STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

Groundwater Discharges Section

Telephone: (302) 739-9948

MEMORANDUM

GWDS Engineering Review

To: John Rebar Jr., EPMI, DNREC-GWDS

Review by: Marlene Baust, P.E., Environmental Engineer IV

Facility: Inland Bays Regional Wastewater Treatment Facility
Spray Irrigation Permit DEN Number: 359141-05

Submittal: July 12, 2019 Application Submittal for a Construction Permit for the Phase 2 Expansion of the Inland Bays Regional Wastewater Facilities prepared by Whitman, Requardt & Associates, LLP and submitted on behalf of Sussex County

Date: August 3, 2020

Background

The Groundwater Discharges Section (GWDS) has performed an engineering review of the Application for a Construction Permit for the Phase 2 Expansion of the Inland Bays Regional Wastewater Facilities (IBRWF) prepared by Whitman, Requardt & Associates, LLP (WRA) and submitted on behalf of Sussex County.

Sussex County currently operates and maintains the Inland Bays Regional Wastewater Treatment Facility (IBRWF) under State Permit DEN No. 359141-05. The facility provides treatment of domestic wastewater and uses spray irrigation to dispose of the treated effluent on 432.5 acres of irrigated agricultural land adjacent to the treatment facility. The IBRWF has an existing treatment capacity of 2.0 MGD. In December 2009, the Department issued a Construction Permit for treatment upgrades that included biological nutrient removal and amended the Operation Permit in July 2012 subsequent to construction. And, in September 2015, the Department issued a Construction Permit for sludge storage and dewatering improvements and amended the Operations Permit in October 2016 subsequent to construction.

The July 12, 2019 application submittal for a Construction Permit for the Phase 2 Expansion requests a permit to increase both the treatment and disposal capacities of the IBRWF. Sussex County is seeking to increase the treatment capacity from 2.0 MGD to 4.0 MGD on a maximum monthly basis (annual average flow of 3.0 MGD) by expanding and upgrading its treatment facility. A summary of treatment upgrades in Phase 2 may be found on page 4 and/or page 21 of the July 2019 Design Engineer Report (DER).

The application submittal also proposes an increase in the disposal capacity from 2.65 MGD to 5.4 MGD on a maximum monthly basis (annual average flow of 3.0 MGD) by adding approximately 280 acres of total area (219.9 wetted acres) by developing two spray fields: Area C (north of Inland Bays Rd), and Area D (north of Inland Bays Rd).

A regional septage receiving facility is included in the proposed upgrades and will take the place of the existing septage receiving facility at the South Coastal WRF.

Additionally, on April 12, 2018 Sussex County met with the Division of Water to discuss future expansion plans for the IBRWF. During the meeting, Sussex County discussed potential alternative disposal options in lieu of providing 45 days of storage in accordance with Section 6.3.2.3.12.1 of the Regulations. An email to Sussex County dated April 18, 2019 indicated that the Division of Water is supportive of reviewing and potentially permitting the proposed alternative disposal methodologies in lieu of requiring additional storage capacity, up to the 3 million gallon a day threshold presented. However, the area portrayed as the location for the proposed lagoon (17.6 acres) must remain available in case it is needed in the future pending actual operations and performance of the permitted alternative disposal methods. The email further iterated that the concept of using the rapid infiltration basins at Stonewater Creek Wastewater Treatment and Disposal Facility (owned and operated by Artesian) and constructed wetlands are viable alternatives that the Division would support given the appropriate details and design considerations were submitted leading to a Construction Permit and subsequent Operations Permit Amendment. Since then, the Department has approved the use of the Stonewater Creek WWTDF for disposal of IBRWF treated effluent; and, a proposal for the constructed wetland has been submitted on June 1, 2020 and is currently under review.

The Phase 2 Expansion Application (only) was reviewed for compliance in accordance with the intent of 7 Del. Admin. C. §7101, *Regulations Governing the Design, Installation and Operation of On-site Wastewater Treatment and Disposal Systems* (the Regulations). The following are the GWDS's comments and requests for additional information.

