Onslow Water & Sewer Authority
Board of Directors' Regular Meeting Jacksonville City Hall
Thursday, May 18, 2023
APPROVED MINUTES

CALL TO ORDER: Having a quorum, Chairman Royce Bennett called the meeting to order at 6:00 pm. Board members present included Chairman Royce Bennett, Vice Chairman Paul Conner, Secretary/Treasurer Pat Turner and Directors Timothy Foster, Robert Warden, and Jeff Wenzel. Absent was Director Joann McDermon.

PLEDGE OF ALLEGIANCE: Chairman Royce Bennett led the Board and audience in the Pledge of Allegiance.

INVOCATION: Mr. Brian Young, Senior Pastor with Love Grace & Mercy Church provided the invocation.

CHAIRMAN'S REMARKS –Chairman Royce Bennett provided general guidance to the audience regarding the meeting.

1. **APPROVAL OF AGENDA –** Vice Chairman Paul Conner made a motion to approve the agenda as presented. Director Tim Foster made a second. All were in favor. The agenda was approved as presented.

2. **APPROVAL OF CONSENT AGENDA**

   A motion was made by Vice Chairman Paul Conner to approve the consent agenda. A second was made by Secretary/Treasurer Pat Turner. The motion passed unanimously. Therefore, the March & April 2023 Finance Reports and December, March 2023 Operations Reports were accepted, the February 16, 2023 Special Meeting Minutes and March 16, 2023 Regular Meeting Minutes were approved as presented.

3. **BUSINESS**

   A. **Strategic Plan Update**

   Chairman Royce Bennett called on Ms. Catherine Carter, Senior Manager– Raftelis to present the item. Ms. Carter explained the reason we do strategic planning as an exercise is to ultimately to create a space to have deliberate conversations around a few key content areas and answers the three questions of What do we know to be true today, what do we hope will be true in the future, and How do we get there. Ms. Carter provided an overview of the Strategic Framework Elements as well as the Strategic Planning Process. Ms. Carter then provided the Strategic Plan draft language. Secretary/Treasurer Pat Turner asked if the term utility professionals was inclusive of everyone that works for ONWASA. Ms. Carter answered that was the goal and there was some discussion round is this something that resonates, and folks and the leadership team felt like everyone could see themselves if they were talking about utility professionals. Secretary/Treasurer Turner replied it seems like utility professionals is the wastewater and water treatment people only but if you are saying that everyone felt that it included them then that is fine. Ms. Carter then said she could say there was deliberate conversation about it and folks felt good about it. Ms. Carter then provided an overview of the goal areas.

   Director Jeff Wenzel expressed his desire to have anticipate and meet future water and wastewater needs added within the goals adding he thinks that is very important for us to do as Southeastern NC continues to grow. Director Wenzel went on to say it was

identified slightly in the second goal, sufficient infrastructure. Ms. Carter replied so make sure to be cognizant of our infrastructure needs as the community changes and grows. Chairman Royce Bennett asked if the study included an evaluation of the last CIP to see how we've done over the last five years. Ms. Carter answered the Strategic Plan doesn't have an evaluation of the CIP but we had several conversations around how implementation of the last Strategic Plan went and that was one of the components in it and that was one of the projects folks felt like they wanted to highlight in this strategic plan as having gone really well adding with this strategic plan we do kind of a retrospective on the previous strategic plan so that we can talk about building on successes and so that was one of the projects that was identified as something that we wanted to highlight and build on in the future. Director Jerry Bittner asked do you talk about Workforce Development training, Workforce Diversity and things like that. Ms. Carter replied training is certainly covered in the career paths and development planning and as we had conversations around the values we had conversations about the diversity equity inclusion concepts and felt like those concepts were well represented in the values of the organization in different ways. Ms. Carter ended by informing the Board they will incorporate feedback from the meeting into the strategic framework, finalize the strategic framework and hope to have a full strategic plan document by the end of next month. Mr. Howard thanked Ms. Carter and her team and added we have been working on this for quite a while now and of course leadership team and their staff had some great input and discussion across the table as we develop this. Director Warden said Royce brought up do you know how often you discuss the Strategic Plan with the employees in other words does it just get printed or how is it used. Mr. Howard said we do present it to all new hires as part of the package and it is used frequently like we use it in every agenda package because we tie our agenda items back to the Strategic Plan. Mr. Howard explained that part of the plan for the future was more frequent engagement surveys talking to them about the Strategic Plan. Ms. Carter sad as part of the focus groups we did with employees we started the conversation by asking what is your awareness level of the Strategic Plan now and generally speaking it was pretty good people had a good awareness of some of the specific initiatives that had come out of the Strategic Plan and they knew roughly the organizations vision and mission.

No action was taken.

B. Sale of Timber – Timber Management Plan
[A COPY OF THE TIMBER SALE PROPOSAL PACKET DATED APRIL 10, 2023, TIMBER CRUISE MAP, AND TIMBER CRUISE REPORT MAY BE FOUND AT EXHIBIT A AND ARE FULLY INCORPORATED HEREIN BY REFERENCE]

Chairman Royce Bennett called on CEO, Franky Howard, to present the item. Mr. Howard said the Authority's Timber Consultant, Pine State Forestry, has made a recommendation to have two timber sales on the Wachovia Tract located in Holly Ridge. Mr. Howard said he initially had a lower estimated amount but when he did the cruise he was highly impressed with the quality of timber that is out there so he sees a pretty good sale coming from that and we are trying to line it up with the fact that we have Weyerhaeuser already out there about to start cutting the timber sale that we had earlier in the year. Director Robert Warden said I know we are going to be talking about selling a portion of the tract, are we planning on any logging of that timber resources before we sell. Mr. Howard said they want us to and as part of that we will make sure we retain our timber rights as we are going through that option period adding that 100 acres of it is already part of that first sale.

Vice Chairman Paul Conner made a motion to approve the sale of timber by bid as recommended by the Timber Consultant and to delegate to the Chairman the authority

to accept the high bid as long as it is reasonable in his judgement and authorize the Chairman to execute a timber deed for the timber sold. A second was made by Director Jeff Wenzel. All were in favor, the motion passed unanimously.

C. Letter of Intent to Sell a Section of the Wachovia Tract
[A COPY OF THE OFFICIAL LETTER OF INTENT TO SELL A PORTION OF THE WACHOVIA TRACT TO JOEDP MAY BE FOUND AT EXHIBIT B AND ARE FULLY INCORPORATED HEREIN BY REFERENCE]

Chairman Royce Bennett called on Mr. Franky Howard, CEO, to present the item. Mr. Howard said this is a follow up from the item that the Board took action on at the last meeting adding we had a meeting with them since the last Board meeting and this concept came up where we would start with a letter of intent while we are drafting the final option and this will allow them to go after some grant monies that are available in the near future adding he talked to Golden Leaf and they will use a letter of intent to go along with their grant applications. Mr. Howard said it is roughly 258 acres and he did meet with their surveyor earlier in the week and what we are planning to do is break down the tract into four sub purchases or areas that they can sort of take options on as they get the funding to do so or purchase when they had the funding to do so. Mr. Howard said there was discussion in the letter about the road easement that would need to be dedicated and then ultimately turned over to the town as far as that road that they would like to connect through our property or through this tract when it is purchased so that is part of the intent. Director Bittner said he believes Chuck had some reservations about the form of agreement and the conditions, are you [Chuck Kitchen, Authority Attorney] satisfied now with this. Mr. Kitchen replied I am as the CEO mentioned we had a meeting and went over what we could and could not do. He added the Chairman was at that meeting and I think we worked out everything at this point but of course with the road easement that is contingent with Holly Ridge agreeing with the developer to take the road and to annex it obviously.

Chairman Royce Bennett said he thinks it is important to note that a Letter of Intent is not a contract to sell and it is simply a letter of intent. He added that he thinks that if this Board approves it then that means that we will work diligently with JOED and the Town of Holly Ridge to try and make this happen, but it is not a done deal yet.

Director Tim Foster made a motion to authorize the Chairman to sign an official letter of intent to sell a portion of the Wachovia Tract to JOEDP as part of the Camp Davis Industrial Park Phase III Expansion. A second was made by Vice Chairman Paul Conner. All were in favor, the motion passed unanimously.

D. Engineering Reports for Pluris Facilities
[A COPY OF THE ENGINEERING REPORTS MAY BE FOUND AT EXHIBIT C AND ARE FULLY INCORPORATED HEREIN BY REFERENCE]

Chairman Royce Bennett called on Mr. Franky Howard, CEO, to present the item. Mr. Howard said staff has reviewed the final engineering reports completed by WithersRavenel on the two Pluris plants the Board is entertaining purchasing. He said he feels like they have covered or answered all of the questions we had as part of the process and feel like they are sufficient for what we expect the local government commission to be expecting to see as part of the report. He added a big part of that was the estimated useful life of both plants and they answered the question and it was 30 plus years based on their recommendation for upkeeping maintenance on those two plants and there was discussion about the cost of expanding the North Topsail Plant and

whether or not they were sufficient space for the Webb Creek Plant so we answered all of those questions. Mr. Howard said we have included what they initially reported in the feasibility study and said he had a conversation with that team earlier today and will have a follow-up conversation tomorrow and expect to present the final feasibility study at the next meeting in anticipation of hopefully having the final purchase agreement to go in tandem with that. Mr. Howard said there were no red flags based on what we had already anticipated for cost and his recommendation is that the Board proceed to the next phase of this project which is to allow the attorneys to continue to work on the final purchase agreement to have Board consideration at the next meeting.

Chairman Bennett noted he read the reports and said it all looked good. Mr. Howard said the Board received the summary documents and that Mr. David Mohr did have all of the attachments available and said it was a very thorough report and thanked Mr. Mohr and Jeffrey Lohr for working with Withers to complete it in a very short time. Chairman Bennett said this is going to provide us, if it goes through, with some immediate capacity in areas where we need it and of course with the growth of Onslow County and it is not going to be the be all end all we are going to have to keep working to increase capacity in both of the areas that these plants serve but this will help us to move forward over the next few years. Director Robert Warden added and it appears to be the most cost effective solution too saying that is good news along with the extra capacity.

A motion was made by Director Jeff Wenzel to proceed with the acquisition of the Pluris Webb Creek and North Topsail Wastewater Treatment Plants and associated collection systems and direct the Authority Attorney and Staff to develop a draft purchase agreement for review and consideration at the next scheduled Board of Directors meeting. A second was made by Vice Chairman Paul Conner. All were in favor, the motion passed unanimously.

E. Presentation of the Fiscal Year 2023-2024 Proposed Budget
[A COPY OF THE FISCAL YEAR 2023-2024 PROPOSED BUDGET PRESENTATION SLIDES MAY BE FOUND AT EXHIBIT D AND ARE FULLY INCORPORATED HEREIN BY REFERENCE]

Chairman Royce Bennett called on Mr. Franky Howard, CEO, to present the item. Mr. Howard began by saying we have had great budget sessions this year working with the team in the room tonight along with Dawn Taylor and Amanda Ramirez with the finance office who have really worked diligently to help get the budget where it is today. Mr. Howard provided an overview of the budget process. He noted the growth as evident by the ONWASA By-the-Numbers data. [Exhibit D, slide 3] and explained the Budget Drivers [Exhibit D, slide5]. Mr. Howard went on to provide an overview of the FY24 Budget – At a Glance [Exhibit D, slide 6], Sources of Revenue [Exhibit D, slide 7], Total Expenditures [Exhibit D, slide 8], Capital Improvement Plan Highlights[Exhibit D, slide 9]. He announced that the Proposed budget is online at www.onwasa.com and provided method for submitting both written and emailed comments from the public. He also told the Board he would like them to consider setting the public hearing for June at the next scheduled meeting and that he and staff would be available for workshops should they desire to have those.

He provided information on the sixteen new position request saying there is one additional utility locator adding we average 89 locates per day and currently have two locators, one additional water quality person creating a Water Quality Division with their main focus on water quality flushing schedules, four for a collections crew and two for a lift station crew adding they were included in last year's budget request but we

prioritized them out to hold on to for this year, one development services project manager explaining this would be someone under Wynne Ray, Development Services Director, to help with that workload adding they see all of the projects that come to ONWASA, one lab technician, a facility maintenance crew which is a three man crew, one accounting specialist in Finance, and two water treatment operators. Mr. Howard explained the recommended changes to the fee schedule by saying the recommendation was to take out the tap fee for sewer because it is all over the place as far as the actual cost to do sewer taps and we do very few of those in-house adding a lot of those come in with larger projects and the recommended fee is cost plus 10% saying that is in line with what the City of Jacksonville charges for their taps that they do internally, a change to clarify the language about the per unit charges on the fee schedule to align with what we have seen other communities do with that language on multi-user accounts. Director Jerry Bittner asked him to explain the per unit language change. Mr. Howard said it was highlighted when we were doing the feasibility study for the Pluris project because we saw we were missing some potential revenue based on how they were billing versus how our financial consultants saw we were billing explaining most of the difference is with the multi-user apartment complexes or mobile home parks so they have one tap but multiple users on the end of that tap so currently what we do is we charge the one base fee for the tap size whereas others like City of Jacksonville, Surf City, and Pluris charge a three quarter inch base fee per unit that is tied to that tap so it is a significant difference when you look at the entire organization adding it may not be that much per account depending on how many users they have. Director Warden asked if that would be retro-active so in other words if somebody's already set up under a larger master meter and you are doing that change, you are not going back. Mr. Howard said no. He went on to say we do have a couple of accounts that are already set up that way that came with the system when we took over the County system years ago so we have about 855 units that are billed that way but there is about 7000 units roughly within our system that we are auditing right now and on the Pluris feasibility study there was about 1800 unit difference between what we had in accounts versus what they were billing per account and just for that area alone it was about a million dollars difference in revenue. Mr. Howard also highlighted the budgeted alternative revenue for future timber sales adding that is obviously good to have with the increased expenses we have seen across the board.

Director Robert Warden asked if this budget reflects any Pluris acquisition cost. Mr. Howard said this budget does not take into account any Pluris project expenses because the Board will need to take final action and we didn't want to anticipate anything and then have to take it out what we would likely do is work with our team to establish a budget amendment that would be required to come along with that project. Director Warden said you are talking possibly really maybe a half a fiscal year anyway adding he was just curious if it had been anticipated with the debt service. Mr. Howard said we did have some that were already anticipating cost and had put some discussions about what their needs would be for Pluris if it came together and we parked those to the side and we will put them together in a package to present as part of that project later in the year adding we anticipate that in January so half a fiscal year likely if everything comes together. Mr. Warden said obviously I guess you wait until the LGC approves it and you go find your bond counsel to go ahead and put a bond out to sell, is that what you will be doing? Mr. Howard replied yes we are in discussion with bond counsel saying they have reviewed some of the potential language so far and we would likely need to have a meeting in August to approve some documents that will be presented to the LGC and October meeting is our goal either late September or October is our goal. Chairman Bennett said how are we financing the pre purchase expenses, the surveys, and studies, that is in this year's budget, right? Mr. Howard replied yes that is in this year's budget.

Director Jerry Bittner asked if there is an assumption that all Pluris employees will come over to be ONWASA employees. Mr. Howard said in the current language we have been presented with, we would be given a list of eligible employees adding he has already received that list just to start looking at what the total employees would be and their cost for the feasibility study. He said there are some questions about some that maybe won't be on that list. He went on to say from a private company to a private company those types of things are commonplace as far as employees that aren't eligible for transitioning with an acquisition like this we are working through whether or not that applies to local government.

Director Jerry Bittner made a motion to set the public hearing on the proposed FY24 budget at the Board of Directors meeting in the Jacksonville City Hall Council Chambers on June 15, 2023, at 6 pm or as soon thereafter as it practicable. A second was made by Director Tim Foster. All were in favor, the motion passed unanimously.

4. PUBLIC COMMENT

There were no members of the public wishing to comment.

5. CHIEF EXECUTIVE OFFICER COMMENTS

Chairman Bennett called on CEO, Franky Howard, to provide comments. Mr. Howard informed the Board and audience that 171 accounts were added in April which brings our total accounts for water customers to just over 57,000 and said that aligns with making us the second largest water and sewer authority in the State just under Cape Fear Public Utility Authority. He said Staff have been real busy on several projects and highlighted the test well project going in by the Dixon plant right along HWY 17 which is visible from the road with equipment going in and hope to start drilling in the near future saying we desperately need more raw water supply for that area and that plan so this is one of three there is two more wells going in the Wachovia tract further down away from the Base. He said the foundations are pretty close to being complete at the Northwest Wastewater Treatment Plant for the flood proof buildings. He said the Topsail Island Booster Pump was reported to be at 60% complete as far as design goes. He said staff installed some new membranes at Summer House and as a result was able to get the freeboard level down into a safe zone. He said they are working on an agenda item for the June meeting to convert that plant to a Kubota style membrane which is similar to what one of the Pluris plants has and we hope to increase the flow even further so we can get our capacity where it needs to be to give us some cushion in that area until we get everything else done. Mr. Howard informed the Board that several customer compliments have been received this quarter and he sent out approximately 10 employee emails that received direct customer compliments adding that shows we have a good group of employees working diligently to keep our customers happy and that is what we like to hear. He said we have an audit kick off meeting with our new auditing firm next week so that should be fun. Mr. Howard said the Georgetown Alumni Association is about to begin work on a monument in our parking lot and added that our location is the old Georgetown High School so there are going to have a nice black granite monument there with some history inscribed into it and it will be in the shape of a panther with was their mascot. He expressed his appreciation to our legislators who helped push through the permanent license plate bill that recently passed on its third reading saying that will save us about $20,000 a year on license plate fees we currently have to pay.

6 BOARD OF DIRECTOR'S COMMENTS

Director Jerry Bittner said he was glad to be here.

Chairman Bennett expressed his appreciation to the employees and said growth is an exciting challenge and said he is glad we are growing and not shrinking adding we will continue working to provide safe water and sewer for Onslow County citizens.

No other Directors wished to make comments.

A motion was made by Director Tim Foster to adjourn the meeting. The motion was seconded by Vice Chairman Paul Conner. All were in favor.

The meeting was adjourned at 6:58 pm.

The minutes were approved on June 15, 2023.

Onslow Water & Sewer Authority Board of Directors

ONSLOW WATER & SEWER AUTHORITY CORPORATE SEAL NORTH CAROLINA

Michael Royce Bennett, Chairman

ATTEST:

Heather Norris

Heather Norris, Clerk

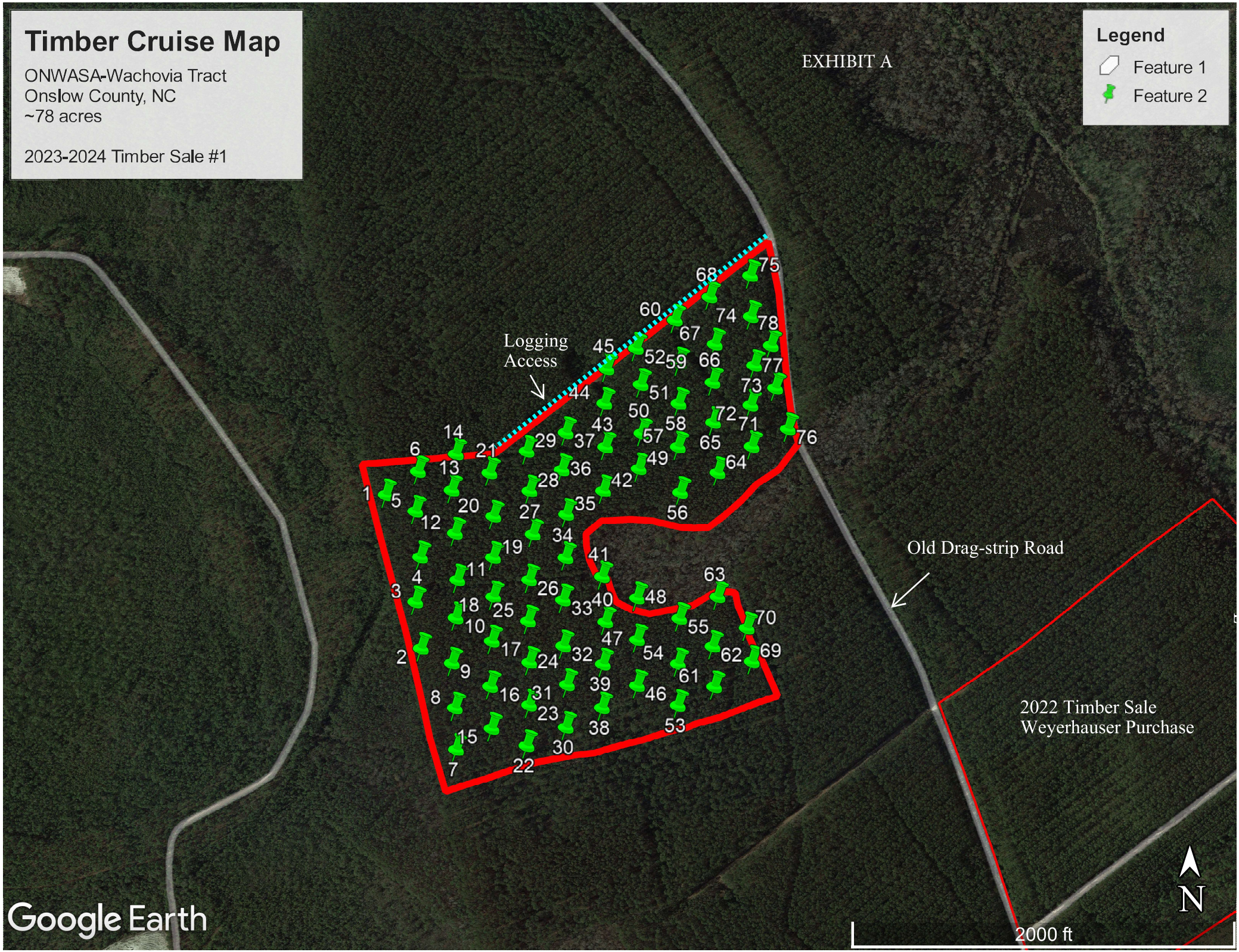
Timber Cruise Map
ONWASA-Wachovia Tract
Onslow County, NC
~78 acres
2023-2024 Timber Sale #1
EXHIBIT A
Legend
Feature 1
Feature 2
Logging Access
Old Drag-strip Road
2022 Timber Sale
Weyerhauser Purchase
Google Earth
N
2000 ft

EXHIBIT A

ONWASA-Wachovia Tract
Onslow County, NC
~78 acres
2023 Timber Sale #1

Volume Table

Product	Volume (tons)	Adjusted Volume (tons)[A]	Tons/Acre	Avg. Diameter (inches)	Avg. Merchantable Height (ft.)	TPA	Stumpage ($/ton)	Total Dollars	
Pine Sawtimber	8101.64	8911.80	114.25	15.2	41.2	101.88	$ 30.00	$ 267,354.12	
Pine Bolts/CNS	990.89	1089.98	13.97	10.6	38.7	27.42	$ 20.00	$ 21,799.58	
Pine Pulpwood	572.93	572.93	7.35	8.7	55.4	22.94	$ 10.00	$ 5,729.30	
Pine Topwood	3401.58	3401.58	43.61				$ 10.00	$ 34,015.80	
Hardwood Pulpwood	25.00	25.00	0.32	12.0	47.5	0.51	$ 2.00	$ 50.00	
	Total	14001.29	179.50			152.75		**$ 328,948.80**	**$ 4,217.29**

A: The model used for timber evaluation uses 52 pounds/cubic foot for pine; Eastern NC the normal pounds/cubic foot is 62 pounds. Therefore, a 10% volume adjustment is used in workup for the pine sawtimber and CNS volumes.

