Water Supply Study

for

Town of River Bend, North Carolina

September, 2024

Prepared by:

RIVERS & ASSOCIATES, INC.
Greenville, North Carolina

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TABLE OF CONTENTS

Executive Summary 1
INTRODUCTION 11
I. PROJECT NEED 11
A. Background 11
B. Existing Water System 11
1. Current Aquifer and Wells 11
2. Existing Water Treatment Plants 12
3. Current Waste Handling 14
4. Existing Distribution System 14
II. PRESENT AND FUTURE WATER DEMANDS 14
A. Current Population and Demand 14
B. Current Supply 16
C. Future Needs 16
III. POTENTIAL RAW WATER AQUIFERS 16
A. NCDEQ DWR Public Water Supply Section 16
B. Preliminary Hydrogeologic Evaluation 16
C. Hydrogeologic Setting 17
D. Existing Groundwater Utilization 19
1. Town of River Bend: 19
2. City of New Bern: 21
3. Jones County Regional Water Treatment Plant: 22
4. Craven County Water Department: 23
E. Available Groundwater Resources in the Town of River Bend 24
1. Existing Castle Hayne Formation/River Bend Strata: 24
2. Lower Castle Hayne Formation/Comfort Member: 25
3. Beaufort Formation: 25
4. Recommended Aquifer: 25
F. Potential Well Locations in the Town of River Bend: 26
1. New WTP Site: 26
2. Town Commons: 26
3. Rocky Run: 27

4. Proposed Aare Creek Community Subdivision Town Park: 27
G. Construction Cost Estimate – New In-Town LCHA Wellfield to Serve New WTP: 27
H. Bulk Water Supply Options: 30
IV. IN-TOWN WATER TREATMENT ALTERNATIVES 30
A. Filter/Softener (F/S) WTP 30
1. Greensand/Greensand Plus Filtration 30
2. Ion Exchange (IE) Softening 31
3. Chemical Addition 31
B. Nanofiltration WTP 32
1. Nanofiltration (NF) Membranes 32
2. Chemical Addition 32
C. Potential In-Town WTP Location 32
D. Construction Cost Estimates – New In-Town Water Treatment Alternatives 34
1. North Carolina Special Appropriation 34
2. Construction Cost Estimate - New Filter Softener WTP 34
3. Construction Cost Estimate – New Nanofiltration WTP 35
V. IN TOWN WTP WASTE TREATMENT/DISCHARGE ALTERNATIVES 36
A. Current WTP Backwash Waste Treatment 36
1. Existing Backwash Waste Treatment 36
2. Existing NPDES Discharge Locations 36
B. Proposed Waste Treatment and Disposal 37
1. Filter/Softener WTP Backwash Waste 37
2. Nanofiltration WTP Waste Concentrate 37
C. Existing Sanitary Sewer Collection System 38
D. WTP Waste Discharge into Plantation Canal 38
E. Combined WTP/WWTP Waste Discharge Diffuser into Trent River 39
F. Construction Cost Estimates for In-Town WTP Waste Discharge Alternatives 40
1. Construction Cost Estimate – Discharge to Existing Sanitary Sewer Collection System 40
2. Construction Cost Estimate – Discharge to Plantation Canal 41
3. Construction Cost Estimate - Combined WTP/WWTP Discharge Diffuser into Trent River 43
VI. SELECTION OF AN IN-TOWN WTP ALTERNATIVE 45

A. Monetary Factors (Present Value of Costs Analysis) 45
1. Total Estimated Filter Softener WTP Project Costs 45
2. Total Estimated Nanofiltration WTP Project Costs 50
3. Computation of Estimated Future Salvage Values 53
4. Net Present Value of Costs Summary: In-Town WTP Alternatives 55
B. Non-Monetary Factors 56
A. Aquifer Sustainability: 56
1. Filter/Softener WTP: 57
2. Nanofiltration WTP: 57
B. Treatability: 57
1. Filter/Softener WTP: 57
2. Nanofiltration WTP: 58
C. Residual Waste Treatment and Disposal/NPDES Permitting: 58
1. Filter/Softener WTP: 58
2. Nanofiltration WTP: 59
D. Disinfection Byproducts Requirements: 60
1. Filter/Softener WTP: 60
2. Nanofiltration WTP: 60
E. Land Requirements: 60
1. Filter/Softener WTP: 60
2. Nanofiltration WTP: 61
F. Study Vulnerabilities: 61
1. Filter Softener WTP: 62
2. Nanofiltration WTP: 62
G. Environmental/Permitting Concerns: 62
1. Filter Softener WTP: 62
2. Nanofiltration WTP: 63
H. Ease of Operation: 63
1. Filter Softener WTP: 63
2. Nanofiltration WTP: 63
I. Social Impact: 63
1. Filter Softener WTP: 63

2. Nanofiltration WTP: 64
J. Non-monetary Factor Summary: 64
K. Decision Matrix: 65
VII. BULK WATER ALTERNATIVES & TRANSMISSION REQUIREMENTS 66
A. Town of River Bend Residual User Charge Rate Requirements 67
B. City of New Bern 70
1. Emergency Interconnect 70
2. Bulk Water Supply User Charge 71
C. Craven County Water Department 76
D. Jones County Regional Water System 77
E. Bulk Water Supply Alternatives Summary 77
F. Bulk Water Supply Pros and Cons 78
1. Pros 78
2. Cons 78
VIII. RECOMMENDATIONS 78
IX. POTENTIAL RATE IMPACT 83
X. POTENTIAL FUNDING OPPORTUNITIES 85
A. Potential Funding Options for Water Utility Improvements: 85
B. Drinking Water State Revolving Fund: 86
C. Commercial Revenue Bonds: 86
D. USDA-RD, Environmental Water/Waste Program: 86
E. Commercial General Obligation Bonds 87

Appendices

A Existing Water Distribution System
B Photo Log
C WTP NPDES Permit NC 0086797
D 2023 Local Water Supply Plan
E GMA Inc. “Evaluation of Groundwater Resources near River Bend Water System”
F NCDEQ DWR PWSS Public Water System Inspection
G 15A NCAC 18C .0203 Public Well Water Supply Requirements
H Potential Production Well Sites

