



**THOMAS
&
HUTTON**

REVISED PRELIMINARY ENGINEERING REPORT

FOR:

ORANGE HILL DEVELOPMENT WASTEWATER TREATMENT PLANT AND WASTEWATER COLLECTION SYSTEM CHARLESTON COUNTY, SOUTH CAROLINA

**PREPARED FOR:
KIAWAH RESORT ASSOCIATES, L.P.**

J – 25152.0100

**JUNE 2023
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1.0 Description of The Project

The Orange Hill Development is on Johns Island in Charleston County, South Carolina. The property is situated between Bohicket Road and River Road. Orange Hill is approximately fifteen miles from downtown Charleston, and approximately four miles from Kiawah Island, a popular resort and golf course community. The site is comprised of nine hundred thirty-four (934) acres of forest and agricultural land.

The current zoning for the subject site is a Planned Development (PD) designation under a Development Agreement with Charleston County. It is a proposed golf course community and will include up to 120 residences (homes and cottages), eighteen holes of golf, expanded practice grounds, a golf clubhouse with a small grill, a golf maintenance area, HOA maintenance area, a farmstand with restaurant and a recreation facility. **Exhibit A** presents a location map.

The purpose of this report is to discuss wastewater service for the development. The St. Johns Water Company (SJWC) will provide water service.

Preparation of a Preliminary Engineering Report (PER) is required by the South Carolina Department of Environmental Services (SCDES) before a wastewater treatment plant (WWTP) can be approved for construction. This PER is to outline the wastewater treatment facilities and present a master collection system layout for Orange Hill.

The proposed Orange Hill WWTP will produce effluent meeting advanced secondary effluent wastewater treatment levels. The WWTP will be designed to meet monthly average effluent limits listed in South Carolina Code of Regulations 61-9, Section 505.42(b)(4)(iii). The intent is to use the treated effluent in a beneficial way and reduce irrigation water from other sources. The effluent will be blended with other water sources to irrigate the golf course and practice grounds. So, the effective water quality applied to the course will be diluted with other water sources.

The PER is prepared in accordance with the requirements of the South Carolina Code of Regulations 61-67, Standards for Wastewater Facility Construction. This report's main goals are:

- 1) Estimate wastewater flows.
- 2) Discuss the type of wastewater.
- 3) Layout a preliminary design for the proposed wastewater treatment.
- 4) Briefly discuss sludge processing and effluent disposal.
- 5) Define limits of service for the WWTP and conceptual collection system.

The report follows the outline of the contents that SCDES requires for Preliminary Engineering Reports (PER) as listed in Section 67-200 of Reg. 61-67.

1.1 Owner

Orange Hill is owned by a single entity who will construct the plant and collection system and at some point, turn its operation over to the Property Owners Association (POA). The point in time when the operation is turned over to the POA is discussed in the revised financial assurances agreement template. The wastewater treatment plant and collection system will be initially owned by:

Kiawah Resort Associates, L.P.
Contact: Ray Pantlik
1 Kiawah Island Parkway
Kiawah Island, SC 29455
(843) 814-3418

Once the POA is established the Kiawah Resort Associates, L.P. or Kiawah Island Club Holdings, LLC being a member of the POA.

Throughout this document several terms or descriptions are included as to what is owned, operated, and maintained by the Owner or Property Owners Association (POA). Note, the facilities owned, operated, and maintained include the WWTP, (treatment, storage, and effluent discharge components) and the collection system (with pump stations). Wastewater facilities include collection, treatment, storage, and discharge components.

1.2 Need for the Project

The development is located outside an urban boundary where traditional wastewater service is available. The project is also located far from existing or proposed wastewater treatment and disposal systems but still needs wastewater service. The Orange Hill development has been identified for over 23 years as a PUD in Charleston County with sewage service provided by a wastewater treatment plant owned, operated, and maintained by the POA (Property Owners Association). The prior PUD called for 181 homesites, golf club and amenity center, which would require a wastewater treatment plant capacity of more than 60,000 gpd. Under the current Orange Hill Development, the wastewater treatment facility will be 45,000 gpd. The new Orange Hill Development Agreement was approved by Charleston County Council effective August 26, 2025. **Exhibit B** includes a copy of the approval letter and an excerpt from Section 17 of the Development Agreement acknowledging the wastewater treatment plant in the prior PD as follows:

17. Facilities and Services

F. Wastewater Treatment:

... Because the PD being replaced with this Plan included a wastewater treatment plant, the County agrees to support approval of the wastewater treatment plant to serve only the Real Property, provided the wastewater treatment facility complies with all applicable County requirements and processes, the application comports with the requirements of DES, and the wastewater treatment plant is approved by BCDCOG. . . .

Wastewater service is needed for the development. The service area for the wastewater treatment plant will be limited to only those facilities in the Orange Hill Planned Development District.

Several options are available for wastewater service. Septic tanks must comply with SC Regulation 61-56 – Onsite Wastewater Systems and must be permitted through SCDES.

1. No Treatment Plant Action – The no action option would rely on wastewater service by septic tanks or similar onsite treatment and disposal systems. Due to the intensity and clustering of development in some areas this is not a feasible solution to serving the entire property. However, some areas where the lots are large and spaced out to have suitable site conditions and where the wastewater is far out and of limited flow may be served by septic tanks. Situations under which septic tanks can be used on the property are:

- Temporary use for facilities such as the golf clubhouse, golf maintenance, or facilities off River Road when the WWTP is not yet operating.
 - If the service site is greater than 800-feet from conventional sewer service.
 - If flows are less than 1,500-gpd.
 - Areas off the main entry near River Road which have low wastewater flows. Areas such as the gatehouse entry, POA or HOA maintenance area, and Farmstand area may use septic tanks or be pumped to the conventional collection system depending upon site conditions.
 - Septic tanks will be permanent if a conventional collection system is not within 800-feet of the site.
2. Regionalization – Orange Hill Development is located outside of the wastewater service area for Charleston Water System. The Charleston Water System Customer Service Area Viewer shows the nearest sewer service area is on Bohicket Road at Berryhill Road, approximately 4.4 miles northeast of Orange Hill Development on Bohicket Road. There are no available regional alternatives in the vicinity. Nearby treatment plants, which are not regional facilities, have a limited-service boundary and no known available capacity. Two approved wastewater treatment facilities in reasonable proximity to Orange Hill are the Kiawah River WWTP and the Briar's Creek Golf Development WWTP. Neither the Kiawah River nor Briar's Creek WWTPs have the treatment or effluent disposal capacity to process Orange Hill wastewater flows. Seabrook Island has a private utility that has a WWTP. Their service area is over 4 miles away and it is not permitted to serve outside its service boundary. Therefore, there are no feasible alternatives for off-site connections to an existing sewer system.
3. Construct an Aerated Lagoon System – This alternative consumes a significant land area and only provides secondary treatment unless additional measures are taken.
4. Installation of an MBR Package Plant – This alternative allows a small footprint and would provide highly treated effluent water. After consideration of the MBR package plant, Orange Hill determined that this alternative had high capital and operational costs. It was decided to review other options to lower the projected operation and maintenance costs to make the WWTP more viable for better sustained operation.
5. Installation of an Orenco AdvanTex AX-Max Treatment System – This system is a fixed film biological treatment system that will provide high quality wastewater treatment. The system can be installed in a modular array so that if one treatment unit has an issue, the others can continue to treat wastewater, allowing for service without interrupting the system's function. The Orenco system will have lower operation and maintenance costs than the MBR package plant and can provide less operation complications during seasonal flow variations or low flow. The treatment level will be similar but will require less operator attention and will be more accommodating to early flows. This alternative has been selected as the best alternative. It will allow the HOA to operate at a lower cost and be more sustainable for the future of the Orange Hill POA (the POA will ultimately own and operate the wastewater plant).

To provide excellent treated effluent water quality, the Orenco AdvanTex AX-Max treatment system option was selected to provide proper wastewater service for development.

The Owner is working with the Berkeley-Charleston-Dorchester Council of Governments on approval for a Major Amendment to the 208 Regional Water Quality Management Plan. See **Exhibit C** for Letters of Coordination from BCDCOG for the proposed Orange Hill WWTP.

1.3 Proposed New Wastewater Treatment Process and Effluent Disposal Method

The wastewater treatment system will be an Orenco AdvanTex AX-Max treatment system with MBBRd enhanced denitrification treatment, UV disinfection and 7-day effluent holding pond. Treated effluent will be blended with potable water purchased from St. John’s Water Company (SJWC) and with lagoon water prior to land application by spray irrigation on the golf course greens.

The Orange Hill WWTP treatment process is an Orenco AdvanTex wastewater treatment system which uses a fixed-film attached growth process to treat waste biologically. Wastewater is distributed over a packed bed of textile media, where beneficial bacteria grow and consume pollutants. AdvanTex treatment systems are low maintenance and energy efficient. They have the ability to produce high-quality effluent. The packaged, high-tech nature of the systems reduce the frequency of operator visits. AdvanTex treatment systems are well suited to facilities receiving seasonal flows.

The WWTP is located on the Maintenance Facility site, isolated from the golf course and residential areas. Odor is not expected to be a problem at the WWTP headworks; however, an odor control system will be provided if necessary.

The Orange Hill WWTP consists of the following main components:

Table 1-1: WWTP Components	
Process	Description
Primary Treatment	Two 34,000-gallon T-Max primary tanks
Primary Treatment/Flow Equalization	One 34,000-gallon T-Max combined primary/ flow equalization tank (17,000-gallon primary / 17,000-gallon EQ)
Stage 1 Secondary Treatment	Six AX-Max 275 Treatment Units
Denitrification	Carbon Feed System and MBBRd Enhanced Denitrification Unit
Stage 2 Polishing	Two AX-Max 275 Treatment Units
Disinfection	Parallel UV disinfection trains
7-day Holding Basin	2.5 MG Lined Irrigation Water Holding Basin
Discharge	Golf Course Irrigation/Land Application System
Backup Power	Generator

A process flow diagram of the proposed wastewater treatment system is shown in **Exhibit D**.

1.3.1 Primary Treatment and Flow Equalization (EQ)

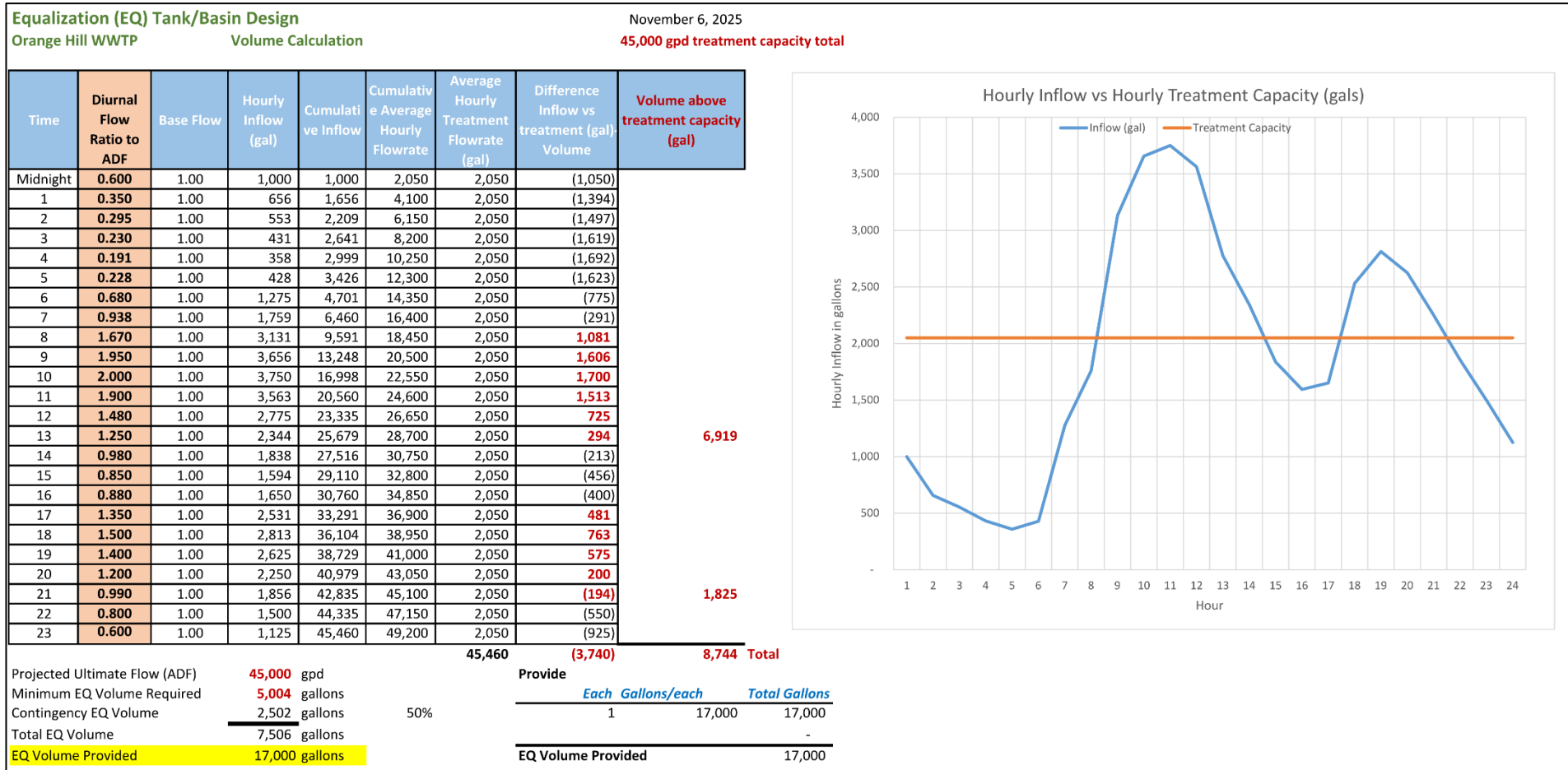
The wastewater collected from the Orange Hill Development service area will consist of a residential type of wastewater with no industrial flows.

The raw wastewater from the Orange Hill Development collection system will be pumped to an above-ground system of primary tanks consisting of three (3) 34,000-gallon T-Max tanks in series. Tank 1 will accept influent from the lift stations and gravity flow to Tank 2. Tank 2 is gravity in, gravity out to Tank 3. Tank 3 will be a primary/EQ combo tank with three duplex pumping systems that pump out to the AX-Max treatment units, one pump per each of six Stage 1 AX-Max treatment units. This series of T-Max tanks provides 85,000 gallons of primary treatment and 17,000 gallons of flow equalization.

Flow equalization is designed to store incoming wastewater during peak flow periods to be treated during low flow periods so that the treatment system receives a more constant inflow. The primary/EQ tank design will also be useful for storing wastewater should the treatment system need to be taken offline for a brief period to perform repairs or replacement.

The wastewater system design includes flow equalization to maintain a consistent inflow to the treatment process and includes excess EQ volume as a safety factor. **Figure 1-1** shows the equalization storage needs

Figure 1-1: Equalization (EQ) Tank/Basin Sizing



1.3.2 Treatment Process

After primary treatment, wastewater will be pumped to the Stage 1 AX-Max Treatment Units which uses a fixed film process where a biological layer (biofilm) develops on the surface of an engineered textile media. Wastewater is uniformly distributed onto the textile media without saturating the media. The system uses fractional-horsepower fans to draw air through the media and provide sufficient oxygen for aerobic digestion. Low-horsepower, high-head turbine pumps operate intermittently with sophisticated controls that automatically adjust recirculation ratios and pump run-times based on daily flows so that treatment is optimized. A percentage of the treated effluent is recirculated back to Tank 1 for dilution and additional treatment, and the remaining treated effluent is discharged to the next process.