Pine Sawtimber Specification: 15-inch butt to 6-inch SED (small end merchantable diameter)
Pine Bolts/CNS Specifications: 10-inch butt to 5-inch SED
Pine Pulpwood Specifications: Any pine low-grade wood, minimum of 10-feet long to a 2-inch SED
Hardwood Sawtimber: Quality Sawlogs 16-inch butt to 11-inch SED
Hardwood Pallet: Mix hardwood logs 14-inch butt to 10-inch SED
Hardwood Pulpwood: Includes topwood, any low-grade material, minimum of 10-feet long to a 4-inch SED

Timber offers could range from $300,000.00 to $350,000.00 due to the market conditions currently.
This tract will get a lot of attention particularly from Weyerhaeuser and West Fraser markets.
Recommended minimum for this tract is $325,000.00.

EXHIBIT A

User Name: Ashley Faircloth
Tract Name: wachovia 2023 stand 1 TS-1
Ruleset Name: Pine Cruise NC
Cruise Dates: 2023-04-29 to 2023-05-06
Number of Plots: 78
Plot Type: 1/10 acre
Tract Acres: 78.27
Confidence: 90%

	Stand Mean	Standard Error	Standard Error as Percent of Mean
TPA	152.76	9.78	6.4
BAPA	156.94	8.1	5.16
QMD	14	0.39	2.79

EXHIBIT A

Cruise Name: wachovia 2023 stand 1 TS-1
Report Date: 2023-05-06

Samples Collected	Sample Types	CV (basal area)	Stnd Error as Percent of Mean (basal area)
78	1/10 acre	27.37	5.16

Type	Average DBH	Trees per acre	Basal Area per Acre
Total	13.8	152.8	156.9
Softwood	13.8	152.2	156.5
Hardwood	12	0.5	0.4

Volume Summaries

Units	Per Acre Volumes	Total Volumes	Percent Err	CV
tons	167.16	13083.48	6.8	37

Product	Units	Per Acre Volume	Total Volume	Trees Per Acre	Total Trees
Pine.Sawlog	tons	103.51	8101.64	101.88	7974.06
Pine.Pulp	tons	7.32	572.93	22.94	1795.5
Pine.CNS	tons	12.66	990.89	27.42	2146.14
Pine.topwood	tons	43.46	3401.58	0	0
Hardwood.Pulpwood	tons	0.21	16.44	0.51	39.92
Hardwood.Topwood	tons	0	0	0	0
		167.16	13083.48	152.75	11955.62

Stumpage Values (per acre)

Flagged Status	Lower	Mean	Upper	Percent Err	CV
FALSE	3004.79	3349.62	3694.45	6.13	32.51

Stumpage Values (total)

Flagged Status	Lower	Mean	Upper	Percent Err	CV
FALSE	235182.47	262172.03	289161.59	6.13	32.51

EXHIBIT A

Total Product Volumes

Product	Units	Total Volume	Trees	Basal Area	QMD (inches)	Mean DBH (inches)	Avg Log Length (feet)
Pine.Sawlog	tons	8101.64	7974.06	10220.39	15.3	15.2	41.2
Pine.Pulp	tons	572.93	1795.5	711.47	8.8	8.7	55.4
Pine.CNS	tons	990.89	2146.14	1319.62	10.7	10.6	38.7
Pine.topwood	tons	3401.58	0	0	NA	NA	43.2
Hardwood.Pulpwood	tons	16.44	39.92	32.09	12	12	47.5
Hardwood.Topwood	tons	0	0	0	NA	NA	8.5

Total Volumes by Flagged Status

Product	Units	Flag Status	Total Volume	Trees	Basal Area	QMD (inches)	Mean DBH (inches)	Avg Log Length (feet)
Pine.Sawlog	tons	FALSE	8101.64	7974.06	10220.39	15.3	15.2	41.2
Pine.Pulp	tons	FALSE	572.93	1795.5	711.47	8.8	8.7	55.4
Pine.CNS	tons	FALSE	990.89	2146.14	1319.62	10.7	10.6	38.7
Pine.topwood	tons	FALSE	3401.58	0	0	NA	NA	43.2
Hardwood.Pulpwood	tons	FALSE	16.44	39.92	32.09	12	12	47.5
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Stumpage Values (per acre)

Flagged Status	Lower	Mean	Upper	Percent Err	CV
FALSE	3004.79	3349.62	3694.45	6.13	32.51

Stumpage Values (total)

Flagged Status	Lower	Mean	Upper	Percent Err	CV
FALSE	235182.47	262172.03	289161.59	6.13	32.51

EXHIBIT A

Total Product Volumes

Product	Units	Total Volume	Trees	Basal Area	QMD (inches)	Mean DBH (inches)	Avg Log Length (feet)
Pine.Sawlog	tons	8101.64	7974.06	10220.39	15.3	15.2	41.2
Pine.Pulp	tons	572.93	1795.5	711.47	8.8	8.7	55.4
Pine.CNS	tons	990.89	2146.14	1319.62	10.7	10.6	38.7
Pine.topwood	tons	3401.58	0	0	NA	NA	43.2
Hardwood.Pulpwood	tons	16.44	39.92	32.09	12	12	47.5
Hardwood.Topwood	tons	0	0	0	NA	NA	8.5

Total Volumes by Flagged Status

Product	Units	Flag Status	Total Volume	Trees	Basal Area	QMD (inches)	Mean DBH (inches)	Avg Log Length (feet)
Pine.Sawlog	tons	FALSE	8101.64	7974.06	10220.39	15.3	15.2	41.2
Pine.Pulp	tons	FALSE	572.93	1795.5	711.47	8.8	8.7	55.4
Pine.CNS	tons	FALSE	990.89	2146.14	1319.62	10.7	10.6	38.7
Pine.topwood	tons	FALSE	3401.58	0	0	NA	NA	43.2
Hardwood.Pulpwood	tons	FALSE	16.44	39.92	32.09	12	12	47.5
Hardwood.Topwood	tons	FALSE	0	0	0	NA	NA	8.5

EXHIBIT B

LETTER OF INTENT

TO ENTER INTO AN OPTION AGREEMENT TO PURCHASE REAL PROPERTY

BY AND BETWEEN

Jacksonville Onslow Economic Development Partnership and/or its assigns ("JOEDP")

And

Onslow Water and Sewer Authority ("ONWASA")

Date: May 11, 2023

RE: Option to Purchase (the "Option") Real Property from ONWASA Identified on the Site Readiness Study (the "Property") For the Development of Camp Davis Industrial Park, Phase III, Onslow County, North Carolina (the "Proposed Development")

TO WHOM IT MAY CONCERN:

JOEDP and ONWASA intend to negotiate an Option to Purchase the Property identified on the attached Site Readiness Study area of the Camp Davis Industrial Park, Phase III, Onslow County, North Carolina. The purpose of this action is to enable JOEDP to proceed with the Camp Davis Industrial Park development which includes the extension of public roadways, stormwater systems, and utilities infrastructure, as well as, the development and sale of industrial sites and buildings.

BASIC TERMS FOR OPTION TO PURCHASE:

- PROPERTY DESCRIPTION: Those areas identified on the Site Readiness Study of the Camp Davis Industrial Park, Phase III consisting of approximately 258 acres, more or less.
- PURCHASE PRICE: Two Million and No/100 Dollars ($2,000,000.00).
- DUE DILIGENCE PERIOD: The due diligence inspection period ("Due Diligence") shall be for a period of five (5) years from the date of complete execution of the Option by JOEDP and ONWASA unless otherwise agreed to by the parties.
- ROAD EASEMENT: During Due Diligence, ONWASA agrees to provide a perpetual easement to the Town of Holly Ridge for the purpose of building a road on the Property for ingress and egress.

Upon execution of this Letter of Intent, JOEDP shall work toward the preparation of the Property purchase Option and shall deliver the same to ONWASA for review and consideration. It is understood and agreed by the parties that this Letter of Intent is not intended to be legally binding and shall not be construed as such. Furthermore, neither ONWASA nor JOEDP shall be legally obligated with respect to the Option referred to in this Letter of Intent unless and until an Option acceptable to

ONWASA and JOEDP has been fully executed by each entity's duly authorized officers. Notwithstanding the foregoing, ONWASA and JOEDP execute this Letter of Intent with the intent of working together to consummate the sale and purchase of the Property for the Proposed Development.

Respectfully submitted this the 11th day of May, 2023.

Sincerely,

JACKSONVILLE ONSLOW ECONOMIC DEVELOPMENT

By:_____
Mark Sutherland, CEcD

ACCEPTED AND AGREED TO BY:

Onslow Water and Sewer Authority

By:_____ Dated: 5/18/23
Michael R. Bennett
Chairman, Board of Directors

WithersRavenel
Our People. Your Success.

Engineering Report

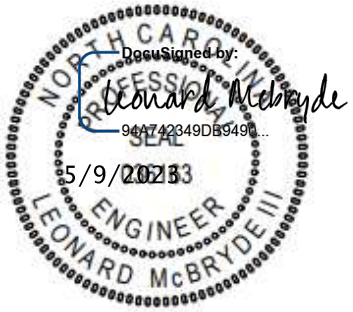
Pluris North Topsail Facilities Evaluation

Prepared For:

Onslow Water and Sewer Authority

Mailing Address
228 Georgetown Rd
Jacksonville, NC
Physical Address
228 Georgetown Rd
Jacksonville, NC

Prepared By:
WithersRavenel
115 MacKenan Drive
Cary, NC 27511
(919) 469-3340
License No.: F-1479



WithersRavenel Project No. 22-0128-001

May 9, 2023

Leonard McBryde III, PE
Professional Name
Plan Preparer

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- C9 – Summerhouse WWTP Lift Station Preliminary Calculations

1 Executive Summary

Background and Project Purpose

Pluris North Topsail is a wastewater collection and treatment system owned and operated by Pluris, LLC. The system serves approximately 6,000 residential and commercial customers in the town of North Topsail Beach and Sneads Ferry. The North Topsail wastewater treatment plant (WWTP) is located at 1095 State Hwy 210 in the census-designated place of Sneads Ferry in south-eastern Onslow County, NC. The WWTP is permitted to treat and discharge 1,542,635 gallons per day (GPD) via a wastewater irrigation system rated for 542,635 gallons per day and two high-rate infiltration basins rated for 1,000,000 GPD. The collection system permits the operation and maintenance of approximately 40 miles of gravity sewer, 55 miles of force main, 835 lift stations, and all associated piping, valves, and appurtenances.

Onslow Water and Sewer Authority (ONWASA) is considering the acquisition of Pluris North Topsail System as part of a long-term wastewater treatment capacity planning effort. ONWASA has commissioned this report to provide a technical evaluation of North Topsail WWTP to determine the plant's current condition, verify operational capabilities and capacities, assess permit compliance, and identify current and future operational or mechanical deficiencies and their potential cost. This report will also provide an assessment of system configuration and permit compliance for Pluris North Topsail's collection system.

North Topsail WWTP Permit Compliance

North Topsail WWTP treats wastewater below permitted requirements with no regulatory orders or notices of violations (NOVs) received since May 2021.

North Topsail WWTP Capacity and Expansion

North Topsail WWTP is currently rated for a total of 1.042 million gallons per day (MGD) with a 0.542 MGD rating for the passive lagoon treatment train and 0.500 MGD for the Phase 1 membrane bioreactor (MBR) train. The second MBR treatment train is currently in commissioning phase, and upon completion, the rating will increase to 1.542 MGD. The annual average daily flow in 2022 was 0.803 MGD or approximately 52% of the rated 1.542 capacity. Based on population growth data for Onslow County, the plant is not expected to meet the 80% threshold for 20+ years and no expansion is required in the interim. However, ONWASA has expressed interest in re-allocating 0.483 MGD of capacity from the Summerhouse and Holly Ridge WWTPs to the North Topsail WWTP. In this scenario, the plant would be projected to surpass the 80% threshold and plans for expansion would need to begin immediately, and final construction plans would be required in less than five years. Disposal is likely to be the limiting factor for expansion and a hydrogeological study is needed to determine if there is additional area on-site that is suitable for high-rate infiltration basins and groundwater storage or if there is unused capacity within the spray fields. There is space for treatment plant expansion as the site is a 120+ acre site. The recommended cost estimate for a near future expansion is $25 - $35 per gallon.

North Topsail WWTP Condition and Capital Planning

The equipment at North Topsail WWTP is currently in good condition. The expected useful life of the plant, with routine maintenance of structures and equipment, is expected to be 30+ years. Specific major pieces of equipment that are expected to reach end of useful life in the next 10 years are:

1) MBR Membranes – Projected Replacement Cost: $790,000
2) Irrigation Pumps – Projected Replacement Cost: $330,000
3) MBR and Pre-Aeration Blowers – Projected Replacement Costs: $400,000
4) Equalization, Nitrate, Return Activated Sludge, and Permeate Pumps – Projected Replacement Cost: $600,000
5) Ozzy Cup Screens - Projected Replacement Cost: $1,090,000
6) Trojan UV3000 – Projected Replacement Cost: $610,000
7) Anaerobic, Pre-Anoxic, Pre-Aeration, and Post-Anoxic Mixers – Projected Replacement Cost: $290,000
8) Flowmeters – Projected Replacement Cost: $130,000
9) Chemical Pumps – Projected Replacement Cost: $40,000
10) Secondary Containment – Projected Cost: $5,000

North Topsail WWTP Operations

Current Pluris LLC staff associated with North Topsail WWTP and available to transfer to ONWASA consists of one MBR plant operator, two certified collection systems operators and three other collection systems employees. Pluris LLC has employees at other WWTPs in the area available to assist as needed that would not transfer to ONWASA.

The only operational changes required upon transfer of operating permits are hiring a Grade 3 or higher operator to serve as back-up ORC and installing secondary containment for the chemical tanks. Additional staffing should be considered due to the size of the site.

Pluris, LLC Collection System

The North Topsail Beach and Sneads Ferry Collection System consists of 835 simplex and duplex lift stations and approximately 55 miles of force main, including a low-pressure system. Additionally, the system includes approximately 40 miles of gravity sewer, 3 portable generators, 4 portable bypass pumps, 14 permanent generators, and 2 permanent bypass pumps. The system serves the North Topsail Beach island with a low-pressure system as well as some inland areas near Sneads Ferry. WithersRavenel completed multiple site visits to observe and assess the condition of the lift stations, grinder pump stations, and manholes throughout the system. From the results of the site visits and information provided by Pluris and ONWASA, WithersRavenel recommends the following projects to improve the collection system:

- Repair or replacement of 10% of duplex lift station wet wells, piping, and valve vaults and installation of dri-prime emergency standby pumps at the lift stations to allow for more secure backup power and bypass pumping.
- Repair or replacement of 10% of the simplex lift station wet wells, piping, and valve vaults
- Rehabilitation of 10% of the gravity sewer system, including by Cured-in-Place Pipe, laterals, and manholes using cementitious liner. This rehabilitation will require further

CCTV investigation to determine the exact linear footage of sewer mains to be replaced/rehabilitated and the required method of rehabilitation.
- Spatial data collection through GIS field exercises, operational information acquisition, hydraulic model development, model calibration using SCADA and flow meter data, and scenario modeling to improve the existing sewer hydraulic model.
- Construction of 694 gpm lift station and 6.5 miles of 12-inch force main to divert flow from the Summerhouse WWTP to the North Topsail WWTP.

Wastewater Treatment Plant Evaluation

1.1 Plant Background

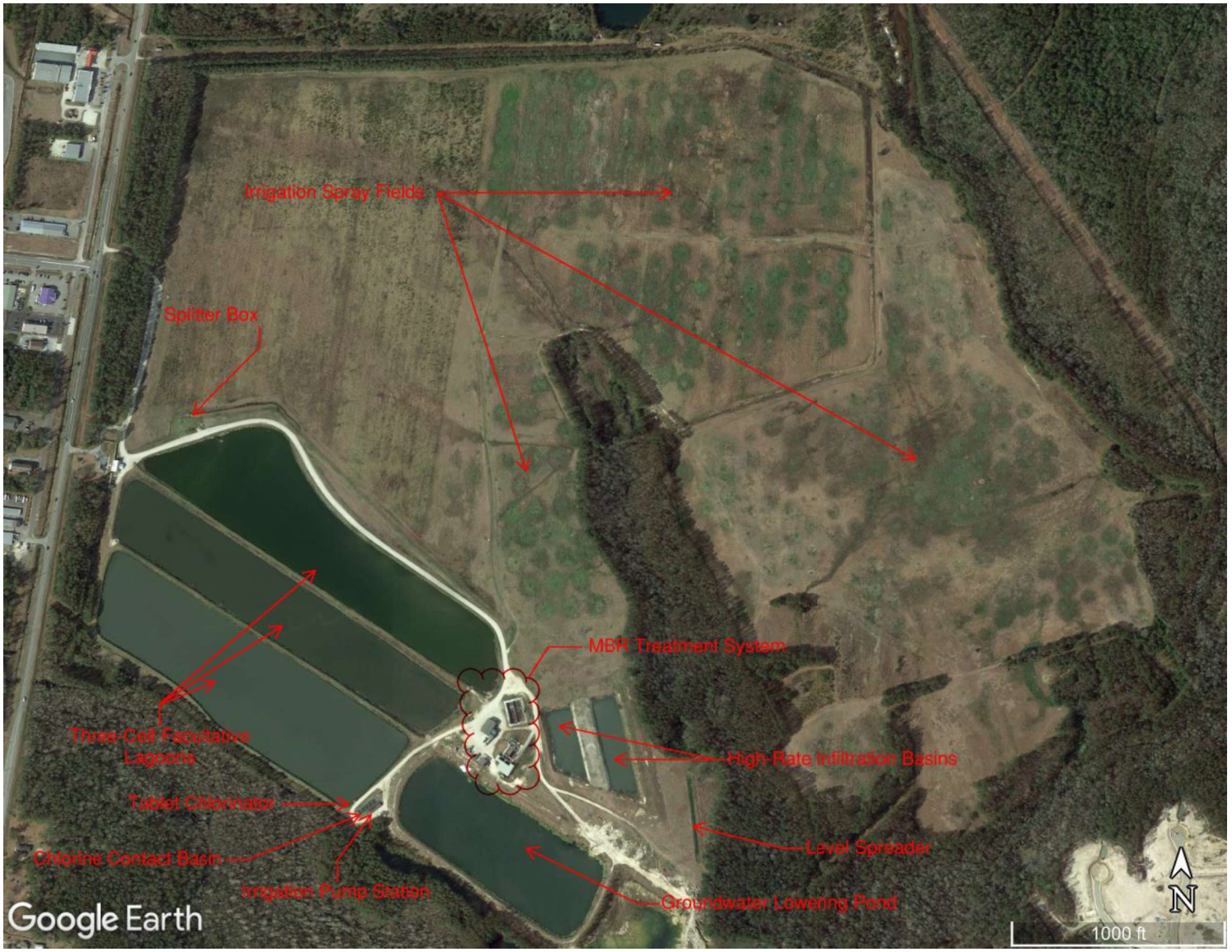
1.1.1 Existing Permit

Pluris, LLC was issued a non-discharge permit WQ0005849 with an effective date of October 20th, 2020, and an expiration date of December 31, 2026. The permit authorized Pluris, LLC to operate the 1,542,635 GPD wastewater treatment, high-rate infiltration, and irrigation facility which consists of:

1. A Three-Cell Passive Lagoon Treatment System with the following:
    a. An existing wastewater treatment train with:
        i. Parshall flume
        ii. Ultrasonic flow meter
        iii. Manually cleaned, mechanical bar screen
        iv. 42.2 acre three-cell facultative lagoon with approximately 57 million gallons of capacity
        v. Tablet chlorinator with 138,875-gallon chlorine contact chamber
        vi. Irrigation pump station with duplex 1,800 gallons per minute (gpm) pumps
        vii. All associated piping, valves, controls, and appurtenances
    b. An existing 542,635 gpd wastewater irrigation system with
        i. 129.28 acres of spray irrigation area comprised of 25 fields,
        ii. All associated piping, valves, controls, and appurtenances
2. An MBR Treatment System with
    a. An existing wastewater treatment train with:
        i. Flow splitter box with a 3-inch spaced manual bar screen
        ii. Magnetic induction flow meter and totalizer
        iii. 254,320-gallon aerated flow equalization (EQ) Basin with two 1,200 gpm submersible pumps and two 10 horsepower (hp) floating mechanical aerators
        iv. Two 2-millimeter (mm) rotary drum fine screens with auto wash
        v. 52,229-gallon anaerobic Basin with a 2 hp mechanical mixer
        vi. Aluminum sulfate (alum) chemical feed system with two 20 gallon per hour (gph) chemical feed pumps.
        vii. 49,745-gallon pre-anoxic Basin with 1.5 hp mechanical mixer

viii. Two 121,583-gallon pre-aeration Basins with two 300 cubic foot per minute (CFM) blowers, fine bubble diffusers, and two 4.6 hp mechanical mixers
ix. Pre-aeration recirculation wet well with two 2,778 gpm recirculation pumps
x. 70,324 gallon post anoxic Basin with one 3.6 hp mechanical mixer
xi. Micro C chemical feed system with two 1.8 gph chemical feed pumps
xii. Two 41,888-gallon membrane bioreactor (MBR) aeration basins with one basin with 10 membrane cassettes, a 386 gpm permeate pump, fine bubble diffusers, a telescoping valve, a turbidimeter, and two 711 CFM blowers
xiii. Recycled activated sludge (RAS) and waste activated sludge (WAS) wet well with two 2,082 gpm RAS/WAS pumps.
xiv. 330,616-gallon aerobic digester with 6-inch diameter decanting pipes, coarse bubble diffusers, and two 1,000 CFM blowers
xv. UV disinfection unit bank with 48 bulbs
xvi. Wash water lift station with two 300 gpm submersible pumps and a gravity feed line to the high-rate infiltration basins
xvii. 9.5-acre dewatering storage lagoon with 22.4 million gallons of storage
xviii. Auxiliary generator with automatic transfer switch
xix. All associated piping, valves, controls, and appurtenances

b. A to-be-constructed (**Note: Start-up of second phase MBRs are on-going as of March 2023**) modification of the previous wastewater treatment train with:
   i. 10 membrane cassettes installed in the second MBR aeration basin, a 386 gpm permeate pump, and turbidimeter.
   ii. UV disinfection unit bank with 48 bulbs
   iii. Ground water pumping station with a hydropneumatics Basin, two submersible pumps, and duplex control panel
   iv. All associated piping, valves, controls, and appurtenances
c. An existing 1,000,000 gpd high-rate infiltration system with:
   i. Two high-rate infiltration basin effluent flow meters
   ii. Refrigerated effluent sampler.
   iii. 1.07 acre high-rate infiltration basin with a loading rate of 10.77 gallons per day per square foot (gpd/ft^2)
   iv. 1.52 acre high-rate infiltration basin with a loading rate of 7.54 gpd/ft^2
   v. Gravity dewatering collection piping network with ultrasonic flow meter, and drains to a water collection pond that overflows via a 400-foot rip rap and ABC stone level spreader,
   vi. All associated piping, valves, controls, and appurtenances

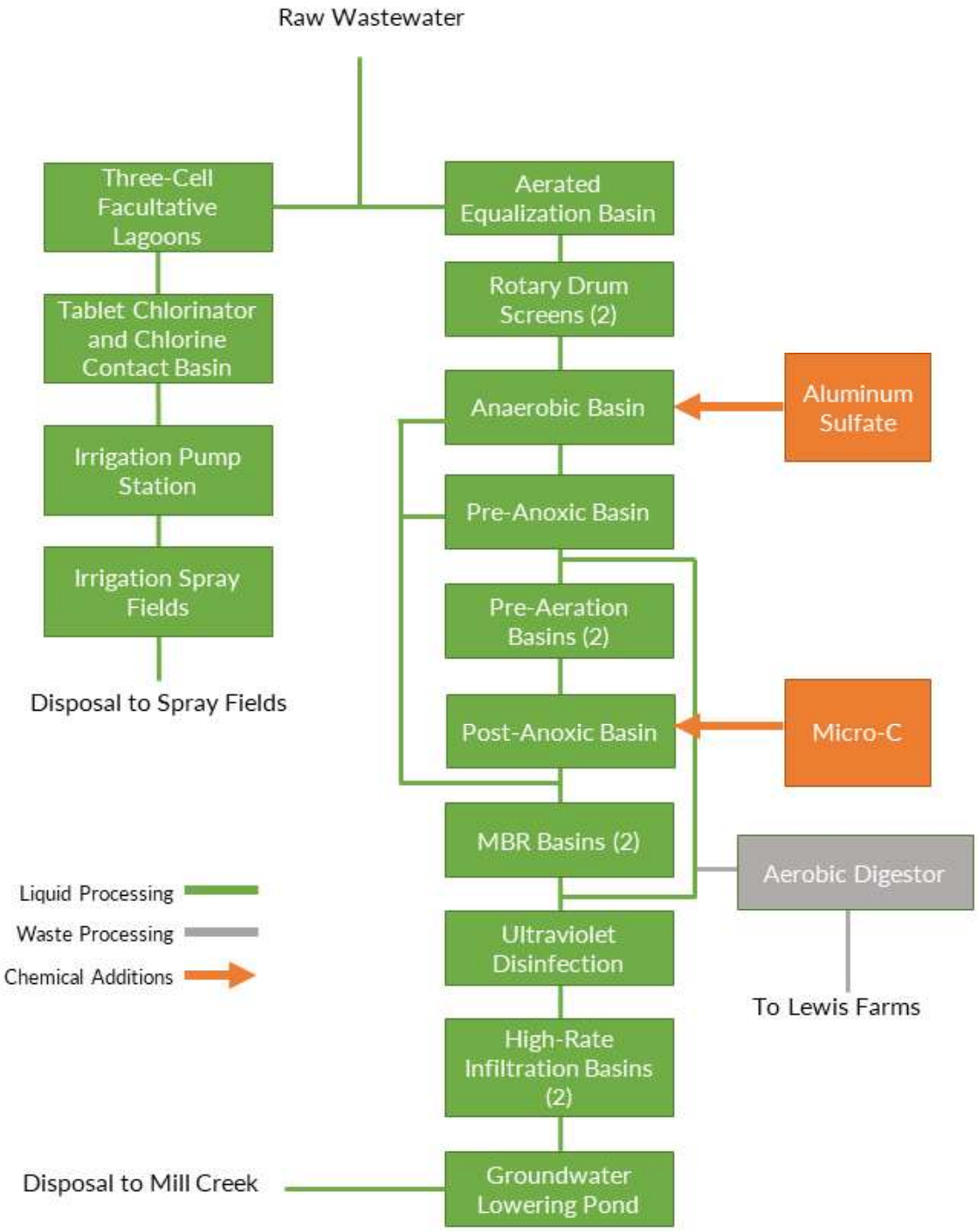


North Topsail WWTP - Full Site Layout

EXHIBIT C

North Topsail WWTP - MBR Treatment Site Layout

EXHIBIT C



North Topsail WWTP Schematic Layout

The non-discharge permit requires that the passive lagoon treatment system effluent be limited to a monthly average of 542,635 gallons per day (GPD) with monitoring of effluent quality. The permit requires the two-train MBR treatment system effluent meet the criteria shown in the table below.

Table 1: North Topsail WWTP - Phase II Discharge Limits*

		Appendix Reference:	**A1**
Parameter	**Monthly Average**	**Monthly Geometric Mean**	**Units of Measure**
Flow	1,000,000**	-	GPD
BOD, 5-Day	10	-	mg/L
Fecal Coliform	-	14	#/100 mL
Total Suspended Solids	15	-	mg/L
Nitrogen, Ammonia Total	4	-	mg/L
Nitrogen, Nitrate Total	10	-	mg/L
Nitrogen, Total	4	-	mg/L
Phosphorus, Total	2	-	mg/L

*Parameters that were "Monitor and Report" only are not listed
**Applies to MBR treatment system with two trains in service. Only one train in service as of March 2023 limiting flow to 500,000 GPD. All other limits remain the same.

The permit requires the groundwater lowering system effluent to meet the criteria shown in the table below with sampling occurring across nine groundwater monitoring wells.

Table 2: North Topsail WWTP – Groundwater Lowering System Discharge Limits*

			Appendix Reference	**A1**
Parameter	**Monthly Average**	**Daily Minimum**	**Daily Maximum**	**Units**
Chloride	250	-	-	mg/L
Nitrogen, Ammonia Total	1.5	-	-	mg/L
Nitrogen, Nitrate Total	10	-	-	mg/L
Total Dissolved Solids	500	-	-	mg/L
pH	-	6.5	8.5	su

*Parameters that were "Monitor and Report" only are not listed

1.1.2 NCDEQ Violation History

North Topsail WWTP has received 1 limit exceedance violation since 2019 as shown in Table 3 below. There are no regulatory orders against North Topsail WWTP and no elements of the treatment methods at North Topsail WWTP are expected to create extraordinary additional issues.

Table 3: North Topsail WWTP Violations (2019 – 2023)

			Appendix Reference	A2
Parameter	**Date**	**Limit Value**	**Reported Value**	**Type of Violation**
Flow, In conduit or Thru treatment plant (50050)	5/31/2021	542,635	835,341.16	Monthly Average Exceeded

1.1.3 Plant Capacity

North Topsail WWTP is currently rated for a total of 1.042 MGD with a 0.542 MGD rating for the passive lagoon treatment train and 0.500 MGD for the single MBR train. The second MBR treatment train is currently in commissioning phase as of March 2023, and upon completion, the rating will increase to 1.542 MGD. In 2022, North Topsail WWTP had an average daily flow of 0.803 MGD (~52% of 1.542 MGD design capacity) as shown in Tables 4 and 6. The passive lagoon treatment train experiences periods of high flow caused by heavy rains during the spring to summer months. Operator notes indicate a need to run the spray fields 24 hours during periods of heavy rain to maintain an acceptable freeboard within the lagoons. Operator notes also indicate that the volume applied to individual fields during periods with heavy rain can be high enough to need offsetting through less runtime during drier months later in the year. For the advanced treatment train, the Operator and Engineer stated that the old Microdyne membranes caused bottlenecks during previous years and that the new Kubota membranes installed in 2021 allow the plant to consistently send more flow to the MBR treatment system. Historical water records corroborate this as the passive lagoon system ADF decreased and MBR ADF increased from 2021 to 2022.

Table 4: Historical Flow Data

Appendix Reference		A3		
Passive Lagoon Treatment System				
Year	**Annual Average Daily Flow (MGD)**	**Max Monthly Average Flow (MGD)**	**Min Monthly Average Flow (MGD)**	**Max Daily Flow (MGD)**
2020	0.467	0.668	0.161	1.015
2021	0.501	0.835	0.170	1.478
2022	0.342	0.609	0.183	0.710
$Q_{3\text{-yr:}}$	**0.437**	**0.704**	**0.171**	**1.068**
MBR Treatment System				
Year	**Annual Average Daily Flow (MGD)**	**Max Monthly Average Flow (MGD)**	**Min Monthly Average Flow (MGD)**	**Max Daily Flow (MGD)**
2020	0.229	0.316	0.126	0.407
2021	0.313	0.499	0.109	0.635
2022	0.460	0.496	0.306	0.819
$Q_{3\text{-yr:}}$	**0.334**	**0.437**	**0.180**	**0.620**
Plant Total				
Year	**Annual Average Daily Flow (MGD)**	**Max Monthly Average Flow (MGD)**	**Min Monthly Average Flow (MGD)**	**Max Daily Flow (MGD)**
2020	0.619	0.932	0.403	1.325
2021	0.815	1.115	0.578	2.002
2022	0.803	1.096	0.640	1.304
$Q_{3\text{-yr:}}$	**0.746**	**1.048**	**0.540**	**1.542**

Per 15A NCAC 02T .0118, a wastewater treatment system must submit an approvable engineering evaluation of their future wastewater, utilization, and disposal needs prior to exceeding 80 percent of its permitted hydraulic capacity (Appendix A4). Future flow projections were calculated using a persons per household value of 2.61 (US Census Data, Appendix A5) and applying that value to the flow data and customer counts for 2020 to 2022 to estimate current service population and determine an average daily flow per person of 48 gallons per day as shown in Table 5 below.

Table 5: Flow Per Person Calculation

			Appendix	**A6**
Year	**ADF (MGD)**	**Connections**	**Estimated Population**	**Flow/Person**
2020	0.619	5,616	14,658	42
2021	0.815	5,925	15,464	53
2022	0.803	6,404	16,714	48
			Average Daily Flow/Person	**48**

Estimated yearly population growth rates of 1.18% and 1.05% were used for the years 2020-2030 (OSBM Population Projections, Appendix A7) and 2030-2040 (OSBM Population Projection, Appendix A8), respectively, to estimate service area population growth. The population

projections were then used to project future flow as a function of future population growth. An additional scenario adding Summerhouse and Holly Ridge WWTPs combined obligated capacity of 0.483 MGD was included in the projection. The obligated capacity was then interpolated linearly based on ONWASA's flow projection of 1.0 MGD for Summerhouse and Holly Ridge WWTPs in twenty years. Based on these projections, North Topsail WWTP's average daily flow is not projected to exceed the 80% threshold in the next 20 years. However, if capacities from Summerhouse and Holly Ridge WWTPs are applied to North Topsail WWTP, an expansion plan would be required immediately, and final construction plans would be required in less than five years.

Table 6: Future Flow Projections

Year	Estimated Population	Population Based Projected Flow (MGD)	% of Hydraulic Capacity	Summerhouse and Holly Ridge WWTP Capacities (MGD)	Projected Flow including Summerhouse and Holly Ridge WWTPs (MGD)	% of Hydraulic Capacity
2022	16,714	0.803	52%	0.483	1.286	84%
2027	17,700	0.850	55%	0.612	1.462	96%
2032	18,629	0.894	58%	0.742	1.636	107%
2037	19,607	0.941	61%	0.871	1.812	119%
2042	20,637	0.991	64%	1.000	1.991	131%

Effluent quality data for both the MBR treatment system and groundwater lowering system from July 2021 to December 2022 (Appendix A9) was analyzed and summarized in the tables below. November and December 2021 data was not provided. The results indicate that the North Topsail WWTP consistently met all effluent limits during this period.

Table 7: MBR Treatment System Effluent Quality Data

Parameter	Average	Limit
Fecal Coliform	1.05	14
BOD5	<2	10
Ammonia	<0.2	4
Nitrate	0.33	10
Total Nitrogen	0.94	4
Total Phosphorus	0.60	2
TSS	<2.5	15

Table 8: Groundwater Lowering System Effluent Quality Data

Parameter	AVG	Limit
Chloride	99	250
Ammonia	0.39	1.5
Nitrate	0.54	10
TDS	485	500

There is adequate space for treatment plant expansion as the entire site is 120+ acres. However, a hydrogeological study is needed to determine if there's any additional capacity remaining for expansion of the irrigation spray fields or if there are additional areas on-site that are suitable for additional high-rate infiltration basins and groundwater storage. The system valuation performed by Raftelis values the replacement cost of the 1.0 MGD MBR plant at $18 per gallon or $18,000,000 as of December 2022. For the purposes of the capital improvement planning and construction cost increases, it is estimated that the cost of a mirrored 1.0 MGD MBR plant in the next 5 to 10 years is $25 - $35 per gallon or $25,000,000 – $35,000,000.

1.1.4 Flood Risk

North Topsail WWTP has two sections with a 0.2% annual chance flood hazard rating as shown in the FEMA National Flood Insurance Program Map and the North Carolina Flood Risk Map. The first section is a wooded area that serves as the ultimate discharge of the groundwater lowering pond effluent through a level spreader. The second area covers the southwestern portion of the groundwater lowering pond. The flood elevation for both areas is 11 ft. The groundwater lowering pond has a berm elevation ranging from 25 ft to 30 ft while the level spreader has an overflow elevation of 19 ft. As a result, North Topsail WWTP is not expected to be susceptible to flooding from coastal storms (Appendix A10, A11, A12).

1.2 Plant and Equipment Condition

1.2.1 Specific Equipment Condition – Facultative Lagoon Plant

Specific equipment pictures can be found in Appendix B

1.2.1.1 Splitter Box

Splitter Box		
	Appendix Reference	B1
Condition	**Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	30+	Manual Slide Gate Parshall Flume with Ultrasonic Flowmeter
Information		
Description: Simple splitter box used to divert flow to lagoons. Pipe leading to MBR plant is always open. Flow is diverted to lagoon using manual slide gate to flow through a Parshall flume and into lagoons.		

Splitter Box
Observations: A large amount of FOG was present at time of observation. Operators stated that FOG is removed using a vac truck periodically. FOG needs to be removed consistently to maintain flow during high flow events. ONWASA operator stated interest in installation of grit removal system. Splitter box would likely be a good location for grit removal system. Some form of automated control of the splitter box slide gate should be considered but is not required. **Deficiencies:** None

1.2.1.2 Facultative Lagoons

Facultative Lagoons		
	Picture Reference	B2
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	30+	42.2 Acre, three cell facultative lagoon system Concrete discharge structure
Information		
Description: Facultative lagoons consists of three cells and covers ~42 acres with a capacity of ~57 million gallons. Wastewater enters the northernmost cell and exits via the southernmost cell. **Observations:** Lagoon system seems well maintained. Grass around the lagoons was mowed and the dikes between the cells were well maintained. No obvious erosion. The concrete structure and sluice gate system seems in good condition and shows no sign of needed maintenance. The sluice gate operating handle seems to be missing. It seems that this is set in the open position as there is an actuated valve between this structure and the chlorine contact basin. Staff reports that the area surrounding the inlet structure of cell 1 was dredged in the last 5 – 7 years. **Deficiencies:** None		

1.2.1.3 Tablet Chlorinator and Chlorine Contact Basin

Tablet Chlorinator and Chlorine Contact Basin		
	Picture Reference	B3
Condition	**Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	30+	Plastic Tablet Chlorinator anchored to a wooden deck (~5 years old) Electronically Controlled Actuated valve Concrete serpentine Chlorine contact basin (~30+ years old)
Information		

Tablet Chlorinator and Chlorine Contact Basin
Description: Tablet chlorinator consists of white plastic barrel with a schedule 40 PVC water line attached. Chlorine tablets are stored in a white plastic bucket next to the chlorinator and manually added. Chlorinated water is then dosed into the discharge point of the lagoons before entering the chlorine contact chamber. Chlorine contact chamber has 4 baffle walls with a serpentine flow path to the pump station. **Observations:** The Tablet Chlorinator seems to be a few years old – it still has the label partially adhering to the outside of the barrel. It seems to be made of some white plastic material – possibly PVC. Its operation is such that when the irrigation pumps start pumping – water is fed to the tablet chlorinator and the chlorinated water then flows into the concrete lagoon outlet structure to the chlorine contact basin. This allows for chlorine to only be added during operation of the irrigation pumps. The wooden deck that the tablet chlorinator was fastened to was in good shape – though showed some signs of weathering the elements. The electronically controlled actuator valve will open, and the water will flow into the chlorine contact basin. The visible portions of the valve and controlled system looked in good shape. The irrigation pumps are drawing water from the chlorine contact basin. The chlorine contact basin looks to be in good shape. The visible portions of the baffle walls seem to be in good shape. The retaining wall along the lagoon side did not show any major cracking or movement. The security fencing was up and in good order. **Deficiencies:** If the Tablet Chlorinator is PVC – exposure to the sun would weaken its structure. The electronically actuated valve needs painting. The side walls of the chorine contact basin could not be observed – but the concrete walkway around the basin did have some cracks present.