I	Filter Softener WTP Process Schematic
	Filter Softener WTP Conceptual Site Plan
	Filter Softener WTP Conceptual Building Plan
J	Nanofiltration WTP Process Schematic
	Nanofiltration WTP Conceptual Site Plan
	Nanofiltration WTP Conceptual Building Plan
K	Land Acquisition Site Evaluation Report (LASER)
	Phase I Environmental Assessment
L	Craven County Tax Parcel Map
M	NCDEQ DWI Revised Letter of Intent to Fund (LOIF)
N	NPDES Fact Sheet
	2023 Renewal Permit NC0086797
O	2023 NPDES Permit NC0030406
P	New Bern – River Bend Conceptual Plan – Emergency Water Interconnect Interlocal Agreement
Q	City of New Bern Water Rates Schedule
R	New Bern – River Bend Conceptual Plan – Bulk Water Supply Interconnect

TOWN OF RIVER BEND
WATER SUPPLY STUDY

EXECUTIVE SUMMARY

On January 12, 2024, Rivers & Associates, Inc. (Rivers) was authorized by the Town of River Bend to conduct a Water Supply Study to evaluate potential water supply and treatment alternatives in order to provide a secure and cost-effective future water supply.

Background: The Town of River Bend was originally developed as a retirement community known as River Bend Plantation. Construction of the development began in the late 1960's, and continued to expand in subsequent years. The residents of River Bend Plantation elected to incorporate in the late 1970's, and the Town was chartered in 1981. The water and sanitary sewer utilities were originally sold by the developer to Carolina Water Service which operated them until 1995. At that time, the Town purchased the water and sanitary sewer systems, and has operated them as public utilities ever since.

The Town has provided routine maintenance and has performed periodic upgrades, such as installation of the 300,000-gallon elevated storage tank at the southern terminus of Plantation Drive. However, the bulk of the water supply and treatment system has outlived its useful service life as most of the facilities and equipment are 36 – 52 years old. The condition of the facilities requires that they be rehabilitated or replaced.

Purpose: This Water Supply Study is intended to evaluate potential water supply and treatment options to determine and recommend the most secure and cost-effective alternative to serve the Town for the future.

Future Capacity: Historical population and water demand data were evaluated to identify trends in the River Bend and Craven County area in order to develop 20-year population and demand projections. The results supported only modest growth of approximately 3% per decade. As such, the current 0.95 MGD cumulative capacity of the existing two (2) water treatment plants (WTPs) appears sufficient to meet the 20-year maximum day demand. Given this, 0.95 MGD capacity was utilized as the basis for evaluating and estimating costs for the various alternatives considered.

Preliminary Hydrogeological Findings: Rivers contracted with Groundwater Management Associates, Inc. (GMA) to conduct a preliminary hydrogeologic evaluation as a planning-level summary of available groundwater resources in the River Bend area. As a result of their efforts, two (2) freshwater aquifers are believed to be suitable for future use to meet the projected raw water-supply requirements for the Town of River Bend: (1) the Upper Castle Hayne Aquifer (UCHA)/River Bend Strata, and (2) the underlying Lower Castle Hayne Aquifer (LCHA)/Comfort Member.

Upper Castle Hayne Aquifer/River Bend Strata - The Town's existing three (3) production wells tap into the UCHA/River Bend Strata. These wells are relatively shallow at 110 feet deep, and have limited yields due to minimal drawdown capability. Individual yields of these shallow wells average less than 250 gallons per minute (gpm). In addition, the water-quality

tends to be high in iron, manganese and hardness. The Town of River Bend is the only municipal water system in the local area that utilizes the River Bend strata. Due to its shallow depth, this aquifer is much more susceptible to contamination than the LCHA. Treatment is required in order to produce a potable quality drinking water. Although the Upper Castle Hayne/River Bend Strata could be utilized as a future water supply for the Town of River, a better alternative is believed to exist.

Lower Castle Hayne Aquifer/Comfort Member - The LCHA/Comfort Member produces greater yields averaging on the order of 500 – 1,000 gpm due to the greater depth and available drawdown. Historically, aquifer testing has shown that groundwater sampled from the Lower Castle Hayne Aquifer exhibits superior water quality to that contained in the shallower Upper Castle Hayne Aquifer at a similar geographic location. As such, the water-quality of Lower Castle Hayne water is anticipated to be superior to that of the River Bend Strata expressed in the form of lower iron and reduced hardness. However, the aquifer can exhibit significant variability across the area. Treatment is required in order to produce potable quality drinking water. Both the City of New Bern and Jones County utilize the LCHA/Comfort Member to supply their individual Filter Softener WTPs.

If the Town pursues development of a new Water Treatment Plant, GMA and Rivers recommend the Town pursue the Lower Castle Hayne/Comfort Member as the water supply source based on our evaluation of available groundwater resources in the River Bend area. Two (2) 380 gpm production wells are recommended to supply a 0.95 MGD WTP. These recommendations are based on anticipated water-quality and water quantity estimates that must be validated through test well evaluation.

Four (4) potential locations were preliminarily considered for siting the two (2) production wells. The two locations that appear most suitable are (1) the new WTP site and (2) the Town Commons. Both sites will require a site investigation and approval by NCDEQ Public Water Supply Section (PWSS) staff prior to drilling of a test well and/or a production well.

In-Town WTP Alternatives: Two (2) In-Town WTP alternatives were evaluated to provide treatment of fresh groundwater: (1) Filter Softener WTP and (2) Nanofiltration WTP.

Filter Softener WTP - This alternative makes use of greensand filters and ion exchange softeners. During treatment, as water passes through a greensand filter, soluble iron and manganese are pulled from solution and later react to form insoluble iron and manganese. Regular backwashing, as recommended by the manufacturer, is required to remove the insoluble forms of iron and manganese. In addition, the greensand filter must be regenerated continuously with potassium permanganate. Most greensand filters are rated to be effective treating water with iron concentrations up to 10 mg/l. If the pH of the water is lower than 6.8, greensand will not filter out the iron and manganese adequately, and the pH must be raised prior to filtration. Regular backwashing is essential to remove particles collected in the filter and to ensure effective filter performance. Backwash flow rates are typically three to four times the normal usage rate.

