. Oral reports as required by this subsection shall be provided as follows:
 - (1) For unauthorized releases or spills of treated or untreated wastewater reported pursuant to subparagraph (a)4. that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24 hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information to the State Watch Office:
 - (a) Name, address, and telephone number of person reporting;
 - (b) Name, address, and telephone number of permittee or responsible person for the discharge;
 - (c) Date and time of the discharge and status of discharge (ongoing or ceased);
 - (d) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater);
 - (e) Estimated amount of the discharge;
 - (f) Location or address of the discharge;
 - (g) Source and cause of the discharge;
 - (h) Whether the discharge was contained on-site, and cleanup actions taken to date;
 - (i) Description of area affected by the discharge, including name of water body affected, if any; and
 - (j) Other persons or agencies contacted.
 - (2) Oral reports, not otherwise required to be provided pursuant to subparagraph b.1 above, shall be provided to the Department's Central District Office within 24 hours from the time the permittee becomes aware of the circumstances.
- c. If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department's Central District Office shall waive the written report.

[62-620.610(20)]

21. The permittee shall report all instances of noncompliance not reported under Permit Conditions IX.17., IX.18., or IX.19. of this permit at the time monitoring reports are submitted. This report shall contain the same information required by Permit Condition IX.20. of this permit. *[62-620.610(21)]*

22. Bypass Provisions.

- a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment works.
- b. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless the permittee affirmatively demonstrates that:
 - (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (3) The permittee submitted notices as required under Permit Condition IX.22.c. of this permit.
- c. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least 10 days before the date of the bypass. The permittee shall submit notice of an

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unanticipated bypass within 24 hours of learning about the bypass as required in Permit Condition IX.20. of this permit. A notice shall include a description of the bypass and its cause; the period of the bypass, including exact dates and times; if the bypass has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

- d. The Department shall approve an anticipated bypass, after considering its adverse effect, if the permittee demonstrates that it will meet the three conditions listed in Permit Condition IX.22.b.(1) through (3) of this permit.
- e. A permittee may allow any bypass to occur which does not cause reclaimed water or effluent limitations to be exceeded if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Permit Condition IX.22.b. through d. of this permit.

[62-620.610(22)]

23. Upset Provisions.

- a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee.
 - (1) An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, careless or improper operation.
 - (2) An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of upset provisions of Rule 62-620.610, F.A.C., are met.
- b. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required in Permit Condition IX.20. of this permit; and
 - (4) The permittee complied with any remedial measures required under Permit Condition IX.5. of this permit.
- c. In any enforcement proceeding, the burden of proof for establishing the occurrence of an upset rests with the permittee.

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- d. Before an enforcement proceeding is instituted, no representation made during the Department review of a claim that noncompliance was caused by an upset is final agency action subject to judicial review.
[62-620.610(23)]

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION



Wanda Parker-Garvin
Environmental Manager

PERMIT ISSUANCE DATE:
February 1, 2018

Attachment(s):
Discharge Monitoring Report

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Aquarina Utilities, Inc.	PERMIT NUMBER:	FLA010352-006-DW3P	DMR Effective Date:	May 1, 2018
MAILING ADDRESS:	1726 NE Darlich Avenue Jensen Beach, Florida 34957-	LIMIT:	Final	REPORT FREQUENCY:	Monthly
FACILITY:	Aquarina Utilities WWTF	CLASS SIZE:	N/A	PROGRAM:	Domestic
LOCATION:	235 Hammock Shore Drive Melbourne Beach, FL 32951-3941	MONITORING GROUP NUMBER:	R-001		
COUNTY:	Brevard	MONITORING GROUP DESCRIPTION:	Drainfields, including Influent		
OFFICE:	Central District	RE-SUBMITTED DMR:	<input type="checkbox"/>		
		NO DISCHARGE FROM SITE:	<input type="checkbox"/>		
		MONITORING PERIOD	From: _____ To: _____		

Parameter		Quantity or Loading	Units	Quality or Concentration	Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (Drainfield)	Sample Measurement							
PARM Code 50050 Y Mon. Site No. FLW-3	Permit Requirement	0.099 (An. Avg.)	MGD				5 Days/Week	Calculated
Flow (Drainfield)	Sample Measurement							
PARM Code 50050 3 Mon. Site No. FLW-1	Permit Requirement	Report (Mo. Avg.)	MGD				5 Days/Week	Meter
BOD, Carbonaceous 5 day, 20C	Sample Measurement							
PARM Code 80082 Y Mon. Site No. EFA-1	Permit Requirement			20.0 (An. Avg.)	mg/L		Monthly	Grab
BOD, Carbonaceous 5 day, 20C	Sample Measurement							
PARM Code 80082 A Mon. Site No. EFA-1	Permit Requirement			60.0 (Max.)	mg/L		Monthly	Grab
				45.0 (Max.Wk.Avg.)				
				30.0 (Mo. Avg.)				
Solids, Total Suspended	Sample Measurement							
PARM Code 00530 A Mon. Site No. EFA-1	Permit Requirement				mg/L		Monthly	Grab
					10.0 (Max.)			
Coliform, Fecal	Sample Measurement							
PARM Code 74055 Y Mon. Site No. EFA-1	Permit Requirement			200 (An. Avg.)	#/100mL		Monthly	Grab

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: Aquarina Utilities WWTF

MONITORING GROUP NUMBER: R-001

PERMIT NUMBER: FLA010352-006-DW3P

MONITORING PERIOD From: _____ To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration		Units	No. Ex.	Frequency of Analysis	Sample Type
Coliform, Fecal	Sample Measurement									
PARM Code 74055 A Mon. Site No. EFA-1	Permit Requirement				200 (Mo.Geo.Mn.)	800 (Max.)	#/100mL		Monthly	Grab
pH	Sample Measurement									
PARM Code 00400 A Mon. Site No. EFA-1	Permit Requirement				6.0 (Min.)	8.5 (Max.)	s.u.		5 Days/Week	Grab
Chlorine, Total Residual (For Disinfection)	Sample Measurement									
PARM Code 50060 A Mon. Site No. EFA-1	Permit Requirement				0.5 (Min.)		mg/L		5 Days/Week	Grab
Nitrogen, Nitrate, Total (as N)	Sample Measurement									
PARM Code 00620 A Mon. Site No. EFA-1	Permit Requirement					12.0 (Max.)	mg/L		Monthly	Grab
Nitrogen, Total	Sample Measurement									
PARM Code 00600 A Mon. Site No. EFA-1	Permit Requirement					Report (Max.)	mg/L		Monthly	Grab
Phosphorus, Total (as P)	Sample Measurement									
PARM Code 00665 A Mon. Site No. EFA-1	Permit Requirement					Report (Max.)	mg/L		Monthly	Grab
Flow (Total through facility)	Sample Measurement									
PARM Code 50050 P Mon. Site No. FLW-3	Permit Requirement		0.099 (An.Avg.)	MGD					5 Days/Week	Calculated
Flow (Total through facility)	Sample Measurement									
PARM Code 50050 Q Mon. Site No. FLW-3	Permit Requirement	Report (Qt.Avg.)	Report (Mo.Avg.)	MGD					5 Days/Week	Calculated
Flow (Demineralization Concentrate)	Sample Measurement									
PARM Code 50050 R Mon. Site No. FLW-2	Permit Requirement		Report (An.Avg.)	MGD					5 Days/Week	Meter
Flow (Demineralization Concentrate)	Sample Measurement									
PARM Code 50050 S Mon. Site No. FLW-2	Permit Requirement		Report (Mo.Avg.)	MGD					5 Days/Week	Meter

DISCHARGE MONITORING REPORT - PART A (Continued)

FACILITY: Aquarina Utilities WWTF

MONITORING GROUP NUMBER: R-001

PERMIT NUMBER: FLA010352-006-DW3P

MONITORING PERIOD From: _____

To: _____

Parameter		Quantity or Loading		Units	Quality or Concentration			Units	No. Ex.	Frequency of Analysis	Sample Type
Flow (at lift station)	Sample Measurement										
PARM Code 50050 T Mon. Site No. FLW-1	Permit Requirement		Report (An.Avg.)	MGD						5 Days/Week	Meter
Flow (at lift station)	Sample Measurement										
PARM Code 50050 U Mon. Site No. FLW-1	Permit Requirement		Report (Mo.Avg.)	MGD						5 Days/Week	Meter
Percent Capacity, (TMADF/Permitted Capacity) x 100	Sample Measurement										
PARM Code 00180 P Mon. Site No. CAL-1	Permit Requirement					Report (Mo.Avg.)	percent			Monthly	Calculated
BOD, Carbonaceous 5 day, 20C (Influent)	Sample Measurement										
PARM Code 80082 G Mon. Site No. INF-1	Permit Requirement					Report (Max.)	mg/L			Monthly	Grab
Solids, Total Suspended (Influent)	Sample Measurement										
PARM Code 00530 G Mon. Site No. INF-1	Permit Requirement					Report (Max.)	mg/L			Monthly	Grab
	Sample Measurement										
	Permit Requirement										
	Sample Measurement										
	Permit Requirement										
	Sample Measurement										
	Permit Requirement										
	Sample Measurement										
	Permit Requirement										

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Aquarina Utilities, Inc.	PERMIT NUMBER:	FLA010352-006-DW3P
MAILING ADDRESS:	1726 NE Darlich Avenue Jensen Beach, Florida 34957-	LIMIT:	Final
		CLASS SIZE:	N/A
FACILITY:	Aquarina Utilities WWTF	MONITORING GROUP NUMBER:	R-001
LOCATION:	235 Hammock Shore Drive Melbourne Beach, FL 32951-3941	MONITORING GROUP DESCRIPTION:	Drainfields, including Influent
		RE-SUBMITTED DMR:	<input type="checkbox"/>
		NO DISCHARGE FROM SITE:	<input type="checkbox"/>
COUNTY:	Brevard	MONITORING PERIOD	From: _____ To: _____
OFFICE:	Central District		

Parameter		Quantity or Loading	Units	Quality or Concentration	Units	No. Ex.	Frequency of Analysis	Sample Type
Chloride (as Cl)	Sample Measurement							
PARM Code 00940 A Mon. Site No. EFA-1	Permit Requirement			Report (Max.)	mg/L		Quarterly	Grab
Sodium, Total Recoverable	Sample Measurement							
PARM Code 00923 A Mon. Site No. EFA-1	Permit Requirement			Report (Max.)	mg/L		Quarterly	Grab
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

When Completed submit this report to: Department of Environmental Protection, 3319 Maguire Blvd, Suite 232, Orlando, FL 32803-3767

PERMITTEE NAME:	Aquarina Utilities, Inc.	PERMIT NUMBER:	FLA010352-006-DW3P
MAILING ADDRESS:	1726 NE Darlich Avenue Jensen Beach, Florida 34957-	LIMIT:	Final
		CLASS SIZE:	N/A
FACILITY:	Aquarina Utilities WWTF	MONITORING GROUP NUMBER:	RMP-Q
LOCATION:	235 Hammock Shore Drive Melbourne Beach, FL 32951-3941	MONITORING GROUP DESCRIPTION:	Biosolids Quantity
		RE-SUBMITTED DMR:	<input type="checkbox"/>
		NO DISCHARGE FROM SITE:	<input type="checkbox"/>
COUNTY:	Brevard	MONITORING PERIOD	From: _____ To: _____
OFFICE:	Central District		

Parameter		Quantity or Loading	Units	Quality or Concentration	Units	No. Ex.	Frequency of Analysis	Sample Type
Biosolids Quantity (Transferred)	Sample Measurement							
PARM Code B0007 + Mon. Site No. RMP-1	Permit Requirement	Report (Mo. Total)	dry tons				Monthly	Calculated
Biosolids Quantity (Landfilled)	Sample Measurement							
PARM Code B0008 + Mon. Site No. RMP-1	Permit Requirement	Report (Mo. Total)	dry tons				Monthly	Calculated
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							
	Sample Measurement							
	Permit Requirement							

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NAME/TITLE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	TELEPHONE NO	DATE (mm/dd/yyyy)

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here):

DAILY SAMPLE RESULTS - PART B

Permit Number:
Monitoring Period

FLA010352-006-DW3P
From: _____ To: _____

Facility: Aquarina Beach WWTF

Code	BOD, Carbonaceous 5 day, 20C mg/L	Chlorine, Total Residual (For Disinfection) mg/L	Coliform, Fecal #/100mL	Nitrogen, Nitrate, Total (as N) mg/L	Nitrogen, Total mg/L	Phosphorus, Total (as P) mg/L	Solids, Total Suspended mg/L	pH s.u.	Flow (at lift station) MGD	Flow (Demineralization Concentr) MGD	BOD, Carbonaceous 5 day, 20C (Influent) mg/L
Mon. Site	80082	50060	74055	00620	00600	00665	00530	00400	50050	50050	80082
	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	EFA-1	FLW-1	FLW-2	INF-1
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Total											
Mo. Avg.											

PLANT STAFFING:

Day Shift Operator Class: _____ Certificate No: _____ Name: _____

Evening Shift Operator Class: _____ Certificate No: _____ Name: _____

Night Shift Operator Class: _____ Certificate No: _____ Name: _____

Lead Operator Class: _____ Certificate No: _____ Name: _____

DAILY SAMPLE RESULTS - PART B

Permit Number:
Monitoring Period

FLA010352-006-DW3P

From: _____ To: _____

Facility: Aquarina Beach WWTF

Solids, Total Suspended (Influent) mg/L											
Code	00530										
Mon. Site	INF-1										
1											
2											
3											
4											
5											
6											
7											
8											
9											
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27											
28											
29											
30											
31											
Total											
Mo. Avg.											

PLANT STAFFING:

Day Shift Operator Class: _____ Certificate No: _____ Name: _____

Evening Shift Operator Class: _____ Certificate No: _____ Name: _____

Night Shift Operator Class: _____ Certificate No: _____ Name: _____

Lead Operator Class: _____ Certificate No: _____ Name: _____

INSTRUCTIONS FOR COMPLETING THE WASTEWATER DISCHARGE MONITORING REPORT

Read these instructions before completing the DMR. Hard copies and/or electronic copies of the required parts of the DMR were provided with the permit. All required information shall be completed in full and typed or printed in ink. A signed, original DMR shall be mailed to the address printed on the DMR by the 28th of the month following the monitoring period. Facilities who submit their DMR(s) electronically through eDMR do not need to submit a hardcopy DMR. The DMR shall not be submitted before the end of the monitoring period.

The DMR consists of three parts--A, B, and D--all of which may or may not be applicable to every facility. Facilities may have one or more Part A's for reporting effluent or reclaimed water data. All domestic wastewater facilities will have a Part B for reporting daily sample results. Part D is used for reporting ground water monitoring well data.

When results are not available, the following codes should be used on parts A and D of the DMR and an explanation provided where appropriate. Note: Codes used on Part B for raw data are different.

CODE	DESCRIPTION/INSTRUCTIONS
ANC	Analysis not conducted.
DRY	Dry Well
FLD	Flood disaster.
IFS	Insufficient flow for sampling.
LS	Lost sample.
MNR	Monitoring not required this period.

CODE	DESCRIPTION/INSTRUCTIONS
NOD	No discharge from/to site.
OPS	Operations were shutdown so no sample could be taken.
OTH	Other. Please enter an explanation of why monitoring data were not available.
SEF	Sampling equipment failure.

When reporting analytical results that fall below a laboratory's reported method detection limits or practical quantification limits, the following instructions should be used, unless indicated otherwise in the permit or on the DMR:

1. Results greater than or equal to the PQL shall be reported as the measured quantity.
2. Results less than the PQL and greater than or equal to the MDL shall be reported as the laboratory's MDL value. These values shall be deemed equal to the MDL when necessary to calculate an average for that parameter and when determining compliance with permit limits.
3. Results less than the MDL shall be reported by entering a less than sign (" $<$ ") followed by the laboratory's MDL value, e.g. <0.001 . A value of one-half the MDL or one-half the effluent limit, whichever is lower, shall be used for that sample when necessary to calculate an average for that parameter. Values less than the MDL are considered to demonstrate compliance with an effluent limitation.

PART A -DISCHARGE MONITORING REPORT (DMR)

Part A of the DMR is comprised of one or more sections, each having its own header information. Facility information is preprinted in the header as well as the monitoring group number, whether the limits and monitoring requirements are interim or final, and the required submittal frequency (e.g. monthly, annually, quarterly, etc.). Submit Part A based on the required reporting frequency in the header and the instructions shown in the permit. The following should be completed by the permittee or authorized representative:

Resubmitted DMR: Check this box if this DMR is being re-submitted because there was information missing from or information that needed correction on a previously submitted DMR. The information that is being revised should be clearly noted on the re-submitted DMR (e.g. highlight, circle, etc.)

No Discharge From Site: Check this box if no discharge occurs and, as a result, there are no data or codes to be entered for all of the parameters on the DMR for the entire monitoring group number; however, if the monitoring group includes other monitoring locations (e.g., influent sampling), the "NOD" code should be used to individually denote those parameters for which there was no discharge.

Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.

Sample Measurement: Before filling in sample measurements in the table, check to see that the data collected correspond to the limit indicated on the DMR (i.e. interim or final) and that the data correspond to the monitoring group number in the header. Enter the data or calculated results for each parameter on this row in the non-shaded area above the limit. Be sure the result being entered corresponds to the appropriate statistical base code (e.g. annual average, monthly average, single sample maximum, etc.) and units. Data qualifier codes are not to be reported on Part A.

No. Ex.: Enter the number of sample measurements during the monitoring period that exceeded the permit limit for each parameter in the non-shaded area. If none, enter zero.

Frequency of Analysis: The shaded areas in this column contain the minimum number of times the measurement is required to be made according to the permit. Enter the actual number of times the measurement was made in the space above the shaded area.

Sample Type: The shaded areas in this column contain the type of sample (e.g. grab, composite, continuous) required by the permit. Enter the actual sample type that was taken in the space above the shaded area.

Signature: This report must be signed in accordance with Rule 62-620.305, F.A.C. Type or print the name and title of the signing official. Include the telephone number where the official may be reached in the event there are questions concerning this report. Enter the date when the report is signed.

Comment and Explanation of Any Violations: Use this area to explain any exceedances, any upset or by-pass events, or other items which require explanation. If more space is needed, reference all attachments in this area.

PART B - DAILY SAMPLE RESULTS

Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.

Daily Monitoring Results: Transfer all analytical data from your facility's laboratory or a contract laboratory's data sheets for all day(s) that samples were collected. Record the data in the units indicated. Table 1 in Chapter 62-160, F.A.C., contains a complete list of all the data qualifier codes that your laboratory may use when reporting analytical results. However, when transferring numerical results onto Part B of the DMR, only the following data qualifier codes should be used and an explanation provided where appropriate.

CODE	DESCRIPTION/INSTRUCTIONS
<	The compound was analyzed for but not detected.
A	Value reported is the mean (average) of two or more determinations.
J	Estimated value, value not accurate.
Q	Sample held beyond the actual holding time.
Y	Laboratory analysis was from an unpreserved or improperly preserved sample.

To calculate the monthly average, add each reported value to get a total. For flow, divide this total by the number of days in the month. For all other parameters, divide the total by the number of observations.

Plant Staffing: List the name, certificate number, and class of all state certified operators operating the facility during the monitoring period. Use additional sheets as necessary.

PART D - GROUND WATER MONITORING REPORT

Monitoring Period: Enter the month, day, and year for the first and last day of the monitoring period (i.e. the month, the quarter, the year, etc.) during which the data on this report were collected and analyzed.

Date Sample Obtained: Enter the date the sample was taken. Also, check whether or not the well was purged before sampling.

Time Sample Obtained: Enter the time the sample was taken.

Sample Measurement: Record the results of the analysis. If the result was below the minimum detection limit, indicate that. Data qualifier codes are not to be reported on Part D.

Detection Limits: Record the detection limits of the analytical methods used.

Analysis Method: Indicate the analytical method used. Record the method number from Chapter 62-160 or Chapter 62-601, F.A.C., or from other sources.

Sampling Equipment Used: Indicate the procedure used to collect the sample (e.g. airlift, bucket/bailer, centrifugal pump, etc.)

Samples Filtered: Indicate whether the sample obtained was filtered by laboratory (L), filtered in field (F), or unfiltered (N).

Signature: This report must be signed in accordance with Rule 62-620.305, F.A.C. Type or print the name and title of the signing official. Include the telephone number where the official may be reached in the event there are questions concerning this report. Enter the date when the report is signed.

Comments and Explanation: Use this space to make any comments on or explanations of results that are unexpected. If more space is needed, reference all attachments in this area.

SPECIAL INSTRUCTIONS FOR LIMITED WET WEATHER DISCHARGES

Flow (Limited Wet Weather Discharge): Enter the measured average flow rate during the period of discharge or divide gallons discharged by duration of discharge (converted into days). Record in million gallons per day (MGD).

Flow (Upstream): Enter the average flow rate in the receiving stream upstream from the point of discharge for the period of discharge. The average flow rate can be calculated based on two measurements; one made at the start and one made at the end of the discharge period. Measurements are to be made at the upstream gauging station described in the permit.

Actual Stream Dilution Ratio: To calculate the Actual Stream Dilution Ratio, divide the average upstream flow rate by the average discharge flow rate. Enter the Actual Stream Dilution Ratio accurate to the nearest 0.1.

No. of Days the SDF > Stream Dilution Ratio: For each day of discharge, compare the minimum Stream Dilution Factor (SDF) from the permit to the calculated Stream Dilution Ratio. On Part B of the DMR, enter an asterisk (*) if the SDF is greater than the Stream Dilution Ratio on any day of discharge. On Part A of the DMR, add up the days with an "*" and record the total number of days the Stream Dilution Factor was greater than the Stream Dilution Ratio.

CBOD₅: Enter the average CBOD₅ of the reclaimed water discharged during the period shown in duration of discharge.

TKN: Enter the average TKN of the reclaimed water discharged during the period shown in duration of discharge.

Actual Rainfall: Enter the actual rainfall for each day on Part B. Enter the actual cumulative rainfall to date for this calendar year and the actual total monthly rainfall on Part A. The cumulative rainfall to date for this calendar year is the total amount of rain, in inches, that has been recorded since January 1 of the current year through the month for which this DMR contains data.

Rainfall During Average Rainfall Year: On Part A, enter the total monthly rainfall during the average rainfall year and the cumulative rainfall for the average rainfall year. The cumulative rainfall for the average rainfall year is the amount of rain, in inches, which fell during the average rainfall year from January through the month for which this DMR contains data.

No. of Days LWWD Activated During Calendar Year: Enter the cumulative number of days that the limited wet weather discharge was activated since January 1 of the current year.

Reason for Discharge: Attach to the DMR a brief explanation of the factors contributing to the need to activate the limited wet weather discharge.

**STATEMENT OF BASIS
FOR
STATE OF FLORIDA DOMESTIC WASTEWATER FACILITY PERMIT**

PERMIT NUMBER: FLA010352-006
FACILITY NAME: Aquarina Beach WWTF
FACILITY LOCATION: 235 Hammock Shore Drive
Melbourne Beach, FL 32951-3941
Brevard County
NAME OF PERMITTEE: Aquarina Utilities, Inc.
PERMIT WRITER: E. Elliott, Engineer IV

1. SUMMARY OF APPLICATION

a. Chronology of Application

Application Number: FLA010352-006-DW3P
Application Submittal Date: January 16, 2018

b. Type of Facility

Domestic Wastewater Treatment Plant

Ownership Type: Private

SIC Code: 4952

c. Facility Capacity

Existing Permitted Capacity:	0.099 mgd Annual Average Daily Flow
Proposed Increase in Permitted Capacity:	0 mgd Annual Average Daily Flow
Proposed Total Permitted Capacity:	0.099 mgd Annual Average Daily Flow

d. Description of Wastewater Treatment

An existing 0.099 mgd annual average daily flow (AADF) permitted capacity extended aeration domestic wastewater treatment plant consisting of influent screening, aeration, secondary clarification, filtration, chlorination, and aerobic digestion of biosolids.

e. Description of Effluent Disposal and Land Application Sites

An existing 0.099 MGD annual average daily flow permitted capacity absorption field system. R-001 is a reuse system which consists of two (2) drainfields with 0.057 acres size each.

2. SUMMARY OF SURFACE WATER DISCHARGE

This facility does not discharge to surface waters.

3. **BASIS FOR PERMIT LIMITATIONS AND MONITORING REQUIREMENTS**

This facility is authorized to direct reclaimed water to Reuse System R-001, an absorption field system, based on the following:

Parameter	Units	Max/Min	Limit	Statistical Basis	Rationale
Flow (Drainfield)	MGD	Max	0.099	Annual Average	62-600.700(2)(b) & 62-610.810(5) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) & 62-610.810(5) FAC
BOD, Carbonaceous 5 day, 20C	mg/L	Max	20.0	Annual Average	62-610.510 & 62-600.740(1)(b)1.a. FAC
		Max	30.0	Monthly Average	62-600.740(1)(b)1.b. FAC
		Max	45.0	Weekly Average	62-600.740(1)(b)1.c. FAC
		Max	60.0	Single Sample	62-600.740(1)(b)1.d. FAC
Solids, Total Suspended	mg/L	Max	10.0	Single Sample	62-610.510(2) FAC
Coliform, Fecal	#/100mL	Max	200	Monthly Geometric Mean	62-600.440(4)(c)2. FAC
		Max	200	Annual Average	62-610.510 & 62-600.440(4)(c)1. FAC
		Max	800	Single Sample	62-600.440(4)(c)4. FAC
pH	s.u.	Min	6.0	Single Sample	62-600.445 FAC
		Max	8.5	Single Sample	62-600.445 FAC
Chlorine, Total Residual (For Disinfection)	mg/L	Min	0.5	Single Sample	62-610.510 & 62-600.440(5)(c) FAC
Nitrogen, Nitrate, Total (as N)	mg/L	Max	12.0	Single Sample	62-610.510(1) FAC
Nitrogen, Total	mg/L	Max	Report	Single Sample	62-600.650(3) FAC.
Phosphorus, Total (as P)	mg/L	Max	Report	Single Sample	62-600.650(3) FAC.
Chloride (as Cl)*	mg/L	Max	Report	Single Sample	62-4.070 FAC and BPJ
Sodium, Total Recoverable*	mg/L	Max	Report	Single Sample	62-4.070 FAC and BPJ

* Sampling has been added to evaluate the potential impact of the Demineralization concentrate on the land application system and the groundwater.

Other Limitations and Monitoring Requirements:

Parameter	Units	Max/Min	Limit	Statistical Basis	Rationale
Flow (Total through facility)	MGD	Max	0.099	Annual Average	62-600.700(2)(b) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) FAC
		Max	Report	Quarterly Average	62-600.700(2)(b) FAC
Flow (Wastewater Influent)	MGD	Max	Report	Annual Average	62-600.700(2)(b) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) FAC
Flow (Demineralization Concentrate)	MGD	Max	Report	Annual Average	62-600.700(2)(b) FAC
		Max	Report	Monthly Average	62-600.700(2)(b) FAC
Percent Capacity, (TMADF/Permitted Capacity) x 100	percent	Max	Report	Monthly Average	62-600.405(4) FAC

Parameter	Units	Max/Min	Limit	Statistical Basis	Rationale
BOD, Carbonaceous 5 day, 20C (Influent)	mg/L	Max	Report	Single Sample	62-600.660(1) FAC
Solids, Total Suspended (Influent)	mg/L	Max	Report	Single Sample	62-600.660(1) FAC
Monitoring Frequencies and Sample Types	-	-	-	All Parameters	62-600 FAC & 62-699 FAC and/or BPJ of permit writer
Sampling Locations	-	-	-	All Parameters	62-600, 62-610.412, 62-610.463(1), 62-610.568, 62-610.613 FAC and/or BPJ of permit writer

4. DISCUSSION OF CHANGES TO PERMIT LIMITATIONS

The current wastewater permit for this facility FLA010352-006-DW3P expires on March 23, 2023. Adding the sampling of Sodium and Chlorides on a quarterly basis due to inclusion of Concentrate by product water from the potable system and the high loading rate to the reuse system. This was accepted as an alternative to a groundwater monitoring plan but may be revisited in the future.

Historical – Department records show the approved flow was limited to 0.050 MGD at one time due to the construction of only one drainfield cell. Prior to the 002-permit cycle that second cell was completed, and the permit issued with a permitted capacity of 0.099 MGD. The loading rate (over 31 inches/day) is very high, by current Rule 62-610 FAC standards, but this rate is grandfathered, predating the rule. The loading rate will be subject to reconsideration is the facility make any significant changes to the plant, the land application system, or in the event of non-compliance associated with the system.

5. BIOSOLIDS MANAGEMENT REQUIREMENTS

Biosolids generated by this facility may be transferred to BCUD/South Beaches WRF or disposed of in a Class I solid waste landfill.

See the table below for the rationale for the biosolids quantities monitoring requirements.

Parameter	Units	Max/Min	Limit	Statistical Basis	Rationale
Biosolids Quantity (Transferred)	dry tons	Max	Report	Monthly Total	62-640.650(5)(a)1. FAC
Biosolids Quantity (Landfilled)	dry tons	Max	Report	Monthly Total	62-640.650(5)(a)1. FAC
Monitoring Frequency	All Parameters				62-640.650(5)(a) FAC

6. GROUND WATER MONITORING REQUIREMENTS

Since the facility is under 100,000 gpd, a Groundwater Monitoring Plan (GWMP) may not be necessary at this time. The hydraulic loading rate for the absorption fields is permitted at 31.7 inches per day in Section IV.A.4., although according to Rule 62-610.523(3), the rate should not exceed 9 inches per day.

According to Rule 62-610.500(2), the absorption fields shall be operated to preclude saturated conditions from developing at the ground surface

In the permit application, it was stated that the gate to the absorption fields needed to be fixed, so the operator can access the area for inspection. At the time of the site visit, the fields were flooded due to heavy rains. It was also noted that the fields are wetted for 30 days and dried for 30 days. Section IV.A.5 of the permit states that the two absorption fields normally shall be loaded for 7 days and shall be rested for 7 days. Absorption fields shall be allowed to dry during the resting portion of the cycle. (62-610.523(4))

For the current permit, chlorides and sodium have been added to the list of parameters that are to be monitored in the reclaimed water and are included Section I.A.1. The permittee will submit a report after eight (8) valid quarterly sampling events, which will include a data and trending analysis of nitrates, chlorides, and sodium in the reclaimed water. Upon review of the report, a GWMP may be needed.

7. PERMIT SCHEDULES

The following improvement actions shall be completed according to the schedule shown, unless approval to extend the completion date is requested in writing:

Improvement Action	Anticipated Final Completion Date
Implement corrective actions as stated in the Operation and Maintenance Performance Report (OMPR) with designated action due dates.	07/01/2018

8. INDUSTRIAL PRETREATMENT REQUIREMENTS

At this time, the facility is not required to develop an approved industrial pretreatment program. However, the Department reserves the right to require an approved program if future conditions warrant.

9. ADMINISTRATIVE ORDERS (AO) AND CONSENT ORDERS (CO)

This permit is not accompanied by an AO and the permittee has not entered into a CO with the Department.