Following Stage 1 treatment, wastewater will be pumped to the carbon feed system for dosing and then to the Orenco Moving Bed Biofilm Reactor-Denitrifying (MBBRd). The MBBRd provides denitrification treatment as required to meet discharge limits.

After MBBRd treatment, wastewater will be pumped to the Stage 2 AX-Max Treatment Units for effluent polishing. Treated effluent from Stage 2 will be pumped to the UV disinfection system where ultraviolet light will be used to kill or inactivate any potential microorganisms. After disinfection, treated effluent will be pumped to the golf course irrigation holding basin (the 2.5-million-gallon lined irrigation water holding basin) where it will be blended with other waters and used as a ridiculously small percentage of the total water needed for golf course irrigation thereby using this effluent resource in a beneficial way.

Influent Design Flow

The service area for the wastewater treatment plant will be limited to only those facilities in the proposed Orange Hill Planned Development District. The proposed treatment system is designed with the capacity of treating the following Design Flow:

Table 1-2: Design Flow Conditions		
Condition	Ultimate Design Flow (Average Day Flow -ADF)	Unit
Build out Design Flow	45,000	gpd

The treatment plant will be designed based on a reasonable assumption of domestic wastewater properties. Since this is a new development, historical wastewater characteristics are not available. Therefore, the anticipated influent concentrations are based on the historical data of similar systems and textbook values. Table 1-3 presents influent characteristics.

Table 1-3: Influent Characteristics	
Constituent	Assumed Influent Concentration
BOD	300 mg/L
TSS	250 mg/L

- (1) Guidelines from the State of Florida give the assumed treatment facility influent characteristics for grinder pumps. Most pump stations in Orange Hill will use grinder pumps due to the low flow. This fact coupled with the use of low flow fixtures and disposals supports the higher values presented in Design and Use of Pressure Sewer Systems, by David Trasher.

1.3.3 Disinfection

Disinfection of the treated effluent will be by ultraviolet (UV) light. UV uses the electromagnetic energy from mercury lamps to kill or inactivate microorganisms in the wastewater. UV light provides rapid, effective inactivation of microorganisms. The design dose will ensure that the effluent receives a minimum UV transmittance of 65% at peak flow. An inline UV system will follow the second stage treatment units. The system will have redundant UV disinfection units, essentially parallel UV trains that allows for maintenance or the unlikely failure without compromising effluent standards.

1.3.4 Sludge Removal

The three primary tanks function like septic tanks and will need periodic sludge removal by pump and haul.

1.3.5 Effluent/Land Application Storage

After disinfection, treated effluent will be pumped to the golf course irrigation holding basin (the 2.5-million-gallon lined irrigation water holding basin). The effluent water will be blended with other waters and used as a ridiculously small percentage of the total water needed for golf course irrigation thereby using this effluent resource in a beneficial way.

SCDES requires 7-day effluent storage for a land application system. A 2.5-MG lined irrigation water holding basin is proposed to provide more than 7 days of effluent storage and to use as storage for golf course irrigation water.

1.3.6 Flow Measurement Sampling

1.3.6.1 Flow Measurement

The volume of wastewater treated will be measured and recorded on the influent force main and Post-Disinfection.

1.3.6.2 Flow Sampling

A 24-hr composite sampler will collect samples of treated effluent at a sampling point after UV disinfection, and prior to discharge to the lined irrigation water holding basin. Influent sampling will be a grab sample provided to characterize the raw wastewater quality, determine associated treatment, and process control measures.

1.3.7 Groundwater Monitoring Wells

The effluent is high quality and will be blended with other irrigation waters. Since the total maximum effluent flow is less than 10% of the average irrigation demand of 585,000 gpd, monitoring wells are not proposed. The total area to be irrigated is 115 acres. **Exhibit E** shows the proposed golf layout and effluent land application plan.

1.3.8 Support Facilities

The proposed plant is in the golf course maintenance area and utility tract where the golf course maintenance, office, storage, restroom facilities, and such will be located. The intent is to use the nearby facilities to support the treatment plant personnel and operations as much as possible.

2.0 Description Of Wastewater

The service area for the wastewater treatment plant will be limited to only those facilities in the proposed Orange Hill Planned Development District. Wastewater from the Orange Hill Development service area will be residential in nature with typical domestic strength. No industrial flow is anticipated. Flow from the golf course grill and farm stand restaurant will be more like residential flow than a commercial restaurant, and grease traps will be installed at each facility. Likewise, wastewater from the recreation facility will be of typical domestic strength.

3.0 Characteristics of the Wastewater

3.1 Type of Wastewater

Wastewater generated from Orange Hill Development will be domestic.

3.2 Wastewater Flows

Table 3-1 presents the estimated wastewater flows for the development buildout for the uses permitted using SCDES unit contributors loading (UCL). The flow projection at buildout is 45,000 gpd.

Table 3-1: Plant Influent Flow Based on Unit Contributory Loading				
Type of Establishment	Unit	Quantity	Unit Hydraulic Loading (gpd)	Total Hydraulic Loading (gpd)
Residences	House/Cottages	120	300	36,000
Golf Course Club House	Player	150	10	1,500
Golf Course Club House/ Dining at Grill	Seat	40	30	1,200
Comfort Stations	Person	75	4	300
Golf Club/Business Office	Person	10	19	190
Golf Maintenance Facility Office	Person	10	19	190
Golf Maintenance Facility Showers	Person	5	10	50
HOA Maintenance Area	Person	10	19	190
HOA Maintenance Area Showers	Person	2	10	20
Gate House	Person	1	19	19
Recreation Facility	Facility	1	2,000	2,000
Farmstand & Restaurant	Seat	80	30	2,400
Special Events	Meal	120	4	480
<i>Total Estimated Hydraulic Loading</i>				44,539
WWTP Average Daily Design Flow				45,000

Wastewater service needed at locations that are remote (not located within 800 feet of the collection system) may be served by septic tanks since flows are projected to be low. These flows are not included in Table 3-1.

3.3 Wastewater Characteristics

Anticipated wastewater characteristic concentrations based on textbook values and concentrations from similar projects are shown in **Table 3-2**.

Table 3-2: Typical Anticipated Domestic Wastewater Concentrations	
Type	Amount
Solids	
Settleable	10 mg/L
Suspended	250 mg/L
Fixed	65 mg/L
Volatile	200 mg/L
Dissolved	500 mg/L

Table 3-2: Typical Anticipated Domestic Wastewater Concentrations	
Type	Amount
Fixed	300 mg/L
Volatile	200 mg/L
Strength of Wastewater	
BOD ₅	300 mg/L
COD	500 mg/L
TOC	160 mg/L
Color	
Domestic in nature, so color is not anticipated other than typical gray.	
pH	
Range	6.8 to 8.5
Alkalinity	
Total @ CaCO ₃ expected	100 mg/L
Heavy Metals	
Heavy metal, noxious, toxic, or hazardous compounds not expected to be found.	
Phosphorus	
Total	9 mg/L
Organic	3 mg/L
Inorganic	5 mg/L
Nitrogen	
Total	75 mg/L
Organic	35 mg/L
Free Ammonia (NH ₃ -N)	50 mg/L
Nitrites	<5 mg/L
Nitrates	<5 mg/L

(1) Textbook values based on Metcalf and Eddy, 2003 with adjustments from limited historical values of similar nearby applications. Features such as grinding food waste and low flow fixtures support some values characterizing the waste as strong.

BOD₅ = 5-day biochemical oxygen demand

COD = Chemical oxygen demand

TOC = Total organic carbon

(2) Guidelines from the State of Florida give the assumed treatment facility influent characteristics for grinder pumps. Most pump stations in Orange Hill will be grinder pumps due to the low flow. This coupled with the use of low flow fixtures and disposals support the higher values shown in *Design and Use of Pressure Sewer Systems*, by David Trasher.

4.0 Treatability of Waste

Since the influent stream will have residential characteristics, the flow should be like other communities in South Carolina, North Carolina, and Georgia close to the coast. Wastewater characteristics from these communities are consistent with those presented in Table 3-2.

The treatment system will be designed to meet the wastewater treatment levels shown in **Table 4-1** below.

Table 4-1: Anticipated Effluent Concentration	
Parameter	Concentration
BOD ₅ (Biological Oxygen Demand)	10 mg/L
TSS (Total Suspended Solids)	10 mg/L
Fecal Coliform	< 14/43 MPN/100 ml

5.0 Sludge Removal and Disposal

The primary tanks function like septic tanks that will need periodic sludge removal by pump and haul. The primary tanks are in series, with the lead tank capturing most of the solids. Subsequent tanks are expected to have minimal sludge accumulation. The sludge accumulation rate is dependent on usage from the incoming flow. Sludge removal is expected to be more frequent in the lead tank than the subsequent tanks. Orange Hill will apply to SCDES for a sludge disposal permit and obtain written approval prior to actual removal of sludge.

6.0 Location of Treatment and Effluent Disposal Facilities

The Orange Hill Development will include a maintenance and utility area. This area will contain the wastewater treatment plant, golf course irrigation system, 2.5 MG lined irrigation water holding basin, and the golf course maintenance facility.

The coordinates of the WWTP are:

Latitude: 32° 40' 09"
Longitude: (-) 80° 06' 56"

Treated effluent will be pumped into the 2.5 MG lined irrigation water holding basin and blended with other water sources for golf course irrigation.

7.0 Description of the Blended Water (Treated Effluent Water and Irrigation Water)

Orange Hill Development is committed to an ecological initiative and sustainability standards as demonstrated within the golf course design and project layout. The development shows the commitment to preserve the existing wetlands while integrating the golf course with conservation areas providing natural spaces and buffers. It was determined that a point discharge into local waters will not be as sustainable as reusing the effluent for irrigation. So, the use of treated effluent water blended with other irrigation waters will be used on the golf course.

Treated effluent from the WWTP will be blended with the irrigation water as described herein. The treated effluent, approximately 45,000 gpd max flow buildout, will blend with the irrigation water, approximately 585,000 gpd potable water, giving a dilution ratio of 1:13 (7.7%). To meet irrigation demands during summer months, water will be withdrawn from the golf course lagoon system as

needed and blended with the irrigation water, further diluting the treated effluent. The blended water will irrigate the 115-acre Orange Hill Golf Course (including driving range practice areas and a short course). **Exhibit F** includes calculations on the blended water anticipated characteristics. **Exhibit G** presents the golf course irrigation water supply concept.

8.0 Layout Of Areas to Be Served

Exhibit H shows the boundary of the area to be served, and a concept plan for the collection system. **Exhibit I** presents a conceptual layout of the plant. The plant and collection system will not serve areas outside these boundaries. The service area for the wastewater treatment plant will be limited to only those facilities in the proposed Orange Hill Planned Development District.

9.0 Impact Of Discharge on Receiving Waters

Treated effluent from the wastewater plant will not be discharged to the receiving water body. Treated effluent will be blended with irrigation water and used to irrigate the Orange Hill Golf Course, so there is no impact on the receiving waters.

10.0 Equipment And Service Failure or Shutdown

Maintaining uninterrupted wastewater treatment and proper disposal is paramount. Therefore, the entire treatment plant and related processes will be provided with standby power or emergency generator should the primary power supply fail. An emergency generator will be provided and sized to provide sufficient electrical power to operate the plant at full capacity. Consideration will be given to providing redundant key operations equipment to provide a backup in case of equipment failure. Examples of components potentially needing redundancy are:

- Pumps
- Blowers
- Treatment process equipment

In addition, spares or duplicate components will be kept on-site for needed replacements.

Following disinfection, treated effluent will be pumped to the 2.5 MG lined irrigation water holding basin. The 7-day effluent storage requirement for the WWTP is 315,000 gallons at buildout (7 days x 45,000 gpd). Since effluent will be stored in the 2.5 MG lined irrigation water holding basin, a separate effluent holding tank is not required to temporarily hold the treated effluent if the dispersion equipment or rains limit disposal.

A SCADA (Supervisory Control and Data Acquisition) system will monitor the key equipment and operations. The SCADA system will provide instant notice to the operators regarding the process and emergency or alarm conditions. The system will also allow AQWA, the wastewater treatment system supplier, to remotely troubleshoot the process if needed for immediate action.

11.0 Alternatives Analysis and Consolidation of Facilities

An alternative analysis of various wastewater treatment and disposal options was previously evaluated for their applicability to the Orange Hill Development project.

The option of a centralized public wastewater treatment plant was excluded because no such service is available around the Project. So, designing and building a new WWTP is the only available solution and has been the accepted plan by regulatory agencies for over 23 years. It was determined a treatment plant would be built using a small area in the northeast corner of the Orange Hill property.

Discharging the treated effluent directly to surface water was ruled out because it is not wisely using the effluent in a beneficial fashion.



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**PRELIMINARY ENGINEERING REPORT
FOR:**

**ORANGE HILL DEVELOPMENT
WASTEWATER TREATMENT PLANT (WWTP) AND
WASTEWATER COLLECTION SYSTEM
CHARLESTON COUNTY, SOUTH CAROLINA**

APPENDIX A

J – 25152.0100

APRIL 2026

1.0 Operation and Maintenance

The development must be private therefore a Homeowners Association (HOA) or Property Owners Association (POA) will maintain the roads, drainage, sanitary sewer collection system, the wastewater treatment plant, and (if needed) individual septic systems. Individual septic systems may be utilized for facilities not located within 800 feet of the collection system.

It should be noted that throughout this document several terms or descriptions are included as to what is owned, operated, and maintained by the Owner or POA. The facilities owned, operated, and maintained include the WWTP, (treatment, storage, and effluent discharge components), the collection system and individual septic systems. Wastewater facilities include collection, treatment, storage, and effluent discharge components.

Since this facility will be maintained by the HOA (POA), the entity will have assurances as follows:

1. Contact information for those responsible for policy decisions, ensuring compliance with State regulatory requirements and daily operations.
2. Description of any contracts for the management or operation of the system and how legal, engineering, and other professional services are provided.
3. Description of the qualifications of the operators and managers of the system including experience in operating other utility systems.
4. Emergency Management Plan in accordance with the SCDES requirements including a notification plan containing names and 24-hour phone numbers of responsible people to contact in the event of an emergency.
5. Proper certification of personnel to operate and maintain the infrastructure. Proper certification will be in accordance with SCDES regulations for the size and type of plant.
6. A list of maintenance equipment and spare parts to be kept on hand at the new facility.
7. A list of laboratory testing equipment and/or testing firm(s) for compliance monitoring.
8. A copy of the Operation & Maintenance (O&M) Manual for the proposed system.

South Carolina Department of Environmental Services (SCDES) requires financial assurances to ensure proper funds are set aside to operate and maintain the plant if needed. **Exhibit J** is a template for a financial assurance agreement.



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APPENDIX B

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1.0 POA Viability

Since this facility will be established as a private entity (by Kiawah Resort Associates, L.P.) ultimately operated by the Property Owners Association (POA), the initial Owner and Developer will initially offer Management, Operation & Maintenance until the POA is established and abide by the tasks listed below. Once the POA is established, Kiawah Resort Associates will be a member of the POA. Financial assurances will be in accordance with the draft agreement included in **Exhibit J**. Kiawah Resort Associates, L.P. (KRA) has experience owning and operating a utility. KRA owned and managed the Kiawah Island Utility from June 1988 through July 1, 2014, and managed operations thereafter through an affiliated entity until March 9, 2016. This experience will help direct proper operations and establish the framework for operating.