Ion exchange softening is used to reduce the hardness associated with raw water such as that from the Castle Hayne aquifer. During water treatment, the ion exchange resin removes hardness ions, i.e. calcium and magnesium from the water, and replaces them with non-hardness ions, typically sodium. A brine solution is utilized to periodically regenerate the resin to flush out excess hardness ions. This results in a brackish waste discharge from the WTP. Some raw waters that have lower amounts of iron and manganese can be treated by ion exchange softening only, because dissolved iron and manganese can be exchanged for sodium on the anionic exchange resin or zeolite. The process of iron and manganese removal is the same as the ion exchange process that removes hardness.

In the case of the Castle Hayne Aquifer, ion exchange softening would not be typically used without first reducing iron and manganese via filtration due to the concentrations normally present in the raw water. The use of ion exchange softening would eliminate the need for each customer to provide and maintain a residential water softener.

A greensand filter system followed by cationic softening would make for a high-quality water that is capable of consistently meeting secondary limits. A similar water treatment process is utilized by the City of New Bern and Jones County.

Nanofiltration WTP – This process makes use of partially permeable membranes to separate contaminants at a molecular level from a fresh water supply. Nanofiltration membranes are capable of removing organics, soluble iron, manganese, hardness and other contaminants, and produce a very high-quality drinking water.

For a nanofiltration WTP, it is necessary to keep chemical contaminants in a soluble form to prevent membrane fouling and to accommodate separation of the contaminant concentrate from the permeate. As such, submersible well pumps are typically utilized to minimize oxidation and precipitation of iron and manganese. A new water treatment plant building would house the nanofiltration pumps, cartridge filters, membrane skids, clean-in-pace system, chemical feed systems, and electrical gear. However, if iron concentration is too high, iron pre-filters may be required in lieu of cartridge filters. The use of iron pre-filters is similar to the filtration process described previously, and can contribute significantly to the cost of a nanofiltration WTP.

The capital costs associated with construction of a Filter Softener WTP are approximately 25% lower than that of a comparably sized Nanofiltration WTP. However, Nanofiltration costs can increase significantly if iron pre-filters are required.

In-Town WTP Waste Treatment/Discharge Alternatives: The filter backwash and softener regeneration waste from the F/S WTP requires further treatment since precipitated iron and manganese are present. Dual geomembrane-lined settling ponds are recommended for quiescent settling of the precipitates prior to pumping the supernatant to the selected discharge location. The waste concentrate from a Nanofiltration WTP, rather, is in soluble form. It can be pumped directly from the WTP to the selected discharge location. Three (3) alternatives were evaluated for

treatment and disposal of the waste from each of the WTP alternatives: (1) the existing sanitary sewer collection system, (2) Plantation Canal, and (3) combined WTP/WWTP multiport diffuser in the Trent River.

Sanitary Sewer Collection System - Discharge to the existing sanitary sewer collection system is the least costly solution; however, it should be considered a short-term solution. Under this arrangement, the WTP's brackish waste will mix and dilute with the sanitary sewer waste through the collection system and treatment plant prior to discharge through the existing Trent River diffuser. The WTP waste, however, could potentially consume a significant percentage of the WWTP permitted capacity. In addition, it would introduce a brackish waste stream into the WWTP which increases corrosivity and expedites degradation to the existing tankage and equipment. Each of these reasons argues against discharging to River Bend's existing sanitary sewer collection system as a long-term solution.

Under initial conditions, the sanitary sewer collection system could potentially be employed as a short-term viable solution; however, it is not considered a viable long-term solution due to its impact on WWTP capacity, operations and maintenance requirements.

Plantation Canal - The two (2) currently permitted discharge locations from the existing WTPs drain into and through the larger Plantation Canal that serves the River Bend Marina, local boaters and fishermen. Plantation Canal is significantly larger than the existing receiving waters of the two (2) existing WTPs, and is approximately 100 feet to over 200 feet wide along the main channel run which is approximately 1.4 miles long prior to its discharge into the Trent River. Given that Plantation Canal is a much larger waterbody than the current permitted tributary discharge locations, it would seem to be preferable to that which currently exists. The upstream portion of Plantation Canal is likely freshwater that transitions to brackish or saltwater further downstream. There is potential that Plantation Canal could be considered an acceptable location for discharge from a new WTP; however, discharge of a brackish waste stream to a freshwater receiving stream will likely be discouraged. This would have to be addressed directly with the NPDES Unit, and is beyond the scope of this study. If it was acceptable, it would be preferable to discharge into the broader section of Plantation Canal rather than the narrower upper section or tributaries.

Combined WTP/WWTP Discharge into the Trent River – This alternative involves combining the treated effluent discharge from the WTP with the treated effluent discharge from the Town's existing Wastewater Treatment Plant (WWTP). Effluent discharge from the River Bend WWTP is through an 8" diameter gravity outfall under the influence of driving head from the WWTP. Should the WTP treated waste be combined with the WWTP treated waste, a new 10" outfall would be required to accommodate the total flow. Typically, the NPDES Unit encourages discharge to the largest reasonable downstream receiving water in order to maximize dilution within a small regulatory mixing zone. For River Bend, this receiving water is considered to be the Trent River.

From a technical, environmental and permitting standpoint this option would appear to be the most favorable long-term discharge solution.

Selection of an In-Town WTP Supply Alternative: Two (2) combinations of alternatives were evaluated using a Net Present Value of Costs Analysis (NPVCA). This approach evaluates the major capital costs, annual recurring costs and salvage values associated with each option and converts them to an equivalent net present cost to determine which is the least expensive option on a level basis. The two (2) combinations of alternatives evaluated include:

Filter Softener WTP – This alternative includes (1) one new test well and two new production wells in the Lower Castle Hayne Aquifer/Comfort Member plus raw water mains to transmit flow from the well sites to the WTP site, (2) a 0.95 MGD Filter Softener WTP located on the site recently purchased by the Town located adjacent to the Public Works Facility and 300,000-gallon elevated storage tank, and (3) dual settling basins with supernatant pump station and force main to discharge into a common WTP/WWTP outfall and multiport diffuser into the Trent River.