1.2.1.4 Irrigation Pump Station

Irrigation Pump Station		
		Picture Reference B4
Condition	**Age**	**Components**
☐ **Good** ☐ **Fair** ☒ **Poor** ☐ **N/A**	30+	Pump house building Pumps and 200 HP Motors Siemens Sitrans F M MAG 500 flowmeter Electrical Switch Gear Piping and appurtenances
Information		
Description: Pump station consists of a concrete block structure with brick veneer. A second room, formerly used for lab work, is currently empty. Main room houses two 200 HP pumps. Each pump discharges through a check valve and gate valve into a common header that flows through a Siemens Sitrans F M MAG 5000 flowmeter. **Observations:** The pump station building is concrete block with a brick veneer and looks to be in good condition. The interior pump room concrete is in good condition. The solid concrete		

Irrigation Pump Station
base for the pumps and motors has some roughness as it seems that after-the-fact there was concrete added to be able to collect the water from the pump packing to keep it from running onto the floor and pipe it back to the chlorine contact basin. This addition of a small concrete berm to the edge of the pump and motor base has caused the chlorinated water to pool during the pump operations and the lag bolts and base plate show evidence of corrosion from this. There was no ponding or wet water during the site visit. The obvious spraying of the water from the packing has the motor base and pump top and first pipe spool piece showing signs of outer corrosion. The other piping seems to be in good condition and based on the new factory paint – the check valves and gate valves on the discharge side of the pumps seem to be fairly new. The electrical switchgear is 30+ years old but seemed to be in serviceable condition and was raised off the floor. **Deficiencies:** Pump and electrical equipment and are 30+ years old and are past end of life. The motor base and pump top along with the first pipe spool piece on both pumps need to be wire brushed and painted.

1.2.1.5 Irrigation Spray Fields

Irrigation Spray Fields			
		Picture Reference	B5
Condition	**Age**	**Components**	
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	30+	Spray fields Irrigation heads Associated piping and appurtenances	
Information			
Description: 542,635 GPD wastewater irrigation system consisting of a 129.28 acres spray irrigation area comprised of 25 fields; and all associated piping, controls, valves, and appurtenances **Observations:** Observations were in March 2023 and due to recent rains, observations were limited to driving along the edge of several of the fields. There was no visible ponding water in the interior of the fields as can best be determined. Several of the fields had last year's growth still on the fields and the height was around 2.5 to 3.5 feet. Other areas were mown. Operator notes indicate plant has trouble finding ways of disposing of the cut grass because farms are not interested, and burning is prohibited. The few irrigation heads that were closely examined were smoothly operating and seemed to be in good repair. Some of the heads were seen to have last year's growth of vines up the pipe and near the irrigation head. There were a few irrigation heads missing and the vertical piping valved off. **Deficiencies:** The fields need to be managed in accordance with the agronomical plan as originally established for the system. This would require that the vegetive growth be removed on a regular basis. Based on the field observations, it could not be determined if this practice			

Irrigation Spray Fields
was being followed. The missing irrigation heads should be repaired and replaced, and the heads should be kept clear of vines and growth that would hinder the rotation of the heads.

1.2.2 Specific Equipment Condition – Membrane Bio-Reactor Plant

Specific equipment pictures can be found in Appendix B

1.2.2.1 Aerated Equalization Basin

Aerated Equalization Basin		
	Picture Reference	B6
Condition	**Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	12 (2011)	Concrete Basin Surface Aerators ABS Submersible Pumps
Information		
Description: 254,320-gallon aerated flow equalization Basin with two 18 HP 1,200 GPM ABS submersible pumps and two 10 horsepower (hp) floating mechanical aerators. Basin accounts for 25% of MBR treatment flow, not total plant flow. The basin has high-level and low-level floats as well as a pressure level sensor. **Observations:** The concrete Basin walls and guard rails seen above the water level seemed to be in good condition. The one surface aerator within the Basin was operating normally. The submersible pumps were operating normally. EQ pump VFD housed in wooden structure next to basin. The insulation is degrading and needs to be cleaned up. SCADA control allows for complete control of pumps with VFD speed control and feedback and high temperature, moisture, and general alarms. **Deficiencies:** There was only 1 surface aerator installed at the time of the observations.		

1.2.2.2 Rotary Drum Screens

Rotary Drum Screens		
	Picture Reference	B7
Condition	**Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	Unknown	Ozzy Cup Screens Screenings Conveyor and Press Effluent wash wet well Wash pumps Wash system pressure vessel
Information		
Description: The rotary drum screens consist of two Ozzy Cup screens operated in series or parallel. The first unit has 3 mm perforated screens, and the second filter has 1 mm perforated		

Rotary Drum Screens
screens. The unit uses wash water and funnels debris into a Spirac-U320 conveyer that conveys debris to a compactor and into a dumpster for disposal. **Observations:** Screens were in good condition, but the housing and piping need maintenance. Housing and piping are showing signs of corrosion. Discharge piping appears to be painted PVC. Painted PVC is starting to chip. Ancillary piping is all unpainted schedule 40 PVC and exposed to the elements. Engineer and operator stated that original parallel 2 mm screens were not effective at screening debris and were replaced with Ozzy Cup screens with 3 mm and 1mm screens operated in series. However, during observation one was running while the other was in stand-by mode. Age of Ozzy Cup Screen was not known, and they did not know where it was sourced from. Screenings are screw conveyed to a front-loading dumpster box. Electrical panel is stainless steel and seems to be in good condition. The LED readout was slightly faded. The treated effluent wash lift station is located at the back of the building/facility, in-line with the effluent water line. The concrete was in good condition. The pressure vessel for the wash system is located inside the building and is in good condition. The wash pumps were located within the wet well and were not observed. SCADA control system is incorporated into main control screens, but system appears to be operated entirely at the local control panel when observed. **Deficiencies:** HMI (Human Machine Interface) does not have a sunshade which may reduce visibility of screen over time. Ancillary is unpainted PVC exposed to the elements. Paint is peeling on large PVC piping.

1.2.2.3 Anaerobic Basin

Anaerobic Basin			
		Picture Reference	B8
Condition	**Age**	**Components**	
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2011)	17.5 ft x 19 ft x 21 ft Concrete Basin ABS RW3022 Mechanical Mixer	
Information			
Description: 17.5 ft x 19 ft x 21 ft SWD open-top concrete basin with an effective volume of 52,229-gallon anaerobic Basin with a 2 HP ABS RW3022 mechanical mixer. Basin has a high-level float. **Observations:** The concrete basin is in good condition. The ABS mechanical mixer was submerged and could not be observed but appeared to provide adequate mixing. Basin designed for 1Q flow from RAS pumps. Flow meters piping is in basin which could make servicing difficult. Alum is dosed between anaerobic basin and pre-anoxic basin. SCADA control of mixer is local/remote and HOA with high temperature, moisture, and general alarms. **Deficiencies:** None			

1.2.2.4 Pre-Anoxic Basin

Pre-Anoxic Basin		
	Picture Reference	B9
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2011)	17.5 ft x 19 ft x 20 ft Concrete Basin 2 HP ABS RW3022 Mechanical Mixer
Information		

Description: 17.5 ft x 19 ft x 20 ft SWD open-top concrete basin with an effective volume of 49,745-gallon pre-anoxic Basin with a 2 HP ABS RW3022 mechanical mixer. Basin has a high-level float.

Observations: The concrete Basin is in good condition. The ABS mechanical mixer was submerged and could not be observed but appeared to provide adequate mixing. Basin designed for 3Q flow from RAS pumps**.** Flow meter piping is in anaerobic basin which could make servicing difficult. SCADA control of mixer is local/remote and HOA with high temperature, moisture, and general alarms. High level float was in override mode at time of observation. Basin flows into feed channel that feeds the two pre-aeration basins.

Deficiencies: None

1.2.2.5 Pre-Aeration Basin

Pre-Aeration Basins		
	Picture Reference	B10
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2019)	Two 45 ft x 19 ft x 19 ft SWD Concrete Basins Two 6 HP ABS RW4024 Mechanical Mixers Three Kaeser CB131C 25 HP 345 SCFM Hach DO Probe
Information		

Description: Two 45 ft x 19 ft x 19 ft SWD pre-aeration Basins with an effective volume of 121,583 gallon. Aeration is provided by three Kaeser CB131C 25 HP 345 cubic foot per minute (CFM) blowers and fine bubble diffusers. Supplemental mixing is provided by two 6 HP ABS RW4024 mechanical mixers. Each basin has Hach DO probe.

Observations: The concrete Basin looked in good condition. Diffusers seem to have an even pattern with no noticeable dead zones. Air piping is stainless steel. Some of it is underground outside of the Basin. Blowers are in the building and are in good condition. The mechanical mixer was submerged and could not be observed – but seems to be operating as intended. Only one basin is currently in service. Third blower is installed but has not been integrated into the SCADA system yet. Wastewater flows into the pre-aeration wet well.

Deficiencies: None

1.2.2.6 Nitrate Pumps

Nitrate Pumps		
	Picture Reference	B11
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2019)	Pre-Aeration Wet Well Two 30 HP 2,778 GPM Gorman-Rupp T10A60S-B PROMAG 10W3H Flow Meter
Information		
Description: Pre-aeration recirculation wet well with two 2,778 GPM recirculation pumps serving the anaerobic and pre-anoxic Basins. The nitrate pumps and piping are sized and designed to pump 3Q flow to the pre-anoxic basin and 1Q flow to the anaerobic basin. **Observations:** The concrete basins are in good condition. Piping is painted green. Pumps and motors (Gorman-Rupp T Series self-priming) are mounted on a skid that hangs out over the aeration basin behind the handrail with pump first and motor furthest away. This leaves little to no safe room for maintenance. Crane is required to pull pumps. **Deficiencies:** None		

1.2.2.7 Post Anoxic Basin

Post Anoxic Basins		
	Picture Reference	B12
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2019)	14 ft x 39.5 ft 17 ft SWD Concrete Basin 5 HP ABS RW4023 Mechanical Mixers
Information		
Description: A 14 ft x 39.5 ft 17 ft SWD open-top concrete basin with an effective volume of 70,324 gallon and a 5 hp mechanical mixer. **Observations:** The concrete basins are in good condition. The mechanical mixer was submerged and could not be observed but seems to be operating as intended. **Deficiencies:** None		

1.2.2.8 Membrane Bioreactors

Membrane Bioreactors		
	Picture Reference	B13
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair**	2 (2021)	Twelve Kubota SP675 Cassettes Two 7.5 HP Gorman-Rupp T6A60S-B/F

Membrane Bioreactors		
☐ **Poor** ☐ **N/A**		Two 40 HP Kaeser EB291C Two 15 HP Gorman-Rupp T10A60S-B
Information		
Description: Two 41,888-gallon membrane bio-reactor (MBR) basins with six Kubota SP675 membrane cassettes in each basin, a 7.5 HP Gorman-Rupp T6A60S-B/F permeate pump rated for 772 gpm, two 40 HP Kaeser EB291C rated for 765 SCFM , fine bubble diffusers, a telescoping valve, a turbidimeter; a recycled activated sludge (RAS) and waste activated sludge (WAS) wet well with two 15 HP Gorman-Rupp T10A60S-B pumps rated for 2,082 GPM each **Observations:** Only one membrane basin was in use at time of observation. The second basin installation is ongoing. The concrete basins were in good condition. The visible piping was in good condition. Aerators were in good condition – the surface was completely aerated with no dead spots and almost all foam broken up. The blowers, permeate pump and RAS pumps were all in the lower building (gallery) adjacent to the back wall of the membrane Basins and were all in good condition and located where maintenance would be easily performed. Each MBR basin has a dedicated permeate pump and blower. Membranes/permeate pumps operate in relaxation mode which consists of timer with ~ 10 minutes on followed by a 1-minute rest period to allow aeration to scour membrane surface. Operator uses preset run/relax timers as the plant ramps up and down as needed. SCADA control is comprehensive allowing for MBR system run automatically without operator input for extended periods of time. Appears to be enough clearance to easily access equipment in case of repair. Crane required to lift membranes out of basin. Pump needed to drain basin to access diffusers. Header is installed high up between rafters. The telescoping valve control is manual and wheel-mounted just behind the handrail and is easily accessed. ONWASA operator stated interest in installation of mono-rail hoist system for removing/inspecting membranes. Hoist would also be useful in service nitrate pumps and any other large pieces of equipment or piping. **Deficiencies:** The telescoping valve wheel and housing will need painting.		

1.2.2.9 Aerobic Digestor

Aerobic Digestor		
	Picture Reference	B14
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2021)	Concrete Basin Gardner-Denver Sutorbilt Blowers rated for 1000 CFM Coarse Bubble Diffusers
Information		
Description: Open-top concrete basin with effective volume of 330,616-gallon with 6- inch diameter decanting pipes, coarse bubble diffusers and served by two 1, 000 CFM blowers. **Observations:** The walls and guard rails above the water line were in good condition. The blowers and diffusers were seen to be operating correctly and no dead zones were noted within		

Aerobic Digestor
the basin. Sludge is hauled off by Lewis Farms and Liquid Waste, Inc (WQ0000455). According to Lewis Farm's permit, North Topsail WWTP is allocated a maximum of 55 dry tons per year. Lewis Farm's showed no NOVs regarding sludge disposal in the past three years. **Deficiencies:** None

1.2.2.10 Ultraviolet Disinfection System

Ultraviolet Disinfection System		
		Picture Reference B15
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2021)	Trojan UV3000Plus
Information		
Description: Trojan UV3000 ultraviolet (UV) disinfection unit containing one bank of 48 bulbs. **Observations:** Effluent trough and Trojan UV3000 is located indoors. The concrete is in good condition. There are two controllers with two sets of bulbs in series. Controllers currently have 6 bulbs but can hold 12 total bulbs. Bulbs will be installed with the expansion. There is a manual lifting crane mounted to the concrete floor along the UV Trough to remove the bulbs from either section. The crane is in good condition. **Deficiencies:** None		

1.2.2.11 High-Rate Infiltration Basins

High-Rate Infiltration Basins and Groundwater Lowering Pond		
		Picture Reference B16
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2021)	Two high-rate infiltration basins 9.5-acre dewatering storage lagoon 400-foot rip rap and ABC stone level spreader
Information		
Description: Two high-rate infiltration basins consisting of a 1.07 acre high-rate infiltration basin with a loading rate of 10.77 gallons per day per square foot (gpd/ft^2) and a 1.52 acre high-rate infiltration basin with a loading rate of 7.54 gpd/ft^2. The high-rate infiltration basins feed into a 9.5-acre dewatering storage lagoon with 22.4 million gallons of storage. Dewatering storage lagoon then discharges via a gravity dewatering collection piping network with an ultrasonic		

High-Rate Infiltration Basins and Groundwater Lowering Pond
flow meter to a water collection pond that overflows via a 400-foot rip rap and ABC stone level spreader. **Observations:** The basins were well maintained and cleanly mowed. The level spreader was not observed in operation but neatly maintained. **Deficiencies:** None

1.2.2.12 Aluminum Sulfate Dosing System

Aluminum Sulfate Dosing Pump		
	Picture Reference	B17
Condition	**Estimated Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	Unknown	IWAKI EH-E Chemical Metering Pump
Information		
Description: The alum dosing system consists of an Iwaki EH-E chemical metering pump with discharge tubing exiting out the back of the structure and suction tubing placed directly into a 300-gallon tote of alum. **Observations**: Structure needs some cleaning. 300-gallon tote support cage is starting to rust. SCADA control is limited to HOA. No secondary containment. Trucks need to go up an unpaved hill to reach equipment which makes servicing equipment difficult. **Deficiencies:** No secondary containment.		

1.2.2.13 Micro-C Dosing System

Micro-C Dosing System		
	Picture Reference	B18
Condition	**Estimated Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	Unknown	Two IWAKI EH-E Chemical Metering Pump

Micro-C Dosing System
Information
Description: The Micro-C dosing system consists of an Iwaki EH-E chemical metering pump with discharge tubing connecting to schedule 40 PVC piping exiting out the back of the structure. Suction tubing is placed in 300-gallon tote. **Observations**: Structure needs some cleaning. 300-gallon tote is out in the elements. The original tank is dirty and unused. SCADA control is limited to HOA. No secondary containment. Trucks must go up an unpaved hill to reach equipment which makes servicing difficult. ONWASA operator stated interest in installation of 10,000-gallon bulk tank. Larger structure to cover bulk tanks and chemical pumps would need to be constructed. **Deficiencies:** No secondary containment.

1.2.3 Remaining Useful Life

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
Passive Lagoon Treatment Plant				
Influent	Splitter Box	Unknown	Unknown	
Three-Cell Facultative Lagoon WWTP	Parshall Flume	20+	10+	
	Ultrasonic Flow meter	13	10	
	Manually clean bar screen	13+	15+	
	42.2 acre - Three cell lagoons	30+	20+	
	Tablet chlorinator	5	5	
	Chlorine Contact Chamber	30+	20+	
	1,800 gpm Irrigation pumps	30+	5	Passed end of life
	Effluent Flow meter	Unknown	5	
	129.28 Acre Spray area	30+	20+	last year's growth needs removing
	Irrigation Heads	30+	20+	Rainbird 65D

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
Phase I Membrane Treatment Plant				
Influent Flow meter	Flow meter	10	10	
254,320-gallon Aerated Flow Equalization Basin	Basin	12	30+	Concrete Basin
	Two 1,200 Submersible Pumps	12	10	
	Two Surface Aerator	12	12	Only 1 aerator in the basin at time of site visit
Rotary Drum Screens - 1 and 3 millimeter (mm)	Elec. Control Panel	5	10	
	Screen 1	Unknown	5	Leaking, housing is rusting, PVC piping needs replacing, needs routine maintenance
	Screen 2	Unknown	5	Leaking, housing is rusting, PVC piping needs replacing, needs routine maintenance
52,229-gallon Anaerobic Basin	Basin	12	30+	Concrete Basin
	Mixers	12	10	
49,745-gallon Pre-Anoxic Basin	Basin	12	30+	Concrete Basin
	Mixers	12	10	
Two 121,583-gallon Pre-Aeration Tanks	Basin	12	30+	Concrete Basin
	Mixers	12	10	
	Blower	12	10	Kaiser Blowers
	Blower	12	10	Kaiser Blowers
	Diffuser	12	10	Stainless Steel Piping
Pre-Aeration Recirculation Wet Well	Basin	12	30+	Concrete Basin
	Pump	12	10	Need painting
	pump	12	10	Need painting
	Piping	12	20	Need painting
70,324 gallon Post Anoxic Basin	Basin	12	30+	Concrete Basin
	Mixers	12	10	

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
Membrane Bioreactor	Basin	12	30+	Concrete Basin
	Aeration piping	12	10	Stainless Steel Piping
	Blower 1*	12	10	Kaeser Blowers
	Blower 2*	2	20	Kaeser Blowers
	Membranes	2	7	
	Membrane pumps	12	10	Gorman-Rupp Centrifugal pumps
	Waste Activated Sludge Pumps	12	10	
330,616-gallon Aerobic Digester	Basin	3	37+	Concrete Basin
	Blower	12	10	Kaiser Blowers
	Blower	12	10	Kaiser Blowers
	UV disinfection	12	10	Replace bulbs as needed
	aeration piping	12	10	Stainless Steel Piping
	aeration diffusers	12	10	
Wash Water Lift Station	Basin	12	30+	Concrete Basin
	Pumps	12	10	
9.5-acre Dewatering Storage Lagoon	Basin	12	30+	
Alum Chemical Feed System	Metering Pump	2	3	
	Tank	N/A	N/A	switched to Chemical Vendor supplied 300-gallon Tote

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
Micro-C Chemical Feed System	Metering Pump	2	3	
	Tank	N/A	N/A	switched to Chemical Vendor supplied 300-gallon Tote

EXHIBIT C

1.3 Operation and Maintenance

1.3.1 Plant Maintenance Records

The ORC maintains a logbook and keeps maintenance records onsite in a file cabinet in the control room. Pluris provided a list of capital expenses from 2019-2021 (Appendix A13). In 2021, the first full year of operation of the MBR plant, Pluris spent approximately $660,000 on capital expenditures for the WWTP. The largest expenses were $378,330 for new Kubota membranes and $110,398 for transportation equipment including two new trucks.

1.3.2 Annual Operations and Maintenance Expenses

Financial statements provided by Pluris, LLC show the operations and maintenance expenses for 2020 and 2021 were $2,374,549 and $2,720,468 (Appendix A14). The February 2023 Municipal Cost Index Yr-Yr % change of 4.64% was applied to the operations and maintenance expense for 2021 and projected out through 2032 as shown in the table below.

Table 9: Projected North Topsail WWTP Operation and Maintenance Expenses

Current Inflation Rate Based on Municipal Cost Index (February 2023):	**4.64%**
Year	**Projected Total Operations and Maintenance Cost**
2020	$ 2,374,549
2021	$ 2,720,468
2022	$ 2,850,000
2023	$ 2,980,000
2024	$ 3,120,000
2025	$ 3,270,000
2026	$ 3,420,000
2027	$ 3,580,000
2028	$ 3,740,000
2029	$ 3,920,000
2030	$ 4,100,000
2031	$ 4,290,000
2032	$ 4,490,000

1.3.3 Capital Planning

All major pieces of equipment at North Topsail WWTP, apart from the SBR/EQ Basins, are in good condition. However, some equipment is expected to meet its expected lifetime in the next ten years and need replacement. The following are expected to need major maintenance or replacement in the next ten years (February MCI of 4.64% used for cost projections):

1) Membranes - Phase 1 membranes which were replaced in 2021 come with a 7-year warranty. Phase 2 membranes are currently being installed. The expected life of membranes is variable but generally expected to be between 5 and 10 years. For capital

planning purposes, 9 years is the recommended expected lifetime. The projected membrane replacement cost in 2030 is roughly $790,000.