The Owner will be establishing a POA for the entire community and intends to transfer the WWTP and related facilities to the POA around the time the South Carolina Public Service Commission grants the POA the exemption permitted under SC Reg 103-502 for POA-owned sewer utilities. The Owner understands its financial assurance obligations continue even after the transfer according to the terms of the Financial Assurance Agreement.

The POA will need to arrange with a company or establish an entity to perform the tasks which follow.

1.1 Managerial Capacity – Provide:

1. A description of the organization that clearly defines primary responsibilities of all key personnel involved in management and operation of the wastewater infrastructure and reporting relationships.
2. Contact information for those responsible for policy decisions, ensuring compliance with State regulatory requirements and daily operations.
3. Description of any contracts for the management or operation of the system and how legal, engineering, and other professional services are provided.
4. Identification of ownership.
5. Description of any leases or easements for land, wastewater effluent disposal sites or physical facilities used in the operation of the system.
6. Description of the qualifications of the operators and managers of the system including experience in operating other utility systems.
7. Description of a training plan to keep operators current with the regulatory requirements of managing the system.
8. Emergency Management Plan in accordance with SCDES requirements including a notification plan containing names and 24-hour phone numbers or responsible persons to contact in the event of an emergency.
9. Description of service policies including providing customers with information and handling complaints.
10. Disclosure of any encumbrances, trust indentures, bankruptcy decrees, legal orders or proceedings or anything that may affect or limit the control of the system.

1.2 Operation & Maintenance – Provide:

1. Evidence of proper certification of the personnel employed by Owner to operate and maintain the wastewater system. Proper certification shall be in accordance with SCDES regulations for size and type of the plant and related.

2. A list of maintenance equipment and spare parts to be kept on hand.
3. A list of laboratory testing equipment and provisions for compliance monitoring as well as evidence of proper certification of personnel if laboratory analysis is to be conducted in-house (if any).
4. Evidence of sufficient staff to adequately operate and maintain the wastewater infrastructure in accordance with SCDES regulations must be provided.
5. A log of training for each operator/staff.
6. Disclosure of any monitoring violations incurred.
7. A copy of the Operation & Maintenance (O&M) Manual for the wastewater system.
8. An entity (in-house or by contract operations) to fulfill operational requirements such as line repairs, preventative maintenance, reporting, billing, and collection, stopping service, fiscal management.

1.3 Projected Expenses and Revenue

A projection of the expenses and associated revenue needed to cover the expenses are shown in Appendix C.



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**PRELIMINARY ENGINEERING REPORT
FOR:**

**ORANGE HILL DEVELOPMENT
WASTEWATER TREATMENT PLANT (WWTP) AND
WASTEWATER COLLECTION SYSTEM
CHARLESTON COUNTY, SOUTH CAROLINA**

APPENDIX C

J – 25152.0100

APRIL 2026

EXPENSE/REVENUE PROJECTIONS

FOR

**ORANGE HILL DEVELOPMENT
WASTEWATER TREATMENT PLANT
JOHNS ISLAND
CHARLESTON COUNTY, SOUTH CAROLINA**

PREPARED FOR

KIAWAH RESORT ASSOCIATES, L.P.

APRIL 2026

T&H J – 25152.0400

Prepared by:



THOMAS & HUTTON

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- Appendix A: Table 2, Orange Hill Sewer Enterprise Fund Expense and Revenue Projections
- Appendix B: Chart 1, Projected Revenue, Expenses, and Cumulative Net Income

1.0 INTRODUCTION

The proposed Orange Hill Development is in Charleston County, South Carolina on Johns Island and is owned by Kiawah Resort Associates, L.P. (KRA) the Owner. The property is situated between Bohicket Road and River Road. Orange Hill is approximately fifteen miles from downtown Charleston, and approximately four miles from Kiawah Island, a popular resort and golf course community. The site is comprised of nine hundred thirty-four (934) acres of forest and agricultural land. Water service for Orange Hill Development will be provided by St. John's Water Company.

Wastewater service will be provided by the Orange Hill Development Wastewater Treatment Plant (WWTP). Wastewater flow will be conveyed by a collection system consisting of gravity sewer, pump stations and force mains to the WWTP. Individual septic systems may be utilized for facilities not located within 800 feet of the collection system.

The WWTP will utilize an Orenco AdvanTex wastewater treatment system which uses a fixed-film attached growth process to treat waste biologically. Wastewater is distributed over a packed bed of textile media, where beneficial bacteria grow and consume pollutants to produce high quality effluent. Effluent will be blended with other water sources to irrigate the golf course and practice grounds. The WWTP will serve up to 120 residences (homes and cottages), a golf course clubhouse with a small grill, a golf maintenance area, HOA maintenance area, a farmstand with restaurant and a recreation facility. Initial flows to the WWTP (WWTP Operation Years 1-2) will include golf course-related facilities, HOA maintenance area, farmstand and restaurant. Residential flows are expected to come online during WWTP Operation Years 2 through 13. Total residential buildout is expected to occur in WWTP Operation Year 13. Recreation facilities are anticipated in WWTP Operation Year 13.

The Owner will be establishing a POA for the entire community and intends to transfer the WWTP and related facilities to the POA around the time the South Carolina Public Service Commission grants the POA the exemption permitted under SC Reg 103-502 for POA-owned sewer utilities. The Owner understands its financial assurance obligations continue even after the transfer according to the terms of the Financial Assurance Agreement.

2.0 PURPOSE

The purpose of this document is to develop a schedule of projected expenses and revenues associated with the operation of the WWTP, wastewater collection system and individual septic systems. This schedule will eventually be utilized as the basis for the development of wastewater rates. Development of rates will forecast customer fees for wastewater service that will be required to support the operations as it grows. The rate structure for sewer service will be a flat fee to allow for consistent income. This list of expenses and revenue can be used to establish an initial budget.

Potable water service will be billed separately to each user by St. John's Water Company based on metered usage.

3.0 ASSUMPTIONS

Projections are being made 20 years into the future; therefore, it is necessary to make the following assumptions:

- The WWTP will be under construction during Development Years 1-2. During this time, crowd pleasers and portalets will serve as temporary restrooms as necessary.
- The WWTP and initial collection system will be constructed prior to Development Year 3. The developer will fund extensions of collection system components.
- WWTP Operation Year 1 is equivalent to Development Year 3. (See Table 1, below.)
- New customers will be added to the system in accordance with the Absorption Schedule described in Paragraph 4.0 below.
- Wastewater flow rates will be consistent with SC R.61-67 "Standards for Wastewater Facility Construction" Appendix A "Unit Contributory Loadings."
- Revenue projections assume an average usage of 300 gallons per day (9,000 gallons/month) per customer. The average sewer bill is based upon the 2023 Charleston Water Systems (CWS) "outside customer rate" x 85%, which equates to \$162/customer/month), and the bill for individual septic systems is 50% of ERU (\$81/month) for maintenance.

4.0 ABSORPTION SCHEDULE

During WWTP Operation Year 1, the WWTP will serve the Golf Course and HOA maintenance area.

During WWTP Operation Year 2, the Owner anticipates adding wastewater service for the Golf Club dining facility, and the Farmstand and Restaurant. It is expected that residential flow from 3 residences will be added in WWTP Operation Year 2.

Over the next 9 years (WWTP Operation Years 3-11), the Owner expects to add 12 residences per year. Final residential buildout is 120 residences in WWTP Operation Year 11. The Recreation Facility will be added in WWTP Operation Year 12.

This absorption schedule is the Owner's forecast of units and facilities to be completed each year during the development period. The schedule includes both residential units as well as golf course facilities and amenities. This absorption schedule is for planning purposes only and is subject to change.

5.0 WASTEWATER FLOW PROJECTIONS

South Carolina Regulation 61-67 Appendix A, "Unit Contributory Loading to All Domestic Wastewater Treatment Facilities," was used to project wastewater flow based upon the Owner's absorption schedule. **Table 1** below is a summary of wastewater average daily flow (ADF) projected for each year including a cumulative yearly ADF.

WWTP Operation Year 1 reflects wastewater flow for golf course facilities, HOA facilities, farm stand, restaurant and start of residential buildout. Wastewater Operation Year 2 will be Golf Club Dining and residential. Years 3 through 11 represent residential buildout. Full buildout flow of nearly 45,000 gpd to the WWTP is anticipated in WWTP Operation Year 12 with the addition of the recreation facilities:

**Table 1: Wastewater Flow Projections
 Orange Hill WWTP**

Development Year	WWTP Operation Year	Facilities	ADF Added per Year (gpd)	Cumulative ADF (gpd)
1	N/A	N/A	0	0
2	N/A	N/A	0	0
3	1	Golf course facilities,	2,459	2,459
4	2	Golf club dining, Farmstand & Restaurant, Residential	4,980	7,439
5	3	Residential	1,800	9,239
6	4	Residential	2,700	11,939
7	5	Residential	3,600	15,539
8	6	Residential	3,600	19,139
9	7	Residential	3,600	22,739
10	8	Residential	3,600	26,339
11	9	Residential	3,600	29,939
12	10	Residential	3,600	33,539
13	11	Residential	3,600	37,139
14	12	Residential	3,600	40,739
15	13	Residential, Recreation facility	3,800	44,539
16	14	N/A	0	44,539
17	15	N/A	0	44,539
18	16	N/A	0	44,539
19	17	N/A	0	44,539
20	18	N/A	0	44,539
21	19	N/A	0	44,539
22	20	N/A	0	44,539

6.0 OPERATION & MAINTENANCE EXPENSES

The operation & maintenance (O&M) expenses for the WWTP, collection system and individual septic systems are itemized and calculated yearly throughout the buildout period (WWTP Operation Year 13) and beyond to Year 20 in **Appendix A** (Table 2, Orange Hill Sewer Enterprise Fund Expense and Revenue Projections). An inflation rate of 2%/year was used for each expense category plus some categories were increased based upon increasing flows.

6.1 Flow-Related Expenses

As wastewater flow to the plant increases there will be a proportionate increase in some expense categories up to final buildout (WWTP Operation Year 13). These operational expense categories include the following:

- Contract Operator(costs increase as additional grinder pump stations come online)
- Purchased Power (electrical)

- Materials, Repairs, Equipment Rental
- Supplies, Testing & Chemicals

6.2 Deferred Maintenance

The Expense & Revenue projections include a provision for Deferred Maintenance because, while the primary tanks and septic tanks do not need cleaning on an annual basis, solids are continually accumulating in the tanks. Therefore, the expense is "accrued" or collected yearly in advance.

6.3 Capital Replacement Reserves

The Owner will accrue a Capital Replacement Reserve fund covering future expenses for pumps, blowers, flow meters, disinfection, SCADA, and controls. The funds will be deposited on an annual basis so that when an item needs replacement, sufficient funds will be on hand.

7.0 REVENUE PROJECTIONS

The revenue projection, also included in **Table 2**, uses a simplistic approach to forecasting revenues expected to be generated through sewer billings only. This projection does not include revenue from other sources such as impact fees, tap fees, late charges, etc. Average usage per customer per month is based on the recommended SCDES Unit Contributory Loadings.

The basis for calculation of this revenue assumes:

- One ERU is equal to 300 gpd.
- Each residential sewer customer is equal to one ERU (300 gpd) and will have an average usage of 9,000 gallons/month.
- The initial view is that the Average sewer bill per customer per month is calculated from Charleston Water System's rate schedule for "Outside" sewer customers X 85% = \$162 per month. The monthly bill for Individual septic systems will be one-half ERU, or \$81 per month to cover maintenance costs.
- The average sewer bill per customer is inflated at 2%/year.
- Yearly revenue is calculated by multiplying number of ERUs by monthly revenue per ERU multiplied by 12 months/year.

8.0 INCOME BEFORE DEPRECIATION AND DEBT SERVICE

Appendix B (Chart 1, Projected Revenue, Expenses and Cumulative Net Income) graphically depicts expenses, revenue, and net income. This is not a complete rate study and does not include any debt service incurred by bonding capital improvement costs since these expenditures will be paid for by the Owner and/or will be covered by the Capital Replacement Reserve fund. This scenario does not include any line-item expense for depreciation, which is a common expense category in rate studies. The revenues, as mentioned before, do not include impact fees, tap fees or miscellaneous fees commonly collected by a utility. The utility owner (whether it be the developer or the POA) may choose to charge these fees to defray capital outlay and offset the expense required for future infrastructure replacement. Operating Reserves and Capital Replacement Reserves are included in the Cumulative Net Income and Operating Expenses.

APPENDIX A

Table 2 Orange Hill Sewer Enterprise Fund Expense and Revenue Projections

**ORANGE HILL SEWER ENTERPRISE FUND
EXPENSE AND REVENUE PROJECTIONS**

DEVELOPMENT YEARS 1-22

WWTP Operation Years 1-20

2% Assumed Inflation Rate
300 gpd/ERU

Reference 2023 CWS Wastewater Rates - Outside City Rate (Monthly volume based on water use)	\$42.00 First 2 Ccf (minimum charge) \$12.00 per Ccf over 2 Ccf 300 gpd per residence 9,000 gallons per month per residence 12 ccf per month per residence \$162.00 Monthly sewer bill per ERU \$81.00 Monthly sewer bill for septic systems (50% of ERU)
--	--

DEVELOPMENT YEAR	1	2	3	4	5	6	7	8	9	10	11
WWTP Operation Year	N/A	N/A	1	2	3	4	5	6	7	8	9
Inflation Index			1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17
EXPENSES	Increasing Flows										
Operating Expenses											
Contract Operator	\$ -	\$ -	\$ 9,500	\$ 13,800	\$ 28,400	\$ 34,000	\$ 49,600	\$ 55,800	\$ 72,900	\$ 79,700	\$ 97,200
Salaries and Wages - Employees	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Payroll Taxes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Employee Benefits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transportation Expense	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Professional Fees	\$ -	\$ -	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400
Purchased Power	\$ -	\$ -	\$ 1,583	\$ 1,793	\$ 2,230	\$ 2,498	\$ 2,964	\$ 3,255	\$ 3,753	\$ 4,069	\$ 4,601
Property Taxes	\$ -	\$ -	\$ 11,115	\$ 11,337	\$ 11,564	\$ 11,795	\$ 12,031	\$ 12,272	\$ 12,517	\$ 12,767	\$ 13,023
Materials, Repairs, Equipment Rental	\$ -	\$ -	\$ 492	\$ 1,518	\$ 1,922	\$ 2,534	\$ 3,364	\$ 4,226	\$ 5,122	\$ 6,051	\$ 7,016
Supplies, Testing & Chemicals	\$ -	\$ -	\$ 369	\$ 1,138	\$ 1,442	\$ 1,900	\$ 2,523	\$ 3,170	\$ 3,841	\$ 4,538	\$ 5,262
Insurance	\$ -	\$ -	\$ 25,270	\$ 25,937	\$ 26,653	\$ 27,388	\$ 28,141	\$ 28,914	\$ 29,706	\$ 30,519	\$ 31,352
Administrative/Management	\$ -	\$ -	\$ 12,000	\$ 12,240	\$ 12,485	\$ 12,734	\$ 12,989	\$ 13,249	\$ 13,514	\$ 13,784	\$ 14,060
Quarterly Groundwater Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lab Testing	\$ -	\$ -	\$ 4,000	\$ 4,080	\$ 4,162	\$ 4,245	\$ 4,330	\$ 4,416	\$ 4,505	\$ 4,595	\$ 4,687
Miscellaneous	\$ -	\$ -	\$ 1,000	\$ 1,020	\$ 1,040	\$ 1,061	\$ 1,082	\$ 1,104	\$ 1,126	\$ 1,149	\$ 1,172
Total Operating Expenses	\$ -	\$ -	\$ 66,728	\$ 74,263	\$ 91,298	\$ 99,556	\$ 118,425	\$ 127,806	\$ 148,384	\$ 158,572	\$ 179,771
Deferred Maintenance											
Primary Tank Pump & Haul (T-Max Tanks)	\$ -	\$ -	\$ 3,000	\$ 3,060	\$ 3,121	\$ 3,184	\$ 3,247	\$ 3,312	\$ 3,378	\$ 3,446	\$ 3,515
OWTS Septic Tank Pumping	\$ -	\$ -	\$ 150	\$ 153	\$ 156	\$ 159	\$ 162	\$ 166	\$ 169	\$ 172	\$ 176
Total Deferred Maintenance	\$ -	\$ -	\$ 3,150	\$ 3,213	\$ 3,277	\$ 3,343	\$ 3,410	\$ 3,478	\$ 3,547	\$ 3,618	\$ 3,691
Reserves											
Operating Reserves	\$ -	\$ -	\$ 11,100	\$ 1,300	\$ 2,800	\$ 1,400	\$ 3,100	\$ 1,600	\$ 3,400	\$ 1,700	\$ 3,600
Capital Replacement Reserves	\$ -	\$ -	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200	\$ 10,200
Total Reserves	\$ -	\$ -	\$ 21,300	\$ 11,500	\$ 13,000	\$ 11,600	\$ 13,300	\$ 11,800	\$ 13,600	\$ 11,900	\$ 13,800
Total Revenue Required	\$ -	\$ -	\$ 91,178	\$ 88,976	\$ 107,575	\$ 114,499	\$ 135,134	\$ 143,084	\$ 165,531	\$ 174,090	\$ 197,262