Chronology of Submittals Received & Correspondence

February 25, 2017	Soil Investigation Report (SIR) for the proposed Inland Bays Spray Expansion Project. Prepared by Accent Environmental, LLC. with Revisions dated May 2017.
May 19, 2017	DNREC SIR Approval
December 6, 2018	Submittal from WRA 1. DNREC Application Form Application for a Permit to Construct a Wastewater Treatment Spray Irrigation Facility 2. Legal Notice fee in the amount of $210

3. Design Engineering Report (DER) for the Phase 2 Expansion of the Inland Bays Regional Wastewater Facilities in Sussex County, Delaware, dated November 1, 2018. Prepared for: Sussex County, Delaware. Prepared by: Whitman, Requardt & Associates, LLP

January 4, 2019 — DNREC email notifying Application Administratively Incomplete

January 11, 2019 — Submittal from WRA
1. IBRWF Phase #2 Expansion Signed Full Size Drawings
2. IBRWF Phase #2 Expansion Signed Specifications
3. CD with Drawings/Specs and HydroGeo Report (HSR)
    a. Hydrogeologic Report for Spray Irrigation Expansion at the Inland Bays Regional Wastewater Facilities in Sussex County, Delaware dated October 26, 2017. Prepared for Sussex County, Delaware. Prepared by: Whitman, Requardt & Associates, LLP

January 14, 2019 — DNREC Email notifying Application Administratively Incomplete

January 28, 2019 — Submittal from WRA (rec'd January 31, 2019)
1. CD with Updated DER, SWAR, and Site Map
    a. Surface Water Assessment Report (SWAR), Inland Bays Regional Wastewater Facilities, Sussex County, Delaware, dated January 28, 2019. Prepared for: Sussex County Engineering Department, Georgetown, Delaware. Prepared by: Whitman, Requardt & Associates, LLP
2. Comment Response Letter

April 18, 2019 — Email from Hans Medlarz, PE, Sussex County Engineer, withdrawing the Construction Permit Application Submittal to provide revision

July 17, 2019 — Revised Submittal from WRA
1. CD with Updated Drawings, Specs and DER
2. Full Size Updated Drawings
    a. Design Engineering Report for the Phase 2 Expansion of the Inland Bays Regional Wastewater Facilities in Sussex County, Delaware, dated July 12, 2019. Prepared for: Sussex County, Delaware. Prepared by: Whitman, Requardt & Associates, LLP
    b. Drawings titled Inland Bays Regional Wastewater Facility Phase 2 Expansion Contract S19-10 100% Submittal. Signed by the County Engineer on January 7, 2019
    c. Project Specification Contract S19-10 Inland Bays Regional Wastewater Facility: Phase #2 Expansion, December 2018, Final For Bid, Volume I of II. Signed by the County Engineer on January 7, 2019

d. Project Specification Contract S19-10 Inland Bays Regional Wastewater Facility: Phase #2 Expansion, December 2018, Final For Bid, Volume II of II. Signed by the County Engineer on January 7, 2019
    i. Volume II includes a January 2019 Geotechnical Report (begins on pdf page 473)

Regulation Section 3.32.1 and 4.1.3, 4.2 Licensing Requirements

In accordance with Section 3.32.1 of the Regulations, and with 24 Del. C., the submittals must be signed, sealed and dated by the preparing/approving licensed professional engineer. And, in accordance with Section 4.1.3 and 4.2 of the Regulations, the preparing/approving licensed Professional Engineer must also hold a State of Delaware Class C – Designer license.

The DNREC Application form is signed by David R. Nixson, Delaware PE License No. 21385 and Class C License Number: 5935. However, the DER, Drawings and Specs are signed by a PE that does not hold a Class C License.

The DER, Drawings and Specs must be signed/sealed by a P.E. that holds a Class C License.

Design Engineer Report

DER Section 4.1 Influent Wastewater Characteristics

Only data from 2012 through 2016 was analyzed and utilized. The revised submittal must include an analysis of current data.

