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Onslow Water and Sewer Authority

2022 Annual Report

Wastewater System Performance



**ONSLOW WATER AND SEWER AUTHORITY
2022 ANNUAL REPORT
WASTEWATER SYSTEM PERFORMANCE**

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ONSTLOW WATER AND SEWER AUTHORITY 2022 ANNUAL REPORT WASTEWATER SYSTEM PERFORMANCE

INTRODUCTION

Under the requirements of the North Carolina Clean Water Act of 1999, the Onslow Water and Sewer Authority (ONWASA) has prepared this Annual Report on the performance of all domestic/municipal wastewater treatment facilities and wastewater collection systems operated and maintained by ONWASA. The Annual Report provides basic physical and permit information for each facility, along with summaries of monthly activity and overall performance.

During 2022, ONWASA managed a total of five (5) treatment facilities and six (6) collection systems. This includes:

- The Hickory Grove Wastewater Treatment Plant, which is currently inactive and is scheduled for permanent closure soon.
- The Holly Ridge Wastewater Treatment Plant, with a collection system serving the Town of Holly Ridge and surrounding areas.
- The Northwest Regional Water Reclamation Facility, with a collection system serving the Town of Richlands and northwestern Onslow County.
- The Summerhouse Wastewater Reclamation Facility, with a collection system serving the Summerhouse at Everett Bay residential development.
- The Swansboro Wastewater Treatment Facility, with a collection system serving the Town of Swansboro and surrounding areas.
- The Springdale Area collection system, which sends wastewater to the City of Jacksonville for treatment and disposal.
- The Piney Green Road area collection system, which sends wastewater to Marine Corps Base Camp Lejeune for treatment and disposal.

ONWASA's continuing goal through wastewater collection and treatment is to protect public health and safety by minimizing the risk of contamination to surface and ground waters, so they will continue to be available as a drinking water resource for future generations. We hope this information helps the reader understand ONWASA's daily effort to manage and improve the wastewater treatment process.

We are committed to providing you with this information because informed customers better support our continuing efforts.

A copy of this report is available for public review on ONWASA's website at www.onwasa.com as well as at ONWASA's Main Office, 228 Georgetown Road, Jacksonville, NC.

Questions about this report may be addressed to:

ONWASA
228 Georgetown Rd.
Jacksonville, NC 28540
Attn: Wastewater System Performance Annual Report 2022

Or by calling ONWASA's Main Office at (910) 455-0722.

CERTIFICATION

I, Seth A. Brown, certify that the information contained within this report represents the configuration and operation of the above-referenced facilities for the reporting period. Data presented on treatment capacity and flow rates are based on readings taken at individual facilities and reported monthly to the North Carolina Department of Environmental Quality in accordance with their operating permits.



Signing Official Signature

20241107

Date

Deputy Chief Operations Officer

Signing Official Title

TREATMENT FACILITY INFORMATION

HOLLY RIDGE WASTEWATER TREATMENT PLANT

Facility Description

The Holly Ridge Wastewater Treatment Plant is located at 286 North Jenkins Street within the Town of Holly Ridge. This facility is a wastewater treatment lagoon with a permitted capacity of 0.260 MGD. Treatment equipment includes a headworks with manual bar screen and grit chamber; influent flow measurement via an ultrasonic flow meter; a 1.82 million gallon capacity lagoon divided into four (4) treatment cells and a settling cell via floating curtain baffles; eleven (11) floating aerators/mixers to enhance sludge digestion; tablet chlorine disinfection system; an effluent pump station with duplex 450 GPM pumps; and, 17,900 ft. of 8-inch diameter force main to direct effluent to a spray irrigation site for final discharge. The spray irrigation site, located at 220 Dolph Everett Road, is a 0.240 MGD facility consisting of a 13.30-million-gallon storage lagoon; ten (10) spray fields totaling 93.42 wetted acres; and an irrigation pump station with dual 700 GPM pumps and an effluent flow meter that distributes flow to almost 800 spray heads. There are no on-site employee facilities, so this location is monitored by staff from ONWASA's Summerhouse Wastewater Treatment Plant.