10. REQUESTED VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS

No variances were requested for this facility.

11. THE ADMINISTRATIVE RECORD

The administrative record including application, draft permit, fact sheet, public notice (after release), comments received and additional information is available for public inspection during normal business hours at the location specified in item 13. Copies will be provided at a minimal charge per page.

12. PROPOSED SCHEDULE FOR PERMIT ISSUANCE

Notice of Permit Issuance January 30, 2018

13. DEPARTMENT CONTACT

Additional information concerning the permit and proposed schedule for permit issuance may be obtained during normal business hours from:

Gene Elliott, Engineer IV
Gene.elliott@dep.state.fl.us
 3319 Maguire Blvd, Suite 232
 Orlando, FL 32803-3767

Telephone No.: 407-897-4151

APPENDIX C: FDEP INSPECTION REPORT



FLORIDA DEPARTMENT OF Environmental Protection

CENTRAL DISTRICT OFFICE
3319 MAGUIRE BLVD., SUITE 232
ORLANDO, FLORIDA 32803

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

February 20, 2020

Kevin Burge, Director
Aquarina Utilities, Inc.
1726 Darlich Avenue
Jensen Beach, FL 34957
aquarinautilities@bellsouth.net

Re: Aquarina Utilities WWTF
DW Facility ID #FLA010352
Brevard County

Dear Mr. Burge:

Department personnel conducted an inspection of the above-referenced facility on November 1, 2019. Based on the information provided during and following the inspection, the facility was determined to be in compliance with the Department's rules and regulations. A copy of the inspection report is attached for your records.

The Department appreciates your efforts to maintain this facility in compliance with state and federal rules. Should you have any questions or comments, please contact Manuel F. Cardona at 407-897-4134 or via e-mail at Manuel.Cardona@FloridaDEP.gov.

Sincerely,

David Smicherko

David Smicherko, Manager
Central District
Florida Department of Environmental Protection

Enclosure: Inspection Report

cc: David Smicherko, Manuel Cardona, Central District

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
WASTEWATER COMPLIANCE INSPECTION REPORT

Facility Name and Physical Address Aquarina Utilities WWTF 235 Aquarina Boulevard Melbourne Beach, FL 32941	WAFR ID FLA010352	County Brevard	Entry Date 11/1/2019	Entry Time 11:41 AM
	Facility Phone # 772-708-7946		Exit Date 11/1/2019	Exit Time 12:37 PM

LAT	27	°	55	′	14.61	″
LONG	80	°	29	′	24.35	″

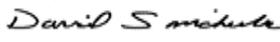
Name(s) of Field Representatives(s) and Title Ron Chupka, WWTP Operator <small>Click or tap here to enter text.</small>	Operator Certification # C-9376 <small>Click or tap here to enter text.</small>	Email N/A <small>Click or tap here to enter text.</small>	Phone 772-708-7946 <small>Click or tap here to enter text.</small>
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Name & Address of Permittee / Designated Rep. Kevin Burge Aquarina Utilities, Inc. 1726 Northeast Darlich Avenue Jensen Beach, FL 34957	Title Director	Email aquarinautilities@bellsouth.net	Phone 772-708-8090
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Inspection Type	C	E	I	Samples Taken(Y/N): N	Sample ID#: N/A	Samples Split (Y/N): N/A
X Domestic <input type="checkbox"/> Industrial						

FACILITY COMPLIANCE AREAS EVALUATED							
<small>IC = In Compliance; MC = Minor Out of Compliance; NC = Out of Compliance; SC = Significant out of Compliance; NA = Not Applicable; NE = Not Evaluated Significant Non-Compliance Criteria Should be Reviewed when Out of Compliance Ratings Are Given in Areas Marked by a "♦"</small>							
	PERMITS/ORDERS		SELF MONITORING PROGRAM		FACILITY OPERATIONS		EFFLUENT/DISPOSAL
IC	1. ♦ Permit	IC	3. Laboratory	IC	6. Facility Site Review	IC	9. ♦ Effluent Quality
IC	2. ♦ Compliance Schedules	IC	4. Sampling	IC	7. Flow Measurement	IC	10. ♦ Effluent Disposal
		IC	5. ♦ Records & Reports	IC	8. ♦ Operation & Maintenance	IC	11. Biosolids
						NA	12. ♦ Groundwater
NA	14. Other					IC	13. ♦ SSO Survey

Facility and/or Order Compliance Status:	<input checked="" type="checkbox"/> In-Compliance	<input type="checkbox"/> Out-Of -Compliance	<input type="checkbox"/> Significant-Out-Of-Compliance
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Recommended Actions: In-Compliance Letter		
Name(s) and Signature(s) of Inspector(s) Manuel F. Cardona  <small>Click here to enter text</small>	District Office/Phone Number CD/407-897-4134	Date 2/10/2020
Name and Signature of Reviewer David Smicherko 	District Office/Phone Number CD/407-897-4169	Date 2/20/2020

Single Event Violations (*SNC SEVs)

Check for Yes	Evaluation Area	Description	Finding Description	Finding ID
<input type="checkbox"/>	Permit	Effluent Violations - Unapproved Bypass	Wastewater was diverted from a portion of the treatment process without department approval.	UNBY
<input type="checkbox"/>	*Permit	Permit Violations - Discharge Without a Valid Permit	The facility was operating without a permit or with an expired permit.	UPHI
<input type="checkbox"/>	Permit	Permit Violations - Failure to Submit Timely Permit Renewal Application	The permittee failed to submit an application to renew the existing permit at least 180 days prior to expiration.	PFSA
<input type="checkbox"/>	Laboratory	Management Practice Violations - Laboratory Not Certified	The laboratory was not certified by the Florida Department of Health and therefore is not certified to meet NELAC standards.	LNCE
<input type="checkbox"/>	Sampling	Monitoring Violations - Analysis not Conducted	The facility failed to collect and/or analyze samples as required by permit or enforcement action.	ANCV
<input type="checkbox"/>	Sampling	Monitoring Violations - Failure to Monitor for Toxicity Requirements	The facility failed to collect and/or analyze routine or follow-up toxicity samples.	FTOX
<input type="checkbox"/>	Records and Reports	Management Practice Violations - Failure to Develop Adequate SPCC Plan	The facility failed to develop or maintain their Spill Prevention Control and Countermeasures (SPCC) plan.	FSPC
<input type="checkbox"/>	Records and Reports	Management Practice Violations - Failure to Maintain Records	The facility failed to maintain records for the required retention period.	FMRR
<input type="checkbox"/>	Records and Reports	Reporting Violations - Failure to Notify	The permittee failed to notify the department of any event or activity that requires notification as required by permit or rule.	RSWP
<input type="checkbox"/>	Records and Reports	Reporting Violations - Failure to Submit DMRs	The permittee failed to submit any DMR required by rule, permit, or enforcement action in a timely manner.	FDMR
<input type="checkbox"/>	Records and Reports	Reporting Violations - Failure to submit required report (non-DMR, non-pretreatment)	The facility failed to submit any report required by rule, permit, enforcement action or inspection activity except for DMRs.	FRPT
<input type="checkbox"/>	Facility Site Review	Management Practice Violations - Improper Land Application (non-503, non-CAFO)	The land application system was not being maintained.	LASN
<input type="checkbox"/>	Flow Measurement	Monitoring Violations - No Flow Measurement Device	The facility failed to install a flow measurement device, an approved flow measurement device, or a working flow measurement device.	NOFL
<input type="checkbox"/>	Operation and Maintenance	Management Practice Violations - Improper Operation and Maintenance	The facility failed to follow their operation and maintenance plan/manual or their Biosolids Nutrient Management Plan.	IONM
<input type="checkbox"/>	Operation and Maintenance	Management Practice Violations - Inflow/Infiltration (I/I)	The facility had an inflow and infiltration problem causing collection system issues and/or operational issues.	ININ
<input type="checkbox"/>	Operation and Maintenance	Management Practice Violations - No Licensed/Certified Operator	The facility was being operated without a certified operator or by an operator that is not licensed for the size of plant.	ONCO
<input type="checkbox"/>	*Effluent Quality	Effluent Violations - Failed Toxicity Test	Persistent acute toxicity has been documented through follow-up tests.	EATX
<input type="checkbox"/>	*Effluent Quality	Effluent Violations - Failed Toxicity Test	Persistent chronic toxicity has been documented through follow-up tests.	ECTX
<input type="checkbox"/>	*Effluent Quality	Effluent Violations - Failed Toxicity Test	Persistent acute or chronic toxicity has been documented in the effluent through the use of routine and follow-up tests.	ETOX
<input type="checkbox"/>	Effluent Quality	Effluent Violations - Narrative Effluent Violation	The facility violated a permit or enforcement narrative effluent limit.	XNEV
<input type="checkbox"/>	*Effluent Quality	Effluent Violations - Reported Fish Kill	The facility had a discharge of wastewater that resulted in a fish kill.	XFSH
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Discharge to Waters	A sewage spill from any components of a collection/transmission system or from a treatment plant reached surface waters including stormwater conveyance system or drainage ditch.	SSO1
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Failure to Maintain Records or Meet Record Keeping Requirements	The facility failed to keep routine documentation and reporting records of spills, and/or operation and maintenance activities on the collection/transmission system.	SSO2
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Failure to monitor	The facility failed to collect and/or analyze bacteriological samples for sewage spills that reached surface waters.	SSO3
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Failure to report violation that may endanger public health 122.41(1)(7)	The facility failed to report a sewage spill within 24 hours of discovery.	SSO4
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Improper Operation and Maintenance	The facility failed to perform routine preventative maintenance to keep the collection/transmission system in good working order.	SSO5
<input type="checkbox"/>	Sanitary Sewer Overflow Survey	WW SSO - Overflow to Dry Land	A sewage spill from any part of a collection/transmission system or treatment plant that did not make it to surface waters, i.e., stormwater collection system, drainage ditch, stream, pond, or lake.	SSO6

Facility Treatment Summary: An existing 0.099 mgd annual average daily flow (AADF) permitted capacity extended aeration domestic wastewater treatment plant consisting of influent screening, aeration, secondary clarification, filtration, chlorination, and aerobic digestion of biosolids. Effluent disposal consists of a two drainfield adsorption field system.

1. Permit: In-Compliance

Current Permit available on-site?	Yes
Date Permit issued	3/24/18
Date Permit Expires	3/23/23
Permit Renewal Application due by	9/25/22
Administrative or Judicial Orders?	N/A

2. Compliance Schedules: In-Compliance

Compliance Schedule in Permit met?	Yes
Compliance Schedules in Order are being met?	Not Applicable

2.1 Observation: Corrective actions stated in the Operation and Maintenance Report have been completed.

3. Laboratory: In-Compliance

Contract Lab Name and Certification #	Pace Analytical Laboratories
Facility DOH Certification #	E86240

3.1 Observation: Current lab certification was onsite.

4. Sampling: In-Compliance

Sampling conducted during inspection?	No
Sampling observed during inspection?	No
Sampling conducted at locations identified by the permit?	Yes
Safe access to sampling locations?	Yes

5. Records and Reports: In-Compliance

Documents/Records reviewed	Timeframe
Discharge Monitoring Reports (DMRs)	From 11/01/19 to 10/31/19

5.1 Observation:

- Minor reporting issues (transcription) were noted. This was discussed during the inspection.
- A copy of the operations and maintenance manual was onsite.
- Copies of operator certifications are onsite and are current.
- A bound and numbered logbook was onsite. Operator staffing is in accordance with the permit.

6. Facility Site Review: In-Compliance

6.1 Observation:

- *General* - The facility grounds are properly secured.
- *Headworks*- The headworks contains a barscreen which is raked daily and dropped into a disposal shoot to a dumpster. The contents are taken to the landfill.
- *Aeration Basin* - The facility contains one circular ring aeration basin around the clarifier. There are three enclosed blowers. The contents in the aeration chambers were brown in color and appeared to be adequately mixed. Some duckweed growth was observed. No excessive noise or odor was noted.
- *Clarifier* – The facility contains one circular clarifier with a functional rake arm. The weirs appeared level. Some duckweed growth was noted.
- Chlorine tabs are used in the weirs.
- *Disinfection* – Two chambers. The facility converted to sodium hypochlorite per the permit renewal. The chlorine contact chamber is covered.
- *Filtration*- The facility has two sand filters which continually backwash. The covers on both filters have been replaced since the last inspection.
- *Digester* - The digester had room and was free from excessive odors. No vectors were present.

7. Flow Measurement: In-Compliance

Flow meter present and location as per permit?	Yes
Easy access to flow meter?	Yes
Date of last flow meter calibration	12/13/18

7.2 Observation: The facility has also provided a calibration report for 2019.

8. Operation and Maintenance: In-Compliance

Facility being operated as per permit?	Yes
--	-----

8.1 Observation: The facility appears to be run and maintained in accordance with the permit.

9. Effluent Quality: In-Compliance

DMRs review period	From 11/01/18 to 10/31/19
Any exceedances?	No

10. Effluent Disposal: In-Compliance

Facility discharging?	Yes
Discharge location(s) as per permit?	Yes

10.1 Observation: Drain fields vegetation is maintained. No effluent ponding was noted. Drain fields are rotated every two weeks.

11. Biosolids: In-Compliance

11.1 Observation: The facility has not hauled biosolids within the last five years, therefore no hauling records are available onsite. Operator stated that in the event of future hauling, the biosolids will be sent to BCUD South Beaches in accordance with the permitted agreement.

12. Groundwater Quality: Not Applicable

13. SSO Survey: In-Compliance

13.1 Observation: No unauthorized discharges were reported between 11/1/18 and 10/31/19.

14. Other: Not Applicable

APPENDIX D: VENDOR QUOTES



R.C. Beach & Assoc. Inc.

Pumping & Process Equipment

April 16, 2021

Mr. Hunter Johnson, E.I.
Woodard & Curran
201 S. Florida Ave. Suite 200
Lakeland, Florida 33801

Subject: Aquarena WWTP Plant Improvements
Re: Budget Estimate Cornell Pumps

Dear Mr. Johnson,

We are pleased to offer the following Cornell budget estimate for your consideration.

RETURN ACTIVATED SLUDGE PUMPS NO's 1 & 2.

Two (2) Cornell Model 4NNT –F16 horizontal mounted pump of cast iron construction to replace current serial number 149710. Pump operating at 1180 RPM and driven by a 3 HP 1200 RPM 3 phase 60 hertz 460 volt motor with premium, efficiency, corrosive duty, inverter duty, 1.15 SF, class F insulation, and TEFC enclosure.

Equipment as above complete with 420 SS HT shaft sleeve, mechanical cyclo-seal (no seal piping required), clean out port, 125 LB FF Flanged suction and 125 LB FF flanged discharge, and all mounted on a common bed plate, coupling and hinged OSHA guard. Pump to be factory performance tested and hydrostatic tested.

Price Net FOB factory is: \$24,170.00 each or \$48,340.00 for lot of Two (2) pumps and motors as above described.

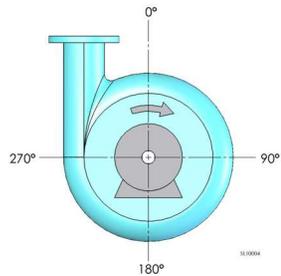
Suction and discharge gages if required add to above price total with diaphragm isolator, snubber and pet cock are: \$720.00 each or \$2,880.00 for lot of Four (4) total gauges both suction and discharge.

If required add to above 316 stainless steel L type anchor bolts with nuts, washers and lock washer, no sleeves are included is \$609.00 for lot of eight (8) assemblies.

No taxes, lubricants or installations or spare parts are included.

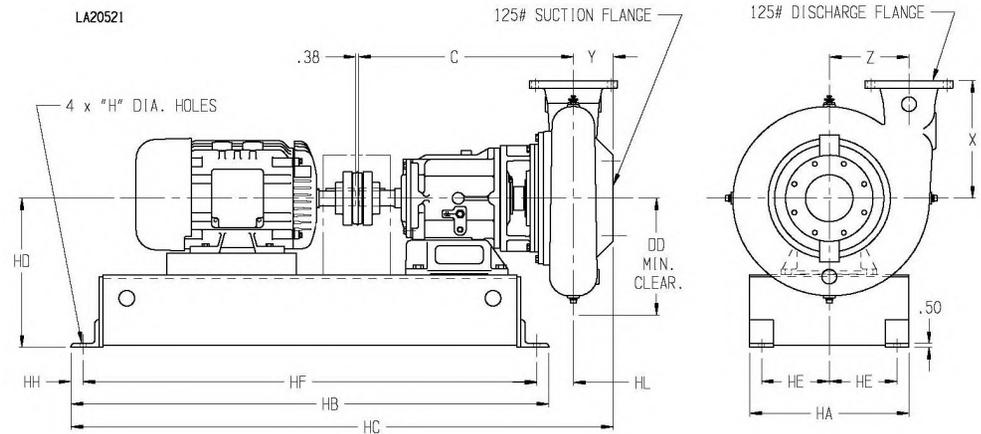
Two (2) YEAR WARRANTY APPLIES TO THESE PUMPS.

Delivery of this equipment is 18 to 20 weeks and subject to change based on factory production schedules at time of approved order entry. No Florida sales or use taxes included should they apply. Standard terms and

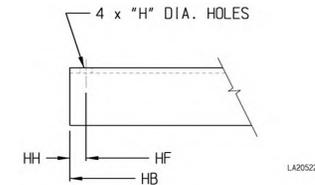


NOTES:

Discharge positions are viewed from the drive end.
 Standard increments of discharge position are shown in the chart below (DISCH INCR). Consult factory for other discharge positions.



- NOTES:**
1. Dimension include motors with "T" or "TS" shafts.
 2. This page does not apply if space coupling is used.
 3. Flange connection dimension can vary $\pm .12$ inch.
 4. Do not use for construction unless certified.



Base variation for 256T motor frame and smaller

PUMP DIMENSIONS														
MODEL	FRAME	CONNECTION		DISCH. INCR.	C	DD	X	Y	Z	MOTOR FRAME	H	HC	HD	HL
		DISCH.	SUCT.											
4NNT	F16	4	4	45°	27.12	9.12	9.25	4.25	6.25	213T/256T	0.75	57.51	13.5	7.26
										284T/286T	0.75	67.51	19	4.76
4NHTA 4414T	F16	4	4	45°	26.5	11.31	11	4.75	9.25	213T/256T	0.75	57.36	13.5	6.61
										284T/326T	0.75	67.36	19	4.11
										364T/365T	0.75	70.36	19	4.11
4514T	F16	4	5	45°	26.5	11.31	11	4.75	9.25	213T/256T	0.75	57.36	13.5	6.61
										284T/326T	0.75	67.36	19	4.11
										364T/365T	0.75	70.36	19	4.11
6NNT 6NNTL	F16	6	6	45°	27.41	11.62	11.75	4.75	8.38	213T/256T	0.75	58.29	13.5	7.54
										284T/326T	0.75	68.29	19	5.04
										364T/365T	0.75	71.29	19	5.04
6NHTA 6NHT 6NHHT	F16	6	6	45°	26.97	13.75	15	5	10	254T/256T	0.75	58.08	13.5	6.08
										284T/326T	0.75	68.08	19	4.58
										364T/365T	0.75	71.08	19	4.58
										404T/405T	0.75	76.08	19.5	4.58

BASE - F16 FRAME						
MOTOR FRAME	HA	HB	HE	HF	HH	BASE PRT. NO.
213T/215T	15	47	6.12	45	1	B4082
254T/256T	15	47	6.12	45	1	B5144
284T/286T	20	60	8.5	57	1.5	B4084
324T/326T	20	60	8.5	57	1.5	B4085
364T/365T	20	63	8.5	60	1.5	B5145
404T/405T	24	68	10.5	65	1.5	B5146



CORNELL PUMP COMPANY

SOLIDS HANDLING F16 HORIZONTAL FRAME MOUNTED PUMPS
 AND BASE WITH CYCLOSEAL AND TANGENTIAL VOLUTE

DIM2050



Aftermarket - Quotation

1401 W. Cypress Creek Road - Suite 100, Fort Lauderdale, FL 33309
 1- 888 PARKSON
 562 Bunker Court, Vernon Hills, IL 60061
 1-800-249-2140

*** The Quotation is submitted pursuant to Parkson Corporation's Aftermarket Terms and Conditions, which are attached hereto**

Quote Name	Aquarina Development - DSF-687 DSF Inspection	Created Date	4/14/2021
		Expiration Date	5/14/2021
Quote Number	00029094		
Prepared By	Edna Sugden	Contact Name	Hunter Johnson
Phone	847-837-4938	Phone	(863) 400-5691
Email	esugden@parkson.com	Email	hrjohnson@woodardcurran.com
Fax	954-252-3775		
Bill To Name	Melbourne FL	Ship To Name	Melbourne FL
Project #	DSF-687	Payment Terms	Net 30
Freight	Prepay and Add	FOB:	Shipping Point

Item Number	Product	Line Item Description	Quantity	Sales Price	Total Price
0900001-	x- Field Service	One Technician onsite for one day to inspect DynaSand Unit Serial Number DSF-687 for rebuild feasibility.	1.00	\$600.00	\$600.00

Line Items	1	Subtotal	\$600.00
		Total Price	\$600.00

Please complete information below:

BILL TO Name: _____	SHIP TO Name: _____
Address: _____	Address: _____
City, State, Zip: _____	City, State, Zip: _____
PO #: _____	SHIP TO Attn of: _____
Bill to - Email: _____	Phone: _____

All amounts expressed in US Dollars

Quote Acceptance Information

Signature _____
 Name _____
 Title _____
 Date _____



DYNASAND® CONTINUOUS BACKWASH SAND FILTER

**Preliminary BUDGET Sizing
Aquarina -Melbourne, FL**

APPLICATION : Tertiary Filtration

DESIGN DATA

Design: **300 gpm = 0.43 mgd**

	pH	Temp deg C	land Grea mg/L	Peak TSS mg/L	TP mg/L	TN mg/L	NO-x-N mg/L
Influent	7	25					
Effluent							

* - All effluent limits may require chemical addition (by others)

RECOMMENDATIONS:

2 DynaSand Model DSF38 SBTF Package units

Filtration Area per unit: **38 ft2**
Loading Rate: Design: **3.947 gpm/ft2**, all units in service

Total filtration area: **76**

Filtration depth: **40 in.**
Sand required per unit: **9**
Design headloss across filter: **36 in. WC**
Total air consumption: **5.2 scfm**
Total reject flow per unit: **7.0 to 14.0 gpm** continuous (on average)

Total sand requirement: **18 tons**
Typical headloss across filter: **18 to 24 inches**
Recommended Compressor Package: **Rotary Screw**
Compressor Type: **Duplex**
Package #: **CW-5-DD**
Motor horsepower: **5 hp**
Dryer Type: **Desiccant**
Dryer Dew Point: **-40 deg F**
Qty: **1**

Package filter dimensions: **7.0 ft Dia 15.4 ft Height**

MATERIALS

Tank: **304SS**
Feed Assembly: **304L SS**
Hardware: **304SS**
Reject compartment: **FRP**
Airlift pump: **PVC**

SCOPE

All filter internals, filter media
FRP NEMA 4X Air Control Panel.
Local headloss gauge, low level float switch
Access Ladder & Platform
Compressor package supplied by Parkson.
Start-up visit including travel & living expenses.

BUDGET PRICING

\$257,000 USD, FOB factory - Equipment & sand freight allowed, taxes extra.

SHIPMENT

Submittals 5 weeks after receipt of written purchase order.
Shipment 13 weeks after receipt of approved drawings or submittal waiver.

* -

Quotation

NUMBER: B01501663 Rev 1

DATE: April 7, 2021

TO: Aquarina
235 Aquarina Boulevard
Melbourne Beach, FL 32951
Kevin Burge (Owner)
Phone: 772-708-7946

REF.: Project Name:
Aquarina
Project Location: Melbourne
Beach, FL
Reconditioning of Project DSF-687

Parkson Corporation proposes the reconditioning of one (1) existing DynaSand® Continuous Backwash Sand Filter and is pleased to provide this *Rebuild/Retrofit Quotation* for the following:

ITEM 1 DYNASAND® CONTINUOUS BACKWASH SAND FILTERS

Existing Units: Two (only reconditioning one unit)
Model: **DSF-38 SBBF FRP Tank Unit**

ITEM 2 DYNASAND® REPLACEMENT PARTS

2.A Equipment Description:

1. One (1) 316 SS Airlift
2. One (1) Carbon Steel platform and handrail
3. One (1) new NEMA 4X air control panel in FRP construction to control both existing filters.
4. Ten (10) tons of .9 mm Filter Media delivered in 3,000 pound – 4,000 pound SuperSacks or via pneumatic truck



ITEM 3 PARKSON SERVICE

DSF CLEANING – (labor) scope of supply:

- Removal of all necessary platforms (as required).
- Removal of sand/media from the tank being worked on to storage bags
- Drain fluid (water) from the tank.
- Inspect and clean plenum area..
- Fill tank with clean Plant effluent.
- Install new sand.
- Re-installation of new platform and handrails (as required).
- Install new airlift.
- Wash filtered media overnight with clean Plant effluent.
- Open feed inlet for the tank (being worked on).

BUDGET PRICE:

Budget price **\$66,510.00 USD (PER UNIT)**
F.O.B. Shipping Point, freight included, taxes excluded.

VALIDITY:

Purchase Price is valid for thirty (30) calendar days from Quotation date, for shipment of Equipment within the timetable stated below.

PAYMENT TERMS:

80% net 30 days upon shipment of parts to site, 20% upon rebuild completion, not to exceed 90 days after shipment of parts should rebuild be delayed by other than Parkson.

OPTIONS:

10 tons of 0.9 mm filter media delivered by pneumatic truck..... **DEDUCT \$600.00 USD**

SERVICES

Drawings and Installation, Operation and Maintenance (IO&M) Manuals:

- Approval Drawings: waived
- Certified Drawings: One (1) electronic included
- IO&M Manuals: One (1) electronic included

Additional manuals are available for \$75 USD at time of order.

Parkson Installation and Start-Up Assistance:

Parkson will furnish certified personnel to provide installation of certain components (as noted below), start-up, and operator training. Services of a locally licensed electrician will be required. Dates of service to be scheduled upon Buyer’s written request.

- **INSTALLATION (by Parkson):**
 - Replace existing Air Lifts with new Air Lifts and new air hoses
 - Replace sand



Mechanical Warranty:

As defined in Section XVI on the attached Standard Conditions of Sale, Parkson offers a one (1) year mechanical warranty for all new parts installed on the DynaSand on-site certified rebuild.

TIMETABLE GUIDELINE:

Shipment Phase: Components shipped within 6-8 weeks following receipt of Purchase Order in Parkson's office.

Installation Phase: Dates of service to be scheduled upon Buyer's written request. Typically requiring a 2-3 week advance notice of desired on site dates. Installation work will be completed within 2-4 weeks from commencement.

Dates are subject to confirmation upon receipt of written Purchase Order.

TERMS AND CONDITIONS:

This Quotation is governed by and subject to Parkson's Standard Conditions of Sale, which are incorporated by reference and accessible at: <http://www.parkson.com/files/documents/AFM-terms.pdf>.

PATENTS:

The Equipment and/or process quoted herein may operate under one or more U.S. patents. The Purchase Price includes a one-time royalty payment (if any), which provides the Buyer with immunity to operate the Equipment specified in the Quotation under any applicable patents.

CLARIFICATIONS AND EXCEPTIONS:

Parkson is not in receipt of any plans and specifications. The equipment quoted above is based upon Parkson's current standards and may or may not comply with any specification that may exist. Parkson reserves the right to revise this quotation upon receipt of any plans and specifications.

BUYER/OWNER RESPONSIBILITY:

- Upon disassembly/reconditioning on site if any unforeseen parts or structural repairs are required, Parkson Corporation will notify the customer prior to commencement of any repairs beyond original quoted scope. The costs for these items will be added to the scope of work.
- Care and storage of rebuild components upon receipt at customer site.
- Dumpster for all old parts
- Disposal of sand.
- Services of a locally licensed electrician (see below)
- Cable trays if required
- Any other auxiliary equipment or service not detailed above.
- **LOCALLY LICENSED ELECTRICAL TECHNICIAN RESPONSIBILITY:**
 - a. All electrical connection and interconnecting wiring.
 - b. Changes to control panel.



Please return one signed copy of this Quotation, or your Purchase Order, to Parkson Corporation at the address below. Refer to this Quotation, date, and related correspondence.

Issued By: Marty Unger

Accepted By: (Herein called the Buyer)

PARKSON CORPORATION
1401 West Cypress Creek Road
Fort Lauderdale, FL 33309-1969

Name: Marty Unger
Title: Regional Sales Manager
Phone: 954-383-1757
Fax: 817-599-9725
E-Mail: munger@parkson.com
Date: April 7, 2021

Name
Title:
Date:

Enclosures: Standard Conditions of Sale, Quotation Addendum

Local Rep: Barry Gregoire
The Mack Company
Mail: P.O. Box 3040
Ponte Vedra, FL 32004-3040
Phone: 904-553-1539
Fax: 904-212-0802
Cell Phone: 925-989-6041
Fax: 925-947-6784
Email: bgregoire@mackcompany-fl.com

cc: Naim Mohhamed, Marty Unger, Barry Gregoire, Ryan Brice
DSF

NOZZLE SCHEDULE				
LTR	SIZE INCHES	FACE	SERVICE	REMARKS
A	8	RF	INLET	FEED
B	8	RF	OUTLET	FILTRATE
C	3	RF	OUTLET	REJECT
D	1	NPT	INSIDE DRAIN	VALVE
E	3	NPT	VENT	PIPE
F	1/4	NPT	CUSTOMER AIR	

NOTES:

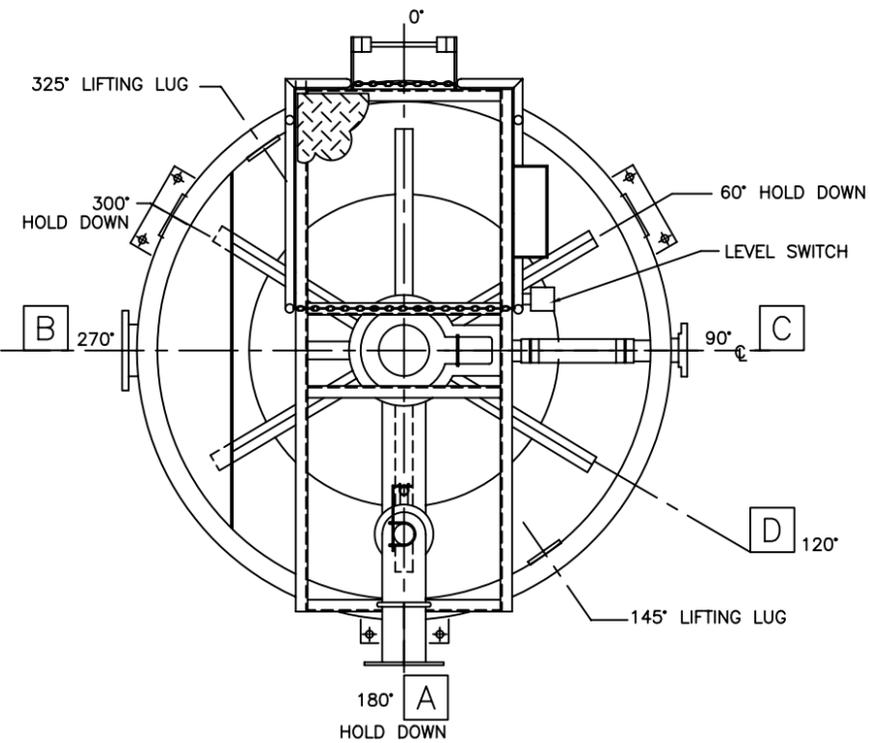
- THIS DRAWING TO BE USED FOR GENERAL INFORMATION ONLY. NOT FOR CONSTRUCTION.
- MATERIAL OF CONSTRUCTION:**
TANK : 11 GA., 304 S.S.
AIRLIFT: PVC
- WEIGHTS**
TANK EMPTY: 3,800#
TANK W/WET SAND: 26,300#
TANK W/SAND & WATER: 40,900#
- 9 TONS SILICA SAND REQUIRED.