Indicates "*The historical flows for 2012 through 2016 were analyzed in the IBRWF Phase 2 Expansion Technical Memorandum, WRA, January 2017*." And "*The full calculation spreadsheet is in Appendix B of the IBRWF Phase 2 Expansion Technical Memorandum, WRA, January 2017*." The GWDS is unable to locate the referenced Technical Memorandum. The revised submittal must include the referenced document.

DER Section 4.2 Effluent Wastewater Characteristics

Table 4.10 - In accordance with Section 6.3.2.3.3.1.2.3 of the Regulations, and because the system contains mechanical components as well as filtration, the facility should be meeting a TSS limit of 50 mg/L. A TSS limit of 50 mg/L will be required if maintaining limited public access criteria. Unlimited public access criteria requires a TSS limit of 10 mg/L. Section 4.2 should be revised accordingly and should indicate the intent to either maintain limited public access criteria, or upgrade to unlimited access criteria.

Page 18 iterates "*The current permit states that the average quantity of effluent discharged to any portion of the spray irrigation fields shall not exceed 1.86 inches per acre per week with a maximum field application rate of 0.25 inches per hour*." Only the North and South Field are

restricted to 1.86 inch/acre-week. All other fields have specified limitations. Section 4.2 should be revised accordingly.

Page 18 iterates "…*the permit requires grab samples be taken every quarter from the ten monitoring wells located on the property and submitted in a report to DNREC. However, the permit does not provide requirements for the measured values.*" Part I.F of Sussex County's Permit DEN Number 359141-05 for the IBRWF requires *"Operation of the wastewater treatment facility and spray irrigation system shall not cause the quality of Delaware's ground water resources to be in violation of applicable Federal or State Drinking Water Standards on an average annual basis*." (i.e., Nitrates <10 mg/L).

Page 19 iterates "*From the nitrogen balance spreadsheets included in the CMR, it was concluded that the application of chemical fertilizer, not the application of wastewater that is the driver of any monthly excess nitrogen in the percolate. It was recommended chemical nitrogen fertilizer be eliminated or spread out over the growing season to affect the excess total nitrogen being applied, which is especially high in the month it is applied. With the elimination or modification of chemical nitrogen fertilizer application to the vegetative management plans, the fields indicated no issues to continuing to assimilate the nitrogen applied by wastewater effluent irrigation*."

Despite the discontinuation of fertilizer application, current groundwater monitoring data indicates there are elevated nitrates in multiple wells:

	MW-02	MW-04	MW-08	MW-12	MW-13	MW-15	MW-16	MW-18	MW-21	MW-22	MW-23	MW-24	MW-25	MW-26	MW-29
	86146	237997	86152	208214	208215	208217	228543	237074	238298	238299	238967	238968	238969	238970	252815
2018															
Mar	13.9	6.34	8.85	20.2	4.71	21.1	13.2	10.9	14.8	10.2	14.4	14.4	8.71	9.46	9.16
Jun	8.76	19.6	9.69	21.9	4.34	17.1	8.08	12.6	15.1	10.3	0.762	14.8	10.8	8.7	10
Sep	8.56	6.82	8.81	19.7	11.7	13.2	6.39	11.8	14.3	10.8	0.61	15.7	7.75	9.24	8.79
Dec	6.67	7.13	12.2	15.4	10.2	12.9	13.7	11.2	15.1	12.8	0.2	8.96	7.5	7.84	12.1
2019															
Mar	1.96	6.9	11.3	11.9	3.86	11.8	4.85	7.81	16.3	10.3	0.38	7.74	4.09	7.02	11.9
Jun	2	6.63	12.8	9.22	4.2	0	4.4	7.54	10.3	8.9	0.712	7.48	4.09	11.1	9.46
Jul	0	0	0	0		8.55	0	0	0	0	0	0	0	0	0
Sep	10.3	1.88	17	8.27	9.18	7.32	2.96	8.68	9.45	8.04	0.5	8.73	3.77	11.4	8.65
Oct	7.2	4.63	0	9.29	10.6	0	0.36	0	0	0	0	0	0	0	0
Dec	0	0	13.7	0	0	10.1	0	0	10.3	7.86	0.4	7.76	5.12	10.3	16
2020															
Mar	7.29	3.64	14.3	9.25	6.41	7.53	2.39	4.33	11.8	7.17	0.506	6.27	6.49	12.9	14.2
Jun	29.5	3.88	6	6.76	2.44	7.57	12.1	9.32	12.9	6.6	1.61	9.65	6.67	12.4	12.5