**ORANGE HILL SEWER ENTERPRISE FUND
EXPENSE AND REVENUE PROJECTIONS**

DEVELOPMENT YEARS 1-22

WWTP Operation Years 1-20

2% Assumed Inflation Rate
300 gpd/ERU

	Transition to POA										
DEVELOPMENT YEAR	12	13	14	15	16	17	18	19	20	21	22
WWTP Operation Year	10	11	12	13	14	15	16	17	18	19	20
Inflation Index	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46

EXPENSES				Buildout									
Operating Expenses													
Contract Operator	\$ 105,500	\$ 124,100	\$ 129,400	\$ 132,600	\$ 134,700	\$ 137,800	\$ 140,900	\$ 143,000	\$ 146,100	\$ 149,300	\$ 152,400		
Salaries and Wages - Employees	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Payroll Taxes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Employee Benefits	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transportation Expense	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Professional Fees	\$ 1,400	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750
Purchased Power	\$ 4,944	\$ 5,513	\$ 5,768	\$ 5,883	\$ 6,001	\$ 6,121	\$ 6,244	\$ 6,368	\$ 6,496	\$ 6,626	\$ 6,758		
Property Taxes	\$ 13,283	\$ 13,549	\$ 13,820	\$ 14,096	\$ 14,378	\$ 14,666	\$ 14,959	\$ 15,258	\$ 15,563	\$ 15,875	\$ 16,192		
Materials, Repairs, Equipment Rental	\$ 8,016	\$ 9,054	\$ 10,131	\$ 11,297	\$ 11,523	\$ 11,754	\$ 11,989	\$ 12,229	\$ 12,473	\$ 12,723	\$ 12,977		
Supplies, Testing & Chemicals	\$ 6,012	\$ 6,791	\$ 7,598	\$ 8,473	\$ 8,642	\$ 8,815	\$ 8,992	\$ 9,171	\$ 9,355	\$ 9,542	\$ 9,733		
Insurance	\$ 32,206	\$ 33,081	\$ 33,861	\$ 34,538	\$ 35,229	\$ 35,934	\$ 36,652	\$ 37,385	\$ 38,133	\$ 38,896	\$ 39,674		
Administrative/Management	\$ 14,341	\$ 14,628	\$ 14,920	\$ 15,219	\$ 15,523	\$ 15,834	\$ 16,150	\$ 16,473	\$ 16,803	\$ 17,139	\$ 17,482		
Quarterly Groundwater Monitoring	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lab Testing	\$ 4,780	\$ 4,876	\$ 4,973	\$ 5,073	\$ 5,174	\$ 5,278	\$ 5,383	\$ 5,491	\$ 5,601	\$ 5,713	\$ 5,827		
Miscellaneous	\$ 1,195	\$ 1,219	\$ 1,243	\$ 1,268	\$ 1,294	\$ 1,319	\$ 1,346	\$ 1,373	\$ 1,400	\$ 1,428	\$ 1,457		
Total Operating Expenses	\$ 191,678	\$ 214,561	\$ 223,465	\$ 230,198	\$ 234,215	\$ 239,271	\$ 244,365	\$ 248,499	\$ 253,675	\$ 258,991	\$ 264,249		
Deferred Maintenance													
Primary Tank Pump & Haul (T-Max Tanks)	\$ 3,585	\$ 3,657	\$ 3,730	\$ 3,805	\$ 3,881	\$ 3,958	\$ 4,038	\$ 4,118	\$ 4,201	\$ 4,285	\$ 4,370		
OWTS Septic Tank Pumping	\$ 179	\$ 183	\$ 187	\$ 190	\$ 194	\$ 198	\$ 202	\$ 206	\$ 210	\$ 214	\$ 219		
Total Deferred Maintenance	\$ 3,765	\$ 3,840	\$ 3,917	\$ 3,995	\$ 4,075	\$ 4,156	\$ 4,239	\$ 4,324	\$ 4,411	\$ 4,499	\$ 4,589		
Reserves													
Operating Reserves	\$ 1,900	\$ 3,900	\$ 1,400	\$ 1,200	\$ 600	\$ 900	\$ 800	\$ 700	\$ 900	\$ 900	\$ 800		
Capital Replacement Reserves	\$ 10,200	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444	\$ 12,444		
Total Reserves	\$ 12,100	\$ 16,344	\$ 13,844	\$ 13,644	\$ 13,044	\$ 13,344	\$ 13,244	\$ 13,144	\$ 13,344	\$ 13,344	\$ 13,244		
Total Revenue Required	\$ 207,543	\$ 234,745	\$ 241,226	\$ 247,837	\$ 251,334	\$ 256,771	\$ 261,849	\$ 265,967	\$ 271,429	\$ 276,834	\$ 282,082		

TABLE 2

DEVELOPMENT YEAR	1	2	3	4	5	6	7	8	9	10	11
WWTP Operation Year	N/A	N/A	1	2	3	4	5	6	7	8	9
Inflation Index			1.00	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17
PROJECTED REVENUE (Sewer Services Only)											
Projected Average Daily Flow (ADF)	0	0	2,459	4,980	1,800	2,700	3,600	3,600	3,600	3,600	3,600
Cumulative ADF	0	0	2,459	7,439	9,239	11,939	15,539	19,139	22,739	26,339	29,939
Number of Customers (ERUs)	0	0	8	25	31	40	52	64	76	88	100
Monthly Revenue Per ERU (Inflated Yearly)	\$ -	\$ -	\$ 162.00	\$ 165.24	\$ 168.54	\$ 171.92	\$ 175.35	\$ 178.86	\$ 182.44	\$ 186.09	\$ 189.81
Monthly Revenue, OWTS (Inflated Yearly)	\$ -	\$ -	\$ 81.00	\$ 82.62	\$ 84.27	\$ 85.96	\$ 87.68	\$ 89.43	\$ 91.22	\$ 93.04	\$ 94.90
Total Anticipated Revenue (Yearly)	\$ -	\$ -	\$ 16,524	\$ 50,563	\$ 63,710	\$ 83,551	\$ 110,473	\$ 138,438	\$ 167,478	\$ 197,624	\$ 228,909
NET INCOME											
By Year	\$ -	\$ -	\$ (74,654)	\$ (38,413)	\$ (43,865)	\$ (30,948)	\$ (24,661)	\$ (4,646)	\$ 1,947	\$ 23,534	\$ 31,647
Cumulative	\$ -	\$ -	\$ (74,654)	\$ (113,067)	\$ (156,932)	\$ (187,880)	\$ (212,542)	\$ (217,187)	\$ (215,240)	\$ (191,707)	\$ (160,059)

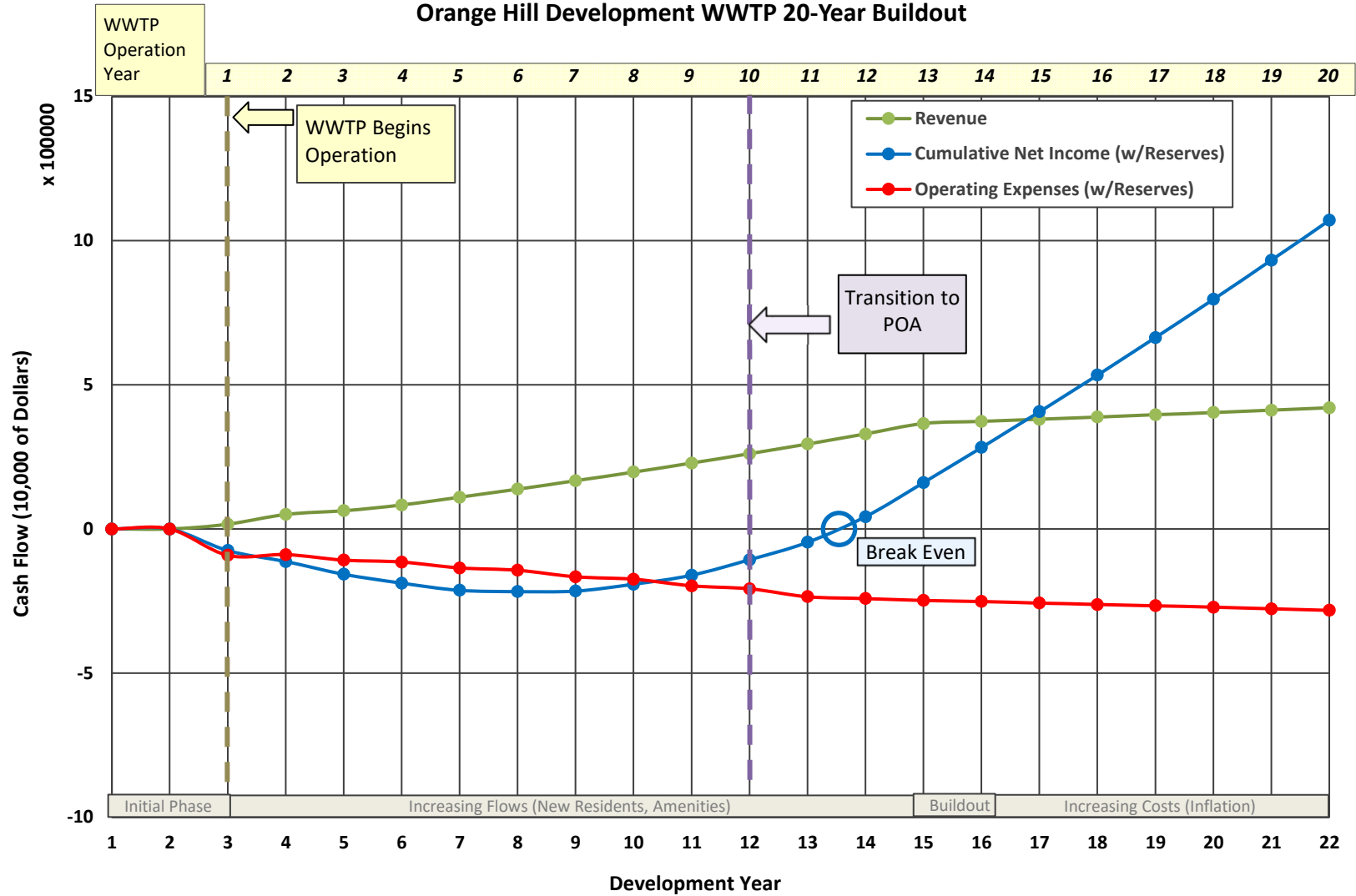
TABLE 2

	Transition to POA										
DEVELOPMENT YEAR	12	13	14	15	16	17	18	19	20	21	22
WWTP Operation Year	10	11	12	13	14	15	16	17	18	19	20
Inflation Index	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46
PROJECTED REVENUE (Sewer Services Only)											
Projected Average Daily Flow (ADF)	3,600	3,600	3,600	3,800	0	0	0	0	0	0	0
Cumulative ADF	33,539	37,139	40,739	44,539	44,539	44,539	44,539	44,539	44,539	44,539	44,539
Number of Customers (ERUs)	112	124	136	148	148	148	148	148	148	148	148
Monthly Revenue Per ERU (Inflated Yearly)	\$ 193.60	\$ 197.48	\$ 201.43	\$ 205.46	\$ 209.56	\$ 213.76	\$ 218.03	\$ 222.39	\$ 226.84	\$ 231.38	\$ 236.00
Monthly Revenue, OWTS (Inflated Yearly)	\$ 96.80	\$ 98.74	\$ 100.71	\$ 102.73	\$ 104.78	\$ 106.88	\$ 109.02	\$ 111.20	\$ 113.42	\$ 115.69	\$ 118.00
Total Anticipated Revenue (Yearly)	\$ 261,367	\$ 295,031	\$ 329,937	\$ 366,121	\$ 373,444	\$ 380,912	\$ 388,531	\$ 396,301	\$ 404,227	\$ 412,312	\$ 420,558
NET INCOME											
By Year	\$ 53,824	\$ 60,286	\$ 88,711	\$ 118,284	\$ 122,110	\$ 124,141	\$ 126,682	\$ 130,334	\$ 132,798	\$ 135,478	\$ 138,476
Cumulative	\$ (106,235)	\$ (45,949)	\$ 42,762	\$ 161,046	\$ 283,156	\$ 407,297	\$ 533,979	\$ 664,313	\$ 797,110	\$ 932,588	\$ 1,071,064

APPENDIX B

Chart 1 Projected Revenue, Expenses, and Cumulative Net Income

CHART 1
Projected Revenue, Expenses and Cumulative Net Income
Orange Hill Development WWTP 20-Year Buildout





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**PRELIMINARY ENGINEERING REPORT
FOR:**

**ORANGE HILL DEVELOPMENT
WASTEWATER TREATMENT PLANT (WWTP) AND
WASTEWATER COLLECTION SYSTEM
CHARLESTON COUNTY, SOUTH CAROLINA**

EXHIBITS

J – 25152.0100

APRIL 2026



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EXHIBIT A AERIAL LOCATION MAP



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LOCATION MAP

PROJECT:
ORANGE HILL DEVELOPMENT

CLIENT:
KIAWAH RESORT ASSOCIATES, L.P.