SPECIAL NOTES

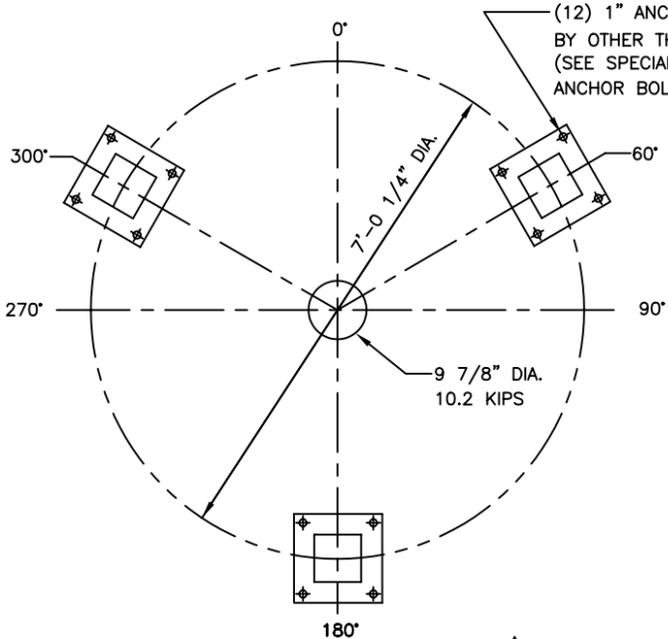
- THE SUPPORTING CONCRETE PAD MUST BE LEVEL.
- APPLY (1 IN.) MIN. GROUT UNDER EACH BASE PLATE AND UNDER THE CONE AT CENTER.
- SEE INSTALLATION INSTRUCTIONS BEFORE SETTING GROUT.
- CUSTOMER ANCHOR BOLT PROJECTION TO INCLUDE GROUT, BASE PLATE (1 1/4 IN.) THICK, PLUS WASHER AND NUT.

**LOADING CONDITIONS
STATIC LOADING**

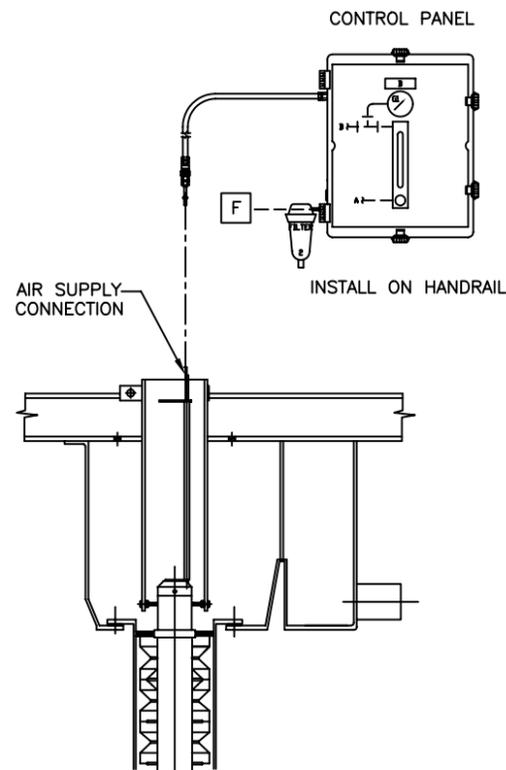
FILTER FULL OF WATER AND SAND:
LOAD UNDER EACH BASE PLATE IS APPROX. 10.2 KIPS
LOAD UNDER CONE AT CENTER IS APPROX. 10.2 KIPS
SEISMIC FORCES FROM ZONE 4 MAY CREATE AN OVERTURNING MOMENT OF 63.1 FT.-KIPS AT THE BASE OF THE UNIT. THE LOADS ACTING ON EACH ANCHOR BOLT WILL THEN BE -800# IN TENSION AND 1900# IN SHEAR.



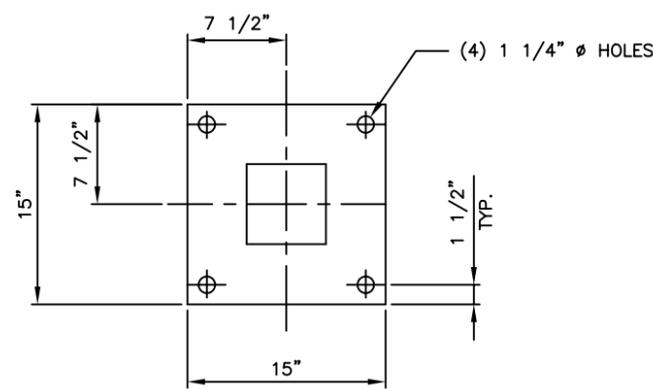
PLAN VIEW



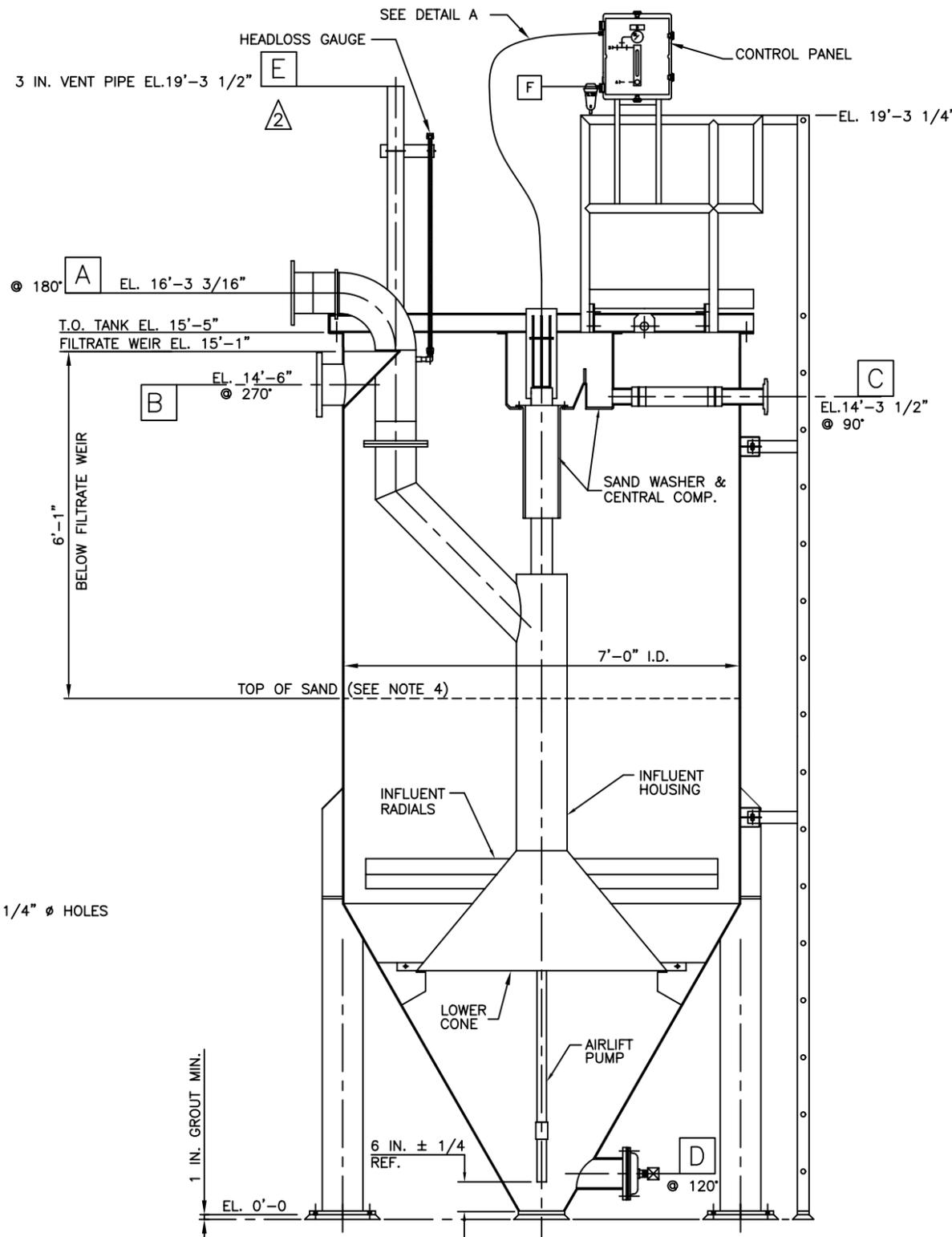
LOADING DIAGRAM



DETAIL A
INST. PANEL TO AIRLIFT CONN.
SCHEMATIC



BASE PLATE DETAIL



SECTIONAL ELEVATION
SEE PLAN FOR TRUE ORIENTATION

PARKSON CORPORATION
DynaSand® Filter

DSF 38FT2 SBTF SS
SALES DRAWING

UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
DIMENSIONS ARE IN FEET AND INCHES TOLERANCE: ±	DRAWN: F. J. CAMARGO	11-2-98
	CHECKED: P. TATASCIORE	10-2-98
	APPROVED: P. TATASCIORE	10-2-98
DATE: 7-15-04	BY: F. CAMARGO	CHECKED: F. CAMARGO
APPROVED: F. J. CAMARGO	DESCRIPTION	

ELEVATION OF NOZZLE "E" WAS 18'-1"
MODIFIED BASE PLATE AS SHOWN
CHANGED MATERIAL OF AIRLIFT PUMP TO PVC

THE OWNER, PROJECT ENGINEER, AND ALL OTHERS INVOLVED WITH THE PROJECT DESIGN MUST IMPLEMENT AND FOLLOW ALL SAFETY STANDARDS REQUIRED BY LOCAL, STATE AND FEDERAL LAWS WHEN INCORPORATING PARKSON CORPORATION EQUIPMENT INTO THE OVERALL PROJECT DESIGN. PARKSON CORPORATION WILL NOT BE RESPONSIBLE FOR LOCATION AND/OR PLACEMENT OF EQUIPMENT IN THE PLANT DESIGN, NOR IS PARKSON RESPONSIBLE FOR PLANT SAFETY DESIGN AND FOR THE FAILURE TO FOLLOW APPROPRIATE SAFETY PRECAUTIONS IN THE OPERATION AND MAINTENANCE OF PARKSON CORPORATION EQUIPMENT.

REVISION:	2
DRAWING FILE NUMBER:	003759-01
SHEET NUMBER:	1 OF 1
PROJECT NUMBER:	
PROJECT NAME:	

Aquarina Utilities WWTF
Convert Disinfection for Gas Chlorination to Sodium Hypochlorite Solution

Design Capacity: 0.30 mgd (300,000 gpd) AADF
Permitted Capacity: 0.099 mgd (99,000 gpd) AADF (limited by discharge to drainfield)

Maximum MADF: 0.0630 mgd AADF
Maximum Daily Flow: 0.1380 mgd (one of high reject days was 0.2030 mgd but not normal operation).

Max Day Flow/MADF max = $0.1380/0.0630 = 2.2$ (Maximum Day Factor)

At permitted flow:

Max Day Flow: $2.2 \times 99,000 \text{ gpd} = 217,800 \text{ gpd}$.
Peak Hour Flow (assumed: no Surge Tank): $3.5 \times \text{AADF} = 3.5 \times 99,000 = 346,500 \text{ gpd}$.

At permitted capacity: $99,000 \text{ gpd}/1440 \text{ min/day} = 68.75 \text{ gpm}$.
Max Day Flow: $217,800 \text{ gpd}/1440 \text{ min/day} = 151.25 \text{ gpm}$.
Peak Hourly Flow: $346,500 \text{ gpd}/1440 \text{ min/day} = 240.63 \text{ gpm}$.

Sodium Hypochlorite (NaClO information):

12.5% Concentration of solution
1.20 Specific Gravity (NaClO)
10.00 grams/Liter (1% solution of NaClO)
Therefore: 125.00 grams/Liter NaClO in 12.5% solution
1.04 lbs/gal water equivalent.
1.25 lbs/gal Sodium Hypochlorite solution at 12.5%.

Calculate Chlorine Feed Rate Needed @:

Assumed Peak: $0.3465 \text{ mgd} \times 8.34 \text{ lbs/gal} = 2.9$
For 2 mg/L: 5.80 lb Cl₂/day
For 4 mg/L: 11.6 lb Cl₂/day

Assumed Maximum Flow: $0.2178 \text{ mgd} \times 8.34 \text{ lbs/gals} = 1.82$
For 2 mg/L: 3.64 lb Cl₂/day
For 4 mg/L: 7.28 lb Cl₂/day

Calculate the Amount of CL₂ Provided by 12.5 % solution:

At Peak Flow: For 2 mg/L: $(5.20 \text{ lb CL}_2/\text{day})/(1.25 \text{ lb/gal}) = 4.16 \text{ gal/day}$ of 12.5 % solution.
For 4 mg/L: $(11.6 \text{ lb CL}_2/\text{day})/(1.25 \text{ lb/gal}) = 9.28 \text{ gal/day}$ of 12.5% solution.

At Maximum Day Flow: 2 mg/L: $(3.64/1.25) = 2.91 \text{ gal/day}$ of 12.5% solution.
4 mg/L: $(7.28/1.25) = 5.82 \text{ gal/day}$ of 12.5% solution.

Calculate the minimum/maximum hourly pump feeding rate of a 12.5% solution: 24 hour of operation considered/assumed:

At Peak of 346,500 gallons/day:

For 2 mg/L: $4.16/24 = 0.17$ gal/hr.

For 4 mg/L: $9.28/24 = 0.39$ gal/hr.

At Maximum Day Flow of 217,800 gallons/day:

For 2 mg/L: $2.91/24 = 0.12$ gal/hr.

For 4 mg/L: $5.82/24 = 0.24$ gal/hr.

Calculate Minimum Required CL2 Storage Volume needed at AADF and Max. Day Flow:

AADF permitted: 0.099 mgd x 8.34 lb/gal = 0.83

For 2 mg/L: 1.66 lbs/day CL2 solution.

For 4 mg/L: 3.32 lbs/day CL2 solution.

Using 12.5% solution @ AADF permitted:

For 2 mg/L: $(1.66/1.25) = 1.33$ gal/day.

For 4 mg/L: $(3.32/1.25) = 2.66$ gal/day.

For Maximum Day Flow: 0.2178 mgd x 8.34 lb/gal = 1.82

For 2 mg/L: 3.64 lbs/day CL2 solution.

For 4 mg/L: 7.28 lbs/day CL2 solution.

Using 12.5% solution @ Max. Day Flow:

For 2 mg/L: $3.64/1.25 = 2.91$ lbs/day CL2 solution.

For 4 mg/L: $7.28/1.25 = 5.82$ lbs/day CL2 solution.

Calculate 15 and 30-day Storage Requirement based on AADF permitted flow and Maximum Day Flow using only 4 mg/L:

15-day storage: AADF: $(2.66$ gal/day) x 15 days = 40 gallons used.

Max. Day: $(5.82$ x 15) = 87.3 gallons used.

30-day storage: AADF: $(2.66$ x 30 days) = 80 gallons used.

Max Day: $(5.82$ x 30) = 175 gallons used.

Proposed is 150-gallon storage with dual metering pumps (Pulsatron); 100% containment or more; and the solution will be under a shaded covering to prevent exposure to direct sunlight and dissipation of CL2. The stored volume could be reduced if usage is lower than anticipated and there are any difficulties with declining strength of the solution.

150 gallons of solution will provide from 25 (max day flow) to 56 days (AADF permitted flow) of storage.

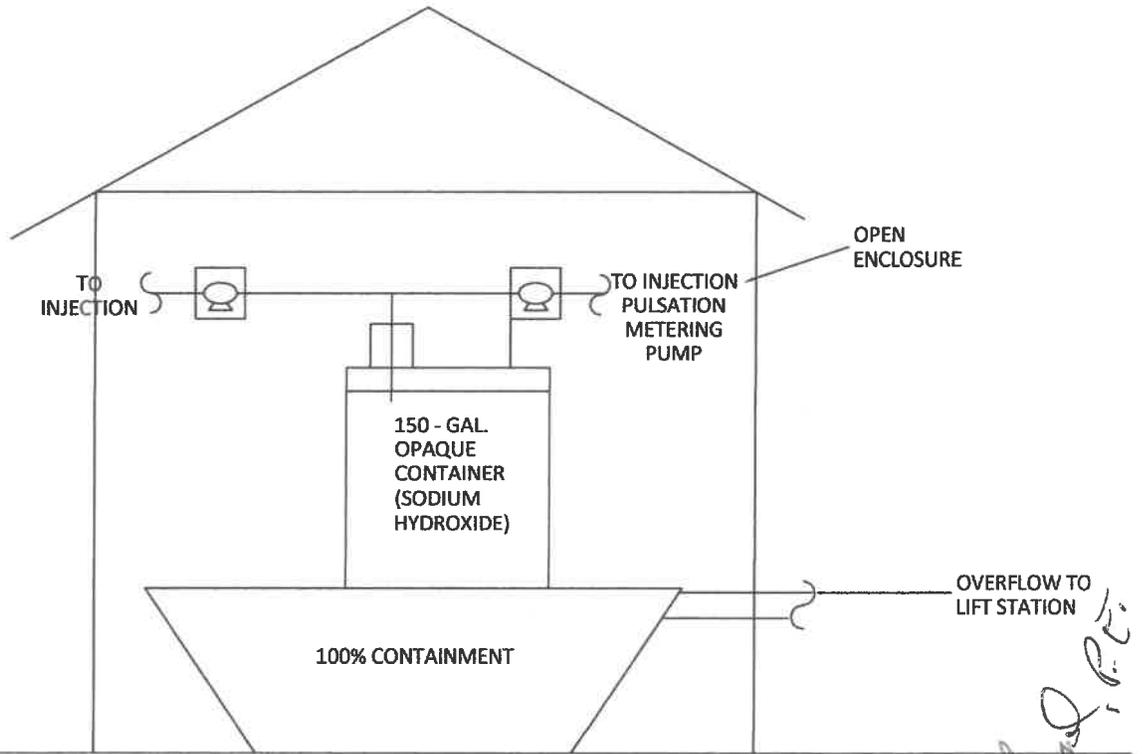
Note: Current Maximum AADF is 0.063 mgd. $(0.063$ mgd x 8.34 lbs/gal) = 0.53 .

For 4 mg/L: 0.53 x 4 mg/L = 2.12 lbs/day.

Using 12.5 % solution: For 4 mg/L: $2.12/1.25 = 1.70$ gal/day.

Calculated required storage; 30-days of use maximum: $(1.70$ gal/day) x 30 = 50 gals.

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Handwritten date: 1/13/18



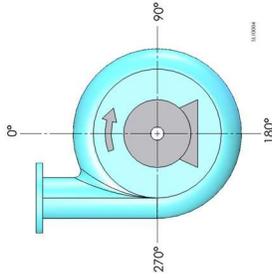
Jim Mark Cadwellhead, P.E.
 #49449
 1/13/18

CADENHEAD ENVIRONMENTAL ENGINEERING SERVICES INC.

DATE: 11/19/17
 SCALE: NONE
 REV.

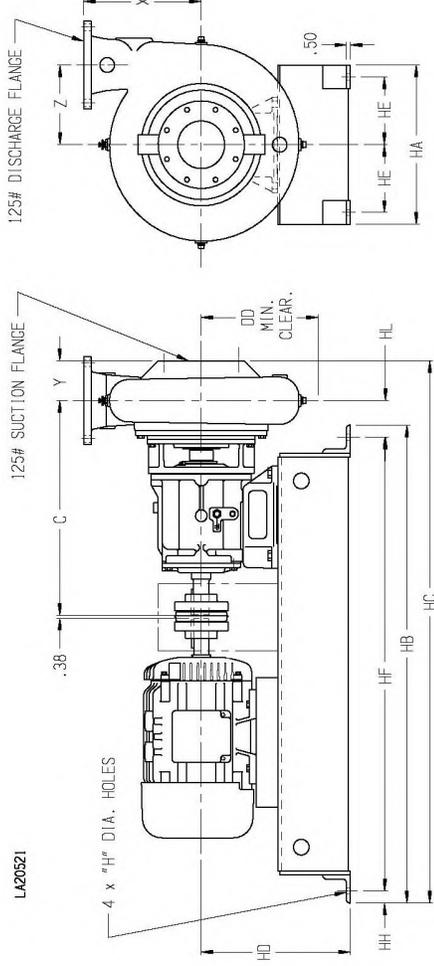
AQUARINA UTILITIES
 WWTF (FLA010352)

DRAWN BY: T.C.
 DRAWING NO. 003
 SODIUM HYDROXIDE CONTAINMENT AREA

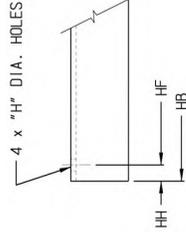


NOTES:

Discharge positions are viewed from the drive end. Standard increments of discharge position are shown in the chart below (DISCH INCR). Consult factory for other discharge positions.



- NOTES:**
1. Dimension include motors with "T" or "TS" shafts.
 2. This page does not apply if space coupling is used.
 3. Flange connection dimension can vary ± 3 mm.
 4. Do not use for construction unless certified.



Base variation for 256T motor frame and smaller

MODEL	FRAME	CONNECTION		DISCH. INCR.	PUMP DIMENSIONS									
		DISCH.	SUCT.		C	DD	X	Y	Z	MOTOR FRAME	H	HC	HD	HL
4NNT	F-16	4	4	45°	689	232	235	108	159	213T/256T	19	1461	343	184
4NHTA 4414T	F-16	4	4	45°	673	287	279	121	235	284T/286T	19	1715	483	121
4514T	F-16	4	5	45°	673	287	279	121	235	213T/256T	19	1711	483	104
6NNT 6NNTL	F-16	6	6	45°	696	295	298	121	213	284T/326T	19	1735	483	128
6NHTA 6NHT 6NHHT	F-16	6	6	45°	685	349	381	127	254	364T/365T	19	1811	483	128
										254T/256T	19	1475	343	154
										284T/326T	19	1729	483	116
										364T/365T	19	1805	483	116
										404T/405T	19	1932	495	116

MOTOR FRAME	BASE - F16 FRAME								BASE PRT. NO.
	HA	HB	HE	HF	HH	HL	HM	HN	
213T/215T	381	1194	155	1143	25	B4082			
254T/256T	381	1194	155	1143	25	B5144			
284T/286T	508	1524	216	1448	38	B4084			
324T/326T	508	1524	216	1448	38	B4085			
364T/365T	508	1600	216	1524	38	B5145			
404T/405T	610	1727	267	1651	38	B5146			



Pump Data Sheet - Cornell

Company: Aquarena RAS Pump Station
 Name: Woodard & Curran Engineers
 Date: 04/16/2021



Pump:		
Size:	4NNT	<u>Dimensions:</u>
Type:	Encl Solids Handling	Suction:
Synch Speed:	1200 rpm	Discharge:
Dia:	10.09 in	
Curve:	4NNT12	

Fluid:		
Name:	Water	
SG:	1	Vapor Pressure:
Density:	62.4 lb/ft ³	Atm Pressure:
Viscosity:	1.1 cP	Margin Ratio:
Temperature:	60 °F	1

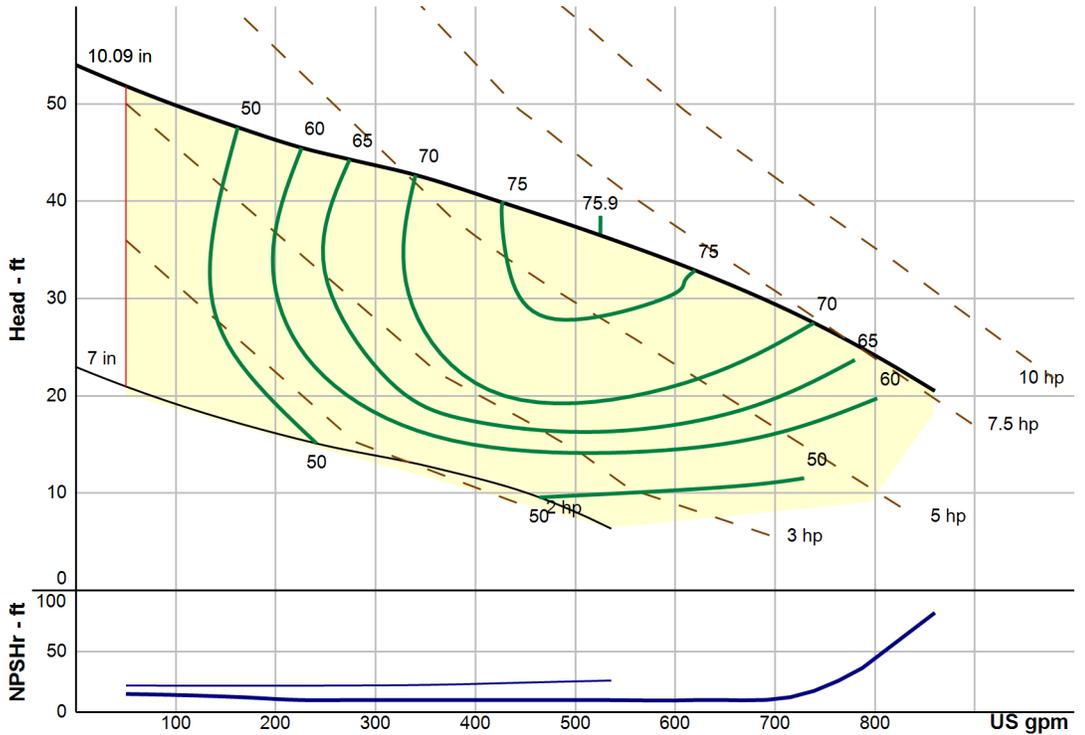
Search Criteria:			
Flow:	---	Near Miss:	---
Head:	---	Static Head:	0 ft

Pump Limits:		
Temperature:	250 °F	Sphere Size:
Wkg Pressure:	150 psi g	3 in

Motor:			
Standard:	NEMA	Size:	10 hp
Enclosure:	TEFC	Speed:	1200 rpm
Frame:	256T		
Sizing Criteria:	Max Power on Design Curve		

Pump Selection Warnings:
 None

--- Duty Point ---	
Flow:	525 US gpm
Head:	36.5 ft
Eff:	76%
Power:	6.38 hp
NPSHr:	10 ft
Speed:	1155 rpm
--- Design Curve ---	
Shutoff Head:	54 ft
Shutoff dP:	23.4 psi
Min Flow:	50 US gpm
BEP:	75.9% @ 525 US gpm
NOL Power:	7.61 hp @ 860 US gpm
--- Max Curve ---	
Max Power:	7.61 hp @ 860 US gpm



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Performance Evaluation:

Flow	Speed	Head	Efficiency	Power	NPSHr
US gpm	rpm	ft	%	hp	ft
826	1155	22.5	62	7.53	63.7
688	1155	29.8	72	7.13	14.3
550	1155	35.6	76	6.5	10
413	1155	40.3	74	5.66	10
275	1155	44.3	65	4.72	10

conditions apply payment is net thirty days after invoice based on accepted credit approval. This proposal is valid for 45 days from above date. Standard manufacture warranties apply to this equipment.

Once again thank you for the opportunity to offer Cornell Pump equipment for your consideration.

Very truly yours,
William R. Beach
R. C. Beach & Assoc., Inc.
Representing
Cornell

Ron Aceto-Cornell
Rick Reiber-RCB



SOUTH BEACHES WWTF MELBOURNE BEACH FL

Preliminary Proposal for Design,
Supply and Inspection of the
Wastewater Treatment System
Upgraded with

infini-D
ZERO-DOWNTIME
CLOTH DISK FILTER

April 30th, 2021

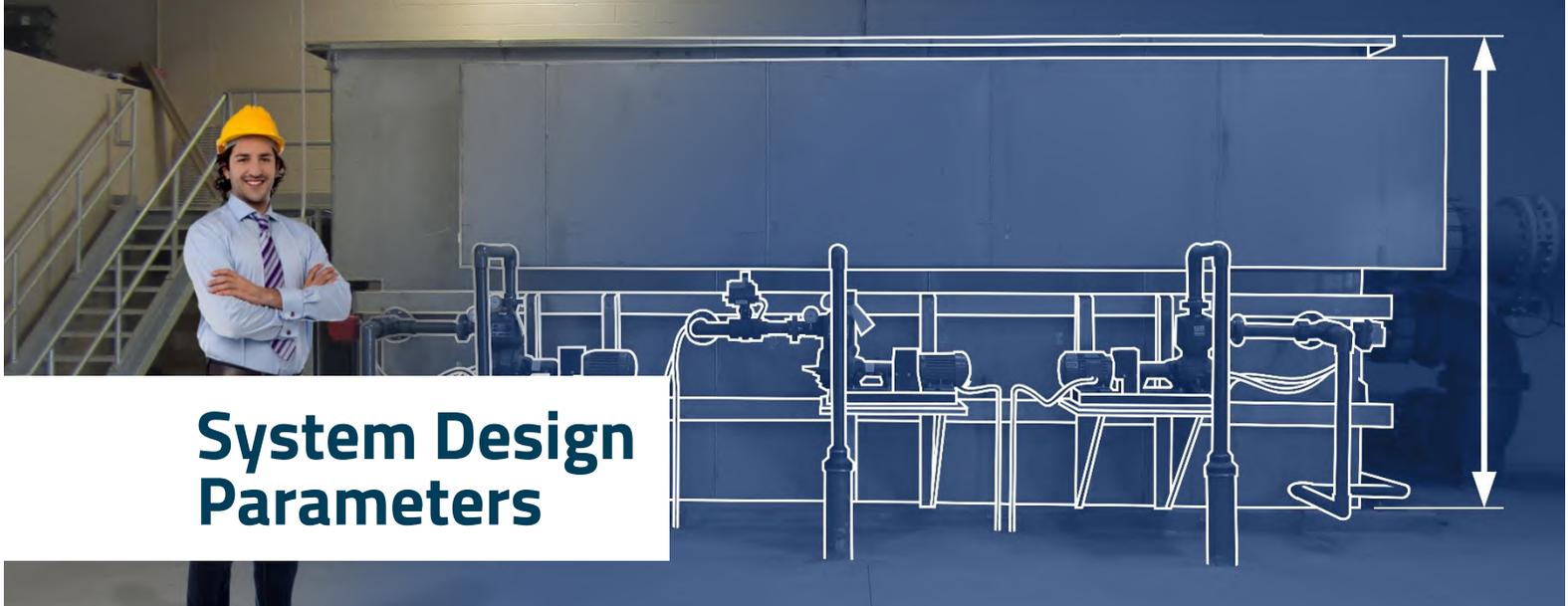
technologies for cleaner water

323 N. Spokane St. Suite 200 • Post Falls ID • 83854
888-710-2583 • www.nexom.com

Project Overview

Nexom is pleased to propose an infini- D™ Zero-Downtime Disk Filter system for South Beaches WWTF in Melbourne Beach, Florida. The proposed system is designed for continuous discharge and would consist of the following processes and technologies:

- infini-D™ Zero-Downtime Cloth Disk Filter system for Total Suspended Solids (TSS) polishing.