Current groundwater conditions should be addressed in the DER to ensure groundwater conditions are not further impacted by the discharge.

DER Section 5.6 Schematic of Pump Stations and Unit Processes

"*The stored effluent is pumped from the storage lagoon Nos. 1 and 2 to spray irrigation rigs and the irrigation loop. The irrigation loop is planned for also providing irrigation water to adjacent agricultural lands not owned by the County*." Section 6.3.2.3.3.2.4 of the Regulations requires

IBRWF to meet unlimited access criteria to provide water to adjacent agricultural lands not owned by the County. Separate Application would also be required in accordance with Section 6.11 of Regulations. These requirements would need to be addressed prior to providing irrigation water to adjacent agricultural lands not owned by Sussex County.

DER Section 5.8 Storage Capacities

"*The average influent flows to the IBRWF vary seasonally, therefore a winter and a summer design average flow have been developed. The distinction between winter and summer flows is significant to the spray irrigation and storage facilities. Information relevant to storage volume calculation from Table 4.2 is provided in Table 5.6.*"

The GWDS is unable to perform a meaningful analysis of current influent flow data to determine seasonal variation as the influent data may have been influenced by the diversion of flows between IBRWF and the Wolfe Neck Regional Wastewater Facility in accordance with an email received on January 16, 2019 from Sussex County indicating that the two systems were connected to balance flows between the two plants. The email did not provide a connection date.

"*The winter average of 2.8 MGD times 45 days equals 126 million gallons of storage*."

Section 6.3.2.3.12.1 of the Regulations requires "*Municipal systems require a minimum of 45 days storage, unless other disposal options are permitted."*

"*Sussex County has discussed other disposal options with DNREC and will pursue them separate from the IBRWF expansion…Figure 3.1 indicates the space reserved for an effluent storage lagoon that could provide the 45 days of storage if needed in the future*."

Reference 'Background' Section of this Review regarding discussion. Application must provide more detailed narrative regarding how the Stonewater Creek WTDF RIBs and constructed wetland will alleviate the need for the 45 days of storage.

Section 6.3.2.3.12.2 requires "*All facilities must demonstrate through monthly wastewater irrigation rate calculations that adequate storage is provided for design flows."*

Section 6.3.2.3.12.4 requires "*The Design Engineer Report must demonstrate through monthly calculations that there is sufficient spray acreage to eliminate the average daily design flow and the total storage volume within a 90 day period via irrigation.*"

Section 6.5.1.4.1.7.6.9.2 requires "*Ensure the spreadsheet includes monthly storage pond volume calculations and required storage calculations. Ensure that the calculations demonstrate the ability to evacuate the maximum accumulated storage within a 90 day period and include the following considerations on a monthly basis: Average Precipitation, Volume Added to Pond from Precipitation, Evaporation, Volume lost due to Evaporation, Net Change in Pond Volume, Treated Effluent Volume to Pond, Potential Application from Pond to Spray Fields, Change in Volume, Required Accumulated Storage."*

The storage balance provided in Section 7 of the DER utilizes an acreage weighted average of the weekly application rates, as well as, yearly averaged influent flow. The GWDS is unable to locate storage balance calculations based on design monthly seasonal influent flows and irrigation volumes to each field. The revised submittal must include monthly storage calculations that address all applicable requirements set forth in the Regulations, utilize variable monthly rates as appropriate for influent and effluent flow rates to each field. The calculations must account for the evacuation of the reserve storage volume.