General Information

Permit Number:	WQ0019907
Permit Type:	Wastewater Irrigation System
Facility Type/Operation:	Grade 2 WWTP and Surface Irrigation
Operator in Responsible Charge (ORC):	Kary Herndon
Contact Phone (Summerhouse):	(910) 937-7575

Performance During 2022

Permitted Capacity:	0.240 MGD ⁽¹⁾
Average Daily Flow Treated:	0.162 MGD
Percent of Permitted Capacity:	72%
Maximum Daily Flow Treated:	0.329 MGD (Dec 11 th)
Total Gallons Treated:	59,102,990 gallons ⁽²⁾
Percent Change from 2021:	-10.93%

Performance Notes:

- (1) Actual treatment capacity is based on the spray irrigation permitted capacity of 0.240 MGD.*
- (2) Total Gallons Treated can vary significantly, depending on the flow volume diverted to the Summerhouse WWTP (see Comments).*

Comments

In May 2019, a project to replace the six (6) existing floating aerators in the lagoon with a total of eleven (11) new floating aerators/mixers and an automated control system was completed and put into service. The new aerators are designed to accelerate the digestion of sludge within the lagoon while reducing operating costs, as they use a much smaller motor and less electricity to accomplish the same task as the older aerators.

In 2019, an environmental engineering firm under contract with ONWASA completed work on a Capacity Evaluation Study of this facility. A copy of this document is available for review at the ONWASA Central Office, 228 Georgetown Road, Jacksonville, NC. This study included an assessment of existing conditions at the plant, projections of future population growth and sewer demand in the service area, and the development of alternatives to address that future demand.

Permit Violations During 2022

There were no violations reported to NCDEQ under the operating permit for this facility.

TREATMENT FACILITY INFORMATION

NORTHWEST REGIONAL WATER RECLAMATION FACILITY

Facility Description

The Northwest Regional Water Reclamation Facility is located at 189 Mills Field Road, one-mile southeast of the Town of Richlands. This facility utilizes a sequencing batch reactor (SBR) treatment process and high-rate infiltration basins for effluent disposal, with a permitted capacity of 1.273 MGD. Treatment equipment includes an elevated headworks with fine screen/grit removal system; two 1,830,000-gallon SBR tanks with aeration equipment and axial flow jet motive pumps; an 822,000-gallon flow equalization basin with axial flow jet motive pumps; two rotating stainless-steel disk filter assemblies with automated backwash for tertiary treatment, and a triple bank ultraviolet disinfection system with a sodium hypochlorite back-up and chlorine contact chamber. Treated effluent is sent via an on-site pumping station and force main to one of four (4) high-rate infiltration basins (totaling 6.99 acres) that are located immediately southeast of the plant. Waste sludge from the treatment process is sent to one of two 614,000-gallon aerobic sludge digesters for further treatment and eventual land application for disposal.

General Information

Facility Permit Number:	WQ0034367
Permit Type:	High-Rate Infiltration
Facility Type:	Sequencing Batch Reactor
Operator in Responsible Charge (ORC):	Mark C. Young
Facility Phone:	(910) 937-7572

Performance During 2022

Permitted Capacity:	1.273 MGD
Average Daily Flow Treated:	0.342 MGD
Percent of Permitted Capacity:	26.86%
Maximum Daily Flow Treated:	0.773 MGD (May 16 th)
Total Gallons Treated:	125,395,500 gallons
Percent Change from 2020:	-19.57%

Comments

This facility was severely damaged in September 2018 because of localized flooding during Hurricane Florence. This included the failure of 30 electrical motors for pumps, aerators, and other process equipment, along with the failure of electrical distribution and automated control systems. Both the disk filters and UV disinfection systems were also damaged and rendered unusable. During 2019, the plant was run in a manual mode of operation with a total bypass of the disk filter/UV systems and the installation of a temporary disk filtration

system in an adjacent outdoor parking area. Flooded motors and pumps were also rebuilt/replaced. Treatment processes and procedures have been modified several times to adapt to the damaged systems at the plant, and many of the permit violations noted below can be attributed to operating under extremely adverse conditions. In November 2019 a construction contract for the first recovery project, restoration of the existing disk filters and installation of a new, flood-resistant open channel UV system, was bid and awarded; work began in early 2020. In March 2021 two additional projects, restoration of electrical distribution and automation systems, along with improvements to reduce risk in future flood events were awarded and remediation continued through 2022 with projected completion expected August 2023.