System Design Parameters

Preliminary design loads, flow, and effluent objectives are presented in the following table:

	Units	Filter Influent	Filter Effluent
Design Flow (ADF)	MGD	0.1	
Peak Day Flow (PDF)	MGD	0.3	
Peak Hour Flow (PHF)	MGD	0.3	
TSS	mg/L	< 20	< 5
Turbidity	NTU	< 10	< 2

Disk filter parameters are presented in the following table:

Configuration	Units	Design Parameter
Filter model		2-30
Filter headloss	in	24
Total number of filters		1
¹ Configuration, duty + standby		1x100% + 0
Area per filter	ft ²	60
Hydraulic loading	gpm/ft ²	< 3.6
Surface solids loading rate (SSLR)	lb/ft ² d	< 0.9

1. A standby filter is quoted as an option.



Treatment Processes

infini-D™ Zero-Downtime Cloth Disk Filter

The infini-D™ Cloth Disk Filter successfully reduces TSS and filterable contaminants in a small footprint with a low lifecycle cost. Pile cloth disk filters can be installed into purpose-built or existing steel or concrete tanks offering high effluent quality from easy-to-maintain disks.



The infini-D™ Disk Filter utilizes an outside-in flow pattern and a stationary disk to minimize the mechanical requirements of the system.

As the water passes from the tank through the cloth filter, it enters the core of each disk module. The water exits each disk through an effluent port located on top of the disk. All the effluents are then collected in the discharge launderer. By having a separate effluent port for each disk, each disk effluent may be isolated and can be individually monitored, maintained, and/or replaced. Filtration can continue as normal with one or more disks isolated. Removal of a disk and replacement of the cloth media can be accomplished in less than 1 hour, minimizing downtime. All disks must be in place to allow backwashing.

Operating Narrative

During the normal filtration process, all filter disks are stationary. As the solids accumulate on the outer surface of the cloth media, a thin filter cake forms, raising headloss through the media. Tank level gradually increases to a set point elevation in the tank for backwash initiation.



Each infini-D™ Disk Filter has its **own effluent discharge pipe** to allow the operator to monitor effluent quality produced by individual cartridges. Cartridges can be removed, inspected and replaced without stopping filtration.

The backwash cleaning system energizes in a set sequence of cleaning operations. Electronically controlled backwash valves are automated to direct suction from a sequence of disks, minimizing the peak backwash flow and required power consumption. Influent will continue to be processed during the backwash cleaning cycle, allowing for continuous uninterrupted filtration. The vacuum head rotates across the disk surface driven by a chain, sprocket, and a locally mounted gear motor. The cleaning cycle is also set to run on a timed basis.

The backwash cleaning cycle is controlled by a PLC-based operation system furnished with the filter equipment.

The filter basin includes an overflow weir. A high-level switch is positioned to provide an alarm at or near overflow conditions.

All components of the system are constructed from corrosion-resistant materials that have been designed for continuous operation. The polyester microfiber filter cloth is removable and replaceable in the field.

The Infini-D Disk Filter is designed for modular expansion as treatment conditions require. The compact filter unit has minimal external support and piping requirements. Additional filter racks can be installed into the same tank without major modifications to the tank, and without interfering with the existing equipment. This means minimal down time during expansion. Backwash pumps can be shared between existing and expansion filter modules, reducing capital costs.



Operation & Maintenance

The anticipated operation and maintenance costs for the infini-D™ Disk Filter system are presented in the following table:

Annual Average Conditions	Quantity	Motor Power		Monthly Cost	Unit Cost	Annual Cost*
		bhp	kW			
Duty backwash pumps	1	2	1.5	\$1	-	\$10
Duty vacuum arm	1	1	0.7	\$0	-	\$5
Media elements	2	-	-	-	\$1,200	\$343
Swivel joints	1	-	-	-	\$3,500	\$500
Total O&M						\$857

* Electrical Rate (estimated by Nexom): 0.08 \$/kW-h

The anticipated average duty run times for backwash motors are:

Idle time (min):	120
Cycle length (min):	1
Duty factor:	~ 1%
Backwash:	< 1%

The disk filter system will require one operator for approximately 15 minutes per day for routine inspection & maintenance.



Budgetary Capital Cost

Included in the wastewater treatment system capital cost are:

GENERAL

- Nexom system process design, CAD drawings and specifications, and O&M manuals
- Equipment inspection, start-up, commissioning, and training
 - Two (2) trips including up to six (6) days onsite.

EQUIPMENT SCOPE

- One (1) infini-D™ cloth disk filter unit, model 2-30
 - Two (2) model 30 disks
 - Two (2) cloth media elements
 - Stainless frame and center tube assemblies
 - Backwash arm assemblies, including vacuum heads and drive motor
 - Sludge removal system
 - Integrated stainless steel filter tanks
- One (1) backwash pump
- One (1) control panel with Allen Bradley PLC, HMI, VFDs and starters
- One (1) lot of instrumentation
 - One (1) level transmitter
 - Two (2) level switches.

TWO-YEAR SPARES

- Two (2) Cloth media elements.

Budgetary Cost for the Equipment Scope:

\$ 166,500 USD
Ex Works

The quote being provided will be in effect only for a period of 60 days. Should the company be awarded a purchase order during that 60-day period, it is understood that shipment of the product will be allowed within a period of 180 days from the date of the purchase order. Should the goods not be required to be delivered until after that time horizon, the company reserves the right to adjust pricing to reflect inflationary changes incurred and expected until the shipment date is reached.

Items Specifically Not Included:

- Material offloading and on-site storage
- Civil works including electrical hookup or electrical work
- Installation, interconnecting process piping, valves wiring/control wiring of all supplied components and equipment
- Maintenance crane.

Shipping FOB Jobsite

\$ 7,850 USD

Actual freight at time of order will be billed at cost +10%.

Optional Equipment Scope:

- One (1) duty standby model 2-30 filter
- One (1) backwash pump
- One (1) control panel with Allen Bradley PLC, HMI, VFDs and starters
- One (1) lot of instrumentation
- One (1) access stairs, platform, railing and kickplates
- One (1) filter cover for exclusion of light and debris.

Duty Standby Filter \$ 153,400 USD
Platform and Covers \$ 12,500 USD



Questions or Comments?

Any questions or comments can be directed to:



Nexom

Info@nexom.com

888-710-2583

323 N. Spokane St. Suite 200, Post Falls ID 83854

www.nexom.com



Documentation

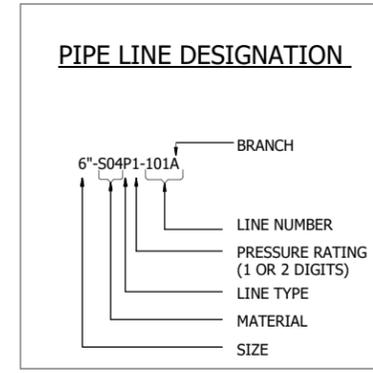
- Infini-D P&ID
- Infini-D GA Drawing
- Brochures

PIPING SYMBOLS

	PRIMARY PROCESS FLOW PATH
	SECONDARY FLOW PATH
	HEAT TRACE
	INSULATED PIPELINE
	INFLUENT
	EFFLUENT
	REJECT
	SYSTEM EXTENTS

INSTRUMENT LINE SYMBOLS

	PNEUMATIC SIGNAL
	CONTROL LOGIC
	ELECTRIC SIGNAL
	UNDEFINED SIGNAL
	INTERNAL SYSTEM LINK SOFTWARE OR DATA
	CAPILLARY TUBE



VALVE ACTUATOR SYMBOLS

(NO SYMBOL) = MANUAL FOR ON/OFF SERVICE	T HANDWHEEL (MANUAL OVERRIDE)	 ELECTRIC
 SOLENOID (WITHOUT)	 DIAPHRAGM AIR TO AIR (WITHOUT)	 DIAPHRAGM & SPRING TO OPEN (WITHOUT)
 SOLENOID (WITH) =MANUAL OVERRIDE	 DIAPHRAGM AIR TO AIR (WITH)=POSITIONER	 DIAPHRAGM & SPRING TO CLOSE (WITH)=POSITIONER
 DOUBLE-ACTING CYLINDER (WITHOUT)	 CYLINDER & SPRING TO OPEN	
 DOUBLE-ACTING CYLINDER (WITH)=POSITIONER	 CYLINDER & SPRING TO CLOSE	

SYMBOLS FOR VALVE ACTION IN THE EVENT OF ACTUATOR POWER FAILURE

FO = FAIL OPEN
 FC = FAIL CLOSED
 FL = FAIL LOCKED
 FI = FAIL INDETERMINATE (LAST POSITION)
 F = USED WITH 3 WAY & 4 WAY VALVE- ARROWS SHOW PATHS OPEN TO FLOW ON POWER FAILURE.

SYMBOL LOCATED BY VALVE- USED ONLY WHERE NECESSARY TO INCREASE UNDERSTANDING OF THE SYSTEM.

MATERIAL DESIGNATION

BRZ - BRASS/BRONZE
 CIR - CAST IRON
 CST - CARBON STEEL
 CPR - COPPER
 FRP - FIBERGLASS
 GCS - GALVANIZED CARBON STEEL
 LCS - LINED CARBON STEEL
 TEF - TEFLON
 PU - POLYURETHANE
 PET - POLYETHYLENE
 POP - POLYPROPYLENE
 PVC - POLYVINYL CHLORIDE
 RUB - RUBBER
 S04 - 304 STAINLESS STEEL
 S4L - 304L STAINLESS STEEL
 S16 - 316 STAINLESS STEEL
 S6L - 316L STAINLESS STEEL
 VIT - VITON
 CVC - CHLORINATED POLYVINYL CHLORIDE

SYMBOLS FOR SELF-ACTUATED REGULATORS

PRESSURE REDUCING REGULATOR SELF CONTAINED	BACK PRESSURE REGULATOR SELF CONTAINED	RUPTURE DISC OR SAFETY HEAD PRESSURE RELIEF
PRESSURE REDUCING REGULATOR EXTERNAL TAP	BACK PRESSURE REGULATOR EXTERNAL TAP	RUPTURE DISC OR SAFETY HEAD VACUUM RELIEF
PRESSURE RELIEF ANGLE	VACUUM RELIEF ANGLE	PRESSURE VACUUM RELIEF
PRESSURE RELIEF STRAIGHT	VACUUM RELIEF STRAIGHT WITH WELL	TEMPERATURE REGULATOR FILLED SYSTEM
LEVEL REGULATOR FLOAT OPERATED MECHANICAL LINKAGE	TRAP CONTINUOUS DRAINER BALL FLOAT TYPE	TANK TRAP WITH EQUALIZING CONNECTION
 DIFFERENTIAL PRESSURE REDUCING REGULATOR - SHOWN WITH INTERNAL AND EXTERNAL PRESSURE TAPS.		

HEAT EXCHANGER SYMBOLS

SHELL & TUBE HEAT EXCHANGER	ELECTRICAL HEATING ELEMENT
AIR COOLED HEAT EXCHANGER	GENERAL HEAT EXCHANGER
DIRECT CONTACT JET MIXER	

PRIME MOVERS FOR MOTOR DRIVEN EQUIPMENT

 ELECTRIC MOTOR	 PNEUMATIC ROTARY MOTOR
--------------------	----------------------------

MOTOR DRIVEN EQUIPMENT

CENTRIFUGAL PUMP	ROTARY BLOWER OR COMPRESSOR	FAN / BLOWER
VERTICAL CENTRIFUGAL PUMP	SUBMERSIBLE PUMP	CHEMICAL FEED PUMP
VERTICAL TURBINE	PERISTALTIC PUMP	PROGRESSIVE CAVITY PUMP
DIAPHRAGM CHEMICAL FEED PUMP W/ INTERNAL RELIEF VALVE	LIQUID RING VACUUM PUMP	
VENT FAN	AGITATOR OR MIXER	DIAPHRAGM PUMP (PNEUMATIC OPER.)
AIR COMPRESSOR	DUPLEX AIR COMPRESSOR	

TYPE

D = DUCT P = PIPE
 H = HOSE T = TUBE

GENERAL NOTES:

1. FOR INSTRUMENTATION SYMBOLS AND LIST OF RELAY FUNCTIONS SEE NEXOM DRAWING NO. PID-B.
 THIS DRAWING IS PROVIDED FOR INFORMATION ONLY.

PIPING ACCESSORIES & DETAILS

Y STRAINER	CONE STRAINER	SCREEN STRAINER OR STATIC MIXER
MIXING SECTION	EJECTOR	BACKFLOW PREVENTER
SPRAY NOZZLE OR SPARGER	CHEMICAL SEAL	EXPANSION JOINT
FLEX HOSE	STRAIGHTENING VANES	
FILTER	SCOPE LIMITS	THERMOWELL
SIMPLEX BASKET STRAINER	DUPLEX BASKET STRAINER	AIR FILTER
AIR DRYER	MIST ELIMINATOR	PULSATION DAMPER
SIGHT GLASS	RESTRICTION ORIFICE	INSULATED FLANGE OR DIELECTRIC UNION
QUICK DISCONNECT ASSEMBLY	SUMP/DRAIN	CALIBRATION COLUMN
VARIABLE AREA FLOW INDICATOR WITH INTEGRAL NEEDLE VALVE	ORIFICE FLANGE	CONCENTRIC REDUCER
ECCENTRIC REDUCER FLAT ON TOP	ECCENTRIC REDUCER FLAT ON BOTTOM	

VALVE SYMBOLS

GATE	GLOBE	BALL
PLUG	3 WAY PLUG	BUTTERFLY
CHECK	DIAPHRAGM	PINCH
NEEDLE	3 WAY	4 WAY
ANGLE	KNIFE GATE	WEIGHTED RELIEF
VALVE (UNDEFINED TYPE)	V-PORT BALL VALVE	AIR RELEASE

TANK AND ACCESSORIES

MANHOLE/ACCESS	COUPLING (HALF OR FULL)	FLANGED NOZZLE
RECEIVER TANK	INSULATION	

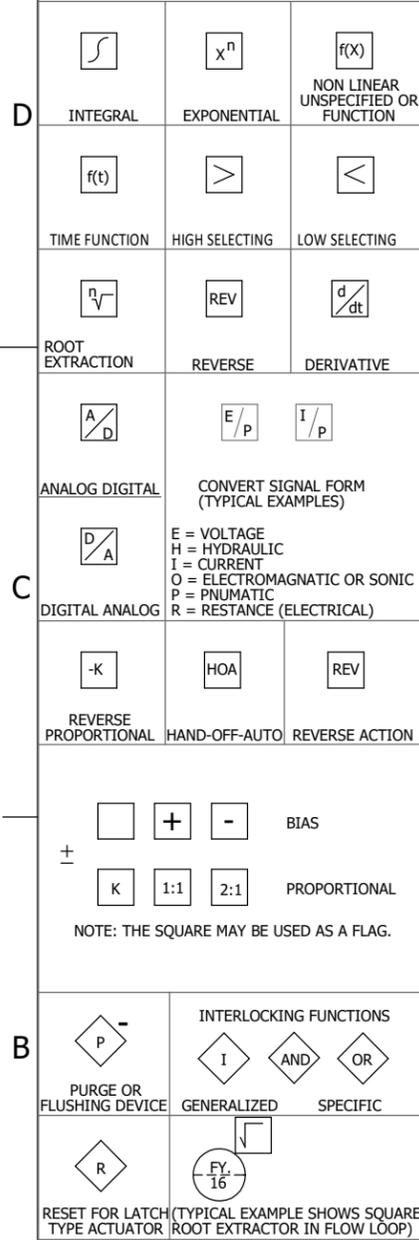


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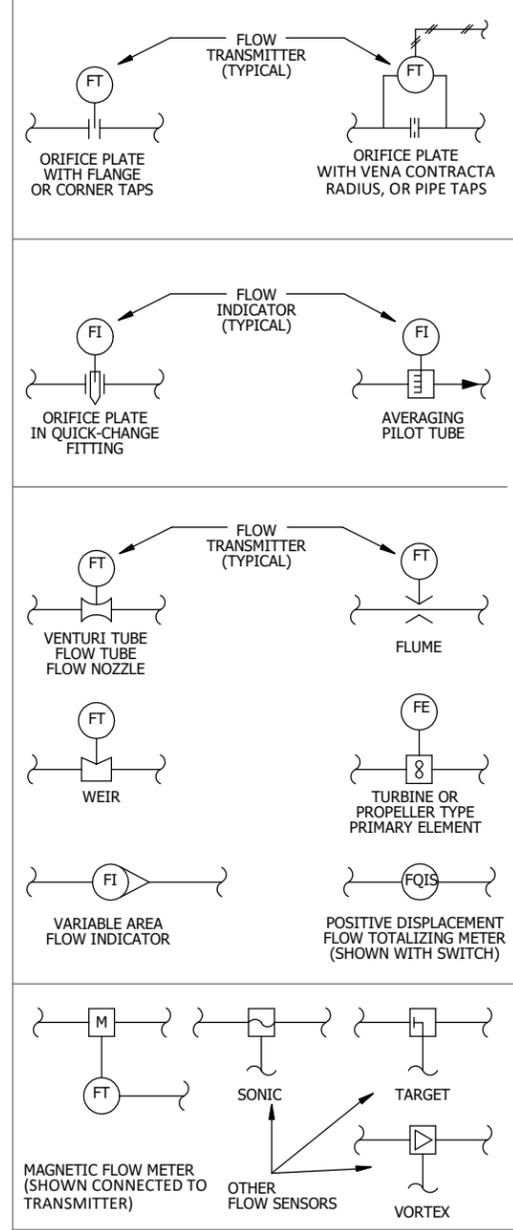
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ONE DECIMAL	± .125"
TWO DECIMAL	± .0625"
ANGULAR	± 2.0°

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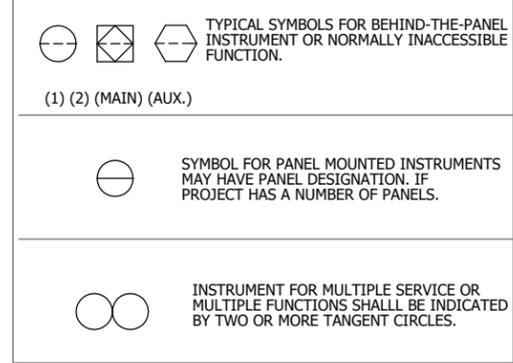
MISCELLANEOUS SYMBOLS



SYMBOLS FOR FLOW MEASUREMENT



SYMBOLS FOR LOGIC CONTROL



INSTRUMENT SYMBOLS

	PRIMARY CONTROL PANEL NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY PANEL OR RACK NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS			
SHARED DISPLAY SHARED CONTROL			
COMPUTER FUNCTION INCLUDING DISTRIB. CNTL. SYS.			
PROGRAMMABLE LOGIC CONTROLLER FUNCTION			

INSTRUMENT IDENTIFICATION LETTERS

FIRST LETTER	SUCCEEDING LETTERS		
	MEASURE OR INIATING VARIABLE	MODIFIER	
A = ANALYSIS			
B = BURNER, COMBUSTION			
C = USER'S CHOICE			
D = USER'S CHOICE	DIFFERENTIAL		
E = VOLTAGE			
F = FLOW RATE	RATIO (FRACTION)		
G = USER'S CHOICE			
H = HAND			
I = CURRENT (ELECTRICAL)			
J = POWER	SCAN		
K = TIME, TIME SCHEDULE	TIME RATE OF CHANGE		
L = LEVEL			
M = USER'S CHOICE	MOMENTARY		
N = USER'S CHOICE			
O = USER'S CHOICE			
P = PRESSURE, VACUUM			
Q = QUANTITY	INTERGRATE, TOTALIZE		
R = RADIATION			
S = SPEED, FREQUENCY	SAFETY		
T = TEMPERATURE			
U = MULTIVARIABLE			
V = VIBRATION, MECH. ANALYSIS			
W = WEIGHT, FORCE			
X = UNCLASSIFIED	X AXIS		
Y = EVENT, STATE OR PRESENCE	Y AXIS		
Z = POSITION, DIMENSION	Z AXIS		

LETTER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ALARM		
B	USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C		CONTROL	
D			
E	SENSOR (PRIMARY ELEMENT)		
F			
G	GLASS, VIEWING DEVICE		
H			HIGH
I	INDICATE		
J			
K		CONTROL STATION	
L	LIGHT		
M			MIDDLE, INTERMEDIATE
N	USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	ORIFICE, RESTRICTION		
P	POINT (TEST) CONNECTION		
Q			
R	RECORD		
S		SWITCH	
T		TRANSMIT	
U	MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V		VALVE, DAMPER, LOUVER	
W	WELL		
X	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y		RELAY, COMPUTE, CONVERT	
Z		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

NOTES:

- ANY FIRST LETTER COMBINED WITH MODIFIER REPRESENTS A NEW AND SEPARATE MEASURED VARIABLE. EXAMPLES: PD = DIFFERENTIAL PRESSURE FQ = TOTALIZED OR INTEGRATED FLOW. EXCEPTION IS THE MODIFIER "J" FOR MULTIPOINT SCANNING.
- FOR ANALYSIS NOT IDENTIFIED BY A SPECIFIC LETTER IN THE TABLE, USE THE LETTER "A" NEAR THE INSTRUMENT SYMBOL, SPECIFY THE NATURE OF THE ANALYSIS. EXAMPLE: PH
- MEANING OF A "USER CHOICE" LETTER SHALL BE CONSISTENT THROUGHOUT A PROJECT AND SHALL BE SPECIFIED IN THE DRAWING LEGEND.
- UNCLASSIFIED LETTERS MAY HAVE A FEW DIFFERENT MEANINGS ON A PROJECT, THE MEANING SHALL BE SPECIFIED NEAR EACH INSTRUMENT SYMBOL USING THE UNCLASSIFIED LETTER.
- THE MODIFIER "SCAN" APPLIES TO MULTIPOINT PRINTING INSTRUMENTS, SUCH AS CJRS (MULTIPOINT CONDUCTIVITY RECORDER WITH ALARM SWITCHES).

GENERAL NOTES:

- FOR MECHANICAL SYMBOLS AND ADDITIONAL NOTES, SEE NEXOM DRAWING NO. PID-A. THIS DRAWING IS PROVIDED FOR INFORMATION ONLY.



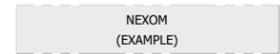
UNLESS OTHERWISE SPECIFIED

TOLERANCES:

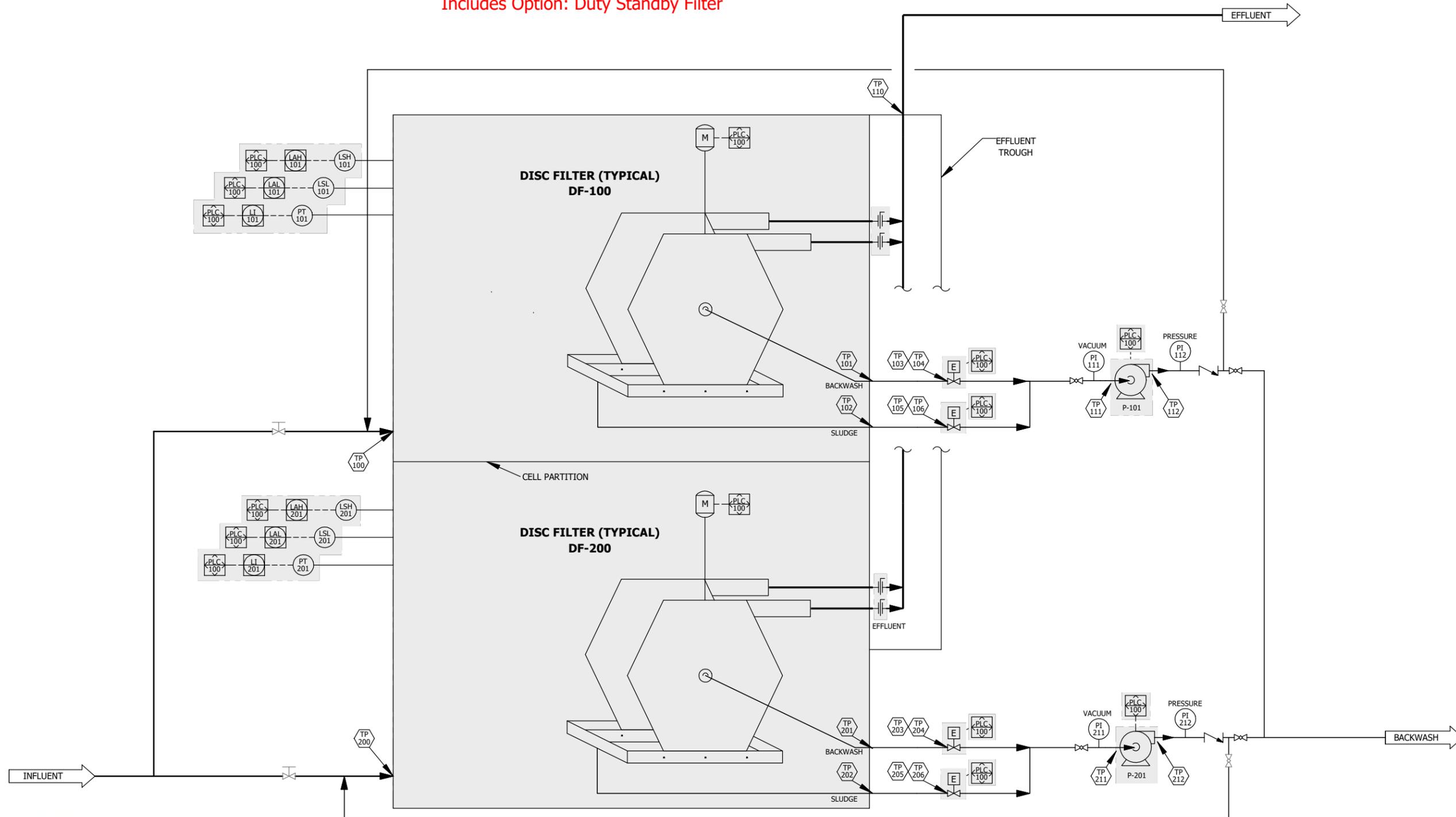
FRACTIONAL	± 1/16"
ONE DECIMAL	± .125"
TWO DECIMAL	± .0625"
ANGULAR	± 2.0°

LOCATION: Custom Sales	SCALE 1:5
DESCRIPTION: Piping & Instrumentation Diagram	
NUMBER:	REV. 0
	PAGE 2/3

NOTES:
 1. SHADED AREAS ARE IN NEXOM'S SCOPE OF SUPPLY



Includes Option: Duty Standby Filter



TERMINAL POINT TABLE	
TP-100	8" ANSI FF
TP-200	8" ANSI FF
TP-101	4" ANSI FF
TP-201	4" ANSI FF
TP-102	4" ANSI FF
TP-202	4" ANSI FF
TP-103	3" SKT/NPT
TP-203	3" SKT/NPT
TP-104	3" SKT/NPT
TP-204	3" SKT/NPT
TP-105	3" SKT/NPT
TP-205	3" SKT/NPT
TP-106	3" SKT/NPT
TP-206	3" SKT/NPT
TP-110	12" ANSI FF
TP-111	2" FNPT
TP-112	2" FNPT
TP-211	2" FNPT
TP-212	2" FNPT