LOCATION: CHARLESTON COUNTY, SOUTH CAROLINA
DATE: MAY 2023 DRAWN BY: CGB SHEET: 1 OF 1
JOB NUMBER: 25152.0100 REVIEWED BY: MFY SCALE: 1" = 2000'

TH **THOMAS & HUTTON**
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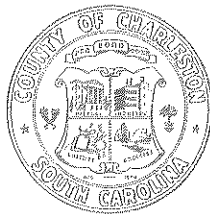
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EXHIBIT B
COUNTY REZONING APPROVAL LETTER &
EXCERPT FROM 2025 DEVELOPMENT
AGREEMENT

Kylon Jerome Middleton – Chair
Larry Kobrovsky – Vice Chair
Joe Boykin
Henry E. Darby
Jenny Costa Honeycutt
C. Brantley Moody
Teddie E. Pryor, Sr.
Herbert R. Sass, III
Robert L. Wehrman



Kristen L. Salisbury, Clerk
(843) 958-4030
1-800-524-7832
FAX (843) 958-4035
E-mail: ksalisbury@charlestoncounty.org

CHARLESTON COUNTY COUNCIL
LONNIE HAMILTON, III PUBLIC SERVICES BUILDING
4045 BRIDGE VIEW DRIVE
CHARLESTON, SOUTH CAROLINA
29405-7464

September 9, 2025

Kiawah Resort Associates, L.P.
Attn: Ray Pantlik
One Kiawah Island Parkway
Kiawah Island, SC 29455

Mr. Pantlik:

County Council has granted approval of your request to rezone parcels, TMS #s 215-00-00-030, 215-00-00-163 and 256-00-00-120, from the PD-83A and AG-8 Zoning Districts to the Orange Hill Planned Development (PD-191) Zoning District in conjunction with the Orange Hill Development Agreement.

The Land Development Agreement and Charleston County Zoning and Land Development Regulations Ordinance was legislatively amended to incorporate this request, effective August 26, 2025.

Cases: ZDA-03-25-00103 & ZREZ-03-25-00158
Parcel Identification: 215-00-00-030, 215-00-00-163, and 256-00-00-120
Acres: 933.097

In granting approval of the request, Council attached the following conditions:

1. Amend Development Agreement Sections 11.F.A and 11.F.B to change the receiving entity of the fees to support housing initiatives from the Charleston County Community Development and Revitalization Department (CCCDD) to the Charleston County Community Services Directorate (CCCSD).
2. Revise Section 14, on page 21 of the Development Agreement to update the table to show the correct numbers of trees encroached upon and unaffected in the various categories.
3. Revise Exhibit 14.1 Tree Plan, to correct the tables to show the correct numbers of trees that are encroached upon and unaffected trees in the various categories and revise the graphics to reflect the correct numbers and locations of trees encroached upon and unaffected.

This letter will serve as final notification. Please contact the Charleston County Zoning and Planning Department and the Charleston County Department of Building Inspections for the necessary permits before executing your plans.

Sincerely,


Kristen L. Salisbury
Clerk of Council

cc: Joel Evans, Director, Zoning & Planning Dept.
Andrea Melocik, Deputy Director, Zoning & Planning Dept.
Zoning and Planning Department Case File

AUGUST 26, 2025



BP1344543

PGS:

1130

ORANGE HILL

DEVELOPMENT AGREEMENT

BY AND AMONG

KIAWAH RESORT ASSOCIATES, LP,

AND

CHARLESTON COUNTY,

SOUTH CAROLINA

and utility area, and from River Road at the proposed new primary access, in the approximate locations shown on Exhibit 11.4. *Property Owner* shall obtain any necessary approvals or encroachment permits from *DOT* for the construction access. Upon completion of the *Golf Course*, the maintenance and utility area, and the entry road, construction traffic will be routed along River Road using the primary entrance as shown on Exhibit 11.1. This primary access is also subject to obtaining any necessary approvals or encroachment permits from *DOT*.

E. Sidewalks and Bike Paths: In light of the rural nature of the *Real Property*, the *Property Owner* shall not be required to install sidewalks but may install bike paths, cart paths, and other trails or paths to access the *Recreational and Natural Areas*, the *Golf Course* clubhouse area, and other amenities and recreational facilities. The approximate location of these trails and paths is shown on Exhibit 11.4 hereto. These trails and paths outside the *Conservancy Tract* shall vary in width from approximately 4 feet to 10 feet, and their surfaces within the *Real Property* outside the *Conservancy Tract* may be asphalt, cement, packed shell sand or other firm pervious material or mulch. Portions of the trails outside the *Conservancy Tract* may traverse short segments of the internal *Streets* as shown on Exhibit 11.4. Trails within the *Conservancy Tract* may consist of existing or new unimproved paths over natural terrain. The *Property Owner* shall not engage in land disturbance activities in the creation or maintenance of trails in the *Conservancy Tract*; routine maintenance of existing trails in the *Conservancy Tract* that does not change their width or location shall not be considered new land disturbance activity. As stated in Exhibit 4.5, Declaration of Restrictive Covenants for Wetlands Preservation, the construction or installation of any utilities or any driveway outside the one acre building area on the *Conservancy Tract* must be located within the existing roads or the existing power line right of way, unless another location is approved in writing by the *Corps* and *BCM* prior to the commencement of the construction. Any and all such paths or trails designed and constructed by the *Property Owner* on the *Real Property* may (1) be owned and maintained as *Common Areas*; or (2) be owned and maintained by the *Property Owner* or a related entity. The *Property Owner*, a related entity, and/or a duly constituted *Association* shall perform the maintenance and upkeep of these paths and trails on the *Real Property* or any portion thereof.

F. Wastewater Treatment: There is no public sewage collection and treatment serving the *Real Property*. The *Property Owner* will provide suitable wastewater treatment or septic to all *Lots* (except the *Preservation Tract*), *Dwelling Units*, the *Golf Course*, other recreational facilities, and the utility/support/maintenance area on the *Real Property* pursuant to the *Agreement* after obtaining all applicable permits and approvals from regulatory agencies and governmental entities. The existing Planned Development District, PD-83A, for the *Real Property* adopted in 2005, includes the right to construct a small wastewater treatment plant to serve only the *Development* on the *Real Property* that shall not serve any area, land, or *Development* outside the boundaries of the *Real Property*. This wastewater treatment plant will be constructed by the *Property Owner* with the intent to transfer it and its operation to the *Association* in accordance with the laws and regulations of the South Carolina Public Service Commission, including S.C. Code Regs. § 103-502.5. In accordance with this regulation, the *Covenants* of the *Association* shall authorize its ownership and operation of the wastewater treatment plant as well as to impose appropriate assessments upon the owners necessary to pay for all aspects of its maintenance, repair, and operation. The *Property Owner* shall enter a Financial Assurances Agreement with the *DES* to assure adequate funds are available to operate the wastewater facilities including an instance where

DES were to determine the *Property Owner* or *Association* is failing to adequately operate, repair, or maintain the wastewater facilities. Because the PD being replaced with this Plan included a wastewater treatment plant, the *County* agrees to support approval of the wastewater treatment plant to serve only the *Real Property*, provided the wastewater treatment facility complies with all applicable *County* requirements and processes, the application comports with the requirements of *DES*, and the wastewater treatment plant is approved by BCDCOG. The *Property Owner* shall submit the Preliminary Engineering Report (“PER”) and *DES*’s bonding requirement to *County* Public Works for review and approval. Any wastewater treatment system shall be subject to best management practices as well as all *Laws*. Any wastewater treatment facility will comply with the Charleston County 208 Water Quality Management Plan and all BCDCOG and SCDES requirements, including the SCDES permitting requirements that the *Property Owner* provide financial protections for the continued economic viability of the system and that the system be managed by a class A licensed operator. It is anticipated that all of the treated effluent will be sprayed on the *Golf Course*.

G. Potable Water: St. John’s Water Company will provide potable water to all *Lots* (except the *Preservation Lot*), *Dwelling Units*, the *Golf Course*, other recreational facilities, and the utility/support/maintenance area on the *Real Property* pursuant to the *Agreement* after obtaining all applicable permits and approvals from regulatory agencies. The new system will be designed and constructed to *DES* standards. Prior to the construction, a water model will be created in order to properly size all mains. The new water distribution system will be designed to meet the requirements of the St. Johns Water Company and *DES*. A proof-of-coordination letter with St. Johns Water Company is included in Appendix D. The *Property Owner* shall design and construct facilities necessary for the transmission and distribution of potable water on the *Real Property*. The *Property Owner* shall transfer facilities for the transmission and distribution of potable water, including necessary easements, to St. Johns Water Co, as requested or required by it. The *Property Owner* may construct one or more wells to provide irrigation water for the *Golf Course* and *Common Areas*. The *Property Owner* may at some future time build a reverse osmosis (“RO”) or other well water treatment facility to assist with the irrigation of the *Golf Course*.

H. Drainage:

1. Stormwater Sketch Plan: A sketch plan of *Project*’s stormwater plan for the *Real Property* is attached hereto as Appendix E. The *Property Owner* shall provide sufficient drainage for the *Development* of the *Real Property*. The *Property Owner* shall not impair or diminish the drainage currently flowing through the *Real Property*. The *Property Owner* shall not impede such drainage during construction nor during land disturbance activities on the *Real Property* and shall provide comparable drainage at a substitute location, if necessary. The *Real Property* has considerable stormwater resilience and capacity. In addition to its extensive freshwater wetlands (and the lagoons that may be constructed), the *Real Property*, as improved, will mostly consist of pervious natural areas. The developed residential areas will occupy only a small percentage of the *Real Property*.

2. County Stormwater Ordinance: The *Property Owner* shall comply with the standards for drainage set forth in the *County* Stormwater Ordinances.



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EXHIBIT C
LETTER OF COORDINATION FROM
BCDCOG



BERKELEY-CHARLESTON-DORCHESTER
COUNCIL OF GOVERNMENTS

www.bcdco.com



CHAIR: Caldwell Pinckney • **VICE CHAIR:** Gary Brewer • **SECRETARY:** David Dennis • **TREASURER:** Joe Boykin • **EXECUTIVE DIRECTOR:** Ronald E. Mitchum

December 20, 2024

Mr. Ray Pantlik, P.E., Vice President of Development
South Street Partners
1 Kiawah Island Parkway
Kiawah Island, SC 29455

Subject: Proposed Orange Hill WWTF – Johns Island
Charleston County, South Carolina

Mr. Pantlik,

Please accept this letter as an indication of Berkeley-Charleston-Dorchester Council of Governments' willingness to continue working with you on the proposed Orange Hill WWTF. Please be reminded that this project does require a Major Amendment to the BCDCOG 208 Regional Water Quality Management Plan. The process for the amendment will resume once the Development Agreement/Planned Development has been finalized with Charleston County and financial assurances regarding the treatment facility have been agreed upon.

If you have any questions or need additional information, please don't hesitate to contact me.

Sincerely,

Ronald E. Mitchum
Executive Director

PLANNING, PARTNERSHIP & PROSPERITY

5790 CASPER PADGETT WAY • NORTH CHARLESTON, SC 29406 • TEL 843.529.0400

May 24, 2023

Mr. Ray Pantlik, P.E., Vice President of Development
South Street Partners
1 Kiawah Island Parkway
Kiawah Island, SC 29455

Subject: Proposed Orange Hill WWTF – Johns Island
Charleston County, South Carolina

Mr. Pantlik,

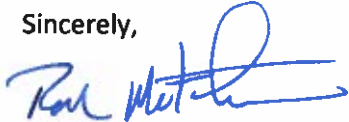
The Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) has been notified of South Street Partners' interest in constructing a non-discharge wastewater treatment facility as part of a planned golf course community that is to be located in Johns Island. As was discussed during a meeting with South Street Partners, Thomas & Hutton and staff of the BCDCOG held on May 15, 2023, existing and proposed wastewater treatment facilities that are located in Berkeley, Charleston and Dorchester counties fall within the jurisdiction of the COG's 208 Water Quality Management Plan. The construction of the proposed treatment facility will require a major amendment to the Water Quality Management Plan. The general process for a major amendment is outlined below. Please note, this process is to be completed prior to requesting SC DHEC's review/approval of the proposed treatment facilities.

1. Preliminary Engineering Report (PER) submittal to the BCDCOG. The PER should identify the area to be served, the proposed treatment system, and the proposed method of disposing of the treated effluent. In addition to the technical information regarding the system and its operation, the PER would need to address long term ownership, operations and maintenance. The PER would also need to document conformance with Charleston County's existing land use regulations as well as address any agreements with the County to insure the long-term financial viability of the system.
2. Public Notice/Public Meeting – Major Amendments require public input. Applicant must coordinate the public meeting location, date and time with the BCDCOG. The meeting must be publicly-noticed in a newspaper that is distributed in the area affected by the proposed amendment. A ten-day comment period will remain open following the meeting to receive public comments.
3. Responsiveness summary – Applicant prepares a responsiveness summary to address any/all public comments, if received.
4. BCDCOG Technical Advisory Committee review and recommendation.
5. BCDCOG Environmental Committee review and recommendation.
6. Full BCDCOG Board of Director's review and recommendation of amendment adoption.

Please be reminded that Charleston County serves as the Designated Management Agency (DMA) for the unincorporated areas of the county that are not currently being served by water/sewer infrastructure, which includes the location of the proposed project. It is our understanding that you are in the process of obtaining a new/revised development agreement with Charleston County. You will also need to obtain 208 approval from the County.

We look forward to assisting you with this process. If you have any questions or need additional information, please don't hesitate to contact me.

Sincerely,



Ronald E. Mitchum
Executive Director

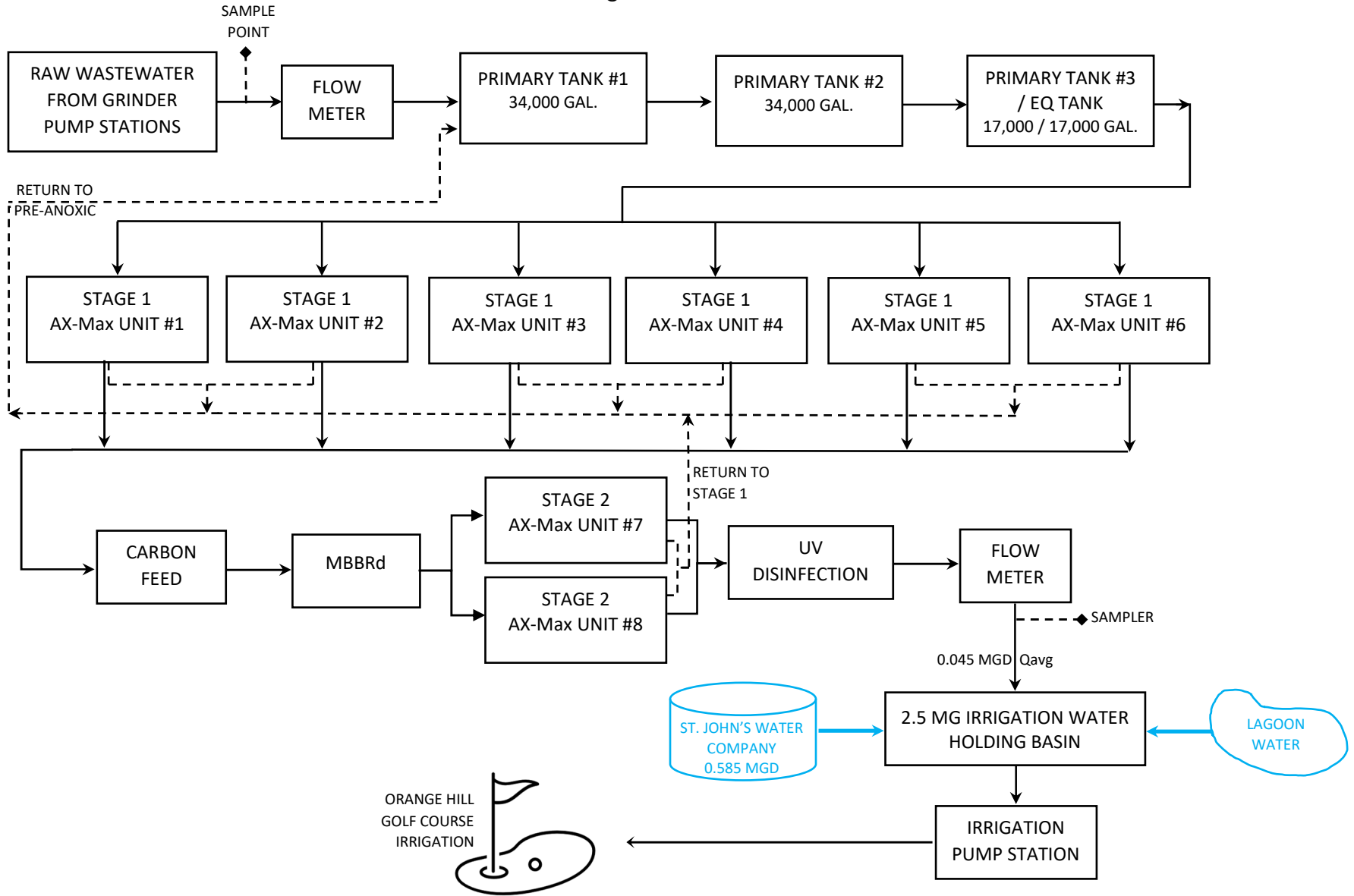


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EXHIBIT D PROCESS FLOW DIAGRAM