2) Ozzy Filters – The projected cost for replacing for replacing the Ozzy Cup Screen filters in 2028 is $1,090,000.
3) Trojan UV3000Plus – The projected cost for replacing the UV system in 2033 is $610,000.
4) Irrigation Pumps – The projected cost of replacing the irrigation pumps in 2028 is $330,000.
5) Blowers
    a. Pre-Aeration Blowers – The projected cost for replacing two blowers in 2033 is $240,000.
    b. MBR Blowers - The projected cost for replacing two blowers in 2033 is $160,000.
6) Pumps
    a. EQ Basin Pumps – The projected cost for replacing two pumps in 2033 is $130,000.
    b. Nitrate Pumps – The projected cost for replacing two pumps in 2033 is $180,000.
    c. RAS Pumps – The projected cost for replacing two pumps in 2033 is $160,000.
    d. Permeate Pumps – The projected cost for replacing one pump in 2033 is $130,000.
7) Mixers
    a. Anerobic Basin Submersible Mixer – The projected cost for replacing one mixer in 2033 is $40,000.
    b. Pre-Anoxic Submersible Mixer – The projected cost for replacing one mixer in 2033 is $40,000.
    c. Pre-Aeration Mixers – The projected cost for replacing two mixers in 2033 is $140,000.
    d. Post-Anoxic Mixer – The projected cost for replacing one mixer in 2033 is $70,000.
8) Chemical Pumps – The projected of replacing the chemical pumps in 2026 is $40,000.
9) Flowmeters
    a. Passive Lagoon Treatment Flowmeters – The projected cost of replacing the flowmeters associated with the passive lagoon treatment system in 2028 is $30,000.
    b. MBR Treatment Flowmeters – The projected cost of replacing the flowmeters associated with the MBR treatment system in 2033 is $100,000.
10) Tablet Chlorinator – The projected cost of replacing the tablet chlorinator in 2028 is $2,000.
11) Secondary Containment – The projected cost of secondary containment for the chemical totes is $6,000.

A detailed OPC can be found in Appendix A15.

1.3.3.1 Staff

North Topsail WWTP is a Grade IV Biological Water Pollution Control System which requires:

1) One Operator-in-Responsible-Charge with grade 4 or higher
2) One or more Back-up ORCs with grade 3 or higher
3) The ORC to visit no less frequently than five days per week, excluding State and Federal holidays.

Based on the list of available employees who are certified operators for North Topsail WWTP shown below, a second operator with a grade 3 license or higher will be needed to meet the requirements for back-up ORC. The plant facility is large (130+ acres) and hiring additional operators should be considered.

List of Available Employees		
Employee	**Title**	**Certificates Held**
Dwight "Pete" Peterson	North Topsail MBR Plant Operator	Wastewater Treatment – 4 Collection System- 3 Spray Irrigation Operator in Training

2 Off-Site Infrastructure Evaluation

2.1 Off-Site Infrastructure Background

The North Topsail Beach & Sneads Ferry collection system consists of sewer mains, manholes, lift stations, a low-pressure system, and force mains. As part of this report, WithersRavenel investigated many of the lift stations and performed visual inspections of the exterior and interior conditions at these lift stations, with photos of these stations taken and included in Appendix C7. In addition, WithersRavenel performed visual inspections of manholes in different areas of the North Topsail Beach & Sneads Ferry collection system to evaluate the gravity sewer system condition. Pluris has owned and operated this collection system since 2009.

WithersRavenel was provided a model of the North Topsail collection system by Jimmy Fentress from Stroud Engineering. The North Topsail sewer system is classified as a low-pressure system that exclusively employs force mains for wastewater conveyance. The existing model of the system is characterized by a heavily skeletonized approach, with limited incorporation of spatial relationships between assets such as manholes, sewer mains, and pump stations. The length of pipes in the model has been hard coded into the EPANET model, and a total of 383 pump stations with varying types of pumps, including duplex and simplex configurations, have been included. There's is also a single outfall in the northeastern part of the system. The force main pipes have a combined length of approximately 21 miles, with diameter information available (breakdown in Table 10, although material information is currently unavailable). Also, record drawings showed that there are 551 lift stations in the basin, this difference in numbers may be due to abandoned pumps or other operational issues, hence the need for sewer model refinement. While the current model may serve basic calculations or schematic purposes, it is essential to develop an updated model that accurately reflects the present conditions of the system.

Table 10: North Topsail Forcemain by Diameter

Forcemain breakdown based on diameter	Length, ft
2-inch	38,951
3-inch	988
4-inch	3,367
6-inch	12,477
10-inch	28,347
12-inch	23,480
Total	107,610

Setting up a sewer hydraulic model for the North Topsail WWTP requires careful consideration of spatial data, operational information, and model calibration using SCADA/flow meter data. A representative sewer hydraulic model can be built and serve as a valuable tool for simulating and analyzing the behavior of the sewer systems, identifying potential issues, and optimizing their operation. It is important to continuously update the model with accurate data to ensure its reliability and accuracy in future simulations.

2.2 Regulatory Background

The North Topsail Beach and Sneads Ferry Collection System operates under permit WQCS00275. In April 2018, the system was issued a Notice of Deficiency by NCDEQ due to the following deficiencies:

- Failure to submit Annual Wastewater Reports to the Division
- Need to complete map by 9-2019
- Out of 8 pump stations inspected, there were 2 audible alarms and 1 telemetry out of service.
- Maintain more detailed Pump station records.
- Improve Pump station signage.

However, the system was inspected in April 2021, and the inspection summary highlighted issues in terms of record keeping "when wet wells are cleaned, pumps pulled for maintenance/replacement, alarms serviced, and routine maintenance". In addition, the inspection had the following comments on the Pump Stations:

- The facility documents weekly inspection. However, improvements in record keeping can be made for maintenance activities in the pump station logs.
- List Station #89 had issues with the generator turning over during the inspection. The generator was tested and functional on 4/21/2021 and a video showed that 20 minutes after the inspection a staff member had the generator running.
- The Simplex station at the Wagoner facility needs to have a warning light replaced.

All the violations reported in 2018 were corrected before the 2021 inspection and the system was deemed compliant.

In January 2023, NCDEQ approved a flow reduction for the North Topsail Beach and Sneads Ferry Collection System that reduced the design flow for future sewer extensions to 130 gallons per day for 1- and 2-bedroom dwellings and 65 gallons per day per additional bedroom.

2.3 Collection System

2.3.1 Inventory of Assets

Pluris currently owns and operates 835 simplex and duplex submersible lift stations and approximately 55 miles of force main, including a low-pressure system. Additionally, the system includes approximately 40 miles of gravity sewer, 3 portable generators, four portable bypass pumps, fourteen permanent generators, and two permanent bypass pumps.

2.3.2 Collection System Condition

WithersRavenel completed multiple site visits to observe and assess the condition of the North Topsail Beach and Sneads Ferry Collection System. This included inspecting lift stations, grinder pump stations, and manholes throughout the system. A focus was put on the oldest sections of the system and areas where there have been problem areas in the past. The gravity sewer lines and manholes were observed on North Topsail Island and had limited deficiencies. There have been no sanitary sewer overflows in the system since Pluris purchased it in 2009, so it is likely that the condition of the majority of gravity sewer and manholes are consistent with the observed locations. However, for budgetary reasons, it has been estimated that 10% of the collection system may need rehabilitation and a cost estimate has been included for that purpose. Further investigation including Closed Circuit Television (CCTV) is necessary to determine the condition of the remainder of the system and possible rehabilitation methods.

Inspected manhole on North Topsail Island. Note good quality bench, invert and manhole.

WithersRavenel also inspected lift stations and simplex and duplex grinder stations in the system. These included Lift Station #88 and Lift Station #91 on the mainland, the main lift station at the bridge to North Topsail Island, and smaller lift stations on the island. The conditions of these lift stations are summarized in Table 11 below.

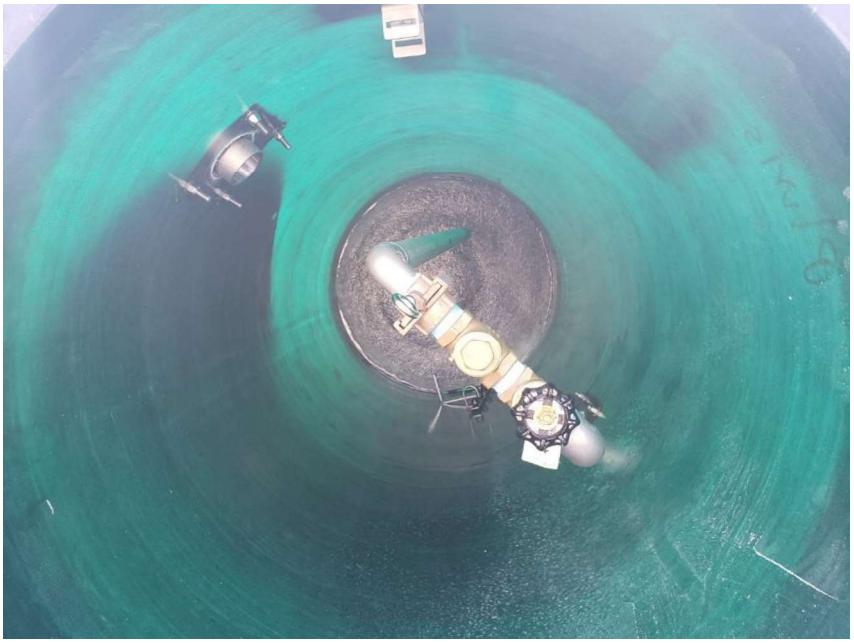
Table 11: North Topsail Beach and Sneads Ferry Collection System Lift Station Evaluation

LOCATION/NAME	Lift Station #88	Lift Station #91	Lift Station at Bridge	Island Lift Stations
SITE-PARCEL OR EASEMENT?	Parcel	Easement	Parcel	Easement
TYPE	Submersible	Submersible	Wet Well/Dry Well	Submersible Grinder
STANDBY PUMP/ EMERGENCY POWER	Standby dri-prime Godwin Pump	None	Generator	None
COMMENTS ON AGE & GENERAL CONDITION	Good quality	Corroded piping and poor quality wet well, onsite manhole needed to be coated	Corroded piping, has odor control, plans to replace piping and pumps, permanent bypass pump	Good quality

The observed simplex and duplex lift stations are in good condition, especially the ones on the island. The lift station at the bridge had a permanent bypass pump and Pluris is planning on rehabilitating it to correct the aging piping and concrete components. The interior piping and metal surfaces in the wet well of Lift Station 91 have become corroded and will need to be replaced. Additionally, some wet wells show evidence of infiltration and surface spalling and will need to be cleaned and epoxy coated. WithersRavenel recommends the installation of dri-prime emergency standby pumps at the lift stations to allow for more secure backup power and bypass pumping. However, for budgetary reasons, it has been estimated that 10% of the collection system may need rehabilitation and a cost estimate has been included for that purpose. Further investigation, including a more detailed pump station inventory is necessary to determine the condition of the remainder of the system and possible rehabilitation methods. Examples of the lift station defects are shown in the following photographs.

Bridge Lift Station valve vault - Note the permanent bypass pump and poor pipe condition. Pluris is in the process of rehabilitating this station.

Lift Station 91 wet well – Note the corroded piping and poor wet well condition.



Example simplex grinder station to be installed in the system. This station is typical of the stations installed recently on North Topsail island.

Example Myers grinder pump to be installed in the system. This pump is typical of the pumps located on North Topsail Island.

Example lift station on North Topsail Island. Note the good quality wet well and interior piping.

In addition, WithersRavenel evaluated the potential diversion of the flow from the existing ONWASA Summerhouse WWTP located at 351 Holly Ridge Road in Holly Ridge, NC to the North Topsail WWTP. WithersRavenel visited the Summerhouse WWTP and inspected the influent line configuration. The existing 12-inch and 8-inch force mains enter the Summerhouse WWTP site from the north and south and enter the membrane treatment train at the same location. However, the plant is only treating 30,000 gpd currently, which is significantly less than the design capacity of 400,000 gpd. This is due to one of the two membrane treatment trains being out of service and the poor quality of the working membranes in the online train. WithersRavenel recommends the

installation of a 694 gpm sewer lift station on the site that will have the capacity to divert all flow from the Summerhouse WWTP to the North Topsail WWTP using approximately 6.5 miles of twelve-inch force main. Tees and valves will be installed on the existing force mains to add flexibility to divert flow to the new lift station. Due to the influent configuration and length of force main, this station will require a Variable Frequency Drive (VFD) and WithersRavenel recommends the addition of a pig launcher for force main maintenance. The force main will travel from Summerhouse WWTP east along Holly Ridge Road, north along Tar Landing Road, east along Old Folkstone Road, and north along Highway 210 to connect to the splitter box at the North Topsail WWTP, where it will have the option of being diverted to the MBR plant or lagoons. WithersRavenel recommends an epoxy coating on the proposed wet well at the Summerhouse WWTP and the splitter box due to the velocities of the force mains discharging into them. A proposed site plan of the lift station location and force main route are shown in Appendix C5 and C6 and preliminary calculations used to size the force main are in Appendix C9.

Existing influent force main to the Summerhouse WWTP. Force mains enter the site from both the north and south and enter the treatment train at the same location.

2.4 Operation and Maintenance

2.4.1 Collection System Maintenance Records

Pluris provided the capital expenditures for the North Topsail Beach and Sneads Ferry Collection System from 2019-2021. Over those three years, the average expenditure for the force main system was $447,000 per year and the average expenditure for the gravity collection system was

$5,000 per year. These values included repairs, new simplex packages and grinder pumps, and staff labor. Due to the large number of both new and existing simplex stations in the system, higher maintenance and replacement costs are expected. A summary of the collection system expenditures is included in Appendix A13 and is accounted for in the Opinions of Probable Construction Cost in Section 3.4.3.

2.4.2 Collection System Personnel

List of Available Employees		
Employee	Title	Certificates Held
Steve Decker	North Topsail Collection System	None
Robert Fanning	North Topsail Collection System	Collection Systems-1; Class B CDL
Edward "Brian" Hurdle	North Topsail Collection System	Collection Systems-1; Class A CDL
Daniel Winkle	North Topsail Collection System	Class A CDL
Nicholas White	North Topsail Collection System	None

2.4.3 Capital Planning

Based on WithersRavenel's assessment of the North Topsail Beach and Sneads Ferry Collection System, construction cost estimates were developed for each aspect of the system. The cost estimates for each portion of the proposed improvements are as follows:

- Gravity Sewer - $2,784,000
  - Includes sewer main, lateral, and manhole rehabilitation.
  - Assumes 10% of the system will be rehabilitated.
- Duplex Lift Stations - $963,000
  - Includes wet well, piping, and valve vault rehabilitation.
  - Includes installation of dri-prime standby emergency pumps
  - Assumes 10% of the lift stations will need rehabilitation.
- Simplex Lift Stations - $338,000
  - Includes wet well, piping, and valve vault rehabilitation.
  - Assumes 10% of the lift stations will need rehabilitation.
- Installation of 694 GPM Lift Station at the Summerhouse WWTP - $7,929,000
  - Includes installing tees and valves on the existing force mains to divert flow when necessary.
  - Includes the lift station – wet well, pumps, VFD, pig launcher, electrical, etc.
  - Includes 6.5 miles of 12-inch PVC force main and corresponding valves and bore and jack street and stream crossings.
  - Includes the tie-in to the existing splitter box at the North Topsail WWTP.
- GIS Data Validation and Model Updates - $534,000

These projects will have a combined minimum starting cost estimate of approximately $15,552,000 including mobilization and 20% contingency. These costs reflect current prices and do not encompass any future upgrades or capacity limitations. A more detailed summary of these cost estimates is in Appendix C4.

3 Conclusions

3.1 Recommendations and Conclusions

North Topsail WWTP is in good condition with a projected life of 30+ years contingent on regular maintenance and as needed replacement of the structures and equipment. The plant currently treats wastewater with effluent quality routinely below permit requirements. The plant has no regulatory orders and no NOVs have been received since May 2021. The current average daily flow is ~52% of the rated hydraulic capacity (contingent on completion of the Phase 2 MBR treatment train) and not expected to reach the 80% threshold in the next 20 years. However, the average daily flow is expected to hit the 80% threshold immediately and the 90% threshold within 5 years if flow from Summerhouse and Holly Ridge WWTPs is reallocated to North Topsail WWTP. A hydrogeological study is needed to determine if there is additional capacity available for disposal of treated wastewater on-site.

The following are recommended operational changes to bring the plant into compliance upon transfer of permit:

1) Grade 3+ Operator – Hire a grade 2 or higher operator to serve as backup ORC as required by Permit.
2) Add secondary containment for all chemicals.

As a whole, no major problems were found within the North Topsail Beach and Sneads Ferry Collection System. However, from the results of site visits and information provided by Pluris and ONWASA, WithersRavenel recommends the following projects to improve the collection system:

- The duplex lift stations require the replacement of piping in the wet wells and valve vaults due to corroded pipes, spalling concrete, and possible infiltration. In addition, many of the valve vaults are partially or fully flooded due to poorly designed or a lack of drains. For budgetary purposes, it was estimated that 10% of the duplex stations in the system require these repairs. WithersRavenel recommends the installation of dri-prime emergency standby pumps at each lift station to allow for more secure backup power and bypass pumping.
- Simplex lift stations also require the replacement of piping in the wet wells and valve vaults due to corroded pipes, spalling concrete, and possible infiltration. Although many of the observed simplex lift stations were in good condition, for budgetary purposes, it was estimated that 10% of the duplex stations in the system require these repairs.
- There have not been any SSOs in the system. However, for budgetary purposes, it is estimated that 10% of the gravity system will need to be rehabilitated, including sewer main using CIPP, laterals, and manholes using cementitious liners. This rehabilitation will require further CCTV investigation to determine the exact linear footage of sewer mains to be replaced/rehabilitated and the required method of rehabilitation.
- The existing model was provided to WithersRavenel. However, Spatial data collection through GIS field exercises, operational information acquisition, hydraulic model development, model calibration using SCADA and flow meter data, and scenario modeling is needed to improve the existing sewer hydraulic model.

In addition, WithersRavenel was tasked with evaluating a method of diverting flow from the existing Summerhouse WWTP in Holly Ridge, North Carolina to the North Topsail WWTP. WithersRavenel proposes the installation of a 694 gpm lift station at the Summerhouse WWTP site and 6.5 miles of 12-inch force main to convey the flow. By installing tees and valves on the two influent force mains, ONWASA will have the flexibility to divert the necessary amount of flow based on plant capacities.

WithersRavenel
Our People. Your Success.

Engineering Report

Pluris Webb Creek Wastewater Facilities Evaluation

Prepared For:

Onslow Water and Sewer Authority

Mailing Address
228 Georgetown Rd
Jacksonville, NC
Physical Address
228 Georgetown Rd
Jacksonville, NC

Prepared By:
WithersRavenel
115 MacKenan Drive
Cary, NC 27511
(919) 469-3340
License No.: F-1479

WithersRavenel Project No. 22-0128-001

May 9, 2023

Leonard McBryde III, PE
Professional Name
Plan Preparer

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1 Executive Summary

Background and Project Purpose

Pluris Webb Creek is a wastewater collection and treatment system owned and operated by Pluris Webb Creek, LLC, a subsidiary of Pluris Holdings, LLC. The system serves approximately 1,400 residential and commercial customers. The Webb Creek wastewater treatment plant (WWTP) is located at 250 Zachary Lane in the unincorporated community of Hubert in eastern Onslow County, NC. The WWTP is permitted to treat and discharge 0.350 million gallons per day (MGD) into Wallace Creek, a currently classified SB-NSW creek in the White Oak River Basin.

Onslow Water and Sewer Authority (ONWASA) is considering the acquisition of Pluris Webb Creek as part of a long-term wastewater treatment capacity planning effort. ONWASA has commissioned this report to provide a technical evaluation of Webb Creek WWTP to determine the plant's current condition, verify operational capabilities and capacities, assess permit compliance, and identify current and future operational or mechanical deficiencies and their potential cost. This report will also provide an assessment of system configuration and permit compliance for Pluris Webb Creek's collection system.