Permit Violations During 2022

The following is a list of all violations reported to NCDEQ under the operating permit for this facility.

Month:

Violation:

Cause:

Corrective Action Taken:

Known Environmental Impacts:

May

(1) Daily Fecal Coliform exceeded

Undetermined

Diverted flow to upset ponds, increased disinfection, collected additional samples

None.

Month:

Violation:

Cause:

Corrective Action Taken:

Known Environmental Impacts:

June

(2) Daily Fecal Limits exceeded, (1) Monthly Phosphorus limit exceeded.

Phosphorus- Chemical feed system failure

Fecal- Likely from cleaning settled solids from the equalization tank.

Diverted flow to upset ponds, repaired chemical feed systems, and increased disinfection.

None.

TREATMENT FACILITY INFORMATION SUMMERHOUSE WASTEWATER RECLAMATION FACILITY

Facility Description

The Summerhouse Wastewater Reclamation Facility is located at 351 Holly Ridge Road southeast of the Town of Holly Ridge. This facility utilizes a membrane bioreactor (MBR) treatment system and high-rate infiltration basins for disposal with a design maximum capacity of 0.180 MGD. Treatment equipment includes a headworks consisting of two automated bar screens and a cyclone-style grit removal system; a 184,000-gallon aerated equalization basin supplying four MBR trains rated at 100,000 gallons per day each (currently only two trains are operational); and an ultraviolet light post-treatment disinfection system with a sodium hypochlorite back-up. Treated effluent is then sent to one of two high-rate infiltration basins (totaling 7.1 acres) that are located within the Summerhouse at Everett Bay housing development. Waste sludge from the trains is sent to one of two 129,400-gallon aerated digesters for further treatment and eventual land application for disposal.

General Information

Permit Number:	WQ0029945
Permit Type:	High-Rate Infiltration System
Facility Type / Operation:	Grade 3 MBR with High-Rate Infiltration Basins
Operator in Responsible Charge (ORC):	Kary Herndon
Contact Phone:	(910) 937-7575

Performance During 2022

Permitted Capacity:	0.180 MGD ⁽¹⁾
Average Daily Flow Treated:	0.049 MGD
Percent of Permitted Capacity:	27%
Maximum Daily Flow Treated:	0.093 MGD (July 27 th)
Total Gallons Treated:	17,729,566 gallons
Percent Change from 2021:	-13.53% ⁽²⁾

Performance Notes:

(1) While the design capacity for the Summerhouse facility is 400,000 gallons per day, only two of the four MBR systems were online as well as basin 1 being limited to 80,000 gallons per day and basin 2 being limited to 100,142 gallons per day.

(2) Total Gallons Treated can vary significantly, depending on the flow volume diverted from the Holly Ridge WWTP (see Comments on Page 11).

Comments

Due to the low number of completed homes in the Summerhouse at Everett Bay development, which is the sole source of wastewater flow for this treatment facility, and the limited capacity of the Holly Ridge Wastewater Treatment Plant, a portion of the wastewater generated from the Holly Ridge collection system was diverted to the Summerhouse facility through a pump station on Jenkins Street and an 18,000-foot-long force main that terminates at the plant.

In November a hydrogeologist began a capacity analysis of the high-rate infiltration basin now in use (Basin #2) to determine if it would support a higher flow rate. In the event this is verified by field testing, a permit modification request will be submitted to NC DEQ to approve a higher Permitted Capacity. In addition, an environmental engineering firm reviewed corrective actions for Basin #1, which was unusable due to an impervious (clay) layer on the pond bottom.

In 2019, an environmental engineering firm under contract with ONWASA completed work on a Capacity Evaluation Study of this facility. A copy of this document is available for review at the ONWASA Central Office, 228 Georgetown Road, Jacksonville, NC. This study included an assessment of existing conditions at the plant, projections of future population growth and sewer demand in the service area, and the development of alternatives to address that future demand. These included the construction of a replacement treatment facility and the sending of all flow to a third party for treatment/disposal. In December, the ONWASA Board of Directors reviewed the alternatives presented and directed the engineering firm to conduct additional analysis on capital and operating expenses for selected alternatives before making a final recommendation on how to proceed.