**ORANGE HILL WWTP
PROCESS FLOW DIAGRAM
February 6, 2026**

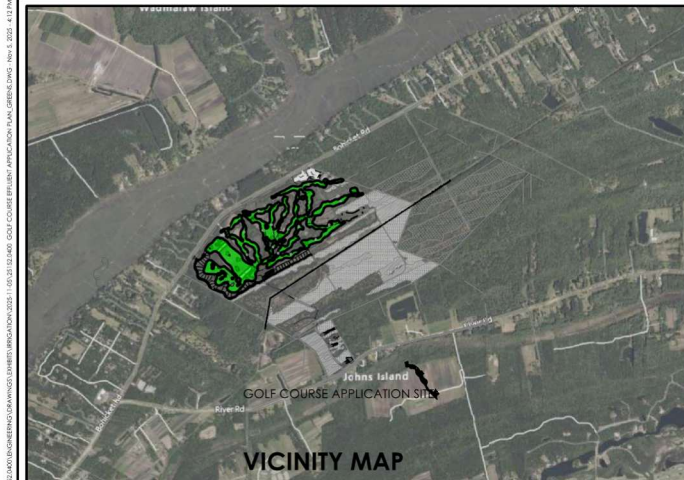
Qavg = 0.045 MGD





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EXHIBIT E GOLF COURSE EFFLUENT APPLICATION PLAN



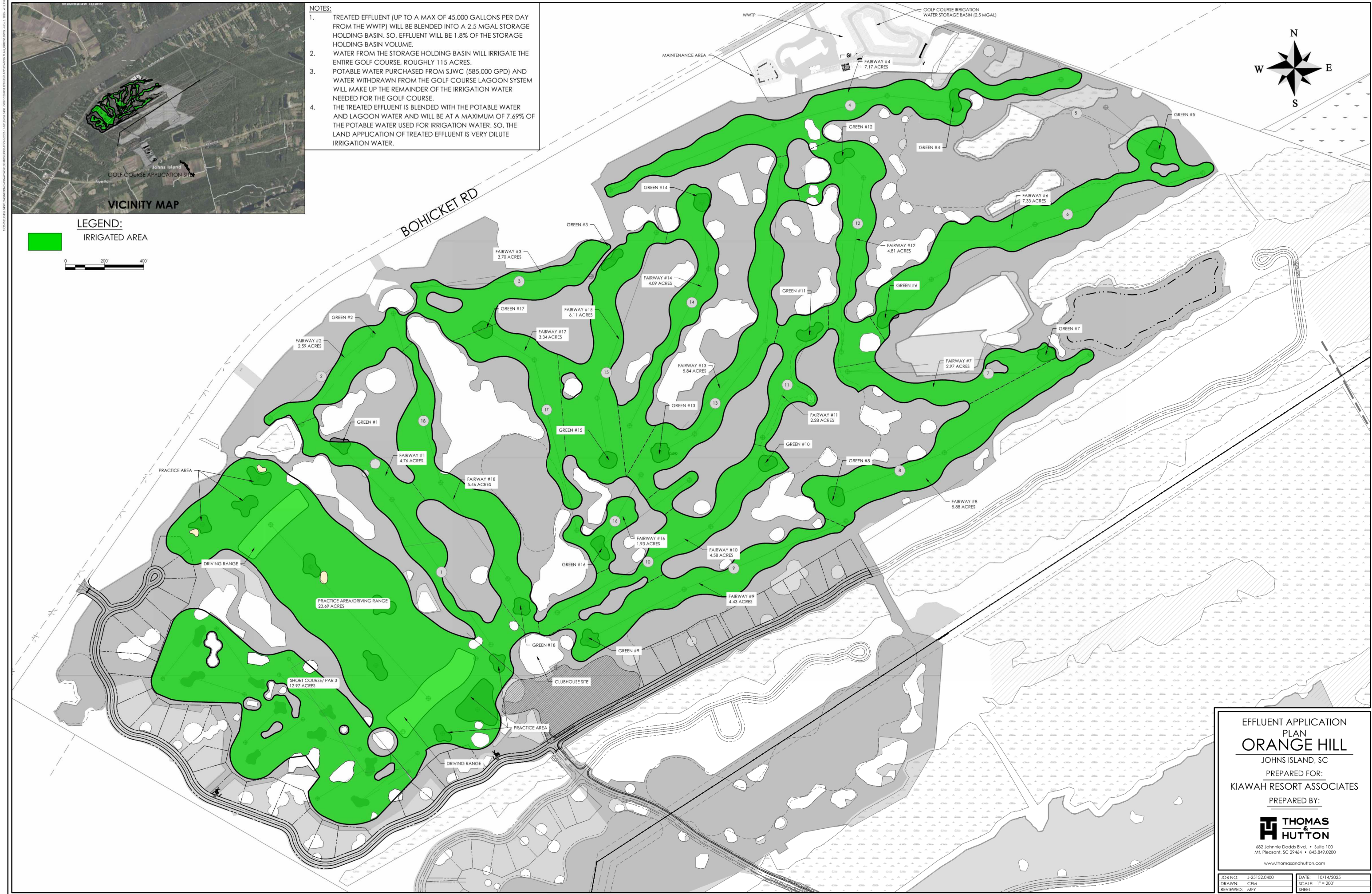
VICINITY MAP

LEGEND:

IRRIGATED AREA



- NOTES:
1. TREATED EFFLUENT (UP TO A MAX OF 45,000 GALLONS PER DAY FROM THE WWTP) WILL BE BLENDED INTO A 2.5 MGAL STORAGE HOLDING BASIN. SO, EFFLUENT WILL BE 1.8% OF THE STORAGE HOLDING BASIN VOLUME.
 2. WATER FROM THE STORAGE HOLDING BASIN WILL IRRIGATE THE ENTIRE GOLF COURSE, ROUGHLY 115 ACRES.
 3. POTABLE WATER PURCHASED FROM SJWC (585,000 GPD) AND WATER WITHDRAWN FROM THE GOLF COURSE LAGOON SYSTEM WILL MAKE UP THE REMAINDER OF THE IRRIGATION WATER NEEDED FOR THE GOLF COURSE.
 4. THE TREATED EFFLUENT IS BLENDED WITH THE POTABLE WATER AND LAGOON WATER AND WILL BE AT A MAXIMUM OF 7.69% OF THE POTABLE WATER USED FOR IRRIGATION WATER. SO, THE LAND APPLICATION OF TREATED EFFLUENT IS VERY DILUTE IRRIGATION WATER.



EFFLUENT APPLICATION
 PLAN
ORANGE HILL
 JOHNS ISLAND, SC
 PREPARED FOR:
 KIAWAH RESORT ASSOCIATES
 PREPARED BY:
THOMAS & HUTTON
 682 Johnnie Dodds Blvd. • Suite 100
 Mt. Pleasant, SC 29464 • 843.849.0200
 www.thomasandhutton.com

JOB NO: J-25152-0400	DATE: 10/14/2025
DRAWN: CFM	SCALE: 1" = 200'
REVIEWED: MFY	SHEET:



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EXHIBIT F BLENDING SNAPSHOT



January 9, 2026

Wastewater Dilution Calculations

Parameter	Concentration
BOD ₅ (Biological Oxygen Demand)	10 mg/L
TSS (Total Suspended Solids)	10 mg/L

WWTP Discharge, gpd (Max)	45,000	Percent Dilution	7.7%
Purchased Water, gpd (Max)	585,000	Dilution Ratio	1/13

$$C_1V_1 + C_2V_2 = C_3(V_1 + V_2)$$

Input Cells

Calculated Cells

WWTP Max Daily Flow	0.045 MGD
Max Purchased Water	0.585 MGD

BOD Dilution

Note: BOD sampling data is not available for Charleston Water System. Assume CWS purchased water has 1 mg/L maximum BOD concentration.

C1	10 mg/L	WWTP Effluent BOD	V1	0.045 MGD	WWTP Effluent Volume
C2	1 mg/L	Purchased Water BOD	V2	0.585 MGD	Purchased Water Volume
C3	1.6 mg/L	Calculated Concentration			

TSS Dilution

Note: TSS sampling data is not available for Charleston Water System. Turbidity is a surrogate measure for TSS.

[A log-linear model shows strong positive correlation between TSS and turbidity \(R2=0.9374\) with a regression equation of \[ln \(TSS\)=0.979 ln \(Turb.\) +0.574\].](#)

95% of Turbidity samples must be less than 0.3 NTU. Assume CWS purchased water has 0.3 NTU maximum Turbidity.

0.3 NTU Converts to approx. 0.55 mg/L

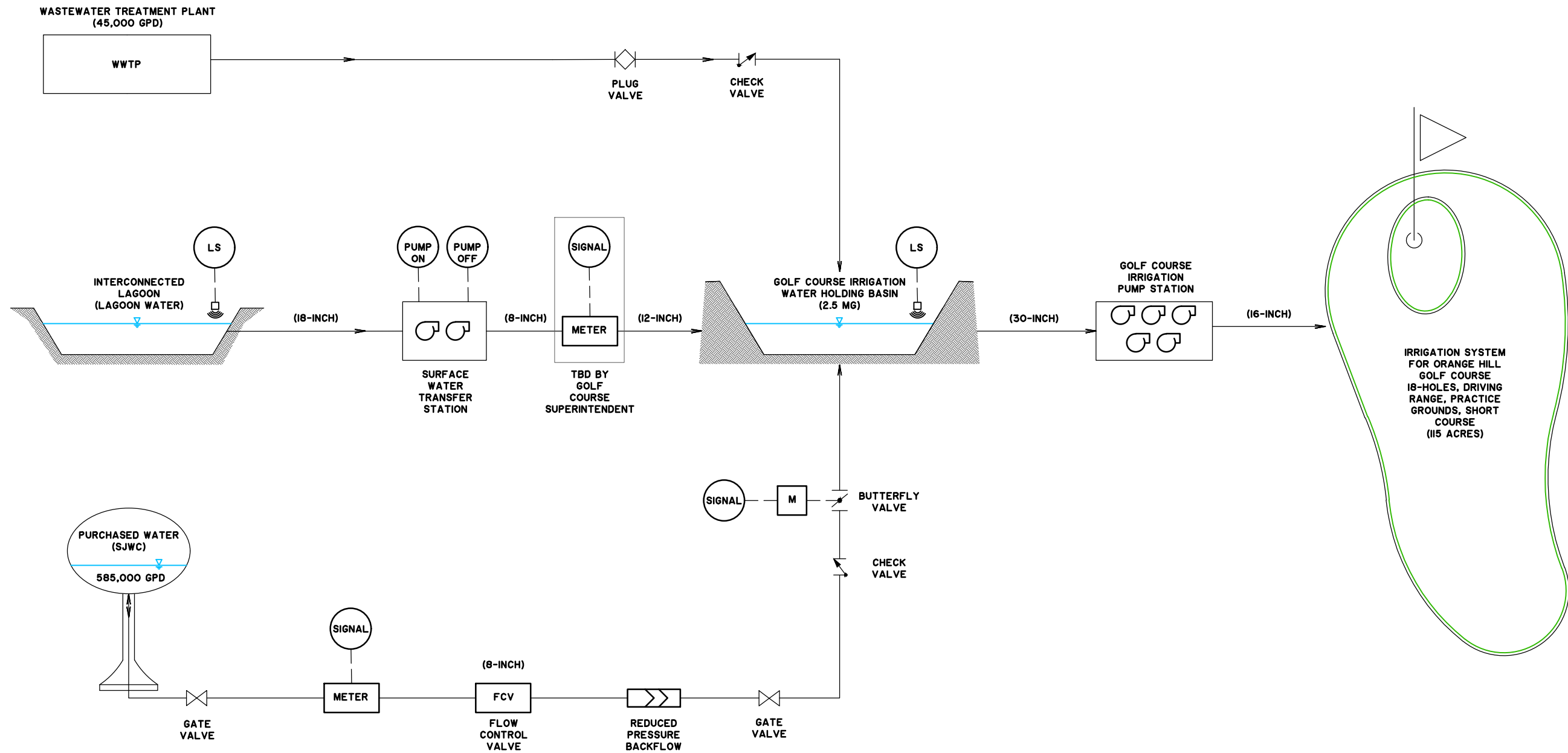
C1	10 mg/L	WWTP Effluent TSS	V1	0.045 MG	WWTP Effluent Volume
C2	0.55 mg/L	Purchased Water TSS	V2	0.585 MG	Purchased Water Volume
C3	1.2 mg/L	Calculated Concentration			



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EXHIBIT G GOLF COURSE IRRIGATION FLOW DIAGRAM

Z:\25152\25152.0400\ENGINEERING\DRAWINGS\EXHIBIT 5\IRRIGATION WATER SUPPLY DIAGRAM 25152.0400 IRRIGATION WATER SUPPLY DIAGRAM.DWG - Apr 30, 2026 - 9:15 AM