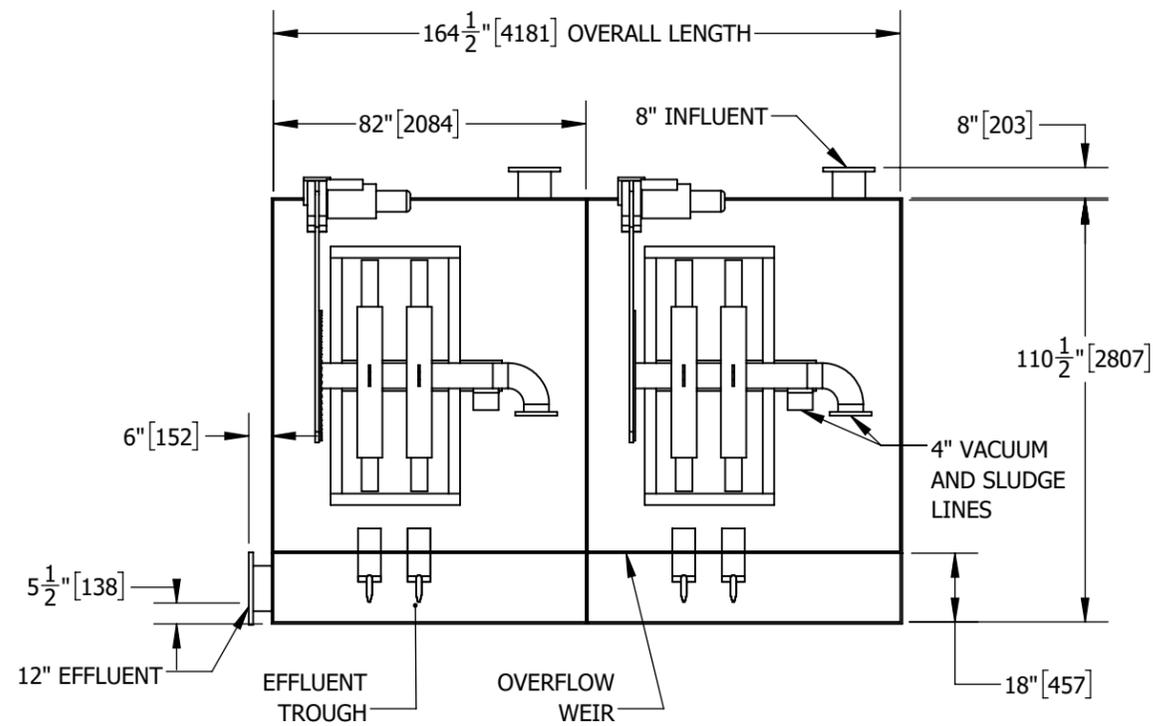


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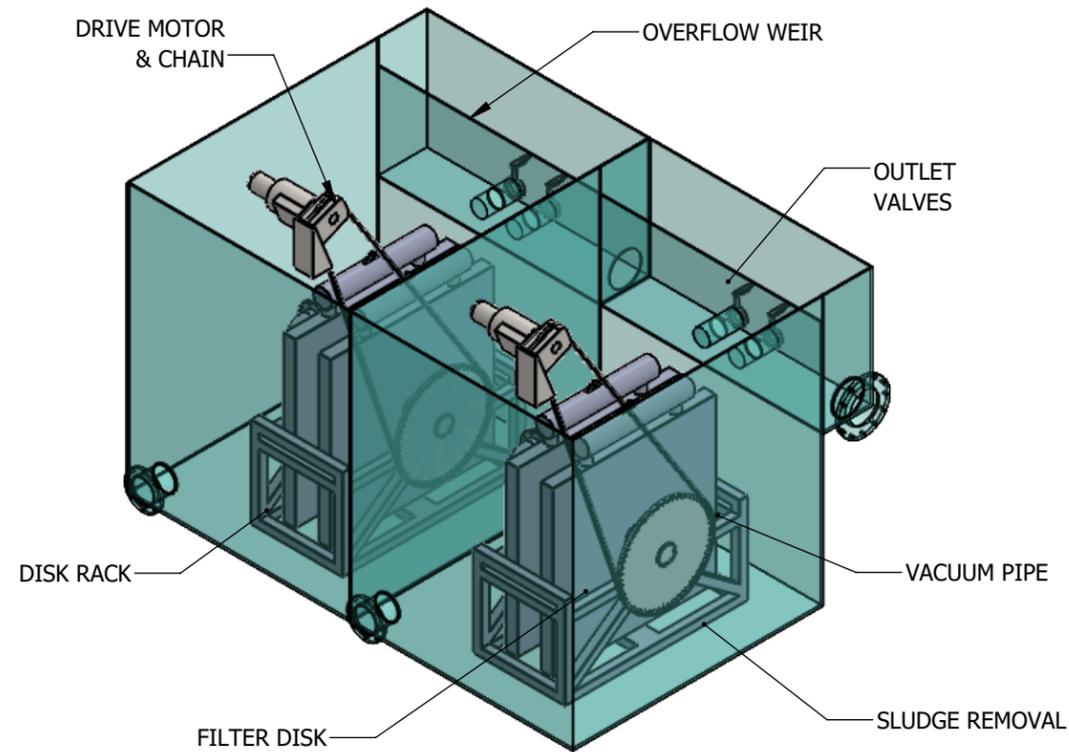
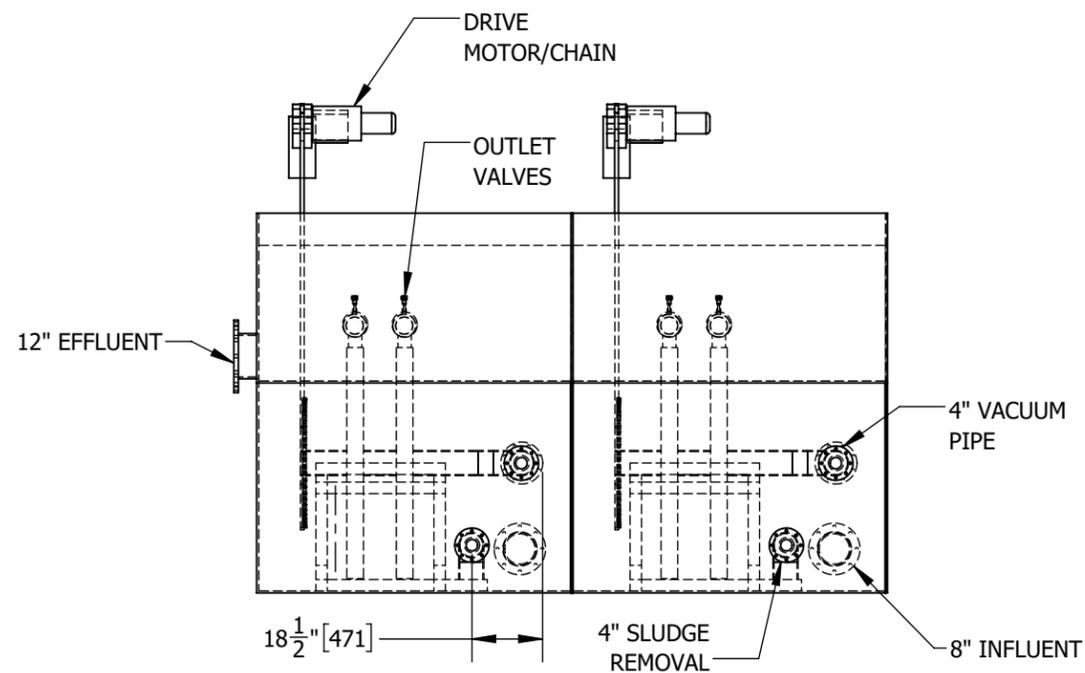
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ± 1/16"
 ONE DECIMAL ± .125"
 TWO DECIMAL ± .0625"
 ANGULAR ± 2.0°
THIRD ANGLE PROJECTION

LOCATION: Custom Sales		SCALE 1:5	
DESCRIPTION: Piping & Instrumentation Diagram			
AUTH.	LPope, 1/21/21	CHKD.	-,-
NUMBER:		REV. 0	PAGE 3/3

TEMPLATE LAST MODIFIED: 08.05.19

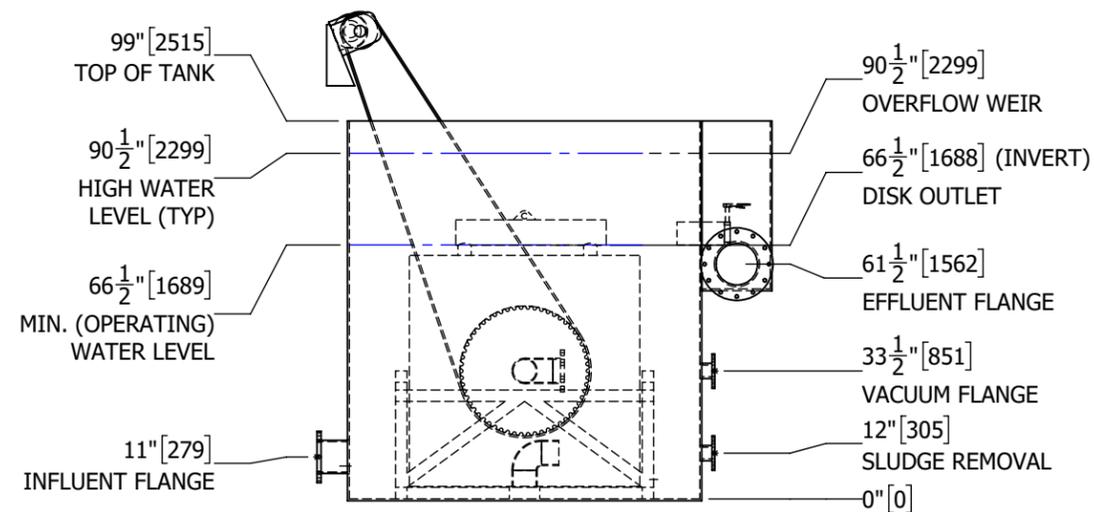


Includes Option: Duty Standby Filter



NOTES:

1. THIS DRAWING IS FOR GENERAL ARRANGEMENT ONLY.
2. FLANGES ARE PRELIMINARY. LOCATION CHANGES MUST BE APPROVED BY NEXOM ENGINEERING.
3. TIE DOWNS AND LIFTING LUGS NOT SHOWN.
4. FILTER ACCESS NOT SHOWN.
5. INDIVIDUAL DISK DRY WEIGHT = 360 LBS.
6. OVERALL DRY WEIGHT = 3,400 LBS
7. OVERALL OPERATING WEIGHT = 52,700 LBS.
8. OVERHEAD LIFTING REQUIRED FOR REMOVAL AND MAINTENANCE OF FILTER DISKS.
 - MINIMUM HEIGHT REQUIRED ABOVE TANK = 72 INCHES
9. MATERIALS OF CONSTRUCTION:
 - TANK - CARBON STEEL (COATED) - STAINLESS STEEL OPTIONAL
 - RACK/DISKS - STAINLESS STEEL



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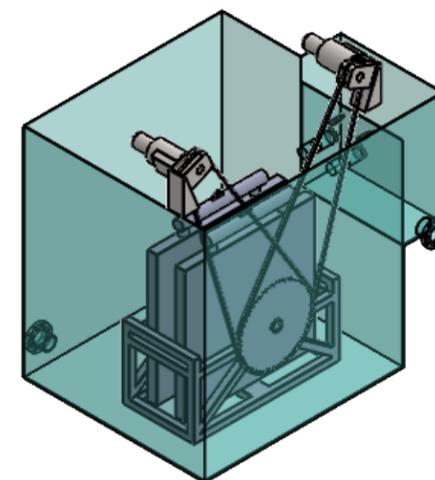
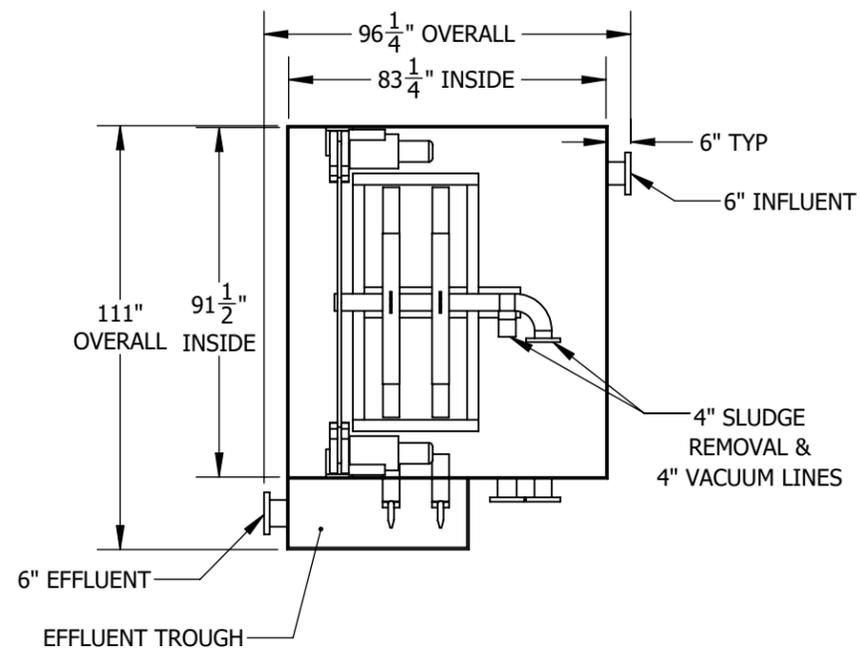
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ± 1/16"
 ONE DECIMAL ± .125"
 TWO DECIMAL ± .0625"
 ANGULAR ± 2.0°
 THIRD ANGLE PROJECTION

LOCATION: Custom Sales		SCALE 1:48	
DESCRIPTION: Custom General Arrangement Drawing			
AUTH.	LPope, 1/21/21	CHKD.	KJennings,
NUMBER:		REV. 0	PAGE 1/1

TEMPLATE LAST MODIFIED: 08.05.19

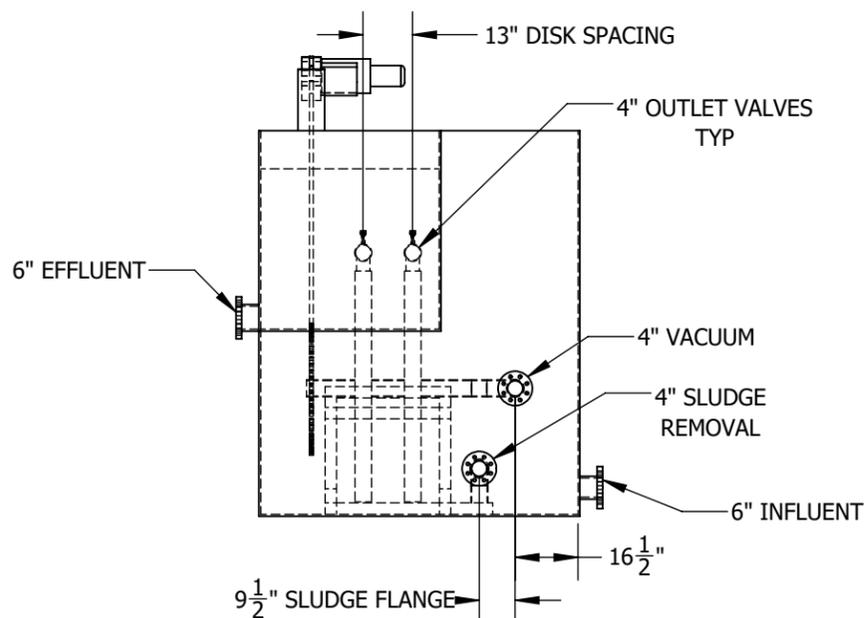
NOTES:

- THIS DRAWING IS FOR GENERAL ARRANGEMENT ONLY. FLANGES ARE PRELIMINARY. LOCATION CHANGES MUST BE APPROVED BY NEXOM ENGINEERING.
- TIE DOWNS AND LIFTING LUGS NOT SHOWN. FILTER ACCESS NOT SHOWN.
- ESTIMATED WEIGHTS:
 - INDIVIDUAL DISK WEIGHT = 400 LBS
 - OVERALL DRY WEIGHT = 7,000 LBS
 - OVERALL OPERATING WEIGHT = 32,000 LBS
- OVERHEAD LIFTING REQUIRED FOR REMOVAL AND MAINTENANCE OF FILTER DISKS.
 - MINIMUM HEIGHT REQUIRED ABOVE TANK = 108"
- MATERIALS OF CONSTRUCTION:
 - TANK - CARBON STEEL (COATED) - STAINLESS STEEL OPTIONAL
 - RACK/DISKS - STAINLESS STEEL

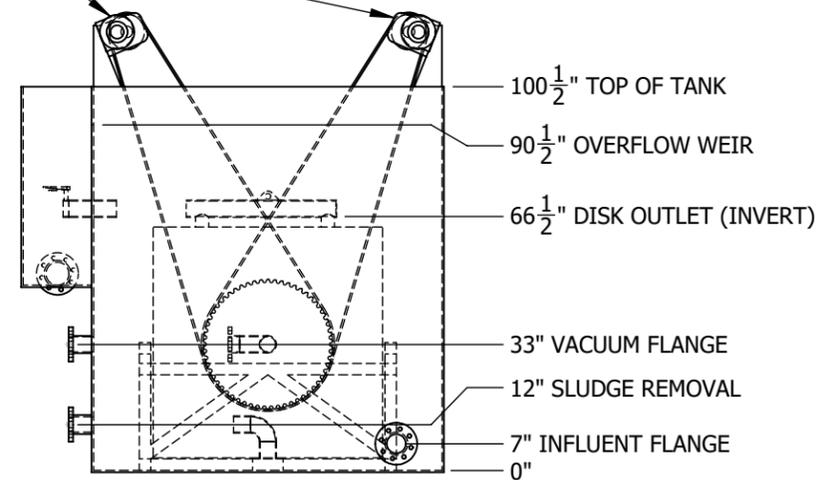


ISOMETRIC VIEW
SCALE 1:60

Single Tank Only



DRIVE MOTOR/CHAIN
(CAN BE PLACED AT EITHER POSITION)



REVISIONS			
REV.	DESCRIPTION	ENGINEER	DATE
01	INITIAL RELEASE	MS	2021-03-11

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UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ± 1/16"
 ONE DECIMAL ± .125"
 TWO DECIMAL ± .0625"
 ANGULAR ± 2.0°
 THIRD ANGLE PROJECTION

LOCATION: Sales		SCALE 1:48	
DESCRIPTION: General Arrangement Drawing, 2-30T			
AUTH.	MS, 2021-03-11	CHKD.	N/A, 2021-03-11
NUMBER: 2-30T		REV. 01	PAGE 1/2



Criteria	infini-D™	
Effluent Quality		
Turbidity	<2 NTU	●
Total Suspended Solids (TSS)	<5 mg/L	●
Advantages		
Remove phosphorus as well as solids		●
Title 22-approved filter cloth		●
Maintain individual disks while filter is online		●
Inspect performance of individual disks		●
Applications		
Phosphorus removal		●
Approved water reuse		●
TSS reduction		●
Tertiary filtration		●
Post-lagoon filtration		●
CSO treatment		●

Problem

Your plant needs to meet reuse requirements and/or phosphorus limits. You want a proven solution that will meet your requirements without a substantial increase in footprint or O&M, and the idea of overpurchasing equipment to accommodate maintenance downtime doesn't sit well with you either.

The Nexom Answer

The **infini-D™ Zero-Downtime Cloth Disk Filter** removes TSS, is approved for Title-22 reuse, and can be configured to remove phosphorus, all in the simplest O&M filter available. Here's why:

- **Removes TSS** to <5 mg/L
- **Removes phosphorus**, meeting limits as low as 0.3 mg/L
- **Easy and cost-effective to operate:** Individual disks' effluent can be isolated, evaluated and, if necessary, disks can be maintained while filter remains online.
- **Uses pile cloth** that filters without the risk of long-term fouling.

How infini-D™ works

In the **infini-D cloth disk filter**, water enters the tank and passes through the cloth filter media, on the outside of which solids collect. The disks don't rotate: to eliminate rotating seals and effluent contamination in the case of a seal failure, only the vacuum head rotates around the disk during the automatic backwash cycle.

Designed to be better

The **infini-D cloth filter** uses individual effluent ports for each disk to enable operators to monitor individual disks' operation and isolate performance metrics. If a disk cloth needs to be replaced, these effluent ports enable each disk cartridge to be removed without stopping filtration.



technologies for cleaner water

5 Burks Way · Winnipeg MB · R2J 3R8
888-426-8180 • www.nexom.com

infini-D helps Camp Verde keep ball diamonds green through water reuse

Located 90 miles north of Phoenix in arid Arizona, Camp Verde was exploring plans in 2017 for a new outdoor sports complex including six baseball fields. The town's engineers decided on irrigation using reuse wastewater, which would mean the 24-hour average turbidity criterion of <2 NTUs and must not exceed 5 NTUs at any time. After exploring various options, they chose Nexom's infini-D™ Cloth Disk Filter for tertiary treatment for achieving a Class A+ target.

Construction started in October 2018. Engineers and staff at the WWTP in Camp Verde did most of the installation work, with guidance and input from the operations team at Nexom. The Infini-D system was commissioned in July 2019. Since then, they have successfully treated their wastewater to a Class A+ level, enabling them to begin irrigating the nearby baseball fields as planned.

Sundridge meet Phosphorus limit with post-lagoon infini-D filter

The infini-D cloth disk filter is also the signature component in the system which Nexom designed to meet Sundridge, Ontario's low Phosphorus limits.

Targeting an effluent phosphorus level of 0.27 mg/L, the engineers chose to place the disk filters after the lagoons and the SAGR, so the majority of the phosphate flocs could settle out well in advance, improving the phosphorus-removal performance and further saving operating costs on the disk filters.

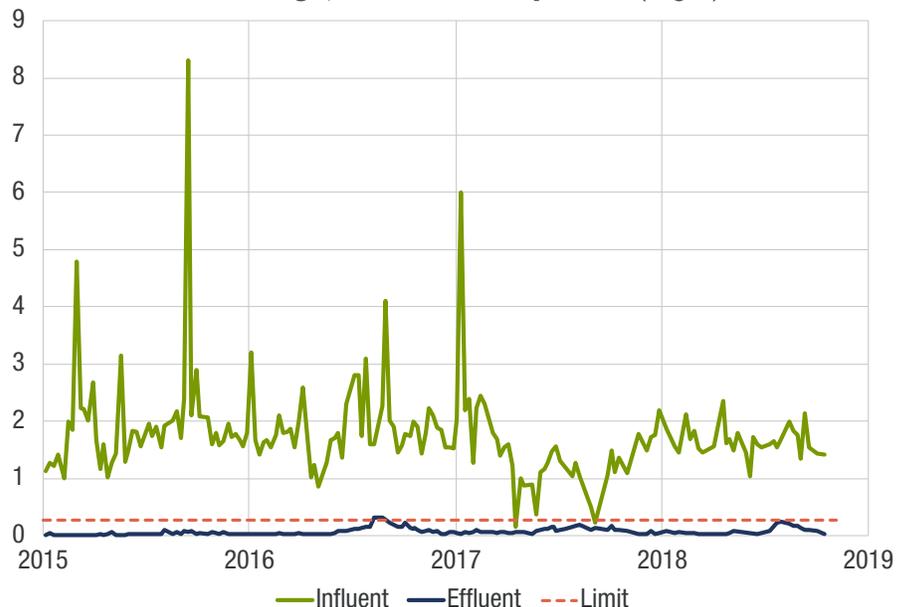
With over three years of data under its belt, the Sundridge plant has seen influent phosphorus as high as 8.3 mg/L, but has demonstrated consistent compliance with its effluent results, with an average effluent phosphorus of 0.07 mg/L (anything below 0.03 mg/L registered as undetectable on the test).

Nexom knows filtration

The Nexom team has been pushing the bounds of filtration for over decade, covering hundreds of projects across the U.S and Canada. Our engineers are the leading experts in a range of technologies and pioneered Blue PRO reactive filtration.

Nexom brings this experience and the patented processes it has developed to the world of disk filters with infini-D. With dozens of sites across North America already using the technology, infini-D is the go-to technology for TSS and phosphorus removal as well as meeting reuse requirements!

Sundridge, ON Total Phosphorus (mg/L)



UPGRADING WITH INFINI-D IS EASY AND EFFECTIVE

1

We walk you through exactly what project details we need. Call 888-426-8180 or email info@nexom.com.

2

We supply design-ready drawings, proprietary technologies, and responsive support.

3

You never worry about your TSS, Turbidity, or Phosphorus levels again.

APPENDIX E: COLLECTION SYSTEM MAPS

APPENDIX F: MARCH 2021 SERVICES SOLD REPORT

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	RESIDENTIAL						
	5/8 X 3/4 W						
	Totals:		301	742961	\$12,864.75	\$0.00	\$12,864.75
	RESIDENTIAL						
	5/8&3/4 SEW RES						
	Totals:		301	742961	\$13,441.85	\$0.00	\$13,441.85
	FLAT RATE SEWER						
	SEWER						
	Totals:		24	0	\$1,091.90	\$0.00	\$1,091.90
	IRRIGATION						
	5/8 X 3/4 NP						
	Totals:		87	1570422	\$3,473.66	\$0.00	\$3,473.66
	MISC WATER						
	5/8 X 3/4 W						
	Totals:		11	32369	\$520.68	\$0.00	\$520.68
	MISC WATER						
	5/8 X 3/4 SEW GS						

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	Totals:		8	27386	\$449.29	\$0.00	\$449.29
	MISC WATER 1 SEW GS						
	Totals:		4	23144	\$475.91	\$0.00	\$475.91
	MISC WATER 1W						
	Totals:		4	23144	\$421.22	\$0.00	\$421.22
	IRRIGATION 3 NP						
	Totals:		3	852993	\$1,953.62	\$0.00	\$1,953.62
	IRRIGATION 2 NP						
	Totals:		26	2383478	\$6,155.46	\$0.00	\$6,155.46
	IRRIGATION 4 NP						
	Totals:		2	503464	\$1,369.23	\$0.00	\$1,369.23

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77
 CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	MISC WATER 2 SEW GS						
	Totals:		2	7456	\$532.79	\$0.00	\$532.79
	MISC WATER 2 W						
	Totals:		2	7456	\$428.45	\$0.00	\$428.45
	RESIDENTIAL LATE_FEE						
	Totals:		14	0	\$98.00	\$0.00	\$98.00
	FLAT RATE SEWER LATE_FEE						
	Totals:		2	0	\$14.00	\$0.00	\$14.00
	COMMERCIAL 1W						
	Totals:		1	9809	\$138.69	\$0.00	\$138.69
	COMMERCIAL						

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	1 SEW GS						
	Totals:		1	9809	\$150.07	\$0.00	\$150.07
	RESIDENTIAL NORMRECCHARGEREG						
	Totals:		7	0	\$266.00	\$0.00	\$266.00
	COMMERCIAL 5/8 X 3/4 W						
	Totals:		5	1583	\$113.94	\$0.00	\$113.94
	COMMERCIAL LATE_FEE						
	Totals:		1	0	\$7.00	\$0.00	\$7.00
	RESIDENTIAL ADJUSTMENT						
	Totals:		1	0	\$-7.00	\$0.00	\$-7.00
	MULTI-FAMILY 2 W						

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	Totals:		5	357263	\$3,881.69	\$0.00	\$3,881.69
	MULTI-FAMILY 2 SEW GS						
	Totals:		5	357263	\$3,949.54	\$0.00	\$3,949.54
	RESIDENTIAL 1SEW RES						
	Totals:		1	734	\$34.43	\$0.00	\$34.43
	RESIDENTIAL 1W						
	Totals:		1	734	\$63.37	\$0.00	\$63.37
	FLAT RATE SEWER NORMRECCHARGEREG						
	Totals:		1	0	\$38.00	\$0.00	\$38.00
	MULTI-FAMILY 3 W						
	Totals:		1	24445	\$569.44	\$0.00	\$569.44

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	MULTI-FAMILY 3 SEW GS		-----	-----	-----	-----	-----
	Totals:		1	24445	\$664.13	\$0.00	\$664.13
	IRRIGATION NORMRECCHARGEREG		-----	-----	-----	-----	-----
	Totals:		1	0	\$38.00	\$0.00	\$38.00
	MULTI-FAMILY LATE_FEE		-----	-----	-----	-----	-----
	Totals:		4	0	\$28.00	\$0.00	\$28.00
	IRRIGATION LATE_FEE		-----	-----	-----	-----	-----
	Totals:		2	0	\$14.00	\$0.00	\$14.00
	MISC WATER LATE_FEE		-----	-----	-----	-----	-----
	Totals:		3	0	\$21.00	\$0.00	\$21.00
	RESIDENTIAL SEWERADJ						

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	Totals:		1	0	\$-33.45	\$0.00	\$-33.45
	RESIDENTIAL WATERADJ						
	Totals:		1	0	\$-79.95	\$0.00	\$-79.95
	IRRIGATION ADJUSTMENT						
	Totals:		1	0	\$-7.00	\$0.00	\$-7.00
	IRRIGATION MISC_CREDIT						
	Totals:		1	0	\$-51.59	\$0.00	\$-51.59
	RESIDENTIAL MISC_DEBIT						
	Totals:		2	0	\$175.26	\$0.00	\$175.26
	IRRIGATION & NP						
	Totals:		1	522228	\$1,858.14	\$0.00	\$1,858.14

SERVICES SOLD

AQUARINA UTILITIES INC.

DATE: 03/29/2021 AUTHOR: AQUAH77

CRITERIA: 02/08/2021 - 03/10/2021

Acct#	Name	Service Location	Count	Usage	Fee	Tax	Total
	IRRIGATION WATERADJ						
	Totals:		3	0	\$-113.33	\$0.00	\$-113.33
	RESIDENTIAL MISC_CREDIT						
	Totals:		1	0	\$-123.67	\$0.00	\$-123.67
	Grand Totals		450	7032349	\$54,885.52	\$0.00	\$54,885.52
	Grand Total Sewer Usage		323	1193198			

APPENDIX G: INFLUENT PUMP STATION DETAILS



woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS



Valbridge
PROPERTY ADVISORS

Appraisal Report

Aquarina Utilities
Aquarina Boulevard and Tract D of Golf Course
Melbourne, Brevard County, Florida 32951

Report Date: 06-15-2021



FOR:

Central States Water Resources
Mr. Todd Thomas
Vice-President
500 Northwest Plaza Drive, Suite 500
St. Ann, Missouri 63074

Client Number:

**Valbridge Property Advisors |
New Orleans**

2030 Dickory Avenue, Suite 200
New Orleans, LA 70123
504.541.5100 phone
504.541.5107 fax
valbridge.com

Valbridge File Number:
LA01-21-0202.000



2030 Dickory Avenue, Suite 200
New Orleans, LA 70123
504.541.5100 phone
504.541.5107 fax
valbridge.com

06-15-2021

Arthur L. Schwertz MAI
504.541.5101
aschwertz@valbridge.com

Mr. Todd Thomas
Vice-President
Central States Water Resources
500 Northwest Plaza Drive, Suite 500
St. Ann, Missouri 63074

RE: Appraisal Report
Aquarina Utilities
Aquarina Boulevard and Tract D of Golf Course
Melbourne, Brevard County, Florida 32951

Dear Mr. Thomas:

In accordance with your request, we have performed an appraisal of the above referenced property. This appraisal report sets forth the pertinent data gathered, the techniques employed, and the reasoning leading to our value opinions. This letter of transmittal does not constitute an appraisal report and the rationale behind the value opinion(s) reported cannot be adequately understood without the accompanying appraisal report.

The subject property, as referenced above, is located in Aquarina PUD and is further identified as tax parcel numbers 2959961. The subject property consists of a total of 16.83-acres or 733,115-square-feet. Of the total, 14.46 acres are easements and 2.37 acres are fee simple area. The subject is the Aquarina Water and Wastewater system.

We developed our analyses, opinions, and conclusions and prepared this report in conformity with the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation; the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute; and the requirements of our client as we understand them.

The client in this assignment is Central States Water Resources and the intended user of this report is Central States Water Resource and no others. The sole intended use is for regulatory filing. The value opinions reported herein are subject to the definitions, assumptions, limiting conditions, and certifications contained in this report.

The findings and conclusions are further contingent upon the following extraordinary assumptions and/or hypothetical conditions, the use of which might have affected the assignment results:

Extraordinary Assumptions:

- The appraiser was unable to locate any documents definitively specifying the location or width of the utility easements. However, a visual inspection of the neighborhood indicates the presence of water and sewer lines near the street frontage and it has been assumed for purposes of this analysis that they lie within a 10' utility easement.

Hypothetical Conditions:

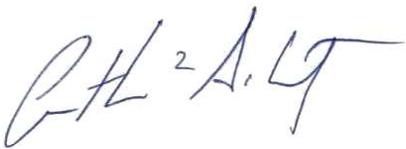
- This appraisal is predicated on the hypothetical condition that the property is unimproved and ready for development.

Based on the analysis contained in the following report, our value conclusions are summarized as follows:

Value Conclusions

Component	As Is	As Is
Value Type	Market Value	Market Value
Property Rights Appraised	Easement	Fee Simple
Effective Date of Value	June 15, 2021	June 15, 2021
Value Conclusion	\$5,290,000	\$2,170,000

Respectfully submitted,
Valbridge Property Advisors | New Orleans



Arthur L. Schwartz, MAI
Senior Managing Director
Florida Certified General
Real Estate Appraiser RZ4249

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Summary of Salient Facts

Property Identification

Property Name	Aquarina Utilities
Property Address	Aquarina Boulevard and Tract D of Golf Course Melbourne, Brevard County, Florida 32951
Latitude & Longitude	27.920687, -80.49019
Tax Parcel Number	2959961
Property Owner	Aquarina Utilities, Inc.