DER Section 5.14 Effluent Flow Metering

"*The influent flow is not measured*." Monitoring of Influent Flow is currently required in Sussex County's IBRWF Permit and has been reported in Sussex County's IBRWF monthly DMRs. Section 6.8.2 of the Regulations requires both influent and effluent monitoring. Section 5.14 should be modified accordingly.

DER Section 5.17.1 Process Design Calculations

"*The design criteria for the facilities included in Phase 2 are detailed in the IBRWF Phase 2 Expansion Technical Memorandum, 2017*." The GWDS is unable to locate referenced document. The revised submittal must include the referenced Technical Memorandum.

DER Section 5.17.2 Wastewater Disposal System Sizing
"The wastewater disposal system was sized to provide sufficient capacity to eliminate the effluent storage lagoons (71 MG) within 90 days during Phase 2 annual average influent flows of 3.0 MGD. See the water balance spreadsheet in Section 7."

Regulation 6.5.1.4.1.7.6.4 Determination of required wetted field area(s)
Unable to locate individual calculations determining required wetted field area required for total and/or expansion volume.

Proposed design does not appear to account for the evacuation of the reserve storage volume in the event the alternate disposal method does not prove viable and the additional storage lagoon is required.

The revised submittal must include calculations determining the required wetted field area. Also, the disposal area must be able to accommodate evacuation of the both the existing plus reserve calculated storage (180 MG) in the event the alternate disposal method does not prove viable and the additional storage lagoon is required.

DER Section 5.18.4 Disinfection

"*There are provisions to dose sodium hypochlorite solution to the Filtered Irrigation Pump Station discharge. The need to add hypochlorite will be as needed to maintain a fecal coliform concentration less than 200 colonies/100 mL at the discharge of the pump station*."

Please note, upon implementation of the proposed distribution loop, Fecal Coliform must be treated to 20 col/100mL in accordance with unlimited access criteria iterated in the Regulations Section 6.3.2.3.3.2.4. Also, the provisions to dose sodium hypochlorite solution to the Filtered Irrigation Pump Station discharge are not depicted on the Process Flow Diagram. The revised submittal should address the aforementioned accordingly.

DER Section 5.5 Level of Treatment

The facility is currently rated for limited public access criteria, Section 6.3.2.3.3.1.2. Section 5.5 should discuss the level of treatment relative to the constituents required to determine the public access level, limited or unlimited, as set forth in Section 6.3.2.3.3 of the Regulations. Section 5.5 should also indicate if the Phase 2 expansion will be maintaining limited public access criteria or will be upgrading to unlimited public access criteria.

DER Section 6 Soil Report

"*The Soil Investigations Report for the Inland Bays Regional Wastewater Treatment Expansion was previously submitted to DNREC by Accent Environmental, LLC, dated December 5, 2016.*"

The outlined requirements in Section 6.5.1.4 of the Regulations for the Design Engineer Report do not require a Soil Report. A Soil Investigation Report (SIR) is required by Section 6.2.2 of the Regulations prior to submitting a permit application.

The GWDS has no record of a December 2016 Soil Investigation Report (SIR). The GWDS has record of a February 2017 SIR for Expansion Project and a May 2017 Revision and an SIR approval on May of 2017. The revised submittal should address this discrepancy.

DER Section 7 Water Balance

The information provided in DER Section 7 appears more relative to the regulatory requirement of Section 6.5.1.4.1.7.6.6 *Determination of Required Storage Volume*.

The GWDS is unable to locate information relative to the regulatory requirement of Section 6.5.1.4.1.7.6.1 *Water Balance/Determination of Design Wastewater Loading(s).* Maximum allowable monthly wastewater loadings are determined from the following water balance equation: D(allowed) = (Evap + Perc) – Precip. WRA's January 28, 2019 Comment Response Letter indicated Section 7 provides the application rates and a storage balance. Design perc rates do not appear to have been included in Section 7. Section 7 appears to provide average application rates and a monthly storage balance. The revised submittal must include a Water Balance calculating the maximum allowable monthly wastewater loading rates as determined utilizing the equation above.