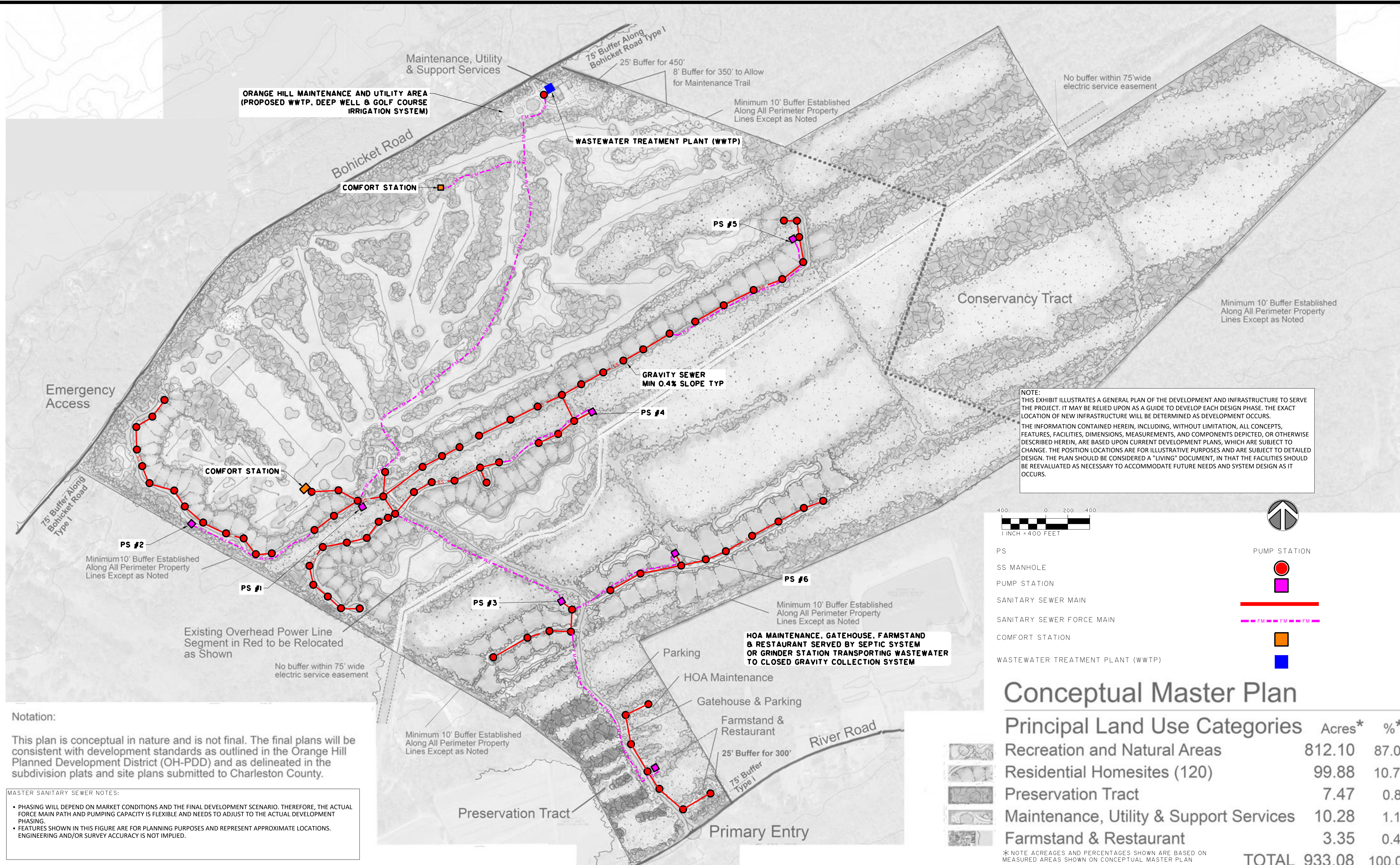
**GOLF COURSE IRRIGATION
FLOW DIAGRAM
ORANGE HILL**
 CLIENT:
KIAWAH RESORT ASSOCIATES, LP
 LOCATION: JOHNS ISLAND, CHARLESTON COUNTY, SC
 DATE: REV: APRIL 2026 DRAWN BY: CGB SHEET: 1 OF 1
 JOB NUMBER: J-25152.0400 REVIEWED BY: MMR SCALE: NTS

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 Mt. Pleasant, SC 29464 • 843.849.0200
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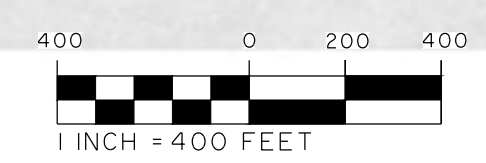


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EXHIBIT H MASTER PLAN COLLECTION SYSTEM



NOTE:
 THIS EXHIBIT ILLUSTRATES A GENERAL PLAN OF THE DEVELOPMENT AND INFRASTRUCTURE TO SERVE THE PROJECT. IT MAY BE RELIED UPON AS A GUIDE TO DEVELOP EACH DESIGN PHASE. THE EXACT LOCATION OF NEW INFRASTRUCTURE WILL BE DETERMINED AS DEVELOPMENT OCCURS.
 THE INFORMATION CONTAINED HEREIN, INCLUDING, WITHOUT LIMITATION, ALL CONCEPTS, FEATURES, FACILITIES, DIMENSIONS, MEASUREMENTS, AND COMPONENTS DEPICTED, OR OTHERWISE DESCRIBED HEREIN, ARE BASED UPON CURRENT DEVELOPMENT PLANS, WHICH ARE SUBJECT TO CHANGE. THE POSITION LOCATIONS ARE FOR ILLUSTRATIVE PURPOSES AND ARE SUBJECT TO DETAILED DESIGN. THE PLAN SHOULD BE CONSIDERED A "LIVING" DOCUMENT, IN THAT THE FACILITIES SHOULD BE REEVALUATED AS NECESSARY TO ACCOMMODATE FUTURE NEEDS AND SYSTEM DESIGN AS IT OCCURS.



- PS
- SS MANHOLE
- PUMP STATION
- SANITARY SEWER MAIN
- SANITARY SEWER FORCE MAIN
- COMFORT STATION
- WASTEWATER TREATMENT PLANT (WWTP)

Conceptual Master Plan

Principal Land Use Categories	Acres*	%*
Recreation and Natural Areas	812.10	87.0
Residential Homesites (120)	99.88	10.7
Preservation Tract	7.47	0.8
Maintenance, Utility & Support Services	10.28	1.1
Farmstand & Restaurant	3.35	0.4
TOTAL	933.08	100.0

* NOTE: ACREAGES AND PERCENTAGES SHOWN ARE BASED ON MEASURED AREAS SHOWN ON CONCEPTUAL MASTER PLAN

Notation:
 This plan is conceptual in nature and is not final. The final plans will be consistent with development standards as outlined in the Orange Hill Planned Development District (OH-PDD) and as delineated in the subdivision plats and site plans submitted to Charleston County.

MASTER SANITARY SEWER NOTES:

- PHASING WILL DEPEND ON MARKET CONDITIONS AND THE FINAL DEVELOPMENT SCENARIO. THEREFORE, THE ACTUAL FORCE MAIN PATH AND PUMPING CAPACITY IS FLEXIBLE AND NEEDS TO ADJUST TO THE ACTUAL DEVELOPMENT PHASING.
- FEATURES SHOWN IN THIS FIGURE ARE FOR PLANNING PURPOSES AND REPRESENT APPROXIMATE LOCATIONS. ENGINEERING AND/OR SURVEY ACCURACY IS NOT IMPLIED.

PREPARED FOR:
 KIAWAH RESORT ASSOCIATES, LP

CONCEPTUAL MASTER SANITARY SEWER PLAN

ORANGE HILL DEVELOPMENT

JOHNS ISLAND, CHARLESTON COUNTY, SC

FEBRUARY 2024
 REVISED: APRIL 2026

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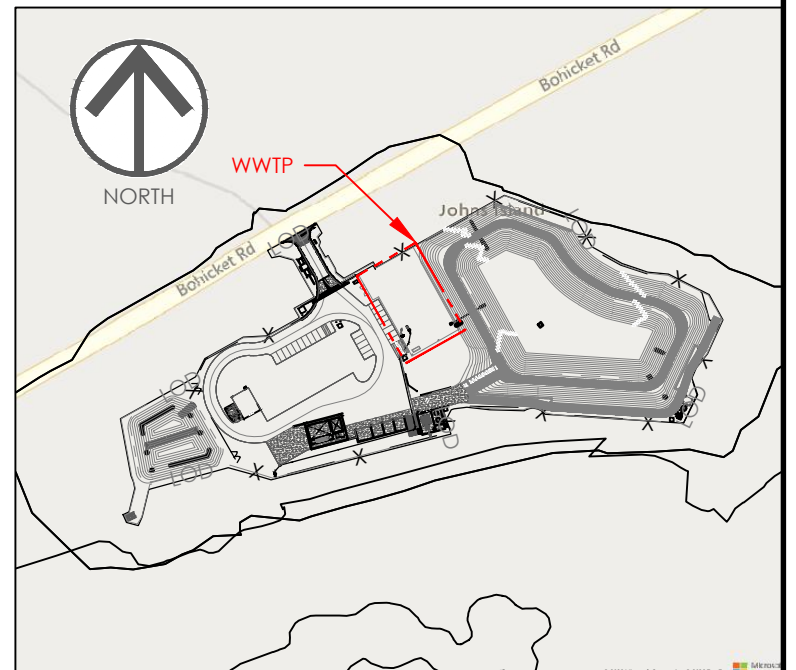
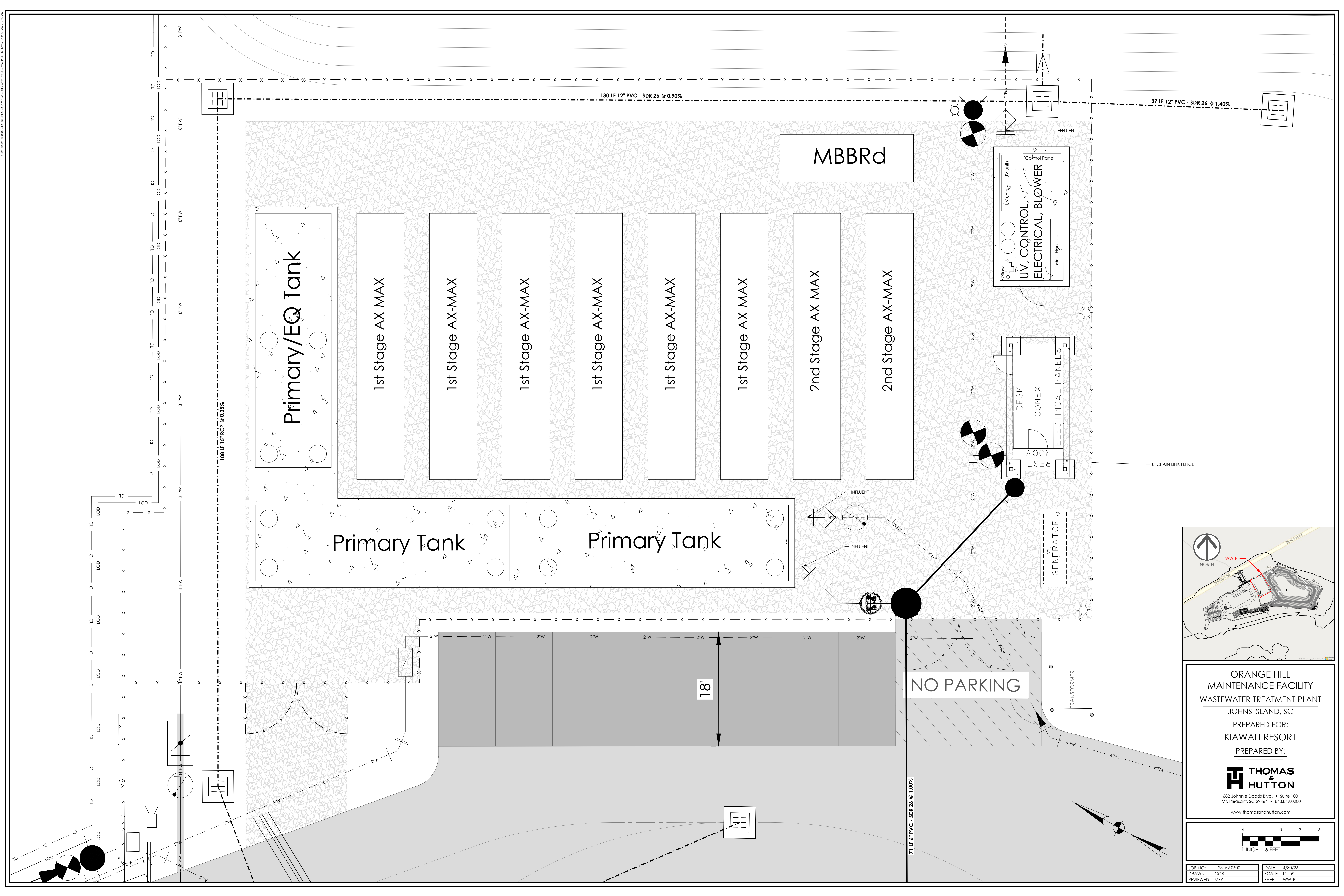
This map illustrates a general plan of the development which is for discussion purposes only, does not limit or bind the owner/developer, and is subject to change and revision without prior written notice to the holder. Dimensions, boundaries and position locations are for illustrative purposes only and are subject to an accurate survey and property description.

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EXHIBIT I CONCEPTUAL LAYOUT WWTP



ORANGE HILL
 MAINTENANCE FACILITY
 WASTEWATER TREATMENT PLANT
 JOHNS ISLAND, SC
 PREPARED FOR:
 KIAWAH RESORT
 PREPARED BY:
THOMAS & HUTTON
 682 Johnnie Dodds Blvd. • Suite 100
 Mt. Pleasant, SC 29464 • 843.849.0200
 www.thomasandhutton.com



JOB NO: J-25152.0600	DATE: 4/30/26
DRAWN: CGB	SCALE: 1" = 6'
REVIEWED: MFY	SHEET: WWTP



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EXHIBIT J FINANCIAL ASSURANCE AGREEMENT TEMPLATE

SOUTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FINANCIAL ASSURANCE AGREEMENT
FOR
KIAWAH RESORT ASSOCIATES, LP
ORANGE HILL WASTEWATER TREATMENT FACILITIES
JOHNS ISLAND, SC
(ESCROW AGREEMENT)

This Escrow Agreement (“Agreement” or “Contract”) by and between Kiawah Resort Associates, L.P. (“Owner”) and the South Carolina Department of Environmental Services (“SCDES”) is made and entered into this ____ day of _____, 20_____.

A. FACTUAL BACKGROUND

1. The intent of this Contract providing Financial Assurance is to reserve a reasonable duration of operational and maintenance costs.
2. Owner owns contiguous parcels of approximately 930 undeveloped acres (the “Project”) on Johns Island in Charleston County located between Bohicket and River Roads where Owner is in the process of planning, permitting, and developing a golf course, other recreational amenities, no more than 120 single family dwelling units, and related infrastructure. Owner desires to establish a wastewater system to provide wastewater facilities (inclusive of collection, treatment, storage, and discharge components) and service (OWS”) for all the uses within the Project including the residential lots. Individual septic systems may be utilized for facilities not located within 800 feet of the collection system.

3. On _____, 20__, Owner submitted a construction permit application to SCDES to establish sewer service for the 120 residences to be located in the Project.
4. The Owner will establish a master property owners' association (the "Association") before conveying any residential lots to purchasers. All property owners within the Project will be members of the Association and will be bound under the Declaration of Covenants, Conditions, and Restrictions (the "Master Declaration"), to pay assessments. The Master Declaration will authorize the Association to own and operate the OWS and further provide, among other things, that the Association shall impose an appropriate assessment to operate, maintain, and repair the OWS that must be paid by each lot owner, and impose appropriate assessments for maintenance and repair of individual septic systems. The Owner intends in the future to transfer the OWS and all related permits to the Association (subject to SCDES approval) to take advantage of the exemption from certain rate making regulations of the South Carolina Public Service Commission ("PSC") under S.C. Code of Regs. Section 103-502.5. The Owner anticipates the transfer of the OWS to the Association will occur within a reasonable time after the PSC approves the Association as a "Homeowners Association" under Reg, 103-502.5, and after SCDES approves the transfer of the OWS and related permits. This Financial Assurances Agreement shall remain in place until SCDES approves the substitution of the Association for the Owner and the terms of that substitution.
5. In accordance with S.C. Regulation 61-9.600, entities owning wastewater treatment systems must demonstrate technical, managerial, and financial viability to reasonably assure compliance with SCDES laws and regulations as a prerequisite for receiving a wastewater discharge permit.
6. Owner will contract with a licensed wastewater operator ("Operator") to provide routine operation, inspection, and maintenance of the OWS as required in the construction permit and to fulfill the requirement to provide financial assurances. Owner will further contract with

qualified, licensed persons for all other operational requirements (e.g., line repairs, preventative maintenance, sampling, reporting, financial management, stopping service, etc.).