Nanofiltration WTP – This alternative includes (1) one new test well and two new production wells in the Lower Castle Hayne Aquifer/Comfort Member plus raw water mains to transmit flow from the well sites to the WTP site, (2) a 0.95 MGD Nanofiltration WTP (no iron pre-filters) located on the site recently purchased by the Town located adjacent to the Public Works Facility and 300,000-gallon elevated storage tank, and (3) waste concentrate force main to discharge into a common WTP/WWTP outfall and multiport diffuser into the Trent River.

The estimated capital cost and annual recurring costs for the Filter Softener WTP alternative are less expensive than the Nanofiltration WTP alternative while the salvage value is greater for the Nanofiltration alternative. Given this, the Net Present Value of Costs is approximately $2,100,000 basis. The following is a summary of the estimated costs for both alternatives:

	Filter Softener WTP Alternative	**Nanofiltration WTP Alternative**
Capital Cost	$18,228,000	$19,798,000
Annual Costs	$696,600	$758,664
Salvage Value	($1,040,774)	($1,252,044)
NPVC	$25,511,863	$27,612,281

The Filter Softener WTP Alternative is the least expensive of the two (2) viable In-Town WTP alternatives.

Non-monetary factors were also considered in formulating a recommendation. A decision matrix was utilized consisting of the following parameters for each alternative included:

- sustainability (future availability and quality) of the raw water supply,
- treatability to primary and secondary drinking water standards,

- residual waste treatment and disposal requirements/NPDES discharge permitting capability
- disinfection byproducts requirements
- land requirements
- vulnerability due to test well/pilot plant/dilution study results
- environmental and permitting concerns
- ease of operations

Each of the parameters was assigned a rating from 1 – 9, which represents least to most favorable. A value of 5 is neutral while values of 1 and 9 represent highly unfavorable and highly favorable scores, respectively. The ratings assigned for each factor are subjective based on experience in the industry and discussions with Publicly Operated Treatment Works (POTW) Owners, Operators and Public Water Supply Section (PWSS) staff. For most parameters, one alternative scored more favorable depending on the specific factor considered. Sometimes the ratings for each alternative were identical.

Based on the total scores for each alternative in the decision matrix, the Filter/Softener WTP alternative received the highest and most favorable score. In addition, it is the more affordable alternative based on the Net Present Value of Costs Analysis. Therefore, if River Bend chooses to move forward with design, permitting and construction of a new in-town WTP, the recommended long-term water supply alternative is to design and construct a single new Filter/Softener WTP. This alternative includes construction of a new Lower Castle Hayne Aquifer wellfield with raw water transmission mains to supply the new WTP site. Filter backwash and softener regeneration waste would be treated in dual geomembrane-lined settling basins with a supernatant pump station and force main to discharge into a combined WTP/WWTP multiport diffuser in the Trent River.

If the Town is unable to secure sufficient funding for all portions of this alternative, the Town could realize some savings by rehabilitating the existing Upper Castle Hayne Aquifer wells and installing raw water mains to the new WTP site. Similarly, as a short-term solution, the Town could discharge the treated backwash and softener regeneration waste to the existing sanitary sewer collection system to combine with the existing treated WWTP discharge to the Trent River.

Bulk Water Supply and Transmission Alternatives - Other water supply alternatives could also be available to the Town of River Bend beyond the in-town WTP options evaluated above. This includes purchasing potable drinking water in bulk from a neighboring system. Several public water systems are located in near proximity to the Town of River Bend. These include the City of New Bern, Jones County Regional Water System and Craven County Water Department. Only the City of New Bern has demonstrated available capacity and willingness to serve as a bulk water supplier to the Town.

A User Rate Impact Analysis was utilized to compare user charge requirements for the recommended In-Town WTP alternative against the City of New Bern bulk water supply alternative. The evaluation was conducted on an “equivalent user” basis to convert commercial

and institutional users to equivalent residential users. The Town's 1,497 actual residential, commercial and institutional customers equate to approximately 1,816 equivalent residential users for purpose of this analysis. Average monthly consumption based on the 1,816 equivalent users is 2,920 gallons.

If the Town purchases water in bulk from a neighboring water system, a portion of the Town's recurring costs associated with water supply and treatment will no longer be required. However, the Town will still need to continue operating its water distribution system. Approximately 91% of the revenue generated by the current water rates is estimated to still be required. Based on the size of the current customer base, current average water sales and current average collections rate, the average monthly water bill per customer is estimated to be $25.08. In addition to the costs required to continue operating the Town's distribution system, the Town's user rates will be increased by the cost to purchase water in bulk, as well as any capital improvements required to fund transmission improvements between the City of New Bern and the Town of River Bend.

The City of New Bern's distribution system includes an 8" water main that extends along US Hwy 17 BUS past the River Bend corporate limits, as well as another 8" water main that extends somewhat parallel along Rocky Run Road.

The City of New Bern is currently working toward design and installation of transmission and elevated water tank improvements to serve the western side of their service area. This western loop and elevated tank will connect from the US Hwy 70/NC Hwy 43 Interchange to the Trent Creek Road/ Bus Hwy 17 intersection. Installation of these water system improvements is expected to be complete within the next two years. Those improvements will improve the capability for New Bern to supply a community like River Bend.

Emergency Interconnect - Based on preliminary hydraulic evaluation, the existing 8" water mains, including the New Bern western elevated storage tank and transmission improvements, appear capable of supplying the current average day demand with reduced pressures, but insufficient to supply the current maximum day demand and fire flow. As such, interconnection with the City of New Bern's water system could be an asset to the Town of River Bend for purposes of an emergency interconnection, but not as a long-term water supply source unless additional transmission improvements are made.

The total estimated project cost for an emergency interconnect is $499,000.00

Bulk Water Supply Interconnect - The City of New Bern has the available capacity to serve the Town of River Bend, and the City has preliminarily indicated a willingness to serve as a bulk supplier to the Town. The City has informally suggested that a reasonable preliminary estimate of the charges to sell water to the Town would be no greater than 150% of the current "In-City" water rates. For the purposes of this evaluation, 150% was utilized for preliminary estimates. On this basis, the estimated average monthly water bill per equivalent user at current average day consumption equals $18.67. This estimated cost

excludes debt service for any required transmission and interconnection capital improvements and other required distribution system operation, maintenance and debt costs.