Site

Zoning	Planned Unit Development (PUD)
FEMA Flood Map No.	12009C0711H
Flood Zone	AE
Easement Land Area	629,878 square feet
Fee Simple Land Area	103,237 square feet

Valuation Opinions

Highest & Best Use - As Vacant	Residential
Reasonable Exposure Time	Six months or less
Reasonable Marketing Time	Six months or less

Value Conclusions

Component	As Is	As Is
Value Type	Market Value	Market Value
Property Rights Appraised	Easement	Fee Simple
Effective Date of Value	June 15, 2021	June 15, 2021
Value Conclusion	\$5,290,000	\$2,170,000

Aerial and Front Views

AERIAL VIEW



FRONT VIEW



Location Map



Introduction

Client and Intended Users of the Appraisal

The client in this assignment is Central States Water Resources and the sole intended user of this report is Central States Water Resource. Under no circumstances shall any of the following parties be entitled to use or rely on the appraisal or this appraisal report:

- i. The borrower(s) on any loans or financing relating to or secured by the subject property,
- ii. Any guarantor(s) of such loans or financing; or
- iii. Principals, shareholders, investors, members or partners in such borrower(s) or guarantors.

Intended Use of the Appraisal

The sole intended use of this report is for regulatory filing.

Real Estate Identification

The subject property is located at Aquarina Boulevard and Tract D of Golf Course, Melbourne, Brevard County, Florida 32951. The subject property is further identified by the tax parcel number 2959961.

Legal Description

The subject consist of the easements for water and sewer pipes for the Aquarina Water and Waste water systems as well as tax parcel 2959961.

Use of Real Estate as of the Effective Date of Value

As of the effective date of value, the subject was a utility property.

Use of Real Estate as Reflected in this Appraisal

The opinion of value for the subject as is reflects use as a utility property.

Ownership of the Property

According to Public Records, title to the subject property is vested in Aquarina Utilities, Inc..

History of the Property

Ownership of the subject property has not changed within the past three years.

Analysis of Listings/Offers/Contracts

The subject is not currently listed for sale or under contract for sale..

Type and Definition of Value

The appraisal problem is to develop an opinion of the market value of the subject property. "Market Value," as used in this appraisal, is defined as "the most probable price that a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus." Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

- *Buyer and seller are typically motivated.*
- *Both parties are well informed or well advised, each acting in what they consider their own best interests;*
- *A reasonable time is allowed for exposure in the open market;*
- *Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and*
- *The price represents the normal consideration for the property sold unaffected by special or creative financing or sale concessions granted by anyone associated with the sale."¹*

The value conclusions apply to the value of the subject property under the market conditions presumed on the effective date of value. Please refer to the Glossary in the Addenda section for additional definitions of terms used in this report.

Valuation Scenarios, Property Rights Appraised, and Effective Dates of Value

Per the scope of our assignment we developed opinions of value for the subject property under the following scenarios of value:

Valuation Scenario	Effective Date of Value
As Is Market Value of the Easement Interest	June 15, 2021
As Is Market Value of the Fee Simple Interest	June 15, 2021

We completed an appraisal inspection of the subject property on 01/02/2021.

Date of Report

The date of this report is 06-15-2021.

List of Items Requested but Not Provided

- All information request has been provided.

¹ Source: Code of Federal Regulations, Title 12, Banks and Banking, Part 722.2-Definitions

Assumptions and Conditions of the Appraisal

This appraisal assignment and the opinions reported herein are subject to the General Assumptions and Limiting Conditions contained in the report and the following extraordinary assumptions and/or hypothetical conditions, the use of which might have affected the assignment results.

Extraordinary Assumptions

- The appraiser was unable to locate any documents definitively specifying the location or width of the utility easements. However, a visual inspection of the neighborhood indicates the presence of water and sewer lines near the street frontage and it has been assumed for purposes of this analysis that they lie within a 10' utility easement.

Hypothetical Conditions

- This appraisal is predicated on the hypothetical condition that the property is unimproved and ready for development.

Scope of Work

The elements addressed in the Scope of Work are (1) the extent to which the subject property is identified, (2) the extent to which the subject property is inspected, (3) the type and extent of data researched, (4) the type and extent of analysis applied, (5) the type of appraisal report prepared, and (6) the inclusion or exclusion of items of non-realty in the development of the value opinion. These items are discussed as below.

Extent to Which the Property Was Identified

The three components of the property identification are summarized as follows:

- Legal Characteristics - The subject was legally identified via public records.
- Economic Characteristics - Economic characteristics of the subject property were identified via information provided by the client, public records, market surveys, discussions with market participants, and the files of Valbridge Property Advisors, as well as a comparison to properties with similar locational and physical characteristics.
- Physical Characteristics - The subject was physically identified via a general inspection of the property.

Extent to Which the Property Was Inspected

We inspected the subject on 01/02/2021.

Type and Extent of Data Researched

We researched and analyzed: (1) market area data, (2) property-specific market data, (3) zoning and land-use data, and (4) current data on comparable listings and transactions. We also interviewed people familiar with the subject market/property type.

Type and Extent of Analysis Applied (Valuation Methodology)

We observed surrounding land use trends, the condition of any improvements, demand for the subject property, and relevant legal limitations in concluding a highest and best use. We then valued the subject based on that highest and best use conclusion.

Appraisers develop an opinion of property value with specific appraisal procedures that reflect three distinct methods of data analysis: the Cost Approach, Sales Comparison Approach, and Income Capitalization Approach. One or more of these approaches are used in all estimations of value.

- Sales Comparison Approach - In the Sales Comparison Approach, value is indicated by recent sales and/or listings of comparable properties in the market, with the appraiser analyzing the impact of material differences in both economic and physical elements between the subject and the comparables.
- Direct Capitalization: Land Residual Method - The Land Residual Methodology involves estimating the residual net income to the land by deducting from total potential income the portion attributable to the improvements, assuming development of the site at its highest and best use. The residual income is capitalized at an appropriate rate, resulting in an indication of land value.

- Direct Capitalization: Ground Rent Capitalization – A market derived capitalization rate is applied to the net income resulting from a ground lease. This can represent the leased fee or fee simple interest, depending on whether the income potential is reflective of a lease in place or market rental rates.
- Yield Capitalization: Subdivision Development Method – Also known as Discounted Cash Flow Analysis (DCF), the methodology is most appropriate for land having multiple lot development in the near term as the highest and best use. The current site value is represented by discounting the anticipated cash flow to a present value, taking into consideration all necessary costs of development, maintenance, administration, and sales throughout the absorption period.

All of these approaches to value were considered. We assessed the availability of data and applicability of each approach to value within the context of the characteristics of the subject property and the needs and requirements of the client. Based on this assessment, we relied upon the Sales Comparison Approach. Further discussion of the extent of our analysis and the methodology of each approach is provided later in the respective valuation sections.

Appraisal Conformity and Report Type

We developed our analyses, opinions, and conclusions and prepared this report in conformity with the Uniform Standards of Professional Appraisal Practice (USPAP) of the Appraisal Foundation; the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute; and the requirements of our client as we understand them. This is an Appraisal Report as defined by the Uniform Standards of Professional Appraisal Practice under Standards Rule 2-2a.

Personal Property/FF&E

All items of non-realty are excluded from this analysis. The opinion of market value developed herein is reflective of real estate only.

Overview

The subject is located south of Melbourne in Brevard County, Florida. The Aquarina area is located on a barrier island between the Indian River and Atlantic Ocean. It is primarily a beach and waterfront vacation and wintering community, centered around the Aquarina Beach and Country Club.

Neighborhood Location and Boundaries

The subject neighborhood is located in the Aquarina section of Melbourne. The area is suburban in nature.

The neighborhood is bounded by the city of Melbourne Beach to the north, Atlantic Ocean to the east, Orchid Island to the south, and Indian River to the west.

Transportation Access

Within the immediate area of the subject property, transportation access helps define the character of its development. Major travel and commuter routes within the area of the subject property include Highway A1A. Access to the area is considered not good with the area being located at the midpoint between two bridges accessing the island, each being about 10 miles away.

Neighborhood Land Use

The subject neighborhood is located in an area with primarily residential land uses. An approximate breakdown of the development in the area is as follows:

LAND USES	
Developed	50%
<i>Residential</i>	90%
<i>Retail</i>	10%
<i>Office</i>	0%
<i>Industrial</i>	0%
Vacant	50%
Total	100%

Land Use Trends

The neighborhood is not experiencing a change in land use. Of the undeveloped vacant land, most if not all, are protected wetlands and state parks. Nearby uses follow: Beach clubs, golf courses, single family housing, lodging, limited retail.

Demographics

The following table depicts the area demographics surrounding the subject within a one-, three-, and five-mile radius from the subject.

Neighborhood Demographics

Radius (Miles)	1 Mile	3 Mile	5 Mile
Population Summary			
2010 Population	963	6,293	15,027
2020 Population Estimate	1,077	7,174	16,909
2025 Population Projection	1,136	7,628	17,880
Annual % Change (2020 - 2025)	1.1%	1.2%	1.1%
Housing Unit Summary			
2010 Housing Units	811	4,342	10,029
% Owner Occupied	49.0%	65.8%	68.8%
% Renter Occupied	9.6%	7.9%	8.5%
2020 Housing Units	883	4,778	10,951
% Owner Occupied	49.7%	67.2%	69.9%
% Renter Occupied	10.0%	8.2%	8.8%
2025 Housing Units	928	5,046	11,495
% Owner Occupied	49.9%	67.5%	70.2%
% Renter Occupied	9.9%	8.3%	8.8%
Annual % Change (2020 - 2025)	1.1%	1.1%	1.0%
Income Summary			
2020 Median Household Income Estimate	\$80,905	\$54,639	\$50,030
2025 Median Household Income Projection	\$86,127	\$59,416	\$54,026
Annual % Change	1.3%	1.7%	1.6%
2020 Per Capita Income Estimate	\$54,328	\$40,816	\$36,108
2025 Per Capita Income Projection	\$60,548	\$45,445	\$40,322
Annual % Change	2.2%	2.2%	2.2%

Source: ESRI (ArcGIS)

(Lat: 27.920687, Lon: -80.49019)

Within a three-mile radius, the reported population is 7,174 with a projected growth rate of approximately 1.2% annually. There are 4,778 housing units within that three-mile radius. The growth rate is expected to be 1.1% annually. Most of the housing is owner-occupied. Our research indicates that property values in the area are stable.

Within a three-mile radius, the median household income is \$54,639. Looking ahead, annual household income growth is projected at **1.7%** per year. The average income figures suggest that the inhabitants are within the middle to upper income brackets.

Nuisances & External Obsolescence

Neighborhood properties have adequate levels of maintenance. No adverse or unfavorable factors were observed.

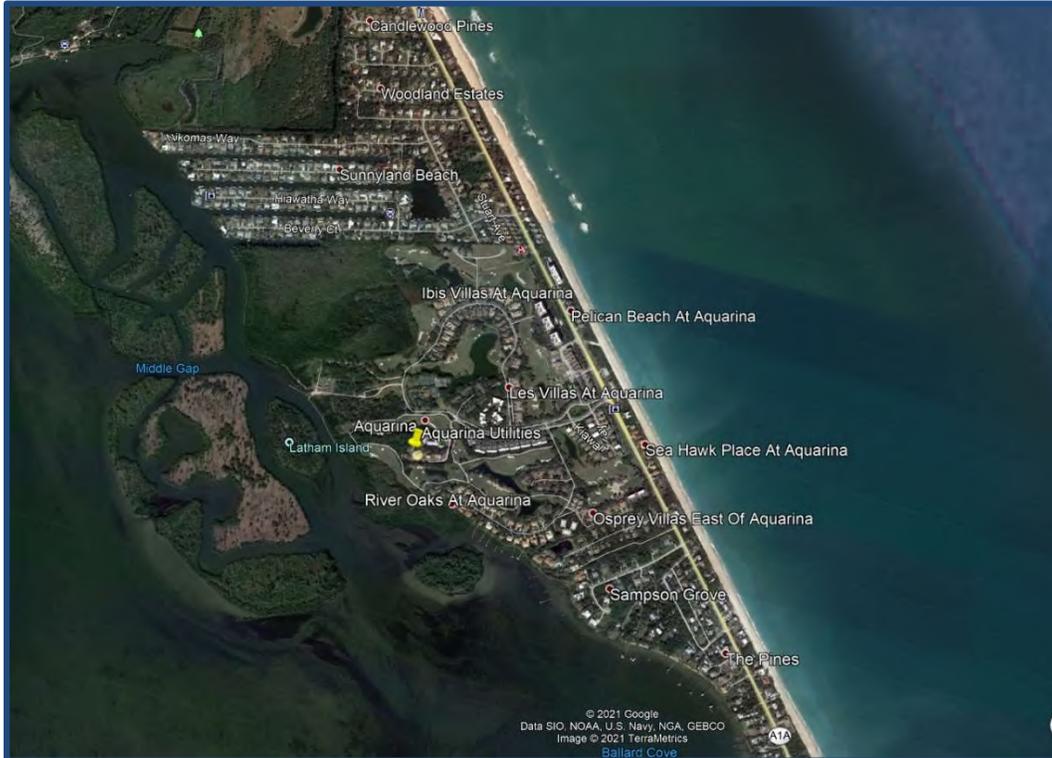
Neighborhood Life Cycle

Most neighborhoods are classified as being in four stages: **growth**, **stability**, **decline**, and **renewal**. Overall, the subject neighborhood is in the Stable stage of its life cycle.

Immediate Area Uses

The below aerial photo exhibits the uses located in the subject's immediate vicinity.

IMMEDIATE AREA USES



Source: Google Maps

Uses in the vicinity of the subject are primarily residential in nature. As shown above, the density of uses in the area is high on the areas that can be developed.

Analysis and Conclusions

The neighborhood is characterized by being a vacation and wintering community on the Atlantic Ocean and Indian River.

Site Description

The subject site is located in Aquarina PUD. The characteristics of the site are summarized as follows:

Site Characteristics

Gross Land Area:	16.83 Acres or 733,115 SF
Fee Simple Land Area:	2.37 Acres or 103,237 SF
Easement Land Area:	14.46 Acres or 629,878 SF
Shape:	Irregular
Topography:	Level
Drainage:	Adequate
Utilities:	All are available

Flood Zone Data

Flood Map Panel/Number:	12009C0711H
Flood Map Date:	01-29-2021
Portion in Flood Hazard Area:	100.00%
Flood Zone:	AE

Flood Zone AE is an area of special flood hazards. Properties in this classification generally require flood insurance for mortgage lending and is generally recommended.

Adjacent Land Uses

North:	Land
South:	Land
East:	Atlantic ocean
West:	Indian River

Zoning Designation

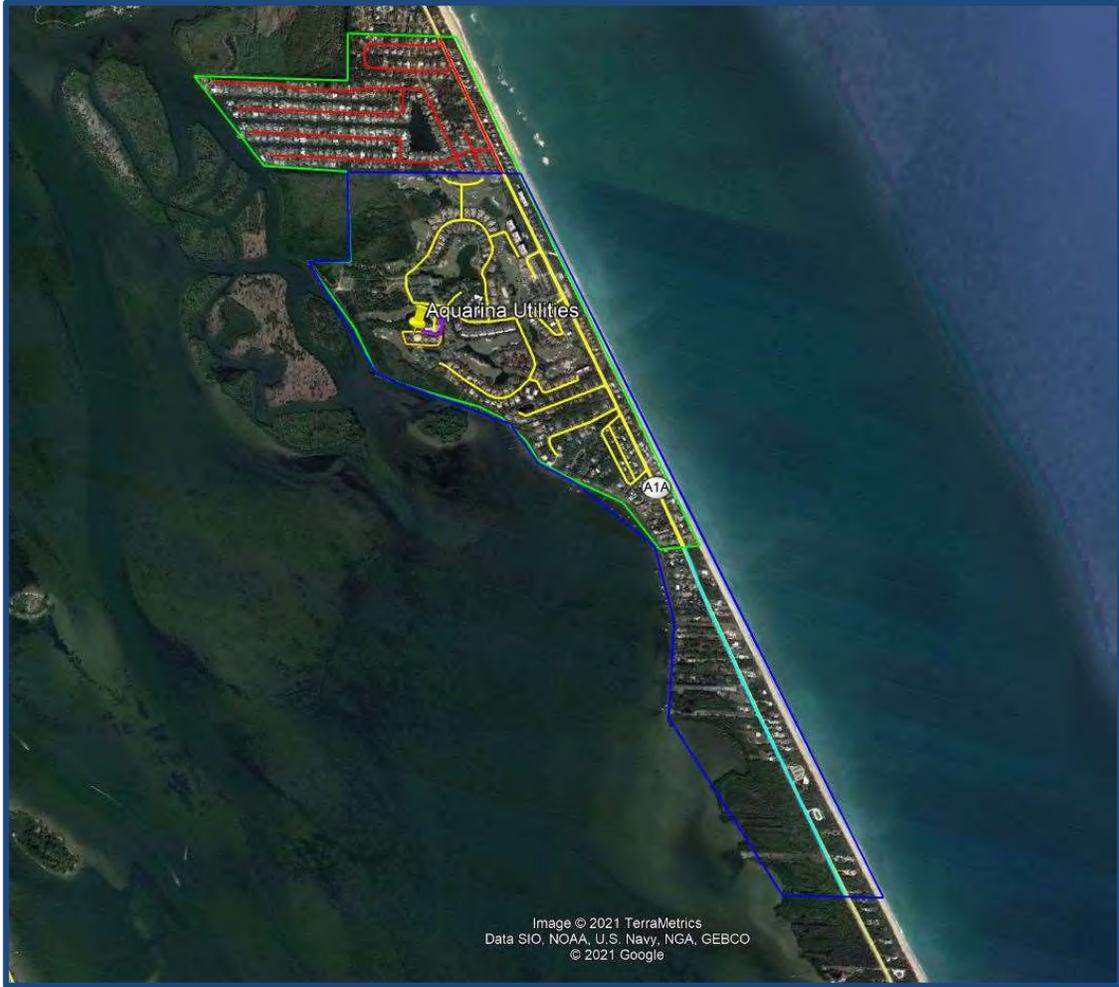
Zoning Jurisdiction:	Brevard County
Zoning Classification:	PUD, Planned Unit Development
General Plan Designation:	Land
Permitted Uses:	Land, open space, utilities

Zoning Comments: For the purpose of this subdivision, certain words and terms used in this subdivision shall be defined as provided in this section. Words used in the present tense shall include the future tense, words used in the singular number shall include the plural number, and words used in the plural number shall include the singular number. The word "shall" is mandatory. The word "person" includes any individual, group of persons, firm, corporation, association or organization, and any legal public entity.

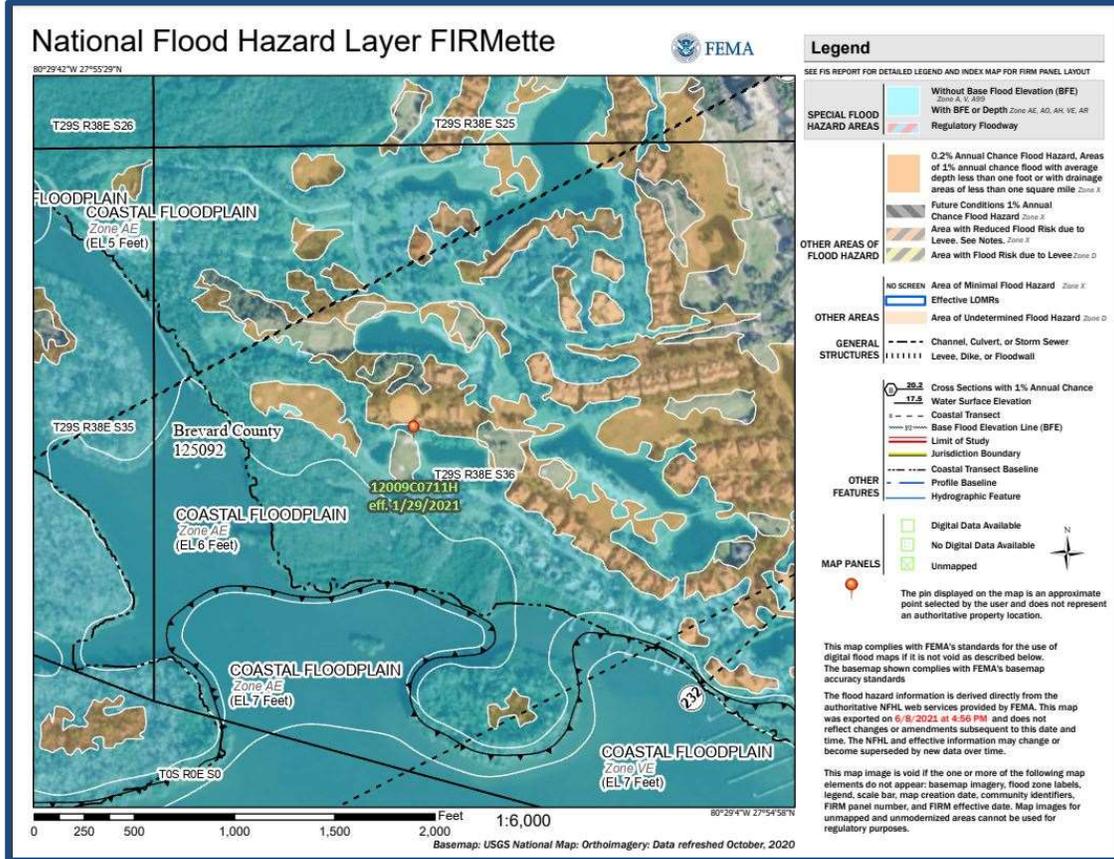
Analysis/Comments on Site

The subject is a water and wastewater system. The service areas of each overlap but are not entirely the same area. The total system consists of 2.37 acres of fee simple area and 14.46 acres of easements

SERVICE AREA MAP



FLOOD MAP



ZONING MAP



Subject Photographs





?? Caption here.



Additional photos are included in the Addenda.

Highest and Best Use

The Highest and Best Use of a property is the use that is legally permissible, physically possible, and financially feasible which results in the highest value. An opinion of the highest and best use results from consideration of the criteria noted above under the market conditions or likely conditions as of the effective date of value. Determination of highest and best use results from the judgment and analytical skills of the appraiser. It represents an opinion, not a fact. In appraisal practice, the concept of highest and best use represents the premise upon which value is based.

Analysis of Highest and Best Use As Though Vacant

The primary determinants of the highest and best use of the property As Though Vacant are the issues of (1) Legal permissibility, (2) Physical possibility, (3) Financial feasibility, and (4) Maximum productivity.

Legally Permissible

The subject site is zoned PUD, Planned Unit Development which controls the general nature of permissible uses but is appropriate for the location and physical elements of the subject property, providing for a consistency of use with the general neighborhood. The location of the subject property is appropriate for the uses allowed, as noted previously, and a change in zoning is unlikely. There are no known easements, encroachments, covenants or other use restrictions that would unduly limit or impede development.

Physically Possible

The physical attributes allow for a number of potential uses. Elements such as size, shape, availability of utilities, known hazards (flood, environmental, etc.), and other potential influences are described in the Site Description and have been considered. There are no items of a physical nature which would adversely impact development with the legal permitted uses.

Financially Feasible

The probable use of the site for residential development conforms to the pattern of land use in the market area. A review of published yield, rental and occupancy rates suggest that there is a balanced supply and demand is sufficient to support construction costs and ensure timely absorption of additional inventory in this market. Therefore, near-term speculative development of the subject site is financially feasible.

Maximally Productive

Among the financially feasible uses, the use that results in the highest value (the maximally productive use) is the highest and best use. Considering these factors, the maximally productive use as though vacant is for residential use.

Conclusion of Highest and Best Use As Though Vacant

The conclusion of the highest and best use As Though Vacant is for residential use.

Most Probable Buyer

As of the date of value, the most probable buyer of the subject property is an owner user.

Land Valuation

Methodology

Site Value is most often estimated using the sales comparison approach. This approach develops an indication of market value by analyzing closed sales, listings, or pending sales of properties similar to the subject, focusing on the difference between the subject and the comparables using all appropriate elements of comparison. This approach is based on the principles of supply and demand, balance, externalities, and substitution, or the premise that a buyer would pay no more for a specific property than the cost of obtaining a property with the same quality, utility, and perceived benefits of ownership.

The process of developing the sales comparison approach consists of the following analyses: (1) researching and verifying transactional data, (2) selecting relevant units of comparison, (3) analyzing and adjusting the comparable sales for differences in various elements of comparison, and (4) reconciling the adjusted sales into a value indication for the subject site.

Unit of Comparison

The unit of comparison depends on land use economics and how buyers and sellers use the property. The unit of comparison in this analysis is per usable square foot.

Elements of Comparison

Elements of comparison are the characteristics or attributes of properties and transactions that cause the prices of real estate to vary. The primary elements of comparison considered in sales comparison analysis are as follows: (1) property rights conveyed, (2) financing terms, (3) conditions of sale, (4) expenditures made immediately after purchase, (5) market conditions, (6) location and (7) physical characteristics.

Comparable Sales Data

To obtain and verify comparable sales of vacant land properties, we conducted a search of public records, field surveys, interviews with knowledgeable real estate professionals in the area, and a review of our internal database.

We included seven sales in our analysis, as these sales were judged to be the most comparable to develop an indication of market value for the subject property.

The following is a table summarizing each sale comparable and a map illustrating the location of each in relation to the subject.

Land Sales Summary

	Sale # 1	Sale # 2	Sale # 3	Sale # 4	Sale # 5	Sale # 6	Sale # 7
Sale ID	1539297	1539809	1539797	1539740	1539672	1539720	1539685
Property Name	143 Ballard Cove Lane	7462 Matanilla Reef Way	400 Hammock Shore Drive	410 Hammock Shore Drive	Vacant Land - Lot 4-A E Sunnyland Subdivision	Vacant Land - Tract A, Aquarina P.U.D. Stage 2	8087 Highway A1A
Sale Status	Closed	Closed	Closed	Closed	Closed	Closed	Closed
Location	143 Ballard Cove Lane Melbourne, Florida	7462 Matanilla Reef Way Melbourne, Florida	400 Hammock Shore Drive Melbourne, Florida	410 Hammock Shore Drive Melbourne, Florida	Unassigned Melbourne, Florida	Not Assigned Melbourne, Florida	8087 Highway A1A Melbourne, Florida
Tax ID	29-38-36-75-*9	29-38-36-WL-B-2	29-38-36-30-*14	29-38-36-30-*13, 29-38-36-30-D.1	29-38-36-01-*4.A3	29-38-36-05-A.4	29-39-31-00-506

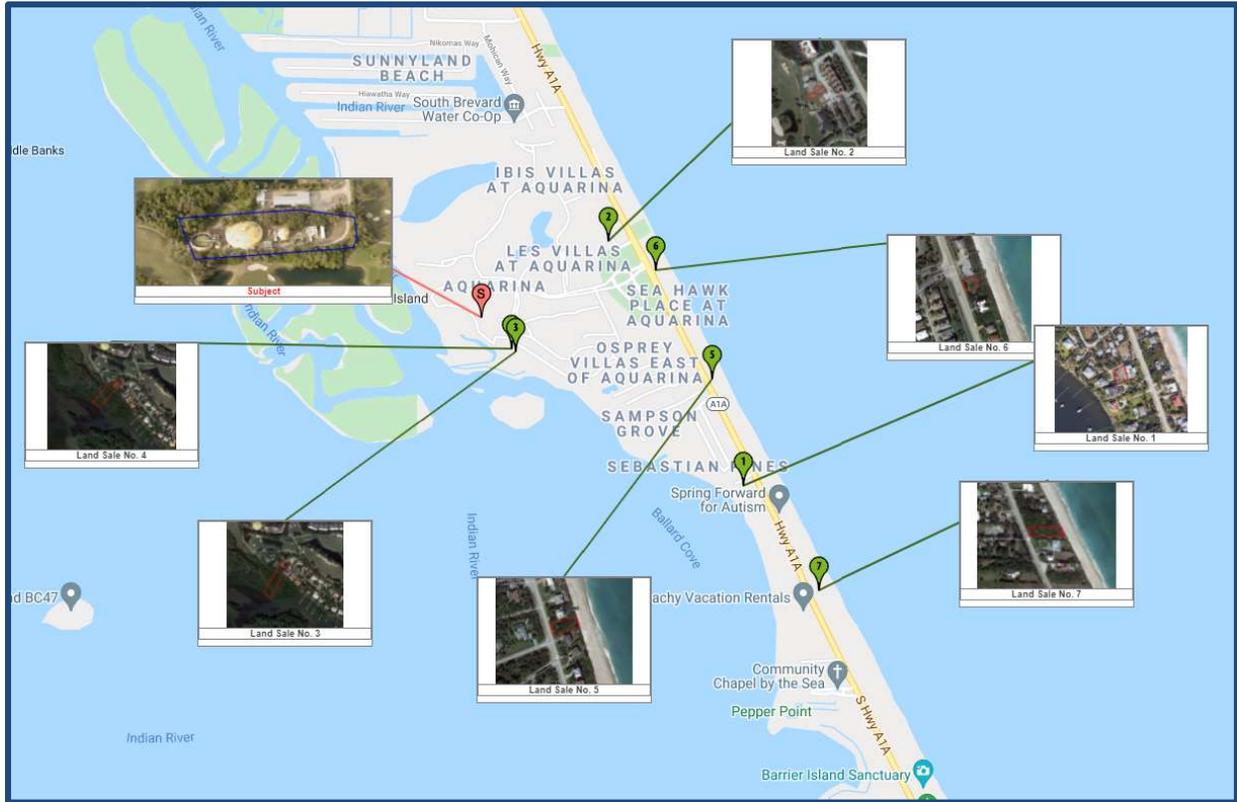
Sales Data

Date of Sale	10/15/2020	5/11/2021	12/18/2020	3/30/2021	3/21/2019	6/17/2020	10/27/2020
Sales Price	\$125,000	\$250,000	\$250,000	\$355,000	\$450,000	\$300,000	\$635,000
Price/Usable Square Foot	\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Grantor	Ocean to River LLC	Phoenix Park Construction LLC	Commercial Building Group	Earl Slattum	Carlton Hargrove	Larry Sazant	Casa del Mar LLC
Grantee	Ballard Beach LLC	Eric Steffe	Laura & Peter Murphy	Brian & Sage Lajoie	Dana & Patrick McDonough	Florida Development of Treasure Coast, Inc.	David & Desiree Settgast Revocable Trust
Recording Number	2020228204	2021129041	2020287977	2021082118	2019060857	2020132246	2020240794
Book/Page Number	8888/20	9126/1838	8960/2852	9071/1295	8397/2875	8774/85	8903/524
Document Number							
Property Rights Conveyed	Fee Simple	Fee Simple	Fee Simple	Fee Simple	Fee Simple	Fee Simple	Fee Simple
Financing	Cash to Seller	Cash to Seller	Cash to Seller	Cash to Seller	Cash to Seller	Cash to Seller	Cash to Seller
Conditions of Sale	Typical	Typical	Typical	Typical	Typical	Typical	Typical

Physical Characteristics

Usable Land Area (Sq. Ft.)	9,583	6,534	13,068	14,375	16,117	6,534	29,621
Gross Land Area (Sq. Ft.)	9,583	6,534	40,511	49,658	16,117	6,534	29,621
Zoning	R-1	R-1	R-1	R-1	R-1	R-2	R-1
Flood Zone	Zone X	Zone X	Zone AE	Zone AE	Zone VE	Zone VE	Zone VE
Topography	Level	Level	Varies	Mostly level with some small wooded areas	Basically level and wooded	Level	Basically level and wooded
Shape	Trapezoidal	Irregular	Irregular	Irregular	Trapezoidal	Square	Trapezoidal
Utilities	Unknown	Unkown	Unknown	Unknown	Unknown	Unknown	Unknown
Corner Exposure	Interior	Interior	Interior	Interior	Interior	Interior	Interior
Access/Visibility	Good/Average	Good/Good	Good/Good	Good/Good	Good/Good	Good/Good	Good/Good
Primary Frontage	90 feet on Ballard Cove Lane	48 feet on Golf Course	90 feet on Indian River	121 feet on Indian River frontage	58 feet on Ocean Front	75 feet on Ocean Front	102 feet on Ocean Front
Secondary Frontage	feet on	54 feet on Matanilla Reef Way	feet on	feet on	84 feet on Highway A1A	75 feet on Highway A1A	95 feet on Highway A1A
Proposed Use	Single Family Residential	Single Family Residential	Single Family Residential	Single Family Residential	Single Family Residential	Undisclosed	Single Family Residential

COMPARABLE SALES MAP



Land Sales Comparison Analysis

When necessary, adjustments were made for differences in various elements of comparison, including property rights conveyed, financing terms, conditions of sale, expenditures made immediately after purchase, market conditions, location, and other physical characteristics. If the element in comparison is considered superior to that of the subject, we applied a negative adjustment. Conversely, a positive adjustment was applied if inferior. A summary of the elements of comparison follows.