Webb Creek WWTP Permit Compliance

Webb Creek WWTP treats wastewater below permitted requirements with no regulatory orders or notices of violations (NOVs) received since January 2021. The plant currently uses unpermitted steel sequencing batch reactor (SBR) tanks remaining from an abandoned package treatment plant on the property as equalization (EQ) basins during rain events and plant shutdowns for emergency maintenance. The use of the tanks is not required to meet treatment targets, as the main plant has EQ capacity built in, but is operationally useful. To remain in compliance with the existing NPDES (National Pollution Discharge Elimination System) permit, the SBR/EQ tanks cannot be used until the SBR/EQ tanks are rehabbed and permitted. SBR/EQ tanks will need the inside surface refinished, handrails replaced or refinished, walkway grating replaced, blowers replaced or repaired, and discharge piping moved from the walkway, and then a minor modification to the NPDES permit application must be submitted to and approved by the North Carolina Department of Environmental Quality (NCDEQ). The existing WWTP site is out of the flood plain and not expected to be susceptible to coastal storms.

Webb Creek WWTP Capacity and Expansion

The annual average daily flow for 2020 to 2022 was 0.231 MGD or 66% of the rated 0.350 MGD capacity. Based on population growth data for Onslow County, the plant is not expected to meet 80% of permitted treatment capacity until the middle to late 2030s; therefore, no expansion is required in the next 10-15 years. However, local development pressure could accelerate the need for expansion. There is space for expansion at the existing site with the most logical location being the open area in the center of the plant. The recommended cost estimate for expansion in 15 years is $47 - $66 per gallon. New and expanded discharges are subject to a freeze load on oxygen consuming nutrients (e.g., increasing capacity from 0.350 MGD to 0.70 MGD will decrease the biological oxygen demand, 5-day (BOD5) limit from 5 mg/L to 2.5 mg/L) and a total phosphorus (TP) limit reduction from 2.0 mg/L to 0.5 mg/L as part of the White Oak Basinwide Water Quality

Plan. The existing NPDES permit also enforces an annual total nitrogen (TN) limit of 5,896 lbs/yr which will not increase with expansion. The existing WWTP comfortably meets water quality limits and can meet the reduced limits for a mirrored plant expansion to 0.70 MGD. However, expansion beyond 0.70 MGD is limited as the decreased effluent quality limits approach the state-of-the-art limits.

Webb Creek WWTP Condition and Capital Planning

The membrane bioreactor treatment trains at Webb Creek WWTP began operation in June 2020. The equipment is currently in good condition, apart from the unpermitted old SBR/EQ tanks. The expected useful life of the plant, with routine maintenance of structures and equipment, is expected to be 30+ years. Specific equipment that is expected to reach end of useful life in the next 10 years are:

1) SBR/EQ Tanks – Projected Rehabilitation Cost: $276,000
2) MBR Membranes – Projected Replacement Cost: $576,000
3) Feed Forward Pump #1 – Projected Replacement Cost: $32,000
4) Feed Forward Pump #2 – Projected Replacement Cost: $38,000
5) Waste Activated Sludge Pumps – Projected Replacement Cost: $42,000
6) Chemical Pumps – Projected Replacement Cost: $33,000
7) Secondary Containment – Projected Cost: $6,000

Webb Creek WWTP Operations

Current Pluris Webb Creek staff associated with Webb Creek WWTP and available to transfer to ONWASA consists of two certified MBR and collection system operators. Pluris LLC has employees at other WWTPs in the area available to assist as needed that would not transfer to ONWASA.

Pluris Webb Creeks annual operating costs in 2020 and 2021 were reported as $652,057 and $763,368, respectively. Annual operations costs are projected to increase 4.64% annually.

Operational changes upon transfer of operating permits are cease use of unpermitted SBR/EQ tanks, or rehab and permit tanks, and hiring a Grade 2 or higher operator to serve as back-up ORC as required by Section B. 1C of the NPDES permit.

Webb Creek Collection System

The Webb Creek collection system currently consists of ten duplex submersible wastewater lift stations, three simplex submersible grinder pump stations, and approximately eleven miles of force main. Additionally, the system includes approximately nineteen miles of gravity sewer. The system serves a small area along Sand Ridge Road in Hubert, North Carolina. WithersRavenel completed multiple site visits to observe and assess the condition of the simplex lift stations, duplex lift stations, and manholes throughout the system. From the results of site visits and information provided by Pluris and ONWASA, WithersRavenel recommends the following projects to improve the collection system:

- Repair or replacement of all duplex submersible lift stations wet wells, piping, and valve vaults and the installation of dri-prime emergency standby pumps at each lift station to allow for more secure backup power and bypass pumping.
- Repair or replacement of simplex submersible grinder pump lift stations wet wells, piping, and valve vaults
- Rehabilitation of 10% of the gravity sewer system, including sewer main by Cured-in-Place Pipe , laterals, and manholes using cementitious liner. This rehabilitation will require further CCTV investigation to determine the exact linear footage of sewer mains to be replaced/rehabilitated and the required method of rehabilitation.
- Spatial data collection through GIS field exercises, operational information acquisition, hydraulic model development, model calibration using SCADA and flow meter data, and scenario modeling to construct sewer hydraulic model.

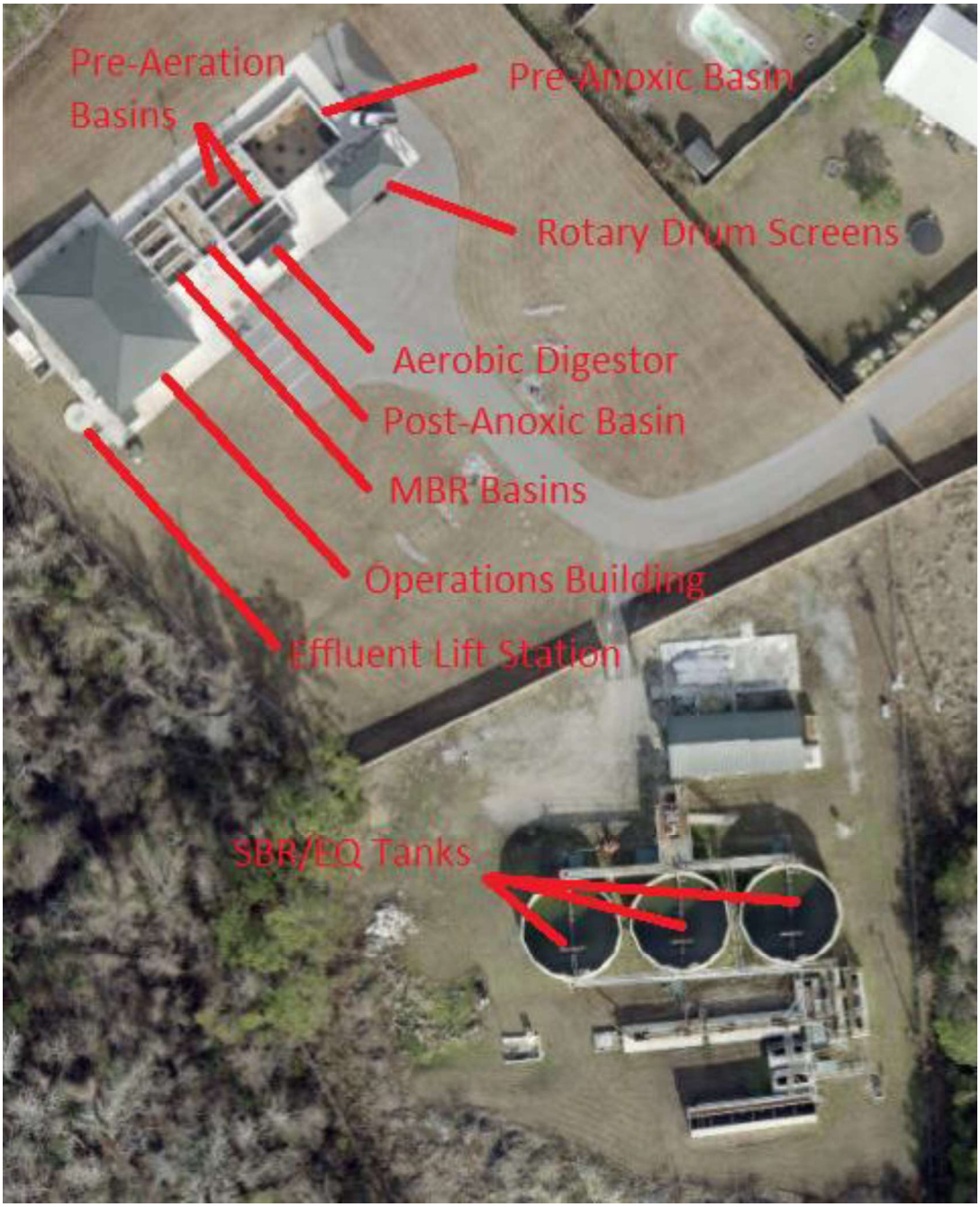
2 Wastewater Treatment Plant Evaluation

2.1 Regulatory Background

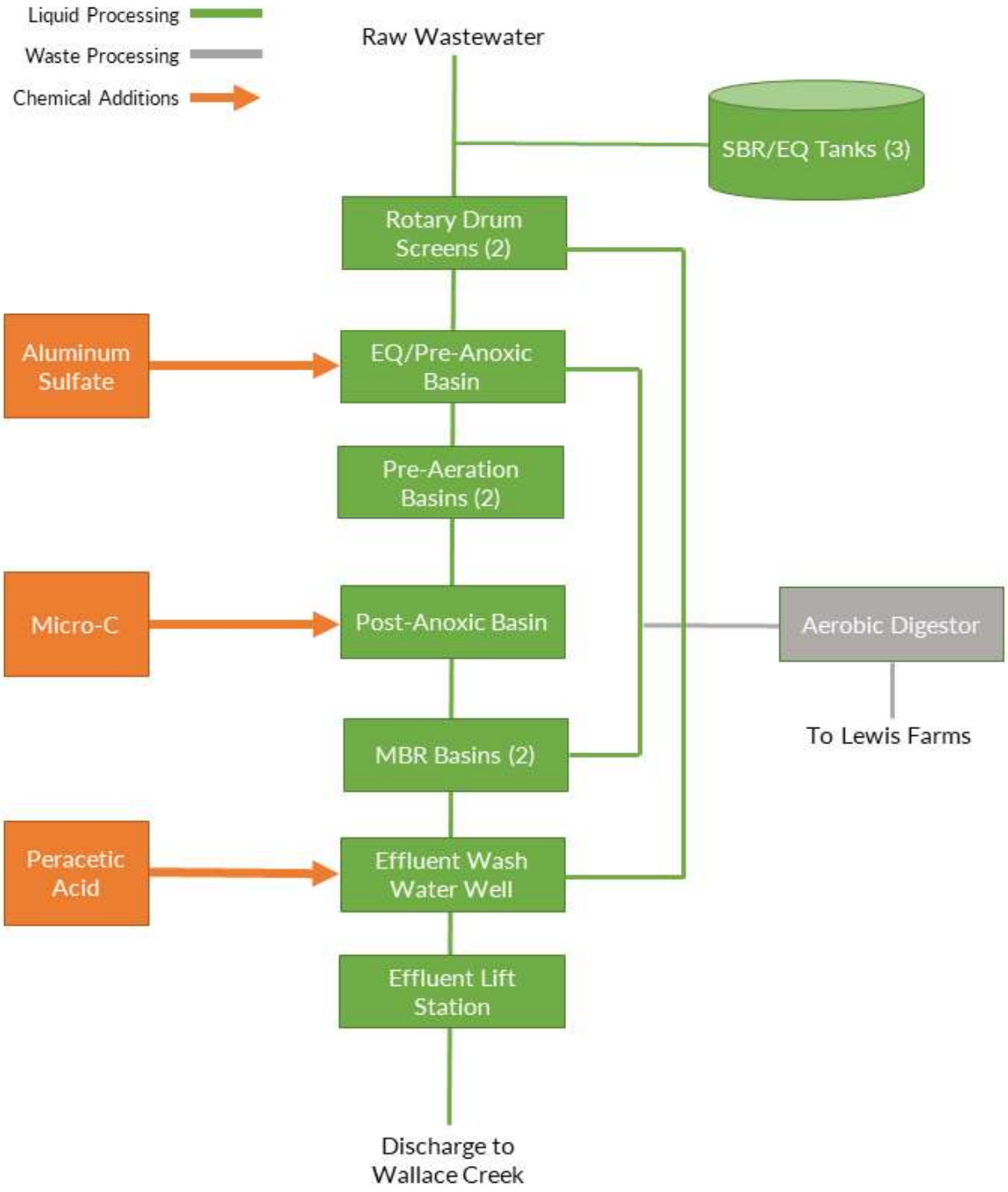
2.1.1 Existing Permit

Webb Creek WWTP was previously permitted as NC0062642 under previous ownership. The previous permit was allowed to expire in 2017. Pluris Webb Creek, LLC was issued a new NPDES permit NC0089877 on August 12th, 2019, with an effective date of September 1st, 2019, and an expiration date of August 31, 2024. The permit authorized Pluris Webb Creek to operate (Appendix A1):

1. An existing 0.3 MGD wastewater treatment system with:
    a. Automatic bar screen
    b. Three sequencing batch reactors (SBR)
    c. Effluent surge tank
    d. UV disinfection
    e. Post aeration
    f. Sludge handling tanks
    g. Effluent pump station
    h. Standby generator
2. And upon receiving authorization to construct permit from Division, replace the existing treatment system with an upgraded 0.35 MGD wastewater treatment system with:
    a. Two 1.87 MGD rotary drum screen system with containment
    b. One 39,300-gallon equalization basin
    c. Two 38,350-gallon pre-aeration basins with air diffusers, and two blowers
    d. One 32,800-gallon post-anoxic basin with mixer
    e. Two 20,750-gallon membrane bioreactor (MBR) basins with eight 0.04-micron membrane cassettes with air diffusers, and three blowers
    f. One 38,350-gallon aerobic digester with air diffusers
    g. One effluent wash water wet well with two 128 gpm submersible wash water pumps.
    h. One effluent composite sampler
    i. One effluent lift station wet well with two 1,100 gpm submersible effluent pumps.
    j. One 55-gallon peracetic acid tank with containment and dual 280 gallons per hour (gph) metering pump system
    k. One 55-gallon drum aluminum sulfate (alum) feed system with dual 1. 8 gph metering pumps.
    l. One 55-gallon Micro-C feed system with dual 20 gph metering pumps.
3. Discharge from said treatment into Wallace Creek [HUC:030203010301], currently classified SB-NSW waters in the White Oak River Basin.



Webb Creek WWTP Site Layout



Webb Creek WWTP Schematic Layout

The 0.35 MGD plant began operation in June 2020. As a result, the existing 0.30 MGD plant is no longer permitted to be used for wastewater treatment. Discussions with plant staff indicate that the plant still uses the SBR tanks as EQ basins during wet weather events and during periods of downtime caused by equipment malfunction, repair, or replacement. Discussions with the Wilmington DEQ office indicate that a minor permit modification is required to use the tanks. Alternatively, the plant could wait until 2024 to permit the tanks during the permit renewal process but would not be allowed to use the tank(s) in the interim.

The permit requires that the effluent from Webb Creek WWTP meet the criteria shown in Table 1. Communication records between the DEQ and the Plant Engineer during the drafting of the 2019 permit indicate that a freeze load was placed on oxygen consuming waste and that any hydraulic expansion will require the effluent limits for BOD5 and ammonia to be lowered to maintain the loading of oxygen consuming waste (Appendix A2). Additionally, Section 4.7 of the White Oak Basinwide Water Quality Plan indicates that new and expanded discharges are subject to a TP limit reduction from 2.0 mg/L to 0.5 mg/L (Appendix A3).

Table 1: Webb Creek Discharge Limits*

			Appendix Reference:	**A1**
Parameter	**Quarterly Average**	**Monthly Average**	**Daily Maximum**	**Units of Measure**
Flow	-	0.350	-	MGD
BOD, 5-Day Winter	-	10.0	15.0	mg/L
BOD, 5-Day Summer	-	5.0	7.5	mg/L
Total Suspended Solids	-	30.0	45.0	mg/L
Nitrogen, Ammonia Total as N Winter	-	2.0	10.0	mg/L
Nitrogen, Ammonia Total as N Summer	-	1.0	5.0	mg/L
Phosphorus, Total as P	2.0	-	-	mg/L
Enterococci, CFU	-	35	276	CFU/100ml
TN Load	5,896			lbs/yr
pH	≥ 6.8 and ≤ 8.5			-

*Parameters that were "Monitor and Report" only are not listed

2.1.2 NCDEQ Violation History

Webb Creek WWTP has received 28 limit exceedance violations since 2019 as shown in Table 2. Of those 28 violations, 26 violations occurred during operation of the original 0.30 MGD SBR plant and 2 occurred within the first six months of operation of the new 0.35 MGD MBR plant. No violations have been received since January of 2021. There are no regulatory orders against Webb Creek WWTP (Appendix A5) and no elements of the treatment methods at Webb Creek WWTP are expected to create extraordinary additional issues.

Table 2: Webb Creek WWTP Violations (2019 – 2023)

		Appendix Reference:	A4	
Parameter	**Date**	**Limit Value**	**Reported Value**	**Type of Violation**
Enterococci	9/3/2019	276	2,420	Daily Maximum Exceeded
BOD, 5-Day	9/4/2019	9	10	Daily Maximum Exceeded
BOD, 5-Day	9/10/2019	9	26	Daily Maximum Exceeded
Enterococci	9/10/2019	276	2,420	Daily Maximum Exceeded
BOD, 5-Day	9/11/2019	9	14	Daily Maximum Exceeded
BOD, 5-Day	9/12/2019	9	10	Daily Maximum Exceeded
Enterococci	9/24/2019	276	1,410	Daily Maximum Exceeded
Enterococci	9/26/2019	276	1,410	Daily Maximum Exceeded
Enterococci	9/30/2019	68.75	68.75	Monthly Geometric Mean Exceeded
BOD, 5-Day	9/30/2019	6	8.55	Monthly Average Exceeded
Nitrogen, Ammonia Total	9/30/2019	2	2.22	Monthly Average Exceeded
Enterococci	10/2/2019	276	3,970	Daily Maximum Exceeded
Enterococci	10/3/2019	276	2,420	Daily Maximum Exceeded
BOD, 5-Day	10/8/2019	9	11	Daily Maximum Exceeded
Enterococci	10/8/2019	276	388	Daily Maximum Exceeded
Enterococci	10/9/2019	276	2,420	Daily Maximum Exceeded
Enterococci	10/31/2019	35	65.67	Monthly Geometric Mean Exceeded
Nitrogen, Ammonia Total	10/31/2019	2	2.55	Monthly Average Exceeded
Enterococci	11/12/2019	276	1,730	Daily Maximum Exceeded
Enterococci	11/13/2019	276	981	Daily Maximum Exceeded
Enterococci	11/14/2019	276	366	Daily Maximum Exceeded
Enterococci	11/19/2019	276	345	Daily Maximum Exceeded
Enterococci	11/20/2019	276	397	Daily Maximum Exceeded
Enterococci	11/25/2019	276	2,420	Daily Maximum Exceeded
Enterococci	11/26/2019	276	2,420	Daily Maximum Exceeded
Enterococci	11/27/2019	276	2,420	Daily Maximum Exceeded
Enterococci	8/12/2020	276	332	Daily Maximum Exceeded
BOD, 5-Day	1/5/2021	15	19	Daily Maximum Exceeded

2.1.3 Plant Capacity

Webb Creek WWTP is rated for 0.350 MGD and designed with a max day peaking factor of 2.5 or 0.88 MGD. Data from September 2021 – February 2023 shows the highest single day flow of 0.307 MGD occurred in February 2023. Historical flow data from 2020 to 2022 are shown in Table 3. From 2020 – 2022, Webb Creek WWTP had an average daily flow of 0.231 MGD (~66% of design capacity). Per 15A NCAC 02T .0118, a wastewater treatment system must submit an approvable engineering evaluation of their future wastewater, utilization, and disposal needs prior to exceeding 80 percent of its permitted hydraulic capacity (Appendix A7).

Table 3: Historical Flow Data

			Appendix Reference:	A6
	Year	Annual Average Daily Flow (MGD)	Maximum Monthly Average Flow (MGD)	Minimum Monthly Average Flow (MGD)
1	2020	0.225	0.272	0.154
2	2021	0.245	0.292	0.212
3	2022	0.223	0.233	0.210
	$Q_{3\text{-yr:}}$	**0.231**	0.266	0.192

Future flow projections were calculated using a persons per household value of 2.61 (US Census Data, Appendix A8) and applying that value to the flow data and customer counts for 2020 to 2022 to estimate current service population and determine an average daily flow per person of 63 gallons/day as shown in Table 4. An estimated yearly population growth of 1.18% and 1.05% were used for the years 2020-2030 (OSBM Population Projections, Appendix A9) and 2030-2040 (OSBM Population Projections, Appendix A10), respectively, to estimate service area population growth. The population projections were then used to project future flow as a function of future population growth as shown in Table 5. Based on these projections, Webb Creek WWTP's average daily flow is not projected to exceed the 80% threshold until 2037.

Table 4: Flow Per Person Calculation

			Appendix	A11, A12, A13
Year	ADF (gpd)	Connections	Estimated Population	Daily Flow/Person
2020	225,342	1,382	3,607	62
2021	245,132	1,406	3,670	67
2022	223,572	1,454	3,795	59
			Average Daily Flow/Person	63

Table 5: Future Flow Projections

Year	Estimated Population	Projected Flow (gpd)	% of Hydraulic Capacity
2022	3,795	223,572	64%
2027	4,019	252,097	72%
2032	4,230	265,332	76%
2037	4,452	279,262	80%
2042	4,686	293,923	84%

Effluent quality data from September 2021 to February 2023 (Appendix A14) was analyzed and summarized in the table below. The results indicate that the Webb Creek WWTP consistently met all effluent limits during this period with effluent water quality parameters often below minimum detection limits.