Also, please note the discrepancy in Table 7.1: acreage for South Burton Field is 46.9 acres versus the Permit that lists 41.9 acres.

DER Section 8 Nitrogen Balance

Section 6.5.1.4.1.7.6.9.1 requires "*After performing individual calculations to determine the design parameters, create and submit an active spreadsheet that incorporates all required calculated design parameters, and demonstrates their mathematical influence on each other* ***per field and per month***."

The Nitrogen Balance provided appears to be an annual average for all fields collectively. The Nitrogen Balance utilized corn instead of pine trees. The DER indicated two Nitrogen Balances were provided; however, only one was provided.

The revised submittal must include a design Nitrogen Balance for Field C and D each separately, for each crop type, in accordance with Section 6.5.1.4.1.7.6.9.1. The Nitrogen Balance spreadsheet must include Storage Balance calculations as required by Section 6.5.1.4.1.7.6.9.2 of the Regulations.

DER Section 9 Vegetative Management Plan (VMP)

"*A vegetative management plan extending through calendar year 2021 was included in the CMR for the existing spray fields submitted in 2017, see Table 9.1. It is expected the crop pattern indicated will continue past 2022 as well*." The 2017 CMR contained a VMP in Section 3.

Regulation 6.5.1.4.1.7.6.8 requires a Five (5) year vegetative management plan to include: 6.5.1.4.1.7.6.8.1 - 6.5.1.4.1.7.6.8.8. The DER, Section 9, does not include a VMP for the proposed expansion areas. In addition, Fields C and D are proposed to maintain pines; however, a Forestry Management Plan (FMP) was not provided. The revised submittal must include a FMP for the proposed expansion areas.

Additional regulatory requirements for consideration; if not considered or proposed for implementation an explanation is needed.

- 6.3.2.3.6.6 Disturbed areas in forest systems must be initially replanted or covered with thick mulch for succession to forest vegetation.
- 6.3.2.3.6.7 Pine forest systems should be harvested at 20 to 25 year intervals.
- 6.3.2.3.6.8 Hardwood forest systems should be harvested at 40 to 60 years.
- 6.3.2.3.6.8.1 Due to soil exposure and compaction as a result of any forest harvesting activities, wastewater loadings must be reduced following harvesting until the hydraulic capacity of the site is restored.

Regulatory Deficiencies: required to be addressed

- Regulation 6.3.2.3.2.4: Automatic diversion of wastewater that fails to meet the operating criteria must be included in the system design.
  - Unable to locate in design. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.2.4.

- Regulations 6.3.2.3.13.7: The Design Engineer Report must include an emergency contingency plan to demonstrate preparedness in the event that the wastewater treatment facility may experience a significant natural occurrence. 6.3.2.3.13.7.1 The contingency plan must address, but must not be limited to, extended periods of excessive precipitation, and extended periods of subfreezing temperatures causing prolonged periods of frozen soil conditions. 6.3.2.3.13.7.2 The contingency plan must delineate the wastewater treatment facilities available options to reduce, eliminate and/or prevent non-compliant conditions.
  - Unable to locate Emergency Contingency Plan. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.13.7.
  - Please reference the following link for an example of expected information:
    - http://www.dnrec.delaware.gov/wr/Information/GWDInfo/Documents/Spray%20Irrigation%20Rescour ce%20Page/2018%2002%2015%20Emer-ContPlan_Checklist.pdf
  - Located at the following website:
    - https://dnrec.alpha.delaware.gov/water/groundwater/spray-irrigation/resources/

- Regulation 6.3.2.3.13.12: Surface water bodies adjacent to wastewater spray irrigation sites must be monitored by the wastewater treatment facility. The Department may deem necessary the monitoring of other surface water bodies in close proximity to the spray irrigation site. Monitoring must be performed upgradient and downgradient of the irrigation site.
  - DER did not indicate if there are surface water bodies adjacent to the spray irrigation sites. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.13.12.