Elements of Comparison	
Real Property Rights Conveyed	Adjustments for differences in property rights appraised.
Financing Terms	Comparable properties are adjusted for differences between a transaction's financing terms and those assumed in the valuation of the subject property - e.g. seller financing, loan assumption, non-market terms.
Conditions of Sale	Comparable properties are adjusted for differences in the motivations of either the buyer or a seller in the transaction. In the instant case, no adjustments are required.
Expenditures After Purchase	Comparable properties can be adjusted for any additional investment required to make the property salable – e. g. costs to cure deferred maintenance, costs to demolish and remove any portion of the improvements, costs to remediate environmental contamination and/or costs to occupy or stabilize the property.
Market Conditions	Comparable properties can be adjusted for changes in market conditions because of inflation, deflation, fluctuations in supply and demand, or other factors.
Location	Location adjustments may be required when the locational characteristics of a comparable are different from those of the subject.
Size	The size adjustment addresses variance in the physical size of the comparables and that of the subject, as a larger parcel typically commands a lower price per unit than a smaller parcel. As this is an estimate of the Across the Fence Value, it is assumed that the subject would be part of a lot similar in size to the comparables. As such, no positive adjustments for size are warranted.
Shape /Depth	This element address variance in utility due to shape and/or depth. No adjustments are warranted.
Corner Exposure	Tracts featuring corner influence typically command higher prices in the market place, as opposed to interior locations. As the subject includes both corner and interior lots, no adjustments are warranted.

Summary of Adjustments

Presented on the following page is a summary of the adjustments made to the sale comparables. As noted earlier, these quantitative adjustments were based on our market research, best judgment, and experience in the appraisal of similar properties.

LAND SALES ADJUSTMENT GRID

	Subject	Sale # 1	Sale # 2	Sale # 3	Sale # 4	Sale # 5	Sale # 6	Sale # 7
Sale ID		1539297	1539809	1539797	1539740	1539672	1539720	1539685
Date of Value & Sale	June-21	October-20	May-21	December-20	March-21	March-19	June-20	October-20
Unadjusted Sales Price		\$125,000	\$250,000	\$250,000	\$355,000	\$450,000	\$300,000	\$635,000
Usable Square Feet	103,237	9,583	6,534	13,068	14,375	16,117	6,534	29,621
Unadjusted Sales Price per Usable Sq. Ft.		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Transactional Adjustments								
Property Rights Conveyed	<i>Easement</i>	<i>Fee Simple</i>	<i>Fee Simple</i>	<i>Fee Simple</i>	<i>Fee Simple</i>	<i>Fee Simple</i>	<i>Fee Simple</i>	<i>Fee Simple</i>
Adjusted Sales Price		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Financing Terms	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>	<i>Cash to Seller</i>
Adjusted Sales Price		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Conditions of Sale	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>	<i>Typical</i>
Adjusted Sales Price		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Expenditures after Sale								
Adjusted Sales Price		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Market Conditions Adjustments								
Elapsed Time from Date of Value		<i>0.67 years</i>	<i>0.10 years</i>	<i>0.49 years</i>	<i>0.21 years</i>	<i>2.24 years</i>	<i>0.99 years</i>	<i>0.63 years</i>
Market Trend Through	June-21	-	-	-	-	-	-	-
Analyzed Sales Price		\$13.04	\$38.26	\$19.13	\$24.70	\$27.92	\$45.91	\$21.44
Physical Adjustments								
Location	<i>Aquarina Boulevard and Tract D of Golf Course</i> <i>Melbourne, Florida</i>	<i>143 Ballard Cove Lane</i> <i>Melbourne, Florida</i>	<i>7462 Matanilla Reef Way</i> <i>Melbourne, Florida</i>	<i>400 Hammock Shore Drive</i> <i>Melbourne, Florida</i>	<i>410 Hammock Shore Drive</i> <i>Melbourne, Florida</i>	<i>Unassigned</i> <i>Melbourne, Florida</i>	<i>Not Assigned</i> <i>Melbourne, Florida</i>	<i>8087 Highway A1A</i> <i>Melbourne, Florida</i>
Adjustment		-	-	-	-	-	-	-
Size	<i>103,237 sf</i>	<i>9,583 sf</i>	<i>6,534 sf</i>	<i>13,068 sf</i>	<i>14,375 sf</i>	<i>16,117 sf</i>	<i>6,534 sf</i>	<i>29,621 sf</i>
Adjustment		-10.0%	-15.0%	-	-	-	-15.0%	10.0%
Waterfront		<i>None</i>	<i>None</i>	<i>Indian River Front</i>	<i>Indian River Front</i>	<i>Ocean Front</i>	<i>Ocean Front</i>	<i>Ocean Front</i>
Adjustment		-	-	-	-	-	-	-
Net Physical Adjustment		-10.0%	-15.0%	-	-	-	-15.0%	10.0%
Adjusted Sales Price per Usable Square Foot		\$11.74	\$32.52	\$19.13	\$24.70	\$27.92	\$39.03	\$23.58

Conclusion

From the market data available, we used seven land sales in competitive market areas which were adjusted based on pertinent elements of comparison. The following table summarizes the unadjusted and adjusted unit prices:

Land Sale Statistics

Metric	Unadjusted	Analyzed	Adjusted
Min. Sales Price per Usable Square Foot	\$13.04	\$13.04	\$11.74
Max. Sales Price per Usable Square Foot	\$45.91	\$45.91	\$39.03
Median Sales Price per Usable Square Foot	\$24.70	\$24.70	\$24.70
Mean Sales Price per Usable Square Foot	\$27.20	\$27.20	\$25.52

Due to the large differences in values for the properties with differing waterfront features, the weighted average of the amounts of these property types was calculate. The chart below summarizes this process:

Weighted Averages

Land Type	Percentage	\$/SF	Weighted \$/Sf
Ocean Front	17%	\$30.00	\$5.10
River Front	37%	\$22.00	\$8.14
Off Water	46%	\$17.00	\$7.82
Total	100%		\$21.00

Based on the adjusted prices and the most comparable sale, a unit value for the subject property is near the middle of the adjusted range, or \$21.50 per usable square foot. Thus, the estimated "Across the Fence Value" of the Fee Simple Interest in the subject easements is calculated to be \$13,542,000.

Valuation of the Fee Simple Area

Based on the adjusted prices and the most comparable sale, a unit value for the subject property is near the middle of the adjusted range, or \$21.50 per usable square foot. Thus, based upon the assumptions, reasoning and comparable data discussed herein, the estimated "Market Value" of the subject Fee Simple area is calculated as follows:

Calculation of Fee Simple Value

Site Area		Unit Value	=	Market Value
103,237 Square Feet	X	\$21.00	=	\$2,170,000

Valuation of the Easement

The use to which the subject easements will be put to is for underground water and sewer pipes. As such, little or no surface improvements will be possible, but access across the surface will be allowed. It is my opinion, therefore, that such an easement will encumber approximately 40% of the ownership rights in the subject.

Thus, based upon the assumptions, reasoning and comparable data discussed herein, the estimated "Market Value" of the subject easements is calculated as follows:

Calculation of Easement Value

Calculation of Easement Value				Indicated Value of Easement		
Site Area		Unit Value	Market Value of Fee	Easement Use		Indicated Value of Easement
629,878 square feet	X	\$21.50 PSF	= \$13,542,000	X	40%	\$5,420,000

Exposure Time and Marketing Period

Based on statistical information about days on market, escrow length, and marketing times gathered through national investor surveys, sales verification, and interviews of market participants, marketing and exposure time estimates of six months or less and six months or less, respectively, are considered reasonable and appropriate for the subject property.

General Assumptions and Limiting Conditions

This appraisal is subject to the following general assumptions and limiting conditions:

1. The legal description – if furnished to us – is assumed to be correct.
2. No responsibility is assumed for legal matters, questions of survey or title, soil or subsoil conditions, engineering, availability or capacity of utilities, or other similar technical matters. The appraisal does not constitute a survey of the property appraised. All existing liens and encumbrances have been disregarded and the property is appraised as though free and clear, under responsible ownership and competent management unless otherwise noted.
3. Unless otherwise noted, the appraisal will value the property as though free of contamination. Valbridge Property Advisors | New Orleans will conduct no hazardous materials or contamination inspection of any kind. It is recommended that the client hire an expert if the presence of hazardous materials or contamination poses any concern.
4. The stamps and/or consideration placed on deeds used to indicate sales are in correct relationship to the actual dollar amount of the transaction.
5. Unless otherwise noted, it is assumed there are no encroachments, zoning violations or restrictions existing in the subject property.
6. The appraiser is not required to give testimony or attendance in court by reason of this appraisal, unless previous arrangements have been made.
7. Unless expressly specified in the engagement letter, the fee for this appraisal does not include the attendance or giving of testimony by Appraiser at any court, regulatory or other proceedings, or any conferences or other work in preparation for such proceeding. If any partner or employee of Valbridge Property Advisors | New Orleans is asked or required to appear and/or testify at any deposition, trial, or other proceeding about the preparation, conclusions or any other aspect of this assignment, client shall compensate Appraiser for the time spent by the partner or employee in appearing and/or testifying and in preparing to testify according to the Appraiser's then current hourly rate plus reimbursement of expenses.
8. The values for land and/or improvements, as contained in this report, are constituent parts of the total value reported and neither is (or are) to be used in making a summation appraisal of a combination of values created by another appraiser. Either is invalidated if so used.
9. The dates of value to which the opinions expressed in this report apply are set forth in this report. We assume no responsibility for economic or physical factors occurring at some point at a later date, which may affect the opinions stated herein. The forecasts, projections, or operating estimates contained herein are based on current market conditions and anticipated short-term supply and demand factors and are subject to change with future conditions. Appraiser is not responsible for determining whether the date of value requested by Client is appropriate for Client's intended use.
10. The sketches, maps, plats and exhibits in this report are included to assist the reader in visualizing the property. The appraiser has made no survey of the property and assumed no responsibility in connection with such matters.
11. The information, estimates and opinions, which were obtained from sources outside of this office, are considered reliable. However, no liability for them can be assumed by the appraiser.

12. Possession of this report, or a copy thereof, does not carry with it the right of publication. Neither all, nor any part of the content of the report, or copy thereof (including conclusions as to property value, the identity of the appraisers, professional designations, reference to any professional appraisal organization or the firm with which the appraisers are connected), shall be disseminated to the public through advertising, public relations, news, sales, or other media without prior written consent and approval.
13. No claim is intended to be expressed for matters of expertise that would require specialized investigation or knowledge beyond that ordinarily employed by real estate appraisers. We claim no expertise in areas such as, but not limited to, legal, survey, structural, environmental, pest control, mechanical, etc.
14. This appraisal was prepared for the sole and exclusive use of the client for the function outlined herein. Any party who is not the client or intended user identified in the appraisal or engagement letter is not entitled to rely upon the contents of the appraisal without express written consent of Valbridge Property Advisors | New Orleans and Client. The Client shall not include partners, affiliates, or relatives of the party addressed herein. The appraiser assumes no obligation, liability or accountability to any third party.
15. Distribution of this report is at the sole discretion of the client, but third-parties not listed as an intended user on the face of the appraisal or the engagement letter may not rely upon the contents of the appraisal. In no event shall client give a third-party a partial copy of the appraisal report. We will make no distribution of the report without the specific direction of the client.
16. This appraisal shall be used only for the function outlined herein, unless expressly authorized by Valbridge Property Advisors | New Orleans.
17. This appraisal shall be considered in its entirety. No part thereof shall be used separately or out of context.
18. Unless otherwise noted in the body of this report, this appraisal assumes that the subject property does not fall within the areas where mandatory flood insurance is effective. Unless otherwise noted, we have not completed nor have we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property. Because the appraiser is not a surveyor, he or she makes no guarantees, express or implied, regarding this determination.
19. The flood maps are not site specific. We are not qualified to confirm the location of the subject property in relation to flood hazard areas based on the FEMA Flood Insurance Rate Maps or other surveying techniques. It is recommended that the client obtain a confirmation of the subject property's flood zone classification from a licensed surveyor.
20. If the appraisal is for mortgage loan purposes 1) we assume satisfactory completion of improvements if construction is not complete, 2) no consideration has been given for rent loss during rent-up unless noted in the body of this report, and 3) occupancy at levels consistent with our "Income and Expense Projection" are anticipated.
21. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures which would render it more or less valuable. No responsibility is assumed for such conditions or for engineering which may be required to discover them.

22. Our inspection included an observation of the land and improvements thereon only. It was not possible to observe conditions beneath the soil or hidden structural components within the improvements. We inspected the buildings involved, and reported damage (if any) by termites, dry rot, wet rot, or other infestations as a matter of information, and no guarantee of the amount or degree of damage (if any) is implied. Condition of heating, cooling, ventilation, electrical and plumbing equipment is considered to be commensurate with the condition of the balance of the improvements unless otherwise stated. Should the client have concerns in these areas, it is the client's responsibility to order the appropriate inspections. The appraiser does not have the skill or expertise to make such inspections and assumes no responsibility for these items.
23. This appraisal does not guarantee compliance with building code and life safety code requirements of the local jurisdiction. It is assumed that all required licenses, consents, certificates of occupancy or other legislative or administrative authority from any local, state or national governmental or private entity or organization have been or can be obtained or renewed for any use on which the value conclusion contained in this report is based unless specifically stated to the contrary.
24. When possible, we have relied upon building measurements provided by the client, owner, or associated agents of these parties. In the absence of a detailed rent roll, reliable public records, or "as-built" plans provided to us, we have relied upon our own measurements of the subject improvements. We follow typical appraisal industry methods; however, we recognize that some factors may limit our ability to obtain accurate measurements including, but not limited to, property access on the day of inspection, basements, fenced/gated areas, grade elevations, greenery/shrubbery, uneven surfaces, multiple story structures, obtuse or acute wall angles, immobile obstructions, etc. Professional building area measurements of the quality, level of detail, or accuracy of professional measurement services are beyond the scope of this appraisal assignment.
25. We have attempted to reconcile sources of data discovered or provided during the appraisal process, including assessment department data. Ultimately, the measurements that are deemed by us to be the most accurate and/or reliable are used within this report. While the measurements and any accompanying sketches are considered to be reasonably accurate and reliable, we cannot guarantee their accuracy. Should the client desire more precise measurement, they are urged to retain the measurement services of a qualified professional (space planner, architect or building engineer) as an alternative source. If this alternative measurement source reflects or reveals substantial differences with the measurements used within the report, upon request of the client, the appraiser will submit a revised report for an additional fee.
26. In the absence of being provided with a detailed land survey, we have used assessment department data to ascertain the physical dimensions and acreage of the property. Should a survey prove this information to be inaccurate, upon request of the client, the appraiser will submit a revised report for an additional fee.
27. If only preliminary plans and specifications were available for use in the preparation of this appraisal, and a review of the final plans and specifications reveals substantial differences upon request of the client the appraiser will submit a revised report for an additional fee.

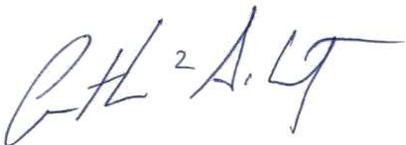
28. Unless otherwise stated in this report, the value conclusion is predicated on the assumption that the property is free of contamination, environmental impairment or hazardous materials. Unless otherwise stated, the existence of hazardous material was not observed by the appraiser and the appraiser has no knowledge of the existence of such materials on or in the property. The appraiser, however, is not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation or other potentially hazardous materials may affect the value of the property. No responsibility is assumed for any such conditions, or for any expertise or engineering knowledge required for discovery. The client is urged to retain an expert in this field, if desired.
29. The Americans with Disabilities Act ("ADA") became effective January 26, 1992. We have not made a specific compliance survey of the property to determine if it is in conformity with the various requirements of the ADA. It is possible that a compliance survey of the property, together with an analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this could have a negative effect on the value of the property. Since we have no direct evidence relating to this issue, we did not consider possible noncompliance with the requirements of ADA in developing an opinion of value.
30. This appraisal applies to the land and building improvements only. The value of trade fixtures, furnishings, and other equipment, or subsurface rights (minerals, gas, and oil) were not considered in this appraisal unless specifically stated to the contrary.
31. No changes in any federal, state or local laws, regulations or codes (including, without limitation, the Internal Revenue Code) are anticipated, unless specifically stated to the contrary.
32. Any income and expense estimates contained in the appraisal report are used only for the purpose of estimating value and do not constitute prediction of future operating results. Furthermore, it is inevitable that some assumptions will not materialize and that unanticipated events may occur that will likely affect actual performance.
33. Any estimate of insurable value, if included within the scope of work and presented herein, is based upon figures developed consistent with industry practices. However, actual local and regional construction costs may vary significantly from our estimate and individual insurance policies and underwriters have varied specifications, exclusions, and non-insurable items. As such, we strongly recommend that the Client obtain estimates from professionals experienced in establishing insurance coverage. This analysis should not be relied upon to determine insurance coverage and we make no warranties regarding the accuracy of this estimate.
34. The data gathered in the course of this assignment (except data furnished by the Client) shall remain the property of the Appraiser. The appraiser will not violate the confidential nature of the appraiser-client relationship by improperly disclosing any confidential information furnished to the appraiser. Notwithstanding the foregoing, the Appraiser is authorized by the client to disclose all or any portion of the appraisal and related appraisal data to appropriate representatives of the Appraisal Institute if such disclosure is required to enable the appraiser to comply with the Bylaws and Regulations of such Institute now or hereafter in effect.

35. You and Valbridge Property Advisors | New Orleans both agree that any dispute over matters in excess of \$5,000 will be submitted for resolution by arbitration. This includes fee disputes and any claim of malpractice. The arbitrator shall be mutually selected. If Valbridge Property Advisors | New Orleans and the client cannot agree on the arbitrator, the presiding head of the Local County Mediation & Arbitration panel shall select the arbitrator. Such arbitration shall be binding and final. In agreeing to arbitration, we both acknowledge that, by agreeing to binding arbitration, each of us is giving up the right to have the dispute decided in a court of law before a judge or jury. In the event that the client, or any other party, makes a claim against Valbridge Property Advisors | New Orleans or any of its employees in connections with or in any way relating to this assignment, the maximum damages recoverable by such claimant shall be the amount actually received by Valbridge Property Advisors | New Orleans for this assignment, and under no circumstances shall any claim for consequential damages be made.
36. Valbridge Property Advisors | New Orleans shall have no obligation, liability, or accountability to any third party. Any party who is not the "client" or intended user identified on the face of the appraisal or in the engagement letter is not entitled to rely upon the contents of the appraisal without the express written consent of Valbridge Property Advisors | New Orleans. "Client" shall not include partners, affiliates, or relatives of the party named in the engagement letter. Client shall hold Valbridge Property Advisors | New Orleans and its employees harmless in the event of any lawsuit brought by any third party, lender, partner, or part-owner in any form of ownership or any other party as a result of this assignment. The client also agrees that in case of lawsuit arising from or in any way involving these appraisal services, client will hold Valbridge Property Advisors | New Orleans harmless from and against any liability, loss, cost, or expense incurred or suffered by Valbridge Property Advisors | New Orleans in such action, regardless of its outcome.
37. The Valbridge Property Advisors office responsible for the preparation of this report is independently owned and operated by VPA of South Louisiana, Inc.. Neither Valbridge Property Advisors, Inc., nor any of its affiliates has been engaged to provide this report. Valbridge Property Advisors, Inc. does not provide valuation services, and has taken no part in the preparation of this report.
38. If any claim is filed against any of Valbridge Property Advisors, Inc., a Florida Corporation, its affiliates, officers or employees, or the firm providing this report, in connection with, or in any way arising out of, or relating to, this report, or the engagement of the firm providing this report, then (1) under no circumstances shall such claimant be entitled to consequential, special or other damages, except only for direct compensatory damages, and (2) the maximum amount of such compensatory damages recoverable by such claimant shall be the amount actually received by the firm engaged to provide this report.
39. This report and any associated work files may be subject to evaluation by Valbridge Property Advisors, Inc., or its affiliates, for quality control purposes.
40. Acceptance and/or use of this appraisal report constitutes acceptance of the foregoing general assumptions and limiting conditions.
41. The global outbreak of a "novel coronavirus" (known as COVID-19) was officially declared a pandemic by the World Health Organization (WHO). It is currently unknown what direct, or indirect, effect, if any, this event may have on the national economy, the local economy or the market in which the subject property is located. The reader is cautioned, and reminded that the conclusions presented in this appraisal report apply only as of the effective date(s) indicated. The appraiser makes no representation as to the effect on the subject property of this event, or any event, subsequent to the effective date of the appraisal.

Certification – Arthur L. Schwertz

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
3. I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. The undersigned Has not performed services regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
6. My engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
8. My analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.
9. Arthur L. Schwertz has personally inspected the subject property via aerial photographs.
10. R. Carter Higdon provided significant real property appraisal assistance to the person signing this certification.
11. The reported analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
12. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
13. As of the date of this report, the undersigned has completed the continuing education program for Designated Members of the Appraisal Institute.



Arthur L. Schwertz, MAI
Senior Managing Director
Florida Certified General
Real Estate Appraiser RZ4249

Addenda

Glossary

Qualifications

- Arthur L. Schwertz, MAI - Senior Managing Director

Information on Valbridge Property Advisors

Office Locations

Additional Subject Photographs (Provided by Client)





Glossary

Definitions are taken from The Dictionary of Real Estate Appraisal, 6th Edition (Dictionary), the Uniform Standards of Professional Appraisal Practice (USPAP), and Building Owners and Managers Association International (BOMA).

Absolute Net Lease

A lease in which the tenant pays all expenses including structural maintenance, building reserves, and management; often a long-term lease to a credit tenant. (Dictionary)

Amortization

The process of retiring a debt or recovering a capital investment, typically through scheduled, systematic repayment of the principal; a program of periodic contributions to a sinking fund or debt retirement fund. (Dictionary)

As Is Market Value

The estimate of the market value of real property in its current physical condition, use, and zoning as of the appraisal date. (Dictionary)

Base Rent

The minimum rent stipulated in a lease. (Dictionary)

Base Year

The year on which escalation clauses in a lease are based. (Dictionary)

Building Common Area

In office buildings, the areas of the building that provide services to building tenants but which are not included in the office area or store area of any specific tenant. These areas may include, but shall not be limited to, main and auxiliary lobbies, atrium spaces at the level of the finished floor, concierge areas or security desks, conference rooms, lounges or vending areas, food service facilities, health or fitness centers, daycare facilities, locker or shower facilities, mail rooms, fire control rooms, fully enclosed courtyards outside the exterior walls, and building core and service areas such as fully enclosed mechanical or equipment rooms. Specifically excluded from building common area are floor common areas, parking space, portions of loading docks outside the building line, and major vertical penetrations. (BOMA)

Building Rentable Area

The sum of all floor rentable areas. Floor rentable area is the result of subtracting from the gross measured area of a floor the major vertical penetrations on that same floor. It is generally fixed for the life of the building and is rarely affected by changes in corridor size or configuration. (BOMA)

Bulk Value

The value of multiple units, subdivided plots, or properties in a portfolio as though sold together in a single transaction.

Certificate of Occupancy (COO)

A formal written acknowledgment by an appropriate unit of local government that a new construction or renovation project is at the stage where it meets applicable health and safety codes and is ready for commercial or residential occupancy. (Dictionary)

Common Area Maintenance (CAM)

The expense of operating and maintaining common areas; may or may not include management charges and usually does not include capital expenditures on tenant improvements or other improvements to the property. (Dictionary)

The amount of money charged to tenants for their shares of maintaining a [shopping] center's common area. The charge that a tenant pays for shared services and facilities such as electricity, security, and maintenance of parking lots. Items charged to common area maintenance may include cleaning services, parking lot sweeping and maintenance, snow removal, security and upkeep. (ICSC – International Council of Shopping Centers, 4th Ed.)

Condominium

A multiunit structure, or a unit within such a structure, with a condominium form of ownership. (Dictionary)

Conservation Easement

An interest in real estate restricting future land use to preservation, conservation, wildlife habitat, or some combination of those uses. A conservation easement may permit farming, timber harvesting, or other uses of a rural nature as well as some types of conservation-oriented development to continue, subject to the easement. (Dictionary)

Contributory Value

A type of value that reflects the amount a property or component of a property contributes to the value of another asset or to the property as a whole.

The change in the value of a property as a whole, whether positive or negative, resulting from the addition or deletion of a property component. Also called deprival value in some countries. (Dictionary)

Debt Coverage Ratio (DCR)

The ratio of net operating income to annual debt service (DCR = NOI/Im), which measures the relative ability of a property to meet its debt service out of net operating income; also called *debt service coverage ratio (DSCR)*. A larger *DCR* typically indicates a greater ability for a property to withstand a reduction of income, providing an improved safety margin for a lender. (Dictionary)

Deed Restriction

A provision written into a deed that limits the use of land. Deed restrictions usually remain in effect when title passes to subsequent owners. (Dictionary)

Depreciation

In appraisal, a loss in property value from any cause; the difference between the cost of an improvement on the effective date of the appraisal and the market value of the improvement on the same date.

In accounting, an allocation of the original cost of an asset, amortizing the cost over the asset's life; calculated using a variety of standard techniques. (Dictionary)

Disposition Value

The most probable price that a specified interest in property should bring under the following conditions:

- Consummation of a sale within a specified time, which is shorter than the typical exposure time for such a property in that market.
- The property is subjected to market conditions prevailing as of the date of valuation;
- Both the buyer and seller are acting prudently and knowledgeably;
- The seller is under compulsion to sell;
- The buyer is typically motivated;
- Both parties are acting in what they consider to be their best interests;
- An adequate marketing effort will be made during the exposure time;
- Payment will be made in cash in U.S. dollars (or the local currency) or in terms of financial arrangements comparable thereto; and
- The price represents the normal consideration for the property sold, unaffected by special or creative financing or sales concessions granted by anyone associated with the sale. (Dictionary)

Double Net (Net Net) Lease

An alternative term for a type of net lease. In some markets, a net net lease is defined as a lease in which the tenant is responsible to pay both property taxes and premiums for insuring the building(s). (Valbridge)

(The market definition of a double net lease varies depending on the market)

Easement

The right to use another's land for a stated purpose. (Dictionary)

EIFS

Exterior Insulation Finishing System. This is a type of exterior wall cladding system. Sometimes referred to as dry-vit.

Effective Date

The date on which the appraisal or review opinion applies. (SVP)

In a lease document, the date upon which the lease goes into effect. (Dictionary)

Effective Gross Income (EGI)

The anticipated income from all operations of the real estate after an allowance is made for vacancy and collection losses and an addition is made for any other income. (Dictionary)

Effective Rent

Total base rent, or minimum rent stipulated in a lease, over the specified lease term minus rent concessions; the rent that is effectively paid by a tenant net of financial concessions provided by a landlord. (TIs). (Dictionary)

EPDM

Ethylene Propylene Diene Monomer Rubber. A type of synthetic rubber typically used for roof coverings. (Dictionary)

Escalation Clause

A clause in an agreement that provides for the adjustment of a price or rent based on some event or index. e.g., a provision to increase rent if operating expenses increase; also called *escalator clause*, *expense recovery clause* or *stop clause*. (Dictionary)

Estoppel Certificate

A signed statement by a party (such as a tenant or a mortgagee) certifying, for another's benefit, that certain facts are correct, such as that a lease exists, that there are no defaults, and that rent is paid to a certain date. (Black's) In real estate, a buyer of rental property typically requests estoppel certificates from existing tenants. Sometimes referred to as an *estoppel letter*. (Dictionary)

Excess Land

Land that is not needed to serve or support the existing use. The highest and best use of the excess land may or may not be the same as the highest and best use of the improved parcel. Excess land has the potential to be sold separately and is valued separately. (Dictionary)

Excess Rent

The amount by which contract rent exceeds market rent at the time of the appraisal; created by a lease favorable to the landlord (lessor) and may reflect unusual management, unknowledgeable or unusually motivated parties, a lease execution in an earlier, stronger rental market, or an agreement of the parties. (Dictionary)

Expense Stop

A clause in a lease that limits the landlord's expense obligation, which results in the lessee paying operating expenses above a stated level or amount. (Dictionary)

Exposure Time

The time a property remains on the market.

The estimated length of time that the property interest being appraised would have been offered on the market prior to the hypothetical consummation of a sale at market value on the effective date of the appraisal;

Comment: Exposure time is a retrospective opinion based on an analysis of past events assuming a competitive and open market. (Dictionary)

Extraordinary Assumption

An assignment-specific assumption as of the effective date regarding uncertain information used in an analysis which, if found to be false, could alter the appraiser's opinions or conclusions.