Table 6: Effluent Quality Data

Parameter	Sep-2021 - Feb-2023	Limit	Units
BOD, 5-Day Winter - Average Month	< 2	10	mg/L
BOD, 5-Day Winter - Max Day	4	15	mg/L
Ammonia Winter - Average Month	< 0.2	2	mg/L
Ammonia Winter - Max Day	2.3	10	mg/L
BOD, 5-Day Summer - Average Month	< 0.2	5	mg/L
BOD, 5-Day Summer - Max Day	3	7.5	mg/L
Ammonia, Summer - Average Month	< 0.2	1	mg/L
Ammonia, Summer - Max Day	1.8	5	mg/L
Total Suspended Solids - Average Month	< 2.5	30	mg/L
Total Suspended Solids - Max Day	< 2.5	45	mg/L
Total Phosphorus - Average Quarter	0.102	2	mg/L
TN Load Yearly Total - Average	1,206	5,896	lbs/yr
Enterococci, CFU - Average Month	1	35	CFU/100 mL
Enterococci, CFU - Max Day	5	276	CFU/100 mL

Due to the freeze load on oxygen consuming waste, Webb Creek WWTP's potential capacity is limited to roughly 0.70 MGD or double its current capacity based on current effluent quality data. The limiting factors are the max day BOD5 and max day ammonia limits which approach the state-of-the-art limits for any expansion beyond 0.70 MGD.

Based on flow projections, Webb Creek WWTP would not be required to expand until the late 2030s. However, the plant site does have additional space in its center that could be used for expansion. The expansion would require the relocation of stormwater piping leading to Parrot Swamp. The system valuation performed by Raftelis values the replacement cost of the 0.350 MGD MBR plant at $18 per gallon or $6,300,000 as of December 2022. For the purposes of the capital improvement planning, it is estimated that the cost of a mirrored 0.350 MGD MBR plant in the near future is $25 - $35 per gallon. The February MCI of 4.64% was applied to the price per gallon cost of a new plant and projected over 14 years. The cost of a mirrored 0.350 MGD treatment plant in 2037 is projected to be $47 to $66 per gallon.

2.1.4 Flood Risk

Webb Creek WWTP is not in a flood plain as shown in the FEMA National Flood Insurance Program Map and the North Carolina Flood Risk Map. Webb Creek WWTP is not expected to be susceptible to flooding from coastal storms (Appendix A15 & AA16).

2.2 Plant and Equipment Condition

2.2.1 Specific Equipment Condition

Specific equipment pictures can be found in Appendix B

2.2.1.1 Equalization Basins (former SBR Tanks)

Equalization Bains (former SBR Tanks)		
	Picture Reference:	B1
Condition	**Estimated Age**	**Components**
☐ **Good** ☐ **Fair** ☒ **Poor** ☐ **N/A**	27 (1996)	Three 141,000-gallon Peabody TecTank Three Sutorbilt Legend Blowers Unknown Submersible Pump
Information		

Description: The former SBR Tanks consist of three 38 ft diameter, 13 ft high circular bolted-panel field-erected painted steel tanks with 141,000-gallon capacities each, 423,000 gallons total or 120% of plant's rated daily capacity. The tanks are Peabody TecTanks manufactured in 1996. Wastewater is routed to these tanks by manually closing off the valves in the yard located in the center of the WWTP site. The tanks have a common header that allows for all tanks to fill equally. Each tank has a dedicated Sutorbilt Bi-Lobe blower; however, one is currently inoperable. Wastewater in tank is transferred to the main plant via a submersible pump and schedule 40 piping that runs along the grating before tying into the larger diameter schedule 40 piping that transports wastewater from pump stations #5 and #8 to the main plant.

Observations: Wilmington DEQ office stated that the SBR tanks were not permitted with the new MBR plant and that a minor modification of the NPDES permit is required to use the SBR tanks. Staff stated that the tanks were used during the rain event 4 days prior to site visit due to rain and downtime on the feed forward pump. Staff also stated that the tanks are regularly used during rain events or when equipment is down and then pumped back to the plant via the submersible pump in the western most tank. Tanks and submersible pump were not observed in use. The equipment used in the previous WWTP on the site is in poor condition. The grating and railing are rusted and warped in many places. Grating is not bolted down in some places. Piping running along grates is a trip hazard and does not give adequate walking room. Elevated walkways have no kick guards. Piping in this area appears to be unpainted PVC and in direct exposure to the sun and elements. PVC piping transporting wastewater from station #5 and #8 also appears to be unpainted PVC. Valve vault is full of water. Steel and DIP piping within SBR is rusty. Engineer mentioned that there is very little information available on how the plant was built. Operationally, the large tank capacity for equalization gives useful operational flexibility to provide consistent flow to the new WWTP if desired.

Deficiencies: Tanks are unpermitted. Rusty piping, grating, and railing. Piping along the walkway is a trip hazard. No kick guards. Grating is warped and is not bolted down in some places. Unpainted PVC piping is exposed to the elements. Pump stations #5 and #8 run through unpainted PVC piping at the head of the old plant. Valve vault is full of water.

2.2.1.2 Rotary Drum Screens

Rotary Drum Screens		
	Picture Reference:	B2
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	12 (2011)	One (1) Endress + Hauser Promag 10W Flowmeter Two (2) Liqui-Fuge LFP-364 Rotary Drum Screens One (1) Model EWP Washing Press
Information		

Description: Influent water flows in through DIP lines through an Endress + Hauser Promag 10W flowmeter and on to the rotary drums. The rotary drum screens consist of two (2) Liqui-Fuge LFP-364 Perforated Rotary Drum Screens sized for 1,250 gpm and operated in duty/standby configuration. The 2 mm perforated screen is driven by a 1 HP motor and equipped with automatic internal and external spray bars. Screened water continues through the screen and out the bottom of the unit. Flights and wash water direct screenings into a discharge chute on the side leading to an EWP 250 washing press. The washing press washes and compacts the screenings over multiple cycles before being discharged to a dumpster. Wash water comes from wash water wet well down stream of membrane permeate.

Observations: Only one unit was seen operating as the drums are typically operated in duty/standby mode. The rotary drum screens and washing presses appear to be in good condition. The perforated screens were clean with very little ragging present. All wetted surfaces are 304SS or 316SS and show minimal signs of corrosion. Appears to be enough room to access hatches for both units. Units are covered, have overhead lighting, and have some secondary containment to catch spills. Motor housing for outer washing press showed some signs of corrosion, possibly due to more exposed positioning. Control panel appears to be in good condition. Inside of panel is neat. Panel disconnect switch is missing. No fan observed inside but panel is covered which may be sufficient for temperature control. SCADA control of drum screens are limited to HOA, start/stop, and alarm/fault status. Unit timers are controlled by time delay switches inside panel. Plant staff reported that they like the drum screens and that they were effective at screening hair/rags/fibrous materials that would otherwise blind the membranes. Operators stated this unit was originally used at North Topsail WWTP and transported for use at Webb Creek WWTP when the MBR plant was built.

Deficiencies: Motor housing showing signs of corrosion. Control panel disconnect switch is missing.

2.2.1.3 Equalization/Pre-Anoxic Basin

Equalization/Pre-Anoxic Basin		
	Picture Reference:	B3
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	One 34' x 25.8' x 18' Concrete Basin Enviro-Mix BioMix with SS piping diffusers Two (2) WILO submersible pumps with 6" DIP
Information		

Description: The equalization/pre-anoxic basin consists of a 34 ft x 25.8 ft x 18 ft open-top concrete tank. The basin can operate as both an equalization basin and an anoxic basin. Under typical conditions, the basin operates as an anoxic basin with a depth of 6 feet with an effective volume of 39,300 gallons. To operate as an EQ basin, the volume in the basin is raised to at least 13.3 ft (approximate volume of 87,500 gallons or 25% of ADF). The maximum side water depth for the basin is 16 ft. Solids in the basin are kept suspended using an Enviro-Mix compressed gas mixing system. Wastewater is transferred from the pre-anoxic basin to the pre-aeration basin via two submersible feed forward pumps with 6" stainless steel discharge pipes. The two feed forward pumps are WILO Model FA 15.52E and are rated for 875 gpm at 25' total dynamic head (TDH). Each pump feeds to separate pre-aeration basins. Alum is dosed just downstream of the inlet.

Observations: Basin was observed operating as pre-anoxic basin with both pumps submerged and operating. Concrete and piping appear to be in good condition. Pump discharge piping shows signs of corrosion at the meeting of the pipe and flange. One feed forward pump failed and was replaced within the past week. Enviro-mix was seen operating and appears to mix the basin. The Enviro-mix operates at 100 psi and the pulse vibrates the control panel. These vibrations could cause issues with the panels over long periods of time. One portable compressor is onsite in case of failure of Atlas Copco compressor supplying Enviro-Mix. Basin has both high- and low-level floats and hydrostatic level transmitter. SCADA control is comprehensive apart from the enviro-mix. Pumps have HOA, speed feedback, with high temperature, moisture, and general failure alarms. Accessing diffusers requires shutting down the plant and draining the tank via pump. Bathroom drains directly into tank.

Deficiencies: Painted DIP is rusting at the joint. Accessing diffusers requires shutdown of plant.

2.2.1.4 Pre-Aeration Basins

Pre-Aeration Basins		
	Picture Reference:	B4
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Two 26' x12.4' x 18' Concrete Basins Two (2) Endress + Hauser Promag 10W Flowmeter Two (2) Aerzen GM 25S Delta Positive Displacement Rotary Lobe Blowers Two sets of 87 Fine Bubble Diffusers Two Hach LDO Probes, Model 2 Two Hach SC200 Controllers
Information		

Description: The pre-aeration basins consist of two 26 ft x 12.4 ft x 18 ft open-top concrete tanks with a typical SWD of 16' with an effective volume of 38,350 gallons each. Flow coming from the pre-anoxic basin via the feed forward pumps flows through an Endress + Hauser Promag 10W flowmeter and into the pre-aeration basins. Aeration is provided for each basin through an Aerzen GM 25S Delta positive displacement rotary lobe blowers rated for 460 SCFM at 9 psi. One blower provides aeration for both basins via flow control valves and speed control from the blower. The basins have 87 fine bubble diffusers each on the tank floor and are rated for 1,148 lbs of O_2/day. Each basin has a Hach LDO Probe and SC200 controller for monitoring DO and temperature.

Observations: Both basins were observed in operation. No aeration dead spots were visible. Concrete and piping appear to be in good condition. Piping does show signs of rust at some joints. In-line flowmeter is difficult to service as it hangs out in the basin. Aerzen blowers are inside main building and are in good condition. Blowers can be routed to both basins. SCADA control for each basin consists of DO and temperature monitoring and a high-level float switch. SCADA control of blowers is comprehensive with HOA, blowers and control valves, high temperature and general alarms, and speed and position feedback on both blowers and control. Second blower can swing between aeration duty and digestor duty, but first blower cannot. Accessing diffusers requires a pump to drain tanks.

Deficiencies: Painted DIP is rusting at the joint.

2.2.1.5 Post Anoxic Basin

Post Anoxic Basin		
	Picture Reference	B5
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	One 11' x 25.8' x 18' Concrete Basin Enviro-Mix BioMix with SS piping diffusers Slide Gates

Information

Description: The post anoxic basin consists of an 11 ft x 25.8 ft x 18 ft open-top concrete basin with a typical SWD of 15.5 ft with an effective volume of 32,800 gallons. Flow comes from the pre-aeration basins via gravity into the combined post anoxic basin. Solids in the basin are kept suspended using an Enviro-Mix compressed gas mixing system. The Enviro-Mix unit is the same unit that mixes the equalization/pre-anoxic system and both tanks are mixed by pulses delivered concurrently. Micro-C is dosed into basin via PVC piping that drips into the basin. Water flows from the post anoxic basin into the two MBR basins via two manually operated Whipps Model 921 36" slide gates. Each basin has low level float switches.

Observations: Basin was observed operating. Concrete and piping appear to be in good condition. Enviro-mix was seen operating and appears to mix the basin. The Enviro-mix operates at 100 psi and the pulse vibrates the control panel. These vibrations could cause issues with the panel over long periods of time. SCADA control consists of HOA for Enviro-Mix unit. Basin does not have drain and will require a pump to drain tank and access diffusers in tank. Accessing diffusers in tank requires stopping plant.

Deficiencies: Accessing diffusers requires shutdown of plant.

2.2.1.6 MBR Basins

MBR Basins		
	Picture Reference	B6
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Two 15' x 12.4' x 18 ft concrete basins Microdyn Bio-Cel L2 TYPEB Two (2) Aerzen GM 10S Delta Positive Displacement Rotary Lobe Blowers Two sets of fine bubble diffusers Two 5 HP Gorman-Rupp T Series Model T4A-B460S Permeate Pumps Blue-White Model A4V24-MNP Hach TU5300 sc
Information		

Description: The MBR basins consists of two 15 ft x 12.4 ft x 18 ft open-top concrete basins with a typical SWD of ~15 ft with an effective volume of 20,750 gallons each. Each basin contains four BIO-CEL L2 membrane cassettes with stainless steel frames and a nominal pore size of 0.04 µm. Aeration for mixing and scouring of the membrane surfaces is provided for each basin through fine bubble diffusers by dedicated Aerzen GM 10S Delta positive displacement rotary lobe blowers rated for 335 SCFM at 6 psi. Water is pulled through the filters via dedicated 5 HP Gorman-Rupp T Series Model T4A-B460S permeate pumps. Two 2 HP WILO Model 2549 WAS/Re-Screen submersible transfer pumps sit at the bottom of the basin. Each basin has a low-level flow switch. A CIP (Clean-In-Place) is performed intermittently using a diluted bleach solution. A Hach TU5300 sc is used to measure permeate turbidity. Permeate from both pumps flow to a wash water well with a back-up dosing point for peracetic acid before being pumped ~6 miles to the discharge point at Wallace Creek.

Observations: Both MBRs were observed in operation with membranes submerged below water line. Concrete and piping that could be observed were in good condition. No ragging or bearding visible from above. No noticeable dead zones. Aeration piping from the building is a bump hazard and is marked with yellow hazard tape. Blowers, permeate pumps, and their associated equipment are located inside the main building and are in good condition. Each MBR basin has a dedicated permeate pump and blower. A spare permeate pump and spare blower equipment are located onsite. Membranes/permeate pumps operate in relaxation mode which consists of timer with ~ 9 minutes on followed by a 1-minute rest period to allow aeration to scour membrane surface. Operator uses preset run/relax timers as the plant ramps up and down as needed. SCADA control is comprehensive allowing for MBR system run automatically without operator input for extended periods of time. Appears to be enough clearance to easily access equipment in case of repair. Pump needed to drain basin to access diffusers. Off-road rated forklift or truck needed to move equipment as garage leads to flat grass field. Trash can used to catch bleach when disconnecting tubing from CIP pump.

Deficiencies: No secondary containment for NaOCl barrels.

2.2.1.7 Aerobic Digestor

Aerobic Digestor		
	Picture Reference	B7
Condition	**Estimated Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Concrete Basin Two (2) Aerzen GM 25S Delta Positive Displacement Unknown submersible pump and hoist
Information		
Description: The aerobic digestor consists of one 26 ft x 12.4 ft x 18 ft open-top concrete tank with a typical SWD of 16' with a volume of 38,350 gallons. Volume is designed to hold ~30 days' worth of sludge. Flow coming from the pre-anoxic basin via the feed forward pumps flow through an Endress + Hauser Promag 10W flowmeter and into the pre-aeration basins. Aeration is provided for the basin through an Aerzen GM 25S Delta positive displacement rotary lobe blower rated for 460 SCFM at 9 psi. The basin is equipped with high- and low-level float switches. **Observations:** Digestor was not seen in operation. Concrete and piping are in good condition. Aeration piping runs through the center of the tank which could make maintenance difficult. Submersible pump attached to hoist is used for sludge collection. Sludge is hauled off by Lewis Farms and Liquid Waste, Inc (WQ0000455). According to Lewis Farm's permit, Webb Creek WWTP is allocated a maximum of 55 dry tons per year. Lewis Farm's showed no NOVs regarding sludge disposal in the past three years. Per Operator, sludge is hauled between every 1 – 2 weeks. **Deficiencies:** None		

2.2.1.8 Aluminum Sulfate Dosing System

Aluminum Sulfate Dosing Pump		
	Picture Reference	B8
Condition	**Estimated Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Blue-White Model A1N10E-7T
Information		
Description: The alum dosing system consists of a Blue-White Model A1N10E-7T with discharge tubing exiting out the back of the structure and suction tubing placed directly into a 300-gallon tote of alum.		

Aluminum Sulfate Dosing Pump
Observations: Simple setup with pump dosing for 30 seconds at a time. SCADA control is limited to HOA. Pump has thin layer of dried alum covering it, presumably from leaks or spills. Dried alum is on top and side of tote. No secondary containment to catch spills. Wall eye wash station does not have eye wash solution. A bucket of potassium permanganate is stored in the same structure. **Deficiencies:** No secondary containment. No eye wash solution.

2.2.1.9 Micro-C Dosing System

Micro-C Dosing Pump		
	Picture Reference	B9
Condition	**Age**	**Components**
☐ **Good** ☒ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Blue-White Model A1N10E-7T
Information		
Description: The Micro-C dosing system consists of a Blue-White Model A1N10E-7T with discharge tubing exiting out the side of the structure and suction tubing placed directly into a 300-gallon tote of Micro-C. **Observations:** Simple setup with pump dosing for 5 seconds at a time. SCADA control is limited to HOA. No secondary containment to catch spills. Wall eye wash station do not have eye wash solution. **Deficiencies:** No secondary containment.		

2.2.1.10 Peracetic Acid Dosing System

Peracetic Acid Dosing Pump		
	Picture Reference	B10
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Blue-White Model A1N10E-7T
Information		
Description: The peracetic acid dosing system consists of a Blue-White Model A1N10E-7T with discharge tubing to the wet well and suction tubing placed through wall and directly into a 55-gallon tote of peracetic acid. The peracetic acid is required by permit as a backup disinfectant in the event of a membrane breach.		

Peracetic Acid Dosing Pump
Observations: Strong vinegar smell in structure. Pump doses directly into wash water wet well. Appears to be manually operated with no observed control from SCADA screens. No secondary containment. Barrell of peracetic acid must be moved down set of stairs. **Deficiencies:** No secondary containment.

2.2.1.11 Other Equipment

Other Equipment		
	Picture Reference	B11
Condition	**Age**	**Components**
☒ **Good** ☐ **Fair** ☐ **Poor** ☐ **N/A**	4 (2019)	Effluent Lift Station Standby Generator
Information		
Description: Lift station consists of two submersible pumps that discharge to Wallace Creek. The generator is a Caterpillar generator rated for 375 kVA/300 kW. **Observations:** Effluent flows from the wet well to the lift station by gravity. Effluent lift station and generator are in good condition. The generator is tested weekly by contractor. **Deficiencies:** None		

2.2.2 Remaining Useful Life

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
USED BUT NOT LISTED IN PERMIT				
Three (3) 141,000-gallon Aerated Wet Weather Equalization Tanks **NOTE: Pump Stations 5 & 8 still pump through piping that is located within the "Previous" plant. Some of this piping is above ground and PVC.**	Tank Man. 2005	18	20	Tanks need maintenance
	Tank Man. 1996	27	15	Tanks need maintenance - interior coating
	Tank Man. 1996	27	15	Tanks need maintenance - interior coating
	Elevated Walkway	27	0	grating & handrails dangerously rusted - possible safety issue – No kick guards
	Blower 1	5	3	Gardner-Denver Sutorbilt Blower
	Blower 2	10	0	Gardner-Denver Sutorbilt Blower Inoperable
	Blower AUX	5	3	Gardner-Denver Sutorbilt Blower
PERMITED - AS LISTED IN PERMIT				
Influent Flow meter	Flow meter	4	12	
Two (2) 1.87 MGD Rotary Drum Screen System with containment	Elec. Control Panel	4	17	Needed maintenance - Disconnect handle missing
	Screen 1	12	18	Stainless Steel, will need routine maintenance
	Screen 2	12	18	Stainless Steel, will need routine maintenance
	Tank	4	37+	Concrete tank

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
One (I) 39,300 gallon Equalization Basin (Pre-Anoxic)	Mixers	4	17	Stainless Steel piping, Enviro-Mix Large Bubble mixing
	Blower*	4	12	Atlas Copco Blower
	Air Surge tank	4	22	Pressure vessel
	Control Panel	4	17	Stainless Steel Cabinet
	Feed Forward Pump 1	4	1	WILO submersible pump
	Feed Forward Pump 2	0	5	WILO submersible pump. Replaced 4 days prior to second site visit
Two (2) 38,350 gallon Pre-Aeration Basins with air diffusers	Tank	3	37+	Concrete tank
	Influent Piping	3	12	Ductile Iron piping - showing signs of rust - routine painting may extend estimated life
	Influent Flow Meters	3	17	
	Aeration Piping	3	17	Stainless Steel Piping.
	Aeration Diffusers	3	17	
	Blower 1*	3	12	Aerzen GM 25S Delta Positive Displacement Rotary Lobe Blowers
	Blower 2*	3	12	Aerzen GM 25S Delta Positive Displacement Rotary Lobe Blowers

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
One (1) 32,800-gallon Post-Anoxic Basin with mixer	Tank	3	37+	Concrete tank
	Mixers	3	17	Stainless Steel piping, Enviro-Mix Mixing Equipment
	Blower	3	12	Atlas Copco Blower
Two (2) 20,750 gallon MBR Basins with eight (8) 0.04-micron membrane cassettes	Tank	3	37+	Concrete tank
	Aeration Piping	3	17	Stainless Steel Piping
	Blower 1*	3	12	Aerzen Delta Blower
	Blower 2*	3	12	Aerzen Delta Blower
	Membranes	3	4	5-year warranty expires in 2025
	Membrane pumps	3	17	Gorman-Rupp 5 HP Centrifugal pumps
	Waste Activated Sludge Pumps	3	7	
Five (5) Blowers (2 pre-aeration, 3membrane)	SEE NOTE			* The Permit list 5 blowers assigned for the pre-aeration (2) and membranes (3), but one of the blowers is dedicated to the Enviro-Mix Large Bubble system. The other 4 blowers are connected so they can serve the pre-aeration, or the membranes as needed.