- Regulation 6.3.2.3.13.18: A low pressure detection system to automatically shut down irrigation pumps in the event of force main, sub-main or lateral blowout is required.
  - Unable to locate in design. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.13.18.

- Regulation 6.3.2.3.13.19: A high pressure shut-off at the irrigation pump station must also be provided.
  - Unable to locate in design. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.13.19.

- Regulation 6.3.2.3.13.20: Above ground piping systems must drain when depressurized. Pipe drains shall discharge either to the spray fields or other identified vegetated areas and must not produce a runoff.
    - Unable to locate in design. The revised submittal must address the regulatory requirement set forth in Section 6.3.2.3.13.20.

- Regulation Section 6.5.1.4.1.2 Summary Table of Design Parameters
    - WRA's January 28, 2019 letter indicated the table is included in the updated DER Section 5.5.
    - Please reference the following link for an example of expected information:
        - http://www.dnrec.delaware.gov/wr/Information/GWDInfo/Documents/Spray%20Irrigation%20Rescource%20Page/2017%20Summary%20of%20Design%20Parameters.xlsx
    - Located at the following website:
        - https://dnrec.alpha.delaware.gov/water/groundwater/spray-irrigation/resources/
    - The revised submittal must include a Summary Table of Design Parameters.

- Regulation 6.5.1.4.1.3.2.3: The 12 digit Hydrologic Unit Code (HUC) Watershed(s) name(s)
    - Unable to locate in the revised DER; however, WRA's January 28, 2019 Comment Response Letter indicated the following:
        - Love Creek - Rehoboth Bay 020403030102
        - Indian River Bay - Indian River Inlet 020403030206
    - The revised submittal must include this information to adequately address the regulatory requirements of Section 6.5.1.4.1.3.2.3.

- Regulation 6.5.1.4.1.4 Site Map including items 6.5.1.4.1.4.1.1 - 6.5.1.4.1.4.1.13
    - The DER indicates that the site plan for the Phase 2 expansion is provided as figure 3.1 and in Contract Drawing C02.01; however, only the RWF is depicted. The expansion fields appear to be depicted in Drawings C07.01-04 as 'Zone 1' and Zone 2' solid set irrigation areas. Comparing Figure 2.4 with C07.01-04, the site north of Inland Bays Road, Site C, appears to be 'Zone 1' and; the site south of Inland Bays Road appears to be Site D, 'Zone 2'.
    - Unable to locate the following and/or annotation if not applicable:
        - 6.5.1.4.1.4.1.4 Irrigation fields including acreage of each pivot or zone with two (2) foot contour elevations
        - 6.5.1.4.1.4.1.6 Location of all monitoring and observation wells (existing and proposed) 6.5.1.4.1.4.1.7 Buffers to property lines, watercourses and wetlands
        - 6.5.1.4.1.4.1.8 Location of any storm water control structures
        - 6.5.1.4.1.4.1.9 Drainage structures
        - 6.5.1.4.1.4.1.10 FEMA 100 year floodplain line
        - 6.5.1.4.1.4.1.11 Location of any wetlands, refer to the 2007 Statewide

Wetlands Mapping Project (SWMP) map, and State Tidal Wetlands maps, if applicable
- 6.5.1.4.1.4.1.12 Watercourses within or contiguous to the site
- 6.5.1.4.1.4.1.13 Residences and habitable structures within or contiguous to the site

- The revised submittal must include (or annotate if not applicable) this information to adequately address the regulatory requirements of Section 6.5.1.4.1.4.

- Regulation 6.5.1.4.1.4.1.6: Location of all monitoring and observation wells (existing and proposed)
  - Figure 2.3 and Figure 2.4 are illegible. Unable to locate monitoring wells on Drawings C07.01- 04. The revised submittal must contain a legible map depicting all monitoring and observation wells.