In order for the City to serve as a reliable source of water supply to River Bend, transmission and interconnection requirements are required to supply a future maximum day demand in River Bend equal to 0.95 MGD. Preliminary hydraulic modelling indicates a booster pump station and 10" transmission main would likely be required between the City's new western elevated storage tank to the River Bend elevated tank. Unless the Town of River Bend is willing to pay for these improvements to the New Bern and River Bend water systems through fund balance or grant funds, additional debt service would be generated to repay a new loan to cover the costs of these capital improvements. The cost for this additional debt service would also increase the user rates for River Bend customers.

The estimated project cost for required transmission improvements to interconnect the Town of River Bend's water system to the City of New Bern as a permanent bulk water supplier is estimated at $5,113,000. If the Town of River Bend utilizes the N.C. Special Appropriation funds to pay the capital improvements costs for the transmission and interconnection to both the New Bern or River Bend systems, then there would be no new debt service to be repaid. Under those circumstances, the estimated monthly utility charge is approximately $43.76.

If, however, the N.C. Special Appropriation cannot be used to pay for the transmission and interconnection costs for New Bern and River Bend, then the Town may need to borrow some or all of the money and repay it over a period of time. Assuming the worst case, that $5,113,000 is borrowed to finance the cost of the capital improvements through a 20-year Division of Water Infrastructure low interest loan at 3.25% half-market-rate interest, the first year's annual debt service is approximately $421,823 which equates to approximately $19.36 per month per customer. As such, the total estimated monthly cost to purchase drinking water from the City of New Bern under this circumstance is approximately $63.11/month/equivalent user.

Both advantages and disadvantages exist for the Town of River Bend to purchase water in bulk from the City of New Bern. Several are listed in this report for the Town's consideration in making a decision between the in-Town WTP solution and the Bulk Water Supply solution.

Recommendation - The Town of River Bend has successfully operated their own in-town water and sanitary sewer systems for almost three decades. The expertise and willingness to continue doing certainly appear to exist. The biggest hurdle confronting the Town is the ability to generate sufficient revenue to address significant capital costs and potential associated debt service with a small customer base.

The Town has previously secured a significant grant to help offset a portion of the potential debt service and the resulting impact to water rates. The ability to pursue design, permitting,

construction and operation of a new in-town WTP will be based on the Town's capability to secure additional grant funding.

The estimated cost for the recommended long-term water supply alternative is $18,228,000. The Town currently has Special Legislative Grant appropriation of $9,252,105. As such, the current shortfall is estimated to be $8,975,895. Ideally, if the Town could secure an additional $8,975,895 in grant, the Town could pursue design, permitting and construction of the long-term recommended water supply improvements.

On the basis of the preliminary estimates and computations included herein, the Town should borrow no more than $3,544,000 based on securing a low interest NCDEQ DWI loan with a 20-year term at 3.25% interest rate. The first-year principal and interest would equal $293,205 which translates to $13.45/month/equivalent customer. Approximately $30.31/month/equivalent user is estimated for operation and maintenance of the water system with a new F/S WTP in place. These two incremental costs added together equal the estimated cost of $43.76/month/equivalent customer such that the average user charge for the long-term water supply alternative does not exceed that required to purchase bulk water from the City of New Bern.

Potential Rate Impact - The Town's current water rates equate to $36.62/month for a 5,000 gal/month customer. This is below the State median of $40.01. However, when viewed in combination with sewer rates, the Town monthly rate of $107.30 far exceeds the State median of $89.71.

The Town does not average 5,000 gal/month per user based on water sales. In 2023, the average consumption was only 2,920 gal/month per equivalent customer. As such, the average water bill was $27.56/month/equivalent customer. Required revenues must be generated based on the actual quantity of water sold.

The impact to water rates for constructing a new F/S WTP is a function of the grant funds available to offset potential debt service plus the inherent cost to operate and maintain the new WTP and the remainder of the water system.

- If the Town is able to secure 100% grant funding, then monthly water rates are estimated to increase from $27.56 to $30.31/month/equivalent customer in order to cover the additional operating costs associated with the new F/S WTP.
- If the Town is unable to secure any additional grant funding, the monthly water rates are estimated to increase to $64.29/month/equivalent customer which far exceeds the cost to purchase bulk water from the City of New Bern.
- If the Town limits their debt service to not exceed that required to purchase bulk water from New Bern, water rates could increase to $43.76/month/equivalent user.

Potential Funding Opportunities - Given that the Town of River Bend has already secured a substantial amount of Special Legislative Grant funding for the project, additional funding efforts

should proceed in parallel with the planning, design and permitting efforts required for the new WTP project.

The Town of River Bend has worked previously with NCDEQ Division of Water Infrastructure (DWI) State Revolving Fund (SRF) program for various grant and loan funded projects. The SRF program provides ½ market interest rate loans with a limited amount of principal forgiveness. The maximum loan amount is $20 million (DW Unit) and $30 million (WW Unit) with a payback term of 20 years. A 2.0% closing fee applies.

The DWI SRF funding process is competitive. The opportunity for the Town to be funded depends on numerous factors, including the availability of funds, the number of applications submitted, and final scoring/ranking of the applications. Given this, it is recommended that the Town proceed with the Drinking Water application at the first available opportunity. In this manner, the Town will have the best opportunity to receive funding for the project.

The SRF Program has two funding cycles per year, typically in March and September. The Town, working with their engineering consultant, should begin preparation of the applications and supporting documents to support a funding request for the proposed alternative. If the Town's application is selected for funding, the Town should expect to be notified and receive a Letter of Intent to Fund (LOIF) letter from DWI approximately five months following application.

Due to significant capital costs, the discussion on financing dictates a need to secure grant funding from as many sources as possible in order to keep the cost of water at as reasonable a level as possible. Drinking Water State Revolving Fund (SRF), USDA-Rural Development and Revenue Bonds appear to be the most promising source of project financing. However, other available sources of revenue could also be pursued.

INTRODUCTION

On January 12, 2024, Rivers & Associates, Inc. was authorized by the Town of River Bend to conduct a Water Supply Study to evaluate potential water supply and treatment alternatives in order to provide a secure and cost-effective future water supply.

I. PROJECT NEED

A. Background

Prior to the Town of River Bend being incorporated, the area was originally developed as a retirement community known as River Bend Plantation. Construction of the development began in the late 1960's, and continued to expand in subsequent years. The homeowners living in River Bend Plantation elected to pursue incorporation in the late 1970's, and the Town was subsequently chartered in 1981.