EXHIBIT C

Unit Process	Component	Estimated Age (yrs)	Estimated Remaining Useful Life (yrs)	Additional Comments
One (1) 38,350-gallon Aerobic Digester with air diffusers	Tank	3	37+	Concrete tank
	Aeration Piping	3	17	Stainless Steel Piping
	Aeration Diffusers	3	17	
One (1) Effluent Wash Water Wet Well with two (2) 128 GPM submersible Wash Water Pumps	Tank	3	37+	Concrete tank
	Pumps	3	12	
One (1) Effluent Composite Sampler	Sampler	3	12	ISCO 5800 Sampler
One (1) Effluent Lift Station Wet Well with two (2) 1, 100 GPM submersible Effluent Pumps	Tank	3	37+	Concrete tank
	Pumps	3	12	
One (1) 55-gallon Peracetic Acid Tank with containment and dual 280 GPH metering pump system	Metering Pump	3	2	Blue-White Model A1N10E-7T
	Tank	N/A	N/A	switched to Chemical Vendor supplied 3; 55-gallon tanks
One (1) 55-gallon drum Alum feed system with dual 1.8 GPH metering pumps	Metering Pump	3	2	Blue-White Model A1N10E-7T
	Tank	N/A	N/A	switched to Chemical Vendor supplied 300-gallon Tote
One (1) 55-gallon Micro-C feed system with dual 20 GPH metering pumps	Metering Pump	3	2	Blue-White Model A1N10E-7T
	Tank	N/A	N/A	switched to Chemical Vendor supplied 300-gallon Tote

EXHIBIT C

2.3 Operation and Maintenance

2.3.1 Plant Maintenance Records

The ORC maintains a logbook and keeps maintenance records onsite in a file cabinet outside the control room. Pluris provided a list of capital expenses from 2019-2021 (Appendix A17). In 2021, the first full year of operation of the MBR plant, Pluris spent approximately $32,000 on capital expenditures for the WWTP.

2.3.2 Annual Operations and Maintenance Expenses

Financial statements provided by Pluris Webb Creek, LLC show the operations and maintenance expenses for 2020 and 2021 were $652,057 and $763,368 (Appendix A18). The February 2023 Municipal Cost Index Yr-Yr % change of 4.64% was applied to the operations and maintenance expense for 2021 and projected out through 2032 as shown in the table below.

Table 7: Project Webb Creek WWTP Operation and Maintenance Expenses

Current Inflation Rate Based on Municipal Cost Index (February 2023):	**4.64%**
Year	**Projected Operations and Maintenance Expenses**
2020	$652,057
2021	$763,368
2022	$800,000
2023	$840,000
2024	$880,000
2025	$920,000
2026	$960,000
2027	$1,010,000
2028	$1,050,000
2029	$1,100,000
2030	$1,150,000
2031	$1,210,000
2032	$1,260,000

2.3.3 Capital Planning

All major pieces of equipment at Webb Creek WWTP, apart from the SBR/EQ tanks, are in good condition. However, some equipment is expected to meet its expected lifetime in the next five years and need replacement. The following are expected to need major maintenance or replacement in the next 10 years:

1) SBR/EQ Tanks – The current tanks are currently unpermitted for use and in need of significant rehabilitation but are used during rain events and during plant down time.

Rehabilitation will require refinishing of the inside surfaces of all three tanks, refinishing and replacement of rusted handrails along walkways, replacement of rusted grating along walkways, re-location of EQ discharge piping from walkways, painting of PVC piping, and rehabilitation of non-functional blowers. The projected cost for rehabbing the SBR/EQ tanks is $276,000.

2) Membranes - The membranes come with a 5-year warranty that began in June 2020 and will end in June 2025. The expected life of membranes is variable but expected to be between 5 and 10 years. For capital planning purposes, 7 years is the recommended expected lifetime. The projected membrane replacement cost in 2027 is $576,000.
3) Chemical pumps - The projected cost for replacing all chemical pumps in 2026 is $33,000.
4) Feed forward pumps – One feed forward pump failed 4 days prior to second site visit – Projected cost for replacing one pump in 2024 is $32,000 and the other pump in 5 years $38,000.
5) WAS pumps - The projected cost for replacing both WAS pumps in 2030 is $42,000.

A detailed OPC can be found in Appendix A19.

2.3.4 Plant Personnel

2.3.4.1 Staff

Webb Creek is Grade III Biological Water Pollution Control System which requires:

1) One Operator-in-Responsible-Charge with grade 3 or higher
2) One or more Back-up ORCs with grade 2 or higher
3) The ORC to visit no less frequently than five days per week, excluding State and Federal holidays.

Based on the list of available employees for Webb Creek WWTP shown below, a second operator with a grade 2 license or higher will be needed to meet the requirements for back-up ORC.

Table 8: List of Available Employees

Employee	Title	Certificates Held
William “Buddy” Andrews	Webb Creek MBR Plant Operator	Wastewater Treatment – 4 Collection System- 4 Class B CDL
Gary Covington	Webb Creek MBR Plant and Collections System Operator	Wastewater Treatment – 1 Collection System- 1 Class B CDL

3 Off-Site Infrastructure Evaluation

3.1 Off-Site Infrastructure Background

The Webb Creek WWTP collection system consists of sewer mains, manholes, lift stations and force mains. As part of this project, WithersRavenel investigated many of the lift stations and performed visual inspections of the exterior and interior conditions at each lift station, with photos

of each station taken and included in Appendix C4. In addition, WithersRavenel performed visual inspections of manholes in different areas of the Webb Creek WWTP collection system to evaluate the gravity sewer system condition.

There is currently no updated model for the Webb Creek WWTP collection system. Building a representative sewer model is crucial to understand the system's capacity, identify existing issues, and support decision-making for long-term planning and management. The model will help determine the system's capacity, identify potential issues, and optimize investments for efficient wastewater collection and conveyance. To create an accurate digital twin that represents the Webb Creek WWTP's collection system, an updated model incorporating recent spatial data, operational information, and asset data, and model calibration using SCADA/flow meter data, will be crucial. A representative sewer hydraulic model can serve as a valuable tool for simulating and analyzing the behavior of the sewer systems, identifying potential issues, and optimizing their operation. It is important to continuously update the model with accurate data to ensure its reliability and accuracy in future simulations.

3.2 Regulatory Background

The Webb Creek Collection System was originally issued permit WQCS00230 in 2013, effective until May 31, 2021. Pluris was issued a permit renewal reminder on October 1, 2020, and has since applied for a new permit, according to Nick Evans, Collections Manager. However, due to extended review times by NCDEQ, the official new permit documents have not been issued as of April 2023. Per the Pluris Wastewater Treatment and Collection Performance Annual Report from 2022, the system was last inspected in April 2021 and was compliant (Appendix C1 and C2).

3.3 Collection System

3.3.1 Inventory of Assets

Pluris currently owns and operates ten duplex wastewater submersible lift stations, three simplex submersible grinder stations, and approximately eleven miles of force main. Additionally, the system includes approximately nineteen miles of gravity sewer. This includes approximately 1,200 linear feet of 2" force main, 1,425 linear feet of 4" force main, 2,350 linear feet of 6" force main, 26,400 linear feet of 8" force main and 100,320 linear feet of 8" gravity sewer per the 2021 Wastewater Treatment and Collection Performance Annual Report.

3.3.2 Collection System Condition

WithersRavenel completed multiple site visits to observe and assess the condition of the Webb Creek collection system. The main defects with the collection system are in the lift stations. Due to their age, the interior piping and metal surfaces in the wet wells have become corroded and will need to be replaced. Additionally, some wet wells show evidence of infiltration and surface spalling and will need to be cleaned and epoxy coated. Many of the valve vaults do not have drains or the drains are too high, which has led to the valve vaults flooding and the piping and valves becoming rusted. All seals and gaskets on valves need to be checked and/or maintenance performed. In addition, there was grease observed in a few of the wet wells that will need to be removed and

monitored. WithersRavenel recommends the installation of dri-prime emergency standby pumps at each lift station to allow for more secure backup power and bypass pumping.

There have been no sanitary sewer overflows in the system since Pluris purchased it, so it is likely that the condition of the majority of gravity sewer and manholes are consistent with the observed locations and that infiltration and inflow levels are low. However, further investigation including smoke testing and flow metering would be necessary to determine the exact extent and locations of any infiltration and inflow in the system. WithersRavenel observed Contech A-2000 PVC sewer pipe at the inverts of the duplex lift station wet wells. This corrugated plastic pipe is common in the system and although it is approved by NCDEQ for installation, it can be difficult to tap for new services. For budgetary reasons, it has been estimated that 10% of the sewer lines are in poor condition and will need to be rehabilitated. Further investigation including Closed Circuit Television (CCTV) is necessary to determine the condition of the remainder of the system and possible rehabilitation methods. The conditions of the observed lift stations are summarized in the table below and examples of defects are shown in the following photographs.

Lift Station Information						
LOCATION/ NAME	Lift Station #1	Lift Station #2	Lift Station #3	Lift Station #4	Lift Station #5	Lift Station #6
SITE-PARCEL OR EASEMENT?	Parcel	Easement	Parcel	Easement	Parcel	Parcel
TYPE	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible
PUMP CAPACITY	400 gpm	135 gpm	400 gpm	75 gpm	150 gpm	320 gpm
EMERGENCY POWER?	Generator	None	Generator	Generator	Generator	Generator
REMOTE TELEMETRY?	Mission Control	Mission Control	Mission Control	Mission Control	Mission Control	Mission Control
COMMENTS ON AGE & GENERAL CONDITION	Corroded piping, poor quality wet well, flooded valve vault (no drain), loose manhole cover and influent manhole	Good quality wetwell and piping, flooded valve vault	Corroded piping, poor quality wet well	Rusted crane, bypass pump connection, wet well piping. Wet well needs to be coated	Flooded valve vault, good quality wet well and interior piping	Flooded valve vault, corroded piping, poor quality wet well

LOCATION/NAME	Lift Station #7	Lift Station #8	Lift Station #9	Simplex Lift Stations
SITE-PARCEL OR EASEMENT?	Easement	Parcel	Parcel	Easement
TYPE	Submersible	Submersible	Submersible	Submersible Grinder
PUMP CAPACITY	135 gpm	180 gpm	300 gpm	75 gpm
EMERGENCY POWER?	Generator	Generator	None	None
REMOTE TELEMETRY?	Mission Control	Mission Control	Mission Control	Mission Control
COMMENTS ON AGE & GENERAL CONDITION	Flooded valve vault, good quality wet well and interior piping	Flooded valve vault, poor quality wet well and interior piping	Good quality	Exposed concrete aggregate, old piping

Lift Station #1 Wet Well and Interior Piping – Note corroded piping and poor quality of wet well that is typical of the lift stations in the Webb Creek collection system.

Lift Station #2 Valve Vault – Note flooding due to a lack of drain that is typical of the lift stations in the Webb Creek collection system.

Simplex lift station wet well - Note the exposed concrete aggregate and old piping.

A-2000 PVC on-site at Lift Station #7. This pipe is typical of the gravity sewer pipe in the system.

3.4 Operation and Maintenance

3.4.1 Collection System Maintenance Records

Pluris provided the capital expenditures for the Webb Creek collection system from 2019-2021. Over those three years, the average expenditure for the force main system was approximately $30,000 per year and the average expenditure for the gravity collection system was approximately $150 per year. These values included lift station repairs, manhole repairs, and staff labor. A summary of the collection system expenditures is included in Appendix A17 and is accounted for in the Opinions of Probable Construction Cost in Section 3.4.3.

3.4.2 Collection System Personnel

List of Available Employees		
Employee	Title	Certificates Held
Gary Covington	Webb Creek MBR Plant and Collection System	Wastewater Treatment-1; Collection System-1; Class B CDL

3.4.3 Capital Planning

Based on WithersRavenel's assessment of the Webb Creek collection system, construction cost estimates were developed for each aspect of the system. The minimum cost estimates for each portion of the proposed improvements are as follows:

- Gravity Sewer - $1,496,000
    - Includes sewer main, lateral, and manhole rehabilitation.
    - Assumes 10% of the system will be rehabilitated.
- Duplex Lift Stations - $875,000
    - Includes wet well, piping, and valve vault rehabilitation.
    - Includes installation of dri-prime standby emergency pumps
- Simplex Lift Stations - $41,000
    - Includes wet well, piping, and valve vault rehabilitation.
- GIS Data Validation and Model Updates - $156,000

These projects will have a combined minimum starting cost estimate of approximately $3,156,000 including mobilization and 20% contingency. These costs reflect current prices and do not encompass any future upgrades or capacity limitations. A more detailed summary of these cost estimates is in Appendix C3.

4 Conclusion

4.1 Recommendations and Conclusions

Webb Creek WWTP is in good condition with a projected life of 30+ years contingent on regular maintenance and as needed replacement of the structures and equipment. The plant currently treats wastewater with effluent quality routinely below permit requirements. The plant has no regulatory orders and no NOVs have been received since January of 2021. While there is room for expansion at the existing site, current average daily flow is ~66% of the rate hydraulic capacity and not expected to reach the 80% threshold until the middle to late 2030s. The following are recommended operational changes to bring the plant into compliance upon transfer of permit:

1) SBR/EQ Tanks
    a. Cease use of tanks and use EQ/anoxic basin for rain events and maintenance down time.
    -Alternatively-
    b. Cease use of SBR/EQ tanks and rehabilitate tanks by refinishing the inside tank surfaces and handrails, replacing rusted grating and nonfunctional blower, re-locating EQ discharge piping from walkway, and painting of exposed PVD piping, and apply for minor modification to the NPDES permit before resuming use of SBR/EQ tanks.
2) Back-up ORC
    a. Grade 2+ Operator – Hire a grade 2 or higher operator to serve as backup ORC as required by Permit.
    - Alternatively-
    b. Grade 1 operator can receive his Grade 2 certification and fulfill this role.
3) Add secondary containment for all chemicals.
4) Stock and maintain solution for eye wash stations.

The following items are expected major equipment expenses over the next 10 years:

1) SBR/EQ Rehab – Projected Cost: $276,000
2) MBR Replacement – Projected Cost: $576,000
3) Chemical Pump Replacement – Projected Cost: $33,000
4) Feed Forward Pump #1 Replacement – Projected Cost: $32,000
5) WAS Pump Replacement – Projected Cost: $42,000

From the results of site visits and information provided by Pluris and ONWASA, WithersRavenel recommends the following projects to improve the collection system:

1) All the duplex lift stations require the replacement of piping in the wet wells and valve vaults due to corroded pipes, spalling concrete, and possible infiltration. In addition, many of the valve vaults are partially or fully flooded due to poorly designed or a lack of drains. WithersRavenel recommends the installation of dri-prime emergency standby pumps at each lift station to allow for more secure backup power and bypass pumping.
2) Simplex lift stations also require the replacement of piping in the wet wells and valve vaults due to corroded pipes, spalling concrete, and possible infiltration.
3) There have not been any SSOs in the system. However, for budgetary reasons, it has been estimated that 10% of the gravity system will need to be rehabilitated, including sewer main using CIPP, laterals, and manholes using cementitious liners. This rehabilitation will require further CCTV investigation to determine the exact linear footage of sewer mains to be replaced/rehabilitated and the required method of rehabilitation.
4) A representative sewer model should be developed. A sewer model is crucial to understand the system's capacity, identify existing issues, and support decision-making for long-term planning and management.
5) Monitor the status of the re-issuance of the new Collection System permit from NCDEQ.

ONWASA

FY24 Proposed Budget

Franky Howard
Chief Executive Officer

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The Process

1. Budget team reviews Board directives (CIP, financial plans, board goals) as well as environmental pressures and revenue projections
2. Budget team develops guidelines for departments
3. Departments research cost increases, equipment repairs/replacements and create budget requests
4. Budget Team and Departments work together to craft a proposed budget
5. Delivered to the Board for your consideration

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ONWASA By-the-Numbers

3,698,402,796	Gallons of Water Pumped Annually
332,139,548	Gallons of Wastewater Treated Annually
16,050,000	Gallons of Stored Water
14,425,644	Gallons of Water Stored in Underground Pipes
1,005,463	Miles Driven Annually
683,543	Meter Readings Annually
281,298	Transactions Processed Annually
243,584	Main Office - Phone Calls Handled Annually
153,883	Estimated Number of Individual Customers
68,783	Lab Analysis' Processed Annually
67,954	Work and Service Orders Processed Annually
56,846	Number of Metered Accounts
1,237	Miles of Water Mains
445	Square Miles of Service Area
195	Miles of Wastewater Mains
152	Facilities to Maintain
131	Full Time Positions

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ONWASA

Budget Details

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Budget Drivers

- Current revenues must equal current expenses (Balanced Budget)
- Increased Customer Demand
- Increased Operational Costs
- 2023 Capital Improvement Plan Update
- 2020 Raftelis Rate Study requirements
- ONWASA Strategic Plan

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FY24 Budget – At a Glance

- Operational Budget balanced at $44.3M
- Unreserved Fund balance less pay-go projects - $32.4M (73% of operating budget)
- User Fees are the primary revenue at $32.3M
- $1M Disaster Contingency
- Fund balance of $4.9M appropriated for 1-time capital requests.
- 4% COLA for all staff budgeted
- 16 new positions
- Pay Plan Steps (2.5%) for new Merit Program.

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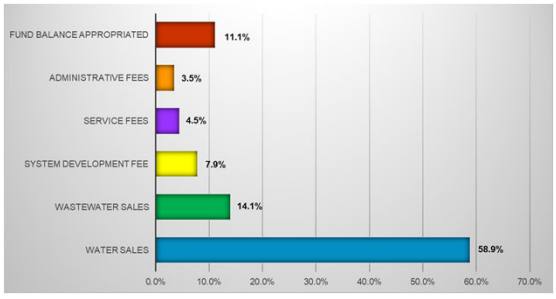
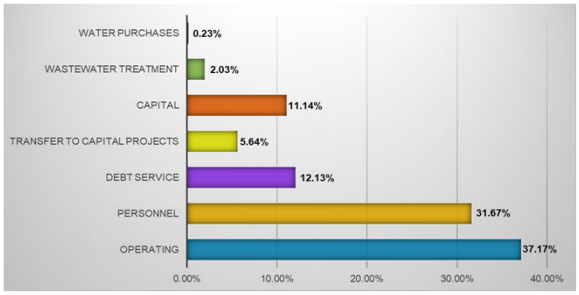
Sources of Revenue



7

Total Expenditures



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Capital Improvement Plan Highlights

- ✓ Begin Construction for the Swansboro Wastewater Force Main Project
- ✓ Begin Construction for the Southeast Wastewater Treatment Plant Project
- ✓ Design and Construct Interim Improvements at the Summerhouse Wastewater Treatment Plant
- ✓ Complete Design & Permitting for the Highway 24 Regional Trunk Main Replacement Project
- ✓ Bid & Begin Construction of the Topsail Island Booster Pumping Station Project
- ✓ Complete Construction of all Recovery & Hazard Mitigation Projects at the Northwest Regional Water Reclamation Facility
- ✓ Complete up to Three Groundwater Test Wells and Begin Design for a Future Expansion at the Dixon Water Plant

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Public Information & Feedback

- Proposed budget is online at www.onwasa.com
- Both written and emailed comments from the public are invited.

budgetcomment@onwasa.com

Budget Comment
c/o ONWASA Administration
228 Georgetown Road
Jacksonville, NC 28540

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ONWASA

Board Action Requested

Franky Howard
Chief Executive Officer

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Request to set the public hearing.

Motion to set the public hearing on the proposed FY24 budget at the Board of Directors meeting in the Jacksonville City Hall Council Chambers on June 15, 2023 at 6pm or as soon thereafter as is practicable.

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