- Regulation 6.5.1.4.1.8.1 Site map depicting proposed locations of monitoring points, wells and lysimeters
  - The revised submittal must either indicate where the aforementioned may be located; or, include a Site Map containing all applicable items. The revised submittal should annotate if any items are not applicable. Also, Figure 2.3 and Figure 2.4 are illegible. And, the GWDS is unable to locate monitoring wells on Drawings C07.01-04. The revised submittal must contain a legible map depicting all monitoring wells.

Drawings/Plans

- Regulation 6.5.1.5.2.3 Process flow diagram showing the flow through all treatment units.
  - Process flow diagram provided as Drawing M00.02. Unable to locate:
    - influent flow meter
    - influent flow compliance monitoring point
    - effluent flow meter
    - effluent flow compliance monitoring point
    - pump system that distributes to expansion Field C and Field D
  - Provisions to dose sodium hypochlorite solution to the Filtered Irrigation Pump Station discharge not depicted.

  The revised submittal must include the aforementioned items.

- Regulation 6.5.1.5.2.7 Influent and effluent flow meters locations.
  - 6.3.2.3.13.16: Requires - a recording device is required to measure the total volume of treated wastewater applied to each spray irrigation pivot/zone.
  - 6.3.2.3.13.17: Requires - a recording device is required to measure the total volume of treated wastewater entering into storage.

  - Unable to locate influent or effluent flow meters on Site Plans. Also not depicted

on Process Flow Diagram - Drawing M00.02. The revised submittal must include influent or effluent flow meters.

- Regulation 6.5.1.5.2.8 Monitoring location point(s). [WWTF]
  - Unable to locate depiction of effluent monitoring location point on Drawings. Also not depicted on Process Flow Diagram - Drawing M00.02. The revised submittal must include the depiction of monitoring location points at the wastewater treatment facility.

- Regulation 6.5.1.5.3.3 Disposal system location, size and layout.
  - Disposal area depicted on Drawings C07.01-05. Drawings do not indicate total acreage and/or acreage of any individual irrigation zones. The revised submittal must include the disposal system location, size and layout.

- Regulation 6.5.1.5.3.5 Piping inverts to disposal system.
  - Unable to locate depiction of piping inverts to disposal system on Drawings. Revision Needed.

- Regulation 6.5.1.5.3.6 Monitoring and observation well locations as approved by the Department.
  - Unable to locate depiction of monitoring well and/or observation well locations on Drawings. Unable to locate monitoring wells on Drawings C07.01-04. Revision Needed.

- Regulation 6.5.1.5.3.8 Buffer areas.
  - Unable to locate depiction of buffer areas and distances on Drawings. Buffer requirements are prescribed in Section 6.3.2.3.10 of the Regulations. The revised submittal must include a depiction of buffer areas and distances.

- Regulation 6.5.1.5.3.9: Requires that the disposal system layout identify laterals, transmission line, manifolds, valving, vaults, splash blocks, runs, laterals, air release valves, remote zoning, etc.
  - Unable to locate depiction of individual irrigation zone areas on Drawings. The revised submittal must include the individual irrigation zone areas.

- Regulation 6.5.1.5.3.12 Piping details to system including inverts.
  - Piping details from filtered irrigation pump station to irrigation loop located on Drawing C04.12-3. Unable to locate depiction of piping details to the disposal system (including inverts) on Drawings. C02.05 indicates “Force Main continuation by others.” No additional note on Drawing. Unable to locate schematic of entire irrigation loop. The revised submittal must include a depiction of piping details to the disposal system (including inverts) and a schematic of entire irrigation loop.

- Regulation 6.5.1.5.3.17 Sign details.
  - Unable to locate depiction of sign details or locations for the disposal system on Drawings. The revised submittal must include the location and details of signage for the disposal system.

Specifications

Section 11399 Wastewater Sampler (Composite) – unable to locate specified location for installation on the Drawings. The revised submittal must include the specified location for installation on the Drawings