B. Existing Water System

The water and sewer systems were originally constructed to support the River Bend Plantation development 40-50 years ago, and were later sold by the original developer to Carolina Water Service (CWS). In 1995, the Town of River Bend purchased the water and sanitary sewer utilities from CWS. Shortly afterward, the Town extended water service to customers throughout the Town, and constructed an additional 300,000-gallon elevated tank at the southern terminus of Plantation Drive. Portions of the original River Bend Plantation water system remain in service today.

The Town's existing WTPs and associated pumping and treatment equipment have outlived their useful service lives, and the Town desires to replace both existing WTPs with a new source of potable water supply.

1. Current Aquifer and Wells

The water supply system currently consists of three (3) raw water wells that draw water from the Castle Hayne Aquifer. The combined 12-hour capacity of the wells is approximately 1.0 MGD. The raw water is characterized by elevated iron, manganese and hardness. Wells #1 and #2 supply raw water to WTP #1 a 0.60 MGD water treatment plant located at the northeast corner of the intersection of Shoreline Drive and Plantation Drive *{Appendix A – Existing Water Distribution System (52 Shoreline Drive)}*. Well #3 supplies raw water to the 0.35 MGD WTP #2 located adjacent to the Rhems Fire Department at 27 Shoreline Drive. The primary treatment provided by both treatment plants is removal of iron and manganese by way of pH adjustment, oxidation and filtration. The plants are not equipped for softening of the hard raw water. Individual customers provide residential softeners within their homes as desired.

The current 8" Well #1 was installed in 1985 by Craven Well Drilling Service to replace the original Well #1 which was installed in the late 1960's – early 1970's. Well #2 is a 6" well that was installed in 1977 by Craven Well Drilling Service. These initial wells were supplying

raw water to the original WTP located at the Shoreline Drive/Plantation Drive intersection. Since the water system was owned and operated by Carolina Water Service at that time, the Town of River Bend does not have plans or specifications to document these early installations. In 1988, a larger well pump was installed in Well #1 and additional filters were installed in the original WTP serving both Wells #1 and #2. The current 8" Well #3 was installed in 1983 by Craven Well Drilling Service. The associated WTP serving Well #3 was constructed in 1984. Portions of the existing WTP facilities are 36 – 52 years old. The well pumps and associated electrical equipment are 36 – 47 years old. *{See Appendix B – Photo Log.}*

2. Existing Water Treatment Plants

The treatment plants utilize chemical addition plus pressure filters to provide treatment and disinfection. Caustic soda is utilized to raise the pH of the raw water, and compressed air is injected to increase dissolved oxygen content to optimize oxidation of soluble iron ahead of the pressure filters. The filters incorporate Birm© sand filter media to capture oxidized iron particles. Polyphosphate is added post-filtration to act as a sequestering agent for any remaining soluble iron, as well as a scale inhibitor to reduce precipitation within the distribution system. Gas chlorine feeders are utilized to provide primary and residual disinfection of the finished water as it is introduced into the distribution system. The distribution system includes approximately 19 miles of 2" – 8" diameter water mains. Approximately 98% of the water mains are constructed of PVC while the remaining 2% are ductile iron pipe. The water system includes two (2) elevated storage tanks: the older 100,000-gallon tank was erected in 1981 adjacent to the Rhems Fire Department, and the newer 300,000-gallon tank referenced earlier.

The principle of operation of the treatment process involves the following steps:

- pH Adjustment: The pH of the raw groundwater is in the range of 6.7 – 6.8. In order for the Birm filter media to function most effectively for iron and manganese removal, the pH must be in the range of 8.0 – 8.5. The operator indicates their target pH is 8.0 – 8.3 at 18.5^{o} C. If pH is outside of the recommended range, then manganese may not be effectively removed, and colloidal iron may be formed which is difficult to filter out. Liquid diaphragm metering pumps are used to inject Caustic Soda (sodium hydroxide) in the raw water piping located ahead of the filters to increase the pH of the water on the filter media. The pumps are activated based on the flow of water from the well. Dosage is manually adjusted at the pump. The effectiveness of Caustic Soda to control pH is somewhat temperature sensitive and subject to manual dosage adjustment.
- Dissolved Oxygen Addition: Compressed air is injected from a vertical electric air compressor into the raw water piping located ahead of the filters in order to increase the dissolved oxygen (D.O.) concentration of the raw water. For optimal operational conditions, Birm media requires the D.O. concentration to be at least equal to 15% of the iron and manganese content. The operator indicates that the target D.O. concentration is 2.50 mg/L. Operation of the air compressor is activated based on the well call-to-run signal. An electric solenoid valve controls air flow into the raw water piping.
- Filtration: The sand filters are pressurized, multi-media filters containing a layer of anthracite over Birm media. As water flows through the Birm media, a chemical reaction

occurs between the dissolved oxygen and dissolved ferrous iron compounds to form an insoluble ferric hydroxide. As water containing dissolved iron flows through the media, if there is sufficient dissolved oxygen, the Birm media causes the iron to form rust particles. The rust particles are then trapped in the filter media. Similarly, soluble manganese, if oxidized to manganese dioxide, can be captured by the filter media. Periodically the filter media is backwashed to remove the trapped particles.