Comment: Uncertain information might include physical, legal, or economic characteristics of the subject property; or conditions external to the property, such as market conditions or trends; or the integrity of data used in an analysis. (USPAP)

Fee Simple Estate

Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat. (Dictionary)

Floor Common Area

In an office building, the areas on a floor such as washrooms, janitorial closets, electrical rooms, telephone rooms, mechanical rooms, elevator lobbies, and public corridors which are available primarily for the use of tenants on that floor. (BOMA)

Full Service (Gross) Lease

A lease in which the landlord receives stipulated rent and is obligated to pay all of the property's operating and fixed expenses; also called a *full service lease*. (Dictionary)

Furniture, Fixtures, and Equipment (FF&E)

Business trade fixtures and personal property, exclusive of inventory. (Dictionary)

Going-Concern Value

An outdated label for the market value of all the tangible and intangible assets of an established and operating business with an indefinite life, as if sold in aggregate; more accurately termed the *market value of the going concern* or *market value of the total assets of the business*. (Dictionary)

Gross Building Area (GBA)

Total floor area of a building, excluding unenclosed areas, measured from the exterior of the walls of the above-grade area. This includes mezzanines and basements if and when typically included in the market area of the type of property involved.

Gross leasable area plus all common areas.

For residential space, the total area of all floor levels measured from the exterior of the walls and including the superstructure and substructure basement; typically does not include garage space. (Dictionary)

Gross Measured Area

The total area of a building enclosed by the dominant portion (the portion of the inside finished surface of the permanent outer building wall which is 50 percent or more of the vertical floor-to-ceiling dimension, at the given point being measured as one moves horizontally along the wall), excluding parking areas and loading docks (or portions of same) outside the building line. It is generally not used for leasing purposes and is calculated on a floor by floor basis. (BOMA)

Gross Up Method

A method of calculating variable operating expenses in income-producing properties when less than 100% occupancy is assumed. Expenses reimbursed based on the amount of occupied space, rather than on the total building area, are described as "grossed up." (Dictionary)

Gross Retail Sellout

The sum of the separate and distinct market value opinions for each of the units in a condominium, subdivision development, or portfolio of properties, as of the date of valuation. The aggregate of retail values does not represent the value of all the units as though sold together in a single transaction; it is simply the total of the individual market value conclusions. Also called the *aggregate of the retail values*, *aggregate retail selling price* or *sum of the retail values*. (Dictionary)

Ground Lease

A lease that grants the right to use and occupy land. Improvements made by the ground lessee typically revert to the ground lessor at the end of the lease term. (Dictionary)

Ground Rent

The rent paid for the right to use and occupy land according to the terms of a ground lease; the portion of the total rent allocated to the underlying land. (Dictionary)

HVAC

Heating, ventilation, air conditioning (HVAC) system. A unit that regulates the temperature and distribution of heat and fresh air throughout a building. (Dictionary)

Highest and Best Use

The reasonably probable use of property that results in the highest value. The four criteria that the highest and best use must meet are legal permissibility, physical possibility, financial feasibility, and maximum productivity.

The use of an asset that maximizes its potential and that is possible, legally permissible, and financially feasible. The highest and best use may be for continuation of an asset's existing use or for some alternative use. This is determined by the use that a market participant would have in mind for the asset when formulating the price that it would be willing to bid. (IVS)

[The] highest and most profitable use for which the property is adaptable and needed or likely to be needed in the reasonably near future. (Uniform Appraisal Standards for Federal Land Acquisitions) (Dictionary)

Hypothetical Condition

A condition, directly related to a specific assignment, which is contrary to what is known by the appraiser to exist on the effective date of the assignment results, but is used for the purpose of analysis.

Comment: Hypothetical conditions are contrary to known facts about physical, legal, or economic characteristics of the subject property; or about conditions external to the property, such as market conditions or trends; or about the integrity of data used in an analysis. (USPAP)

Insurable Value

A type of value for insurance purposes. (Typically this includes replacement cost less basement excavation, foundation, underground piping and architect's fees). (Dictionary)

Investment Value

The value of a property to a particular investor or class of investors based on the investor's specific requirements. Investment value may be different from market value because it depends on a set of investment criteria that are not necessarily typical of the market. (Dictionary)

Just Compensation

In condemnation, the amount of loss for which a property owner is compensated when his or her property is taken. Just compensation should put the owner in as good a position pecuniarily as he or she would have been if the property had not been taken. (Dictionary)

Leased Fee Interest

The ownership interest held by the lessor, which includes the right to receive the contract rent specified in the lease plus the reversionary right when the lease expires. (Dictionary)

Leasehold Interest

The right held by the lessee to use and occupy real estate for a stated term and under the conditions specified in the lease. (Dictionary)

See also Positive Leasehold and Negative Leasehold.

Lessee (Tenant)

One who has the right to occupancy and use of the property of another for a period of time according to a lease agreement. (Dictionary)

Lessor (Landlord)

One who conveys the rights of occupancy and use to others under a lease agreement. (Dictionary)

Liquidation Value

The most probable price that a specified interest in property should bring under the following conditions:

- Consummation of a sale within a short time period.
- The property is subjected to market conditions prevailing as of the date of valuation.
- Both the buyer and seller are acting prudently and knowledgeably.
- The seller is under extreme compulsion to sell.
- The buyer is typically motivated.
- Both parties are acting in what they consider to be their best interests.
- A normal marketing effort is not possible due to the brief exposure time.
- Payment will be made in cash in U.S. dollars (or the local currency) or in terms of financial arrangements comparable thereto.

The price represents the normal consideration for the property sold, unaffected by special or creative financing or sales concessions granted by anyone associated with the sale. (Dictionary)

Loan to Value Ratio (LTV)

The ratio between a mortgage loan and the value of the property pledged as security, usually expressed as a percentage. (Dictionary)

Major Vertical Penetrations

Stairs, elevator shafts, flues, pipe shafts, vertical ducts, and the like, and their enclosing walls. Atria, lightwells and similar penetrations above the finished floor are included in this definition. Not included, however, are vertical penetrations built for the private use of a tenant occupying office areas on more than one floor. Structural columns, openings for vertical electric cable or telephone distribution, and openings for plumbing lines are not considered to be major vertical penetrations. (BOMA)

Market Rent

The most probable rent that a property should bring in a competitive and open market under all the conditions requisite to a fair lease transaction, the lessee and the lessor each acting prudently and knowledgeably, and assuming the rent is not affected by undue stimulus. Implicit in this definition is the execution of a lease as of a specified date under conditions whereby:

Lessee and lessor are typically motivated;
Both parties are well informed or well advised, and acting in what they consider their best interests;
Payment is made in terms of cash or in terms of financial arrangements comparable thereto; and
The rent reflects specified terms and conditions, such as permitted uses, use restrictions, expense obligations, duration, concessions, rental adjustments and revaluations, renewal and purchase options, and tenant improvements (TIs). (Appraisal Institute)

Market Value

The most probable price that a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

- Buyer and seller are typically motivated;
- Both parties are well informed or well advised, and acting in what they consider their own best interests;
- A reasonable time is allowed for exposure in the open market;
- Payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and
- The price represents the normal consideration for the property sold unaffected by special or creative

financing or sales concessions granted by anyone associated with the sale. (Dictionary)

Marketing Time

An opinion of the amount of time it might take to sell a real or personal property interest at the concluded market value level during the period immediately after the effective date of an appraisal. Marketing time differs from exposure time, which is always presumed to precede the effective date of an appraisal. (Advisory Opinion 7 of the Appraisal Standards Board of the Appraisal Foundation)

Master Lease

A lease in which the fee owner leases a part or the entire property to a single entity (the master lease) in return for a stipulated rent. The master lessee then leases the property to multiple tenants. (Dictionary)

Modified Gross Lease

A lease in which the landlord receives stipulated rent and is obligated to pay some, but not all, of the property's operating and fixed expenses. Since assignment of expenses varies among modified gross leases, expense responsibility must always be specified. In some markets, a modified gross lease may be called a *double net lease*, *net net lease*, *partial net lease*, or *semi-gross lease*. (Dictionary)

Negative Leasehold

A lease situation in which the market rent is less than the contract rent. (Dictionary)

Operating Expense Ratio

The ratio of total operating expenses to effective gross income (TOE/EGI); the complement of the net income ratio, i.e., $OER = 1 - NIR$ (Dictionary)

Option

A legal contract, typically purchased for a stated consideration, that permits but does not require the holder of the option (known as the *optionee*) to buy, sell, or lease real estate for a stipulated period of time in accordance with specified terms; a unilateral right to exercise a privilege. (Dictionary)

Partial Interest

Divided or undivided rights in real estate that represent less than the whole, i.e., a fractional interest such as a tenancy in common, easement, or life interest. (Dictionary)

Pass Through

A tenant's portion of operating expenses that may be composed of common area maintenance (CAM), real property taxes, property insurance, and any other expenses determined in the lease agreement to be paid by the tenant. (Dictionary)

Percentage Lease

A lease in which the rent or some portion of the rent represents a specified percentage of the volume of business, productivity, or use achieved by the tenant. (Dictionary)

Positive Leasehold

A lease situation in which the market rent is greater than the contract rent. (Dictionary)

Potential Gross Income (PGI)

The total income attributable to property at full occupancy before vacancy and operating expenses are deducted. (Dictionary)

Prospective Future Value Upon Completion

A prospective market value may be appropriate for the valuation of a property interest related to a credit decision for a proposed development or renovation project. According to USPAP, an appraisal with a prospective market value reflects an effective date that is subsequent to the date of the appraisal report. ... The prospective market value –as completed- reflects the property’s market value as of the time that development is expected to be complete. (Dictionary)

Prospective Future Value Upon Stabilization

A prospective market value may be appropriate for the valuation of a property interest related to a credit decision for a proposed development or renovation project. According to USPAP, an appraisal with a prospective market value reflects an effective date that is subsequent to the date of the appraisal report ...The prospective market value – as stabilized – reflects the property’s market value as of the time the property is projected to achieve stabilized occupancy. For an income-producing property, stabilized occupancy is the occupancy level that a property is expected to achieve after the property is exposed to the market for lease over a reasonable period of time and at comparable terms and conditions to other similar properties. (Dictionary)

Replacement Cost

The estimated cost to construct, at current prices as of a specific date, a substitute for a building or other improvements, using modern materials and current standards, design, and layout. (Dictionary)

Reproduction Cost

The estimated cost to construct, at current prices as of the effective date of the appraisal, an exact duplicate or replica of the building being appraised, using the same materials, construction standards, design, layout, and quality of workmanship and embodying all of the deficiencies, superadequacies, and obsolescence of the subject building. (Dictionary)

Retrospective Value Opinion

A value opinion effective as of a specified historical date. The term *retrospective* does not define a type of value. Instead, it identifies a value opinion as being effective at some specific prior date. Value as of a historical date is frequently sought in connection with property tax appeals, damage models, lease renegotiation, deficiency judgments, estate tax, and condemnation. Inclusion of the type of value with this term is appropriate, e.g., “retrospective market value opinion.” (Dictionary)

Sandwich Leasehold Estate

The interest held by the sandwich leaseholder when the property is subleased to another party; a type of leasehold estate. (Dictionary)

Sublease

An agreement in which the lessee in a prior lease conveys the right of use and occupancy of a property to another, the sublessee, for a specific period of time, which may or may not be coterminous with the underlying lease term. (Dictionary)

Subordination

A contractual arrangement in which a party with a claim to certain assets agrees to make his or her claim junior, or subordinate, to the claims of another party. (Dictionary)

Surplus Land

Land that is not currently needed to support the existing use but cannot be separated from the property and sold off for another use. Surplus land does not have an independent highest and best use and may or may not contribute value to the improved parcel. (Dictionary)

TPO

Thermoplastic polyolefin, a resilient synthetic roof covering.

Triple Net (Net Net Net) Lease

An alternative term for a type of net lease. In some markets, a net net net lease is defined as a lease in which the tenant assumes all expenses (fixed and variable) of operating a property except that the landlord is responsible for structural maintenance, building reserves, and management; also called *NNN lease*, *net net net lease*, or *fully net lease*. (Dictionary)

(The market definition of a triple net lease varies; in some cases tenants pay for items such as roof repairs, parking lot repairs, and other similar items.)

Usable Area

The measured area of an office area, store area, or building common area on a floor. The total of all the usable areas for a floor shall equal floor usable area of that same floor. (BOMA)

Value-in-Use

The value of a property assuming a specific use, which may or may not be the property's highest and best use on the effective date of the appraisal. Value in use may or may not be equal to market value but is different conceptually. (Dictionary)

VTAB

Value of the Total Assets of a Business. The value of a going concern (i.e. the business enterprise). (Dictionary)

Qualifications

Qualifications of Arthur L. Schwertz, MAI
Senior Managing Director
Valbridge Property Advisors | South Louisiana



Independent Valuations for a Variable World

State Certifications

Certified General in:
Louisiana
Mississippi
Alabama
Texas
Virginia
California
Arizona
Kentucky
Tennessee
North Carolina
Maryland

Membership/Affiliations

Member: Appraisal Institute – MAI Designation
Louisiana Chapter President, 2017
Member: Celebration Church Administrative Team (Corporate Secretary)

Appraisal Institute & Related Courses

Continuing education courses taken through the Appraisal Institute and other real estate organizations.

Publications, Seminars Presented, etc.

“Contract or Effective Rent: Finding the Real Rent”, Appraisal Institute, Austin, Texas, 2019.
“Contract or Effective Rent: Finding the Real Rent”, Appraisal Institute, Baton Rouge, Louisiana, 2016.

“Appraising Commercial and Complex Properties in an Historic Area”, Webinar for the Appraisal Institute, 2015.

“The Unique Appraisal: Case Studies in Appraising Special Purpose Properties”, AI Connect 2014 (Appraisal Institute’s National Meeting), Austin, Texas, 2014.

Schwertz, Arthur L. 2014. “History Lesson”, *Valuation Magazine 2nd Quarter, 2014*, 12 – 13.

Huso, Deborah R. 2013. “On the Waterfront”, *Valuation Magazine 2nd Quarter, 2013*, 22 – 27. (Contributor)

Experience

Senior Managing Director
Valbridge Property Advisors | South Louisiana (2013-Present)

Vice-President
Argote, Derbes, Graham, Shuffield & Tatje, Inc. (1992-2013)

Appraisal/valuation and consulting assignments include (but not limited to): Single-family, condominium, apartments, vacant land, funeral homes, amphitheaters, live performance theaters, office buildings, hospitals, nursing homes, specialized healthcare, hotels/motels, service stations, retail, industrial plants, warehouses, fractional interest valuations, contaminated properties, special purpose properties (port facilities, nuclear reactor simulator facility, shipyards, etc.), senior residential and healthcare facilities, feasibility studies, market studies, condemnation, construction defects, litigation support, mediations, and review appraisals.

Mr. Schwertz has provided valuation services in a wide variety of complex civil litigation including real estate, land use cases, condemnation, estate matters, property taxation, construction defect, and bankruptcy/creditors matters.

Qualified as an expert witness in Terrebonne, Jefferson, Orleans, and St. Tammany Parishes, Dallas County, Texas, Indiana Board of Tax Review, United States Court of Federal Claims, United States Court for the Eastern District of Louisiana and the United States Bankruptcy Court for the Middle District of Louisiana.

Education

Bachelor of Arts
History
Louisiana State University

Contact Details

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New Orleans, LA 70123

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QUALIFICATIONS OF THE APPRAISER (Continued)

ARTHUR L. SCHWERTZ, MAI

Designations, Associations and Professional Awards

- Louisiana Certified General Real Estate Appraiser; License No. G-0932
- Mississippi Certified General Real Estate Appraiser; License No. GA-633
- Alabama Certified General Real Estate Appraiser; License No. G00937
- Texas Certified General Real Estate Appraiser, License No. TX-1337393-G
- California Certified General Real Estate Appraiser, License No. 3005682
- Virginia Certified General Real Estate Appraiser, License No. 400101572
- Arizona Certified General Real Estate Appraiser, License No. 1003038
- North Carolina Certified General Real Estate Appraiser, License No. A8506
- Tennessee Certified General Real Estate Appraiser, License No. 5810
- Kentucky Certified General Real Estate Appraiser, License No. 5470
- Maryland Certified General Real Estate Appraiser, License No. 40034070
- Member of the Appraisal Institute, MAI Certificate No. 12678
- Instructor of the Appraisal Institute
- Secretary, Louisiana Chapter of the Appraisal Institute, 2014
- Treasurer, Louisiana Chapter of the Appraisal Institute, 2015
- Vice-President, Louisiana Chapter of the Appraisal Institute, 2016
- President, Louisiana Chapter of the Appraisal Institute, 2017

Civic Organizations

- | | |
|----------------|---|
| 1982 | Eagle Scout, Boy Scouts of America |
| 1983 | Vigil Honor Member, Order of the Arrow, Boy Scouts of America |
| 1999 – 2001 | Board of Directors, Berean Bible Church, New Orleans, Louisiana |
| 2000 – 2001 | Treasurer, Berean Bible Church, New Orleans, Louisiana |
| 2008 – 2010 | School Board Chairman, Crescent City Christian School, Metairie, Louisiana. |
| 2008 – Present | Board of Directors, Celebration Church, Metairie, Louisiana |
| 2010 – Present | Corporate Secretary, Celebration Church, Metairie, Louisiana |

QUALIFICATIONS OF THE APPRAISER (Continued)

ARTHUR L. SCHWERTZ, MAI

Expert Witness Experience

- Expert Witness, United States Court of Federal Claims
- Expert Witness, United States Bankruptcy Court, Middle and Eastern Districts of Louisiana
- Expert Witness, United States Federal Court, Eastern District of Louisiana
- Expert Witness, Civil District Court for the Parish of Orleans, State of Louisiana.
- Expert Witness, State Civil District Court, Dallas County, State of Texas.
- Expert Witness, Louisiana Tax Commission
- Expert Witness, Circuit Court for the City of Norfolk, Virginia
- Expert Witness, 9th JDC, 23rd JDC and 32nd JDC, State of Louisiana
- Expert Witness, Indiana Board of Tax Review, State of Indiana

Court Testimony

- | | |
|------|--|
| 2020 | GIV Green Tree Mall Investor, LLC v. Clark County Assessor, Petition Nos. 10-011-17-1-4-02088-17, 10-011-18-1-4-00149-20 and 10-011-19-1-4-00150-20, Indiana Board of Tax Review, State of Indiana. |
| 2020 | Low Land Investors, LLC, Low Land Construction Co., Inc. v. New Generation Shipbuilding, LLC, Case No. 180743, 32 nd Judicial District for Terrebonne Parish, State of Louisiana (Deposition/Testimony) |
| 2020 | Cella III, LLC v. Jefferson Parish Hospital District No. 2, Civil Action No. EDLA 19-11528, Bankruptcy No. 19-01145, United States District Court for the Eastern District of Louisiana (Deposition/Testimony) |
| 2020 | Elizabeth Sewell, et al v. Sewerage & Water Board of New Orleans, Docket No. 15-4501, Division D-12, Civil District Court, Parish of Orleans, State of Louisiana (Deposition) |
| 2019 | Virginia Natural Gas, Inc. v. Colonna's Ship Yard, Incorporated, Case No. CL18-2169, Circuit Court for the City of Norfolk, State of Virginia (Deposition) |
| 2018 | Jeannette C. Liebman, Wife of/and Paul E. Ramoni, Jr. v. The United States, Docket No. 14-1165, United States Court of Federal Claims (Testimony) |
| 2016 | Appeal of Filmore Parc Apartments v. Orleans Parish Board of Review, Docket Nos. 16-22173-001 and 16-22173-002, Louisiana Tax Commission, State of Louisiana. (Testimony) |
| 2016 | Appeal of Fulton Development (Harrah's Hotel) v. Orleans Parish Board of Review, Docket No. 16-22171-002, Louisiana Tax Commission, State of Louisiana (Testimony) |
| 2016 | Jeannette C. Liebman and Paul E. Ramoni, Jr. v. United States of America, Case No. 14-1165 L, United States Court of Federal Claims (Deposition) |
| 2016 | State of Louisiana, Department of Transportation & Development v. Northport Properties Partnership, Et Al, Docket No. 233,894, 9 th Judicial District, Parish of Rapides, State of Louisiana (Deposition) |
| 2015 | Appeal of Filmore Parc Apartments v. Orleans Parish Board of Review, Docket Nos. 15-22173-018 and 15-22173-019, Louisiana Tax Commission, State of Louisiana. (Testimony) |

QUALIFICATIONS OF THE APPRAISER (Continued)

ARTHUR L. SCHWERTZ, MAI

Court Testimony (Continued)

- 2015 Doretha Z. Walker et al vs. AMID/Metro Partnership, LLC and City of New Orleans, Docket No. 07-14794, Division H-14, Civil District Court for the Parish of Orleans, State of Louisiana. (Testimony)
- 2015 Sandra Oubre Sotile, Et Al vs Dooley Oubre, Et Al, Docket No. 110,622, 23rd Judicial District Court, Ascension Parish, Louisiana (Deposition)
- 2014 North Shore Lodging, LLC vs Commonwealth Land Title Insurance Company, Case No. 2:2013cv06070, United States Court for the Eastern District of Louisiana (Deposition)
- 2014 Appeal of Filmore Parc Apartments v. Orleans Parish Board of Review, Docket Nos. 14-22173-003 and 14-22173-004, Louisiana Tax Commission, State of Louisiana. (Testimony)
- 2014 State Bank of Texas vs. Granbury Hospitality Inc., et al, Cause No. DC-12-06398, 44th State Civil District Court, Dallas County, State of Texas. (Testimony)
- 2013 Bruce L. Feingerts v Succession of Doris Feingerts, et al, Adversary Proceeding No. 2011-9918, Civil District Court for the Parish of Orleans, State of Louisiana. (Testimony)
- 2012 Consolidated Cases of Percy J. Marchand versus Entergy New Orleans, Inc., Docket No. 2009-12695 AND Omar Duncan, Et Al, vs. Entergy New Orleans, Inc., Docket No. 2010-0714 AND Leroy Anthony Vignaud versus Entergy New Orleans, Inc. Docket No. 2010-5566, Division "C" of the Civil District Court for the Parish of Orleans, State of Louisiana. (Deposition)
- 2011 Pleasant View Development, LLC v Charles Anthony Bonaventure, Gina Bonaventure Porciau, Charles R. St. Romain, and Patin Engineers and Surveyors, Inc., Adversary Proceeding No. 10-1024, United States Bankruptcy Court, Middle District of Louisiana (Testimony)
- 2011 1522 R.E. Lee Blvd., LLC v. Bank of New Orleans, Civil District Court for the Parish of Orleans, State of Louisiana (Deposition)

Partial List of Appraisal Assignments Completed

Water and Wastewater Systems

- Resolve Water, Slidell, LA
- Coast Water, Slidell, LA
- H2O Water and Wastewater, St. Tammany Parish, LA
- Mo-Dad Utilities, Tangipahoa, Livingston, West Baton Rouge, East Baton Rouge and West Feliciana Parishes, LA
- Scientific System, Jacksonville, NC
- Center Ridge System, Murray, KY
- Blue Creek Utilities, Jacksonville, NC
- Delaplain Utilities, Georgetown, KY
- River Bluff Wastewater System, River Bluff, KY

- The Shoppes at Fremaux (±600,000 square feet), Slidell, LA
- Slidell Factory Outlet Mall, Slidell, LA
- Southland Mall (±600,000 square feet), Houma, LA
- The Plaza (±1,200,000 square feet), New Orleans, LA
- Belle Promenade (±750,000 square feet), Marrero, LA
- Jax Brewery, New Orleans, LA
- River Marketplace Shopping Center, Lafayette, LA
- Natchez Mall (±268,857 square feet), Natchez, MS
- Bradley Square Mall (568,508 square feet), Cleveland, TN

Major Retail

- Green Tree Mall (±443,933 square feet), Clarksville, IN
- Northshore Square Mall (±621,192 square feet), Slidell, LA

QUALIFICATIONS OF THE APPRAISER (Continued)

ARTHUR L. SCHWERTZ, MAI

Partial List of Appraisal Assignments Completed (Continued)Healthcare

Gilchrist at Stadium Place, Baltimore, MD
Savoy Medical Center, Mamou, LA
Methodist Hospital, New Orleans, LA
Lakeland Hospital, New Orleans, LA
Shriner's Hospital, Shreveport, LA
Fairway Surgical Hospital, Covington, LA
Southpark Hospital, Lafayette, LA
St. James Parish Hospital, St. James, LA
Green Clinic and Surgery Center, Ruston, LA
Numerous Nursing Homes throughout Louisiana
Lambeth House Assisted Living, New Orleans, LA
O'Connor Hospital, San Jose, CA
St. Louise Regional Medical Center, Gilroy, CA
St. Vincent Medical Center, Los Angeles, CA
Rosewood Assisted Living Facility, Charlottesville, VA

Industrial

Colonna's Shipyard, Norfolk, VA
Signal International Shipyard, Orange, TX
Signal International Shipyard, Mobile, AL
Signal International Shipyard, Port Arthur, TX
Signal International Shipyard, Pascagoula, MS
Bender Shipyard, Mobile, AL
Plastic Infusion Plant, Hammond, LA
UBT Coal Transfer Facility, Davant, LA
Trinity Yachts, Gulfport, MS
Trinity Yachts, New Orleans, LA
Coca-Cola Facility, Thibodaux, LA
LaShip Shipyard, Houma, LA
Dow Chemical Plant, Norco, LA
Port of St. Bernard, St. Bernard, LA
Owensboro Riverport, Owensboro, KY
Toulouse Street Wharf, Port of New Orleans, LA
Mississippi River Dock, Venice, LA
Port of Iberia, New Iberia, LA
Kaiser Site, Port of Greater Baton Rouge, LA

Proposed Port of Cameron, Cameron, LA
Union Tank Car Plant, Alexandria, LA

Entertainment/Leisure

Dixie Landing Amusement Park, Baton Rouge, LA
Blue Bayou Water Park, Baton Rouge, LA
Proposed Aqualand Water Park, Dayton, TX
Saenger Theatre, New Orleans, LA
Orpheum Theatre, New Orleans, LA
Vina Robles Amphitheatre, Paso Robles, CA
House of Blues, New Orleans, LA
The Oaks Golf Course, Pass Christian, MS
Money Hill Golf Course, Abita Springs, LA
Pelican Pointe Golf Course, Gonzales, LA
Colonial Country Club, Harahan, LA
O'Neal Theatres, Louisiana/Mississippi
Antoine's Restaurant, New Orleans, LA
AMC Theatres, Metairie/Hammond/Houma, LA
Southern Belle Casino, St. Francisville, LA
Bayou Marina, Casino and Hotel, Chalmette, LA
Lucky Deuces Casino, Greensburg, LA
Lafitte Harbor Marina, Lafitte, LA
Vinot Marina, New Orleans, LA
River Highlands Marina, Ascension Parish, LA
Kemper Marina, Gulfport, MS
C and M Marina, Lafitte, LA
Cypress Cove Marina, Venice, LA
Starlight Movie Studios, New Orleans, LA

Schools

Clifton L. Ganus Academy, New Orleans, LA
Mt. Carmel Academy, New Orleans, LA
Israel Augustine School, New Orleans, LA
Millerville Academy, Baton Rouge, LA
Louise S. McGhee School, New Orleans, LA
Stuart Hall Academy, New Orleans, LA
Believer's Life Academy, Marrero, LA

QUALIFICATIONS OF THE APPRAISER (Continued)

ARTHUR L. SCHWERTZ, MAI

Partial List of Appraisal Assignments Completed (Continued)

Special Purpose Properties

Nuclear Reactor Simulator Facility, St. Francisville, LA
Statewide Economic Obsolescence Study for Hibernia Bank,
State of Louisiana
Mitigation Bank, St. James Parish, LA
Mitigation Bank, Livingston Parish, LA
Mitigation Bank, East Baton Rouge Parish, LA
Elmer's Island, Jefferson Parish, LA
USPS Facilities throughout Louisiana and Mississippi

Multi-Family

Shadowlake Apartments, Harvey, LA
Citrus Creek Apartments, Harahan, LA
Palmetto Creek Apartments, Harahan, LA
The Reserve at Acadiana, Lafayette, LA
Gravier Place Apartments, New Orleans, LA
The Saulet Apartments, New Orleans, LA
Town Oaks Apartments, Shreveport, LA
University Edge Apartments, Hattiesburg, MS
Legacy Condominiums Phase I, Gulfport, MS
Legacy Condominiums Phase II, Gulfport, MS
South Beach Condominiums, Biloxi, MS

Hotels

Super 7 Motel, Lafayette, LA
Harrah's Hotel, New Orleans, LA
Candlewoods Suites Hotel, Houma, LA
Candlewoods Suites Hotel, Lafayette, LA
Hyatt House Hotel, Columbus, MS
Hampton Inn, Harahan, LA
Hampton Inn, Metairie, LA
Hampton Inn Convention Center, New Orleans, LA
Hampton Inn Uptown, New Orleans, LA
Hampton Inn, Mobile, AL
Courtyard by Marriott, Metairie, LA, Baton Rouge,
Residence Inn, Metairie, LA
Quality Inn, Opelousas, LA

LaQuinta, Slidell, LA
Historic French Market Inn, New Orleans, LA
Wyndham Hotel, Metairie, LA
Holiday Inn Superdome, New Orleans, LA
Hilton Garden Inn, Kenner, LA
Hilton Garden Inn LA

Office Buildings

Xerox Centre, Kenner, LA
Park Tower, Lafayette, LA
Former Stewart Enterprises Building, Metairie, LA
First NBC Building, New Orleans, LA
Executive Plaza, New Orleans, LA
Chase Tower, Houma, LA
Maison Blanche Building, New Orleans, LA
Yenni Office Building, Harahan, LA
Dominion Tower, New Orleans, LA
Elmwood Tower, Harahan, LA
Freeport-McMoran Building, New Orleans, LA
Entergy Building, New Orleans, LA
1250 Poydras Building, New Orleans, LA

Subdivisions

Ashton Plantation, Luling, LA
Acadiana Subdivision, Marrero, LA
Acadian Villas, Marrero, LA
The Arbors at English Turn, New Orleans, LA
Plantation Acres, Thibodaux, LA
Woodstone Subdivision, Mandeville, LA
Southlake Villages, Kenner, LA
Village Green Subdivision, Harvey, LA
Oak Island Subdivision, New Orleans, LA



Valbridge

PROPERTY ADVISORS



FAST FACTS

COMPANY INFORMATION

- Valbridge is the largest independent national commercial real estate valuation and advisory services firm in North America.
 - Total number of MAI-designated appraisers: 200+ on staff
 - Total number of office locations: 70+ across U.S.
 - Total number of staff: 675+ strong
- Valbridge covers the entire U.S. from coast to coast.
- Valbridge services all property types, including special-purpose properties.
- Valbridge provides independent valuation services. We are not owned by a brokerage firm or investment company.
- Every Valbridge office is led by a senior managing director who holds the MAI designation of the Appraisal Institute.
- Valbridge is owned by our local office leaders.
- Valbridge welcomes single-property assignments as well as portfolio, multi-market and other bulk-property engagements.

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