Permit Violations During 2022

The following is a list of all violations reported to NCDEQ under the operating permit for this facility:

Month:	May
Violation:	Monthly Avg. Total Nitrogen
Cause:	Low detention time
Corrective Action Taken:	Slowed flow through the anoxic zone, increased wasting and Micro C feeds.
Known Environmental Impacts:	None.
Month:	June
Violation:	Monthly Avg. Total Nitrogen and Total Phosphorus
Cause:	Low detention time
Corrective Action Taken:	Slowed flow through the anoxic zone, increased wasting and Micro C feeds.
Known Environmental Impacts:	None.

Month:

Violation:

Cause:

Corrective Action Taken:

Known Environmental Impacts:

July

Monthly Avg. Total Nitrogen and Total Phosphorus

Low detention time

Slowed flow through the anoxic zone, increased wasting, Micro C feeds, and membrane cleaning.

None.

Month:

Violation:

Cause:

Corrective Action Taken:

Known Environmental Impacts:

October

Monthly Avg. Total Nitrogen

Anoxic mixer and chemical pump failure

Replaced anoxic mixer and Micro C pump, increased wasting, Micro C feeds, and recirculation.

None.

2022 COLLECTION SYSTEM SUMMARY

Facility Description

The ONWASA sanitary sewer collection system consists of four independent regional systems associated with treatment facilities operated by ONWASA and two systems where wastewater is pumped to a third party for treatment and disposal. Existing facilities (mains, manholes, and pumping stations) are of a wide range of materials, ages, and physical conditions since they were originally constructed by various local governments or private developers and later consolidated into ONWASA. The following spreadsheet provides basic information on each regional system, and the number of customers served.

General Information

Permit Number: WQCS00249
Permit Type: System-Wide Collection System
Operator in Responsible Charge (ORC): Justin Sanderson
Contact Phone: (910) 937-7560

System Operation and Maintenance

In addition to regular maintenance and cleaning of sewage pumping stations and force main air release valves, 56,175 linear feet of gravity sewer main was cleaned throughout the system.

Sewer Overflow Events in 2022

The following is a list of the reported sewer overflow events in all regional collection systems during calendar year 2022. Discharges over 1,000 gallons in volume, or those entering surface waters, are reported to the North Carolina Department of Environmental Quality.

Month/Day: March 5, 2022

Regional Collection System Affected: Swansboro Collection System

Location: 785 W Corbett Ave Swansboro, NC

Cause: Force Main failure in the parking lot of 785 W Corbett Ave

Corrective Action: Spill was contained. Made repairs to the force main and properly cleaned the area

Estimated Volume: 1,800 gallons

Receiving Stream: None

Long-Term Environmental Impact: None

ONWASA COLLECTION SYSTEM INFORMATION

(Statistics as of 12/31/2022)

Area	Grade / Type	Total Piping Length (Feet)	Number of Pumping Stations	Number of Service Connections		Receiving Treatment Facility
				Residential	Commercial	
Holly Ridge	Grade 1 / Domestic	118,660	8	1,326	51	Holly Ridge WWTP (1)
Piney Green	Grade 1 / Domestic	188,930	12	1,693	26	French Creek WWTP (2)
Richlands	Grade 2 / Domestic	315,100	17	1,072	153	Northwest RWRP
Springdale	Grade 1 / Domestic	30,896	2	300	6	City of Jacksonville WWTP
Swansboro	Grade 2 / Domestic	262,218	33	1,889	201	Swansboro WWTF
Summerhouse	Grade 1 / Domestic	74,350	5	400	5	Summerhouse WWRF
TOTALS		990,154	77	6,680	442	

Notes: (1) A portion of the flow from the Holly Ridge Collection System is sent to the Summerhouse WRF via force main interconnection.
 (2) This facility is aboard Marine Corps Base Camp LeJeune.