- Polyphosphate Addition: Following filtration, polyphosphate is added as a sequestering agent and scale inhibitor. The operators report that AquaMag by Carus is the chemical utilized. As a sequestering agent, the polyphosphate binds with any remaining soluble metals such as iron, manganese, calcium and magnesium to reduce their precipitation in the distribution system. This is intended to control remaining iron and manganese to minimize rusty and dirty water in the system, reduce discoloration, staining, and mineral buildup, and diminish calcium scale deposits. Liquid diaphragm metering pumps are used to inject polyphosphate into the filtered water effluent piping. The pumps are activated based on the well call-to-run signal. Dosage is manually adjusted at the pump.
- Disinfection: Gas chlorine is utilized for primary and residual disinfection of the finished water prior to entering the distribution system. Chlorine is utilized to kill pathogens such as bacteria, viruses and protozoans. A low residual chlorine concentration is maintained throughout the distribution system to prevent recontamination. Dual chlorine cylinders are provided on a cylinder scale located within a dedicated chlorine room. Vacuum regulators and an automatic cylinder switchover module are provided to control the chlorine gas supply. Chlorine gas is supplied to ejectors to automatically draw and regulate chlorine flow to mix with makeup water supplied by filtered water booster pumps dedicated to each treatment train. Operation of the booster pumps and chlorine injection is activated based on the flow of water from each well. Chlorine is a weak acid that reduces the pH of the finished water close to neutral range (7.0 - 7.2).
- Dechlorination: The backwash waste stream from each WTP contains residual chlorine since finished water is utilized to periodically backwash the pressure filters. Sodium bisulfite is employed to provide dechlorination to comply with NPDES surface water discharge permit requirements. Sodium bisulfite is injected into the waste discharge piping via peristaltic hose pumps. The pumps are manually activated during the backwash cycle. Dosage is manually adjusted at the pump.
- Standby Power: All three wells and associated WTP facilities are powered by commercial electricity. However, in the event of a power failure, all three wells and their associated water treatment equipment have backup power supplied by fixed, diesel-fueled generators and auto-transfer switches.
- System Control: The wells and associated WTP equipment have basic electrical control panels integrated with radio-based telemetry communications. The well pumps are operated either automatically or manually based on controls manufactured by Master Level Control Company. Radio telemetry is incorporated to allow monitoring, communications and control between the remote sites. The radio telemetry system was manufactured by Pribusin, Inc. The master level control and telemetry panels for operation of the wells are located at Well #3 with individual control and remote telemetry panels at Wells #1, #2 and the new elevated tank. In automatic mode, well operations are controlled by the water level

in the new elevated tank with time delay relays. An altitude valve prevents water from overflowing the older elevated tank which is constructed to a lower overflow elevation than the new tank. Chemical feed systems are controlled electrically based on well start signals. Filter face piping valves are manually operated based on service or filter backwash requirements.

3. Current Waste Handling

The water treatment filters are periodically backwashed in order to remove the captured iron and manganese particles and clean the filter media to support further filtration. The backwash wastewater is directed to two (2) - 5,000 gallon below ground settling tanks, one (1) tank located on each of the WTP sites. These tanks allow for quiescent settling of precipitated iron and manganese. The effluent supernatant is pumped from the top of the tanks to NPDES permitted surface water discharge locations within (1) the community boating canal at Plantation Drive and (2) a tributary to the boating canal located behind the Rhems Fire Department. {*See Appendix C - NPDES permit drawings.}*

4. Existing Distribution System

The Town's distribution system provides consumptive demand and fire flow suppression to approximately 1,497 customers through roughly 19 miles of 2" – 8" diameter pipelines and 108 fire hydrants. Approximately 98% of the pipelines are constructed of PVC with the remainder being Ductile Iron Pipe. Water Storage is provided through two steel, multi-leg elevated water tanks. The older elevated tank is located on the site of the WTP site serving Well #3, and has a capacity of 100,000 gallons. It is shorter in height than the newer tank, and has an altitude valve to prevent overflow. The newer elevated tank is located near the northwest termination of Plantation Drive. It has a capacity of 300,000 gallons for a total system storage capacity of 400,000 gallons.

The 2023 Local Water Supply Plan for the River Bend Water System *{Appendix D– 2023 Local Water Supply Plan}* indicates that the Town served 1,497 customers consisting of 1,483 residential customers, 13 commercial customers and 1 institutional customer. For 2023, the average metered use to supply water to the customer base was 0.175 MGD. During the same timeframe, the Town withdrew 0.318 MGD from their wells with a maximum day withdrawal equal to 0.854 MGD. The difference between the average well withdrawal rate and the average metered water use rate equals 0.143 MGD which would reflect non-metered uses such as filter backwash water, line cleaning, flushing, etc. as well as meter inconsistencies.

II. PRESENT AND FUTURE WATER DEMANDS

A. Current Population and Demand

The project planning area is urban. According to data obtained from the US Census Bureau and the NC Office of State Budget and Management, the population in Craven County slightly

decreased between 2010 – 2020, but has mostly recovered through 2023 as reflected in Table 1. Although the population trend for River Bend differs in magnitude from that of Craven County, it has exhibited a similar trend with the population in the Town being fairly stable since 2020.

Table 1 Craven County Historical Population Trends					
Year	1990	2000	2010	2020	2023
Population	*81,613*	*91,436*	*103,505*	*100,720*	*102,391*
Percent Increase		12%	13%	-3%	2%

Table 2 River Bend Historical Population Trends					
Year	1990	2000	2010	2020	2023
Population	*2,408*	*2,923*	*3,119*	*2,902*	*2,916*
Percent Increase		21%	7%	-7%	0%

The Town of River Bend provides a significant draw to residents for amenities such as the waterfront marina, the River Bend Country Club golf course and swimming pool, and various Town recreational facilities.

Table 3 River Bend Water System Customer Trends					
Year	1997	2002	2010	2020	2023
Customers	*793*	*1,255*	*1,343*	*1,480*	*1,497*
Percent Increase		58%	7%	10%	1%

The NC Office of State Budget and Management projects an increasing population trend to continue in Craven County through 2030 and remaining relatively stable through 2050 as indicated in Table 4.

Table 4 Craven County Population Projections (OSBM)				
Year	2020	2030	2040	2050
Population	*101,181*	*107,357*	*107,924*	*107,971*
Percent Increase		6%	1%	0%

Craven County and River Bend's recent historical population and customer trends suggest a minor positive growth trend. NC OSBM projects an average growth trend of slightly less than 3% per decade for Craven County for the next several decades. For purposes of this Study, 3% per decade is reflected in Table 5 below.

Table 5 River Bend Water System Customer Projections				
Year	2023	2030	2040	2045
Customers	*1,497*	*1,528*	*1,574*	1,597
Percent Increase		2.1%	3%	1.5%

B. Current Supply

The existing water system currently consists of three (3) raw water wells that draw water from the Castle Hayne Aquifer. The combined 12-hour capacity of the wells is approximately 1.0 MGD.

C. Future Needs

The proposed WTP finished water capacity is recommended to be 0.95 MGD which is equivalent to the total capacity of the existing WTPs. Consideration should be given during planning and design phases for future capacity expansion options.