7. In light of the above events, and in reference to the requirements of Regulation 61-9.600, SCDES has determined that this Agreement is necessary and appropriate, and both parties agree to the following terms and conditions.

B. AUTHORITY

1. The provisions of R.61-9.600 require financial assurance for the purpose of ensuring the operation and maintenance of the permitted system set forth above is provided by Owner.

C. RESPONSIBILITIES

1. SCDES shall:
 - a) Establish an identified interest-bearing account (“Account”) in the South Carolina Office of the State Treasurer. Interest will be determined by the State Treasurer’s Office.
 - b) Provide monthly Account status information including e-mailing the current balance information to the Owner.
2. Owner, and the Association if SCDES approves the transfer of the OWS and the operating permit(s) to it , shall:
 - a) Limit average sewer flow from the residences and any other users, excluding individual septic systems, to 45,000 gallons per day (“gpd”).
 - b) Construct the OWS in accordance with the plans provided in the construction permit application and any conditions set forth in the OWS Permit (Attachment A).
 - c) Provide for satisfactory operation, inspection, monitoring, maintenance, repair or replacement of the OWS, and regulatory reporting, such that the viability of the OWS is not compromised for the life of the system.

- d) Provide for satisfactory maintenance and repair of individual septic systems.
- e) Enter into an agreement with a Biological Wastewater Operator (Operator) of the appropriate grade certified by the Environmental Certification Board of the South Carolina Department of Labor, Licensing, and Regulation to operate the wastewater treatment plant and to provide inspections, maintenance, and repairs of the OWS covered by this Agreement. Operator will provide routine monitoring, inspection, and maintenance of the OWS covered by this Agreement and provide the required regulatory reporting on and testing of the OWS. The Operator shall be entitled to reasonable compensation from the Owner for its services including reporting the condition of the OWS to Owner and SCDES. The owner will further contract with qualified, licensed persons for all other operational requirements (e.g., line repairs, preventative maintenance, sampling, reporting, financial management, stopping service, etc.).
- f) If Operator terminates its service agreement with Owner as the servicing entity, Owner has the responsibility to procure a new licensed service provider within sixty (60) days from the date of such termination with such new service provider to be approved by SCDES.
- g) Maintain a minimum Account balance of \$230,000 at all times for the ongoing operation, maintenance, and repair of the OWS necessary to serve the average sewer flows referenced above to serve the home sites and other users in Orange Hill who will be members of the Association in the event the Owner defaults and fails to properly perform its responsibilities after notice of such failure and request to cure that failure. An initial deposit of \$50,000 shall be required within sixty (60) days of the execution of this Agreement. The Owner must pay the remaining \$180,000 no later than SCDES' issuance of a permit to operate the OWS. In order to maintain the balance of \$230,000 in the Account, any amount expended therefrom shall be replenished by the Owner. The Owner's failure to replenish any amount expended

from the fund within six (6) months shall constitute a default and evidence of Owner's lack of financial viability and authorize SCDES to take such measures as it determines are reasonably necessary to assure the continued operation of the OWS. Financial assurance is provided for the operation and maintenance line items described in the Engineer's Estimate provided in Attachment B in the event of such default by Owner. These funds may also be expended to engage a separate Operator in the event the Owner is no longer financially viable. SCDES will then submit this money to Account maintained by the State Treasurer's Office for the costs associated with restoration and maintenance of the OWS in accordance with this Agreement in the event of such default by Owner.

- h) Submit to SCDES within sixty (60) days of the execution of this Agreement the initial \$50,000 financial assurance amount referenced above.
- i) Funds in the Account shall be used only upon the authorization of SCDES to perform necessary operation and maintenance of the OWS in the event of the Owner's failure to do so after notice and failure to cure.
- j) In the event that funds from the Account must be used, Owner shall refund/replenish the Account within six (6) months. A refund shall be accomplished by submitting payment to SCDES, and SCDES will then submit this money to the Account maintained by the State Treasurer's Office.
- k) Comply with all regulations, notifications, and approvals required by applicable state law.
- l) In the event Owner desires to sell or otherwise transfer or convey the property, the collection system, the OWS and/or the property upon which the OWS is located, SCDES must be notified of the proposed transfer and this Agreement must be modified to recognize the new proposed Owner and the obligations of each Party, to assure continued Financial Assurance.

No less than thirty (30) days prior to the transfer, Owner must send notice of the proposed transfer of the OWS to:

Domestic Wastewater Permitting Section
Water Facilities Permitting Division of the Bureau of Water
South Carolina Department of Environmental Services
2600 Bull Street; Columbia, SC 29201

- m) The notification shall include Owner's certification of compliance with this Agreement, and that the OWS is in compliance with state and federal statutory and regulatory requirements.
- n) If, during the term of this Agreement, any event arises that would inhibit or prohibit Owner from complying with the duties, obligations, or responsibilities imposed by this Agreement, Owner will give immediate notice to SCDES at the address listed above.

D. TIME OF PERFORMANCE

1. This Contract shall be effective on the date set forth below by the SCDES Contracts Manager and may terminate five (5) years after the effective date in accordance with the terms and conditions of Section F below that would require a determination by SCDES that the OWS has been responsibly operated and there is no further need for Financial Assurance. Further in accordance with Section F below, this Contract shall terminate if Owner transfers the Property, permits or transfers the OWS to another entity subject to new Financial Assurance being provided that is acceptable to SCDES. If there is any conflict between the terms of this Section and Section F below, the terms of Section F shall control.
2. Prior to the termination date of this Contract, Owner and SCDES may evaluate extending the Contract to establish a new termination date. Should both parties agree to extend this Contract, the extension shall be granted for a period up to, but not longer than five (5) years.

E. TERMS AND CONDITIONS

1. The appropriate amount of Financial Assurance required for these permitted facilities is \$230,000 (Attachment B).
2. The failure by Owner to maintain or operate all OWS or to maintain funds in the Account as described in the Terms and Conditions of this Agreement may result in legal action, penalties and/or the revocation of SCDES' approval to operate Owner's OWS.
3. Nothing in this Agreement shall be construed to limit SCDES' authority to issue orders, impose fines, or take other action it deems necessary to protect the environment, public health, and safety, or to compel compliance with the laws of this state. Owner's failure to comply with this Agreement shall subject them to all applicable enforcement actions in accordance with SCDES' statutory and regulatory authority.
4. The release and return of these funds to Owner with interest earned is conditional upon one of the following:
 - a) The permitted OWS (excluding any individual septic systems) being fully and properly connected to either (1) a public wastewater system or (2) a PSC-regulated utility company using other funding mechanisms after approval by SCDES. In this event, SCDES shall determine a reduced amount of Financial Assurance to cover the scope of the collection system connection to either (1) or (2) and release the difference to the Owner; or
 - b) Transfer of the OWS to another entity that does not include the Owner, or their affiliates or assignees, with notification to SCDES of the proposed transfer of the OWS permit (or issuance of a new permit) to prospective Owner in compliance with R.61-56, and subsequent to the new permittee establishing Financial Assurance as required by SCDES.
 - c) Transfer of the OWS to another entity that does not include the Owner, or their affiliates or assignees, with notification to SCDES of the proposed transfer of the OWS permit (or

issuance of a new permit) to prospective Owner in compliance with R.61-56, and subsequent to a determination by SCDES that the finances of the new permittee are sufficient so that SCDES will not require further Financial Assurance.

5. Owner's obligation to pay for operation and maintenance is not limited in any way by the provision of the Financial Assurance. The intent of providing the Financial Assurance is to reserve a reasonable duration of operational and maintenance costs. The owner remains responsible for complying with all state and federal statutes and regulations applicable to the ownership, operation, maintenance, and repair or replacement of the permitted systems.
6. SCDES may utilize the funds in the Account maintained by the State Treasurer's Office in the event Owner:
 - a) is unable, or refuses to perform the required operation or maintenance or regulatory compliance in a timely fashion;
 - b) is unable, or refuses, to contract with a qualified Operator for routine inspection and monitoring; or
 - c) Neglects the OWS and fails to cure such neglect in a reasonable time after notice.

Upon thirty (30) days written notice, SCDES may hire a qualified Operator to perform necessary operation or maintenance of the OWS. The costs for the services listed in subsections 6. a., b., and c. above shall be paid from the Account maintained by the State Treasurer's Office upon SCDES' approval of the invoices submitted by the Operator.

Additionally, SCDES shall have the right to terminate/transfer the applicable permits and if necessary, institute a tap moratorium on additional connections and to notify the building permit division of Charleston County of this tap moratorium so that it may take any steps it deems appropriate under the circumstances including suspending any new building permits.

7. All notices, deliveries, payments, or other communications required or permitted hereunder shall be deemed given when sent by certified or registered mail addressed as follows:

To SCDES:

Domestic Wastewater Permitting Section
Water Facilities Permitting Division of the Bureau of Water
South Carolina Department of Environmental Services
2600 Bull Street; Columbia, SC 29201

To Owner:

Ray Pantlik
Kiawah Resort Associates, LP
1 Kiawah Island Parkway
Kiawah Island SC 29455
o 843.768.3418 | m 843.814.3418
rpantlik@southstreetpartners.com

8. If the Owner's address changes, the Owner shall notify SCDES in writing by a letter sent by certified or registered mail to the address listed above within fifteen (15) days of the change.
9. SCDES will notify Owner in writing of any applicable changes in the address provided above in paragraph 7.

F. TERMINATION

1. Subject to the provisions contained below, this Contract may be terminated by SCDES by providing thirty (30) days advance written notice of termination to the Owner if the Owner has repeatedly failed to perform its obligations under this Contract after notice and a reasonable opportunity to cure, and SCDES determines that such failures by Owner jeopardize the operation and performance of the OWS and the service provided to the community and members of the Association.
2. SCDES may terminate this Contract for cause, default or negligence on the part of Owner at any time without thirty days advance written notice. SCDES may, at its option, allow Owner

a reasonable time to cure the default before termination. SCDES shall have the right to seek a court-appointed receiver for the OWS and to pay any costs associated with the appointment of the receiver and operation of the OWS by the receiver from the Financial Assurance fund.

G. INSURANCE

SCDES maintains liability insurance issued through the South Carolina Insurance Reserve Fund as provided by the South Carolina Tort Claims Act. SCDES does not insure the Property or equipment thereon.

H. LIABILITY, NO AGENCY RELATIONSHIP

Neither party shall be liable for any claims, demands, expenses, liabilities, and losses (including reasonable attorney's fees) which may arise out of any acts or failures to act by the other party, its employee or agents, in connection with the performance of services pursuant to this Contract. Neither party is an employee, agent, partner, or joint venturer of the other. Neither party has the right or authority to control or direct the activities of the other or the right or ability to bind the other to any agreement with a third party or to incur any obligation or liability on behalf of the other party, unless expressly authorized in this Contract.

I. NON-INDEMNIFICATION; LIMITATION ON TORT LIABILITY

Any term or condition of this Contract or any related agreements is void to the extent it: (1) requires SCDES to indemnify, hold harmless, defend, or pay attorney's fees to anyone for any reason; or (2) would have the purpose or effect of increasing or expanding any liability of the State of its agencies or employees for any act, error, or omission subject to the South Carolina Tort Claims Act, whether characterized as tort, contract, equitable indemnification, or any other theory or claim.

J. CHOICE OF LAW

The Contract, any dispute, claim, or controversy relating to the Contract and all the rights and obligations of the parties shall, in all respects, be interpreted, construed, enforced and governed by and under the laws of the State of South Carolina, except its choice of law rules.

K. DISPUTES

All disputes, claims, or controversies relating to the Contract shall be brought exclusively in the South Carolina Court of Common Pleas for Richland County or in the United States District Court for the District of South Carolina, Columbia Division. By signing this Contract, the Owner consents to jurisdiction in the South Carolina courts. Owner agrees that any act by SCDES regarding the Contract is not a waiver of either sovereign immunity or immunity under the Eleventh Amendment of the United States Constitution and is not a consent to the jurisdiction of any court or agency of any other state.

L. SERVICE OF PROCESS

Owner consents to service of process by certified mail (return receipt requested) to the address provided as the Owner's Notice Address herein, or by personal service or by any other manner that is permitted by law, in or outside South Carolina. Notice by certified mail is deemed effective when received.

M. PLACE OF CONTRACTING

This Contract is deemed to be negotiated, made, and performed in the State of South Carolina.

N. CONFIDENTIALITY

The parties shall maintain securely any confidential information obtained through the performance of this Contract to ensure the confidentiality of this information in compliance with applicable law. The parties shall use and disclose such confidential information only as required

to perform services under this Contract and as required by applicable law. Confidential information includes information known or maintained in any form, whether recorded or not, consisting of protected health information, other health information, personal information, personal identifying information, confidential business information, and any other information required by law to be treated as confidential, designated as confidential by SCDES, or known or believed by Owner or Owner's employee or agent to be claimed as confidential or entitled to confidential treatment.

O. REGULATIONS

The provisions of this Contract are subject to revision of applicable and relevant State or federal statutes and regulations.

P. AMENDMENTS

The Contract may only be amended by written agreement of all parties, which must be executed in the same manner as the Contract.

Q. ASSIGNMENT

Owner cannot assign or transfer the Contract or any of its provisions without SCDES' written consent, which shall not be unreasonably withheld. Any attempted assignment or transfer not in compliance with this provision is null and void. A change in ownership of Owner is considered an assignment.

R. INSOLVENCY, BANKRUPTCY, AND DISSOLUTION

1. Notice. Owner shall notify SCDES in writing within five (5) business days of the initiation of insolvency, receivership, or bankruptcy proceedings, whether voluntary or involuntary, and not less than thirty (30) business days before dissolution or termination of business. Notification shall include, as applicable, the date the petition was filed, anticipated date of dissolution or

closure of business, identity of the court in which the petition was filed, a copy of the petition, and a listing of all State contracts against which final payment has not been made. This obligation remains in effect until completion of performance and final payment under this Contract.

2. Termination. This Contract is voidable and subject to immediate termination by SCDES upon Owner's insolvency, appointment of a receiver, filing of bankruptcy proceedings, making an assignment for the benefit of creditors, dissolution (if an organization), death (if an individual), or ceasing to do business.

SOUTH CAROLINA DEPARTMENT OF ENVIRONMENTAL SERVICES

BY: _____
Brenda Green, Manager
Domestic Wastewater Permitting Section

DATE: _____

MAILING ADDRESS:
Attn: Domestic Wastewater Permitting Section
SCDES
2600 Bull Street
Columbia, SC 29201
803-898-4300

KIAWAH RESORT ASSOCIATES, LP

BY: _____

DATE: _____

MAILING ADDRESS:
Attn: _____

Telephone:
Fax:
E-mail:

TAX/EMPLOYER ID#:

TYPE OF ENTITY (check one):

- Corporation
- LLC
- Partnership
- Nonprofit organization
- Government agency or political subdivision
- Other Governmental body (specify)
- Individual/sole proprietor
- Other (specify) _____

If a corporation, LLC, or nonprofit organization:

State of incorporation/organization:

Registered agent and address in South Carolina:

SCDLLR or other license #

THIS AGREEMENT IS NOT OFFICIAL AND BINDING UNTIL SIGNED BY THE SCDES CONTRACTS MANAGER.

BY: _____
Francine Miller
SCDES Contracts Manager

DATE: _____

ATTACHMENT A

OWS CONSTRUCTION PLANS & SCDES PERMIT

ATTACHMENT B
ENGINEER'S ESTIMATE OF
OWS OPERATION & MAINTENANCE COSTS