III. POTENTIAL RAW WATER AQUIFERS

A. NCDEQ DWR Public Water Supply Section

When evaluating potential sources of raw water supply, NCDEQ DWR Public Water Supply Section has consistently encouraged North Carolina municipalities and other public water system purveyors to identify the safest and most secure raw water supply of sufficient quantity to provide safe, potable water to the customer.

In eastern North Carolina, that raw water supply is typically fresh groundwater that is treated based on specific characteristics of its water quality.

The raw water could potentially be treated by the Town of River Bend in a new WTP, or the Town could consider purchasing finished potable water from a neighboring water system.

B. Preliminary Hydrogeologic Evaluation

Rivers contracted with Groundwater Management Associates, Inc. (GMA) to conduct a Preliminary Hydrogeologic Evaluation as a planning-level summary of available groundwater resources in the River Bend area. *{See Appendix E – Evaluation of Groundwater Resources near the River Bend Water System dated July 22, 2024 prepared by GMA.}* GMA has identified two (2) primary groundwater-supply options to meet the projected 0.95 million gallons per day (MGD) finished water needs.

1) continued use of fresh groundwater available in the Upper Castle Hayne/River Bend Strata
2) develop a new fresh groundwater source in the Lower Castle Hayne formation/Comfort Member Unit

Additional water-supply options are discussed, but not recommended for the Town of River Bend. Based on the water-supply options evaluated, five (5) potential supply/treatment alternatives are considered within this Water Supply Study:

1) design, permit and construct a new In-Town Filter/Softener WTP,
2) design, permit and construct a new In-Town Nanofiltration WTP,
3) purchase potable water from the New Bern WTP,
4) purchase potable water from the Jones County WTP,
5) purchase potable water from the Craven County WTP.

GMA's scope of work included review of available published and unpublished information to provide a summary of available groundwater resources, including:

- Review of limited well records, drilling data, aquifer test information, and water-quality data from the existing three (3) River Bend production wells.
- Review of available well records, drilling data, aquifer test information, and water-quality data from production wells located in the Lower Castle Hayne Aquifer for the City of New Bern and Jones County.
- Review of available publications by the United States Geological Survey (USGS) that pertain to the groundwater resources of the area. Specifically, the "Hydrogeologic Framework of the North Carolina Coastal Plain" (Winner and Coble, 1996), and the "Simulation of Ground-Water Flow in the Coastal Plain Aquifer System of North Carolina" (Giese and others, 1997).
- Review of on-line information from the North Carolina Division of Water Resources Groundwater Data (https://www.ncwater.org/?page=20). The NCDWR maintains databases of drilling logs, geophysical logs, and monitoring well data. These databases also include historical and recent water-level records for most of the aquifers that occur beneath the study area.

A summation of GMA's findings and recommendations is included below.

C. Hydrogeologic Setting

The Town of River Bend lies within the central portion of North Carolina's Coastal Plain, a broad, nearly flat region separating the hilly Piedmont region from the Atlantic Ocean. Coastal Plain topography and subsurface geology have been shaped by numerous large fluctuations in sea level that caused repeated lateral transgressions and regressions of the Atlantic Shoreline over the past 90 million years. The Coastal Plain is formed by near-shore deposition of sediments that occurred during those fluctuations in seal level, and the land surface of the Coastal Plain reflects ancient coastal environments that previously existed. In general, these deposits occur as sedimentary wedges that thicken seaward. Geologists have described and mapped these depositional units, and they have subdivided the strata into various geological formations and groups based upon their ages and composition.

Below these sediments are crystalline igneous and metamorphic rocks typical of the Piedmont region. Coastal Plain sediments beneath Craven and Jones Counties have thicknesses that range from approximately 700 feet (on the west side) to approximately 1400 feet. The layers of sediments and sedimentary rocks include sequences of permeable sediments that are able to transmit usable quantities of water (i.e., aquifers), and significant accumulations of low-permeability sediments comprised mostly of clay (confining units). Beneath Craven and Jones Counties, there are 6 named formations. Table 6 below presents the aquifer and confining unit names, ages, and sequencing with depth across the study area. In the vicinity of the Town of River Bend, no units younger than the River Bend Formation are present, with the exception of a relatively modern, unnamed surficial aquifer.

The Coastal Plain Aquifers that exist beneath the Town of River Bend include the following, from youngest to oldest and shallowest to deepest:

Table 6

Hydrostratigraphic Units in Craven County

Formation Name	**Geologic Period**	**Formation Period**
Castle Hayne Aquifer	Eocene and Oligocene	23-56 million years
Beaufort Aquifer	Paleocene	56-66 million years
Peedee Aquifer	Cretaceous	66-72 million years
Black Creek Aquifer	Cretaceous	72-84 million years
Upper Cape Fear Aquifer	Cretaceous	86-90 million years
Lower Cape Fear Aquifer	Cretaceous	90-94 million years

Of these available aquifers, the State of North Carolina, effective 2002, mandated reductions on the use of the Cretaceous Aquifer system (specifically, the Black Creek, Upper Cape Fear, and Lower Cape Fear Aquifers). These reductions were imposed with North Carolina's Central Coastal Plain Capacity Use (CCPCUA) rules. Reductions in withdrawals and permitting for use of these aquifers have forced public water systems to rely upon unrestricted aquifers such as the Castle Hayne, Beaufort and Peedee Aquifers. Additionally, all aquifers with exception of the Castle Hayne Aquifer and Surficial Aquifer are brackish (i.e., have elevated salinity). Groundwater supply from the brackish aquifers would require additional water treatment and include additional associated costs. As such, GMA has recommended that the Castle Hayne Aquifer System (CHAS) is the best choice for the Town of River Bend for any future replacement or expansion of their public water system.

The Castle Hayne Aquifer System consists of a group of permeable sediments and sedimentary rocks of variable ages and physical characteristics. Four distinct lithologic units

comprise the CHAS in the vicinity of the Town of River Bend. The unit formations are as follows from shallowest to deepest:

- the Belgrade Formation (part of the Upper Castle Hayne Aquifer),
- the River Bend Formation (part of the Upper Castle Hayne Aquifer),
- the Spring Garden Member of the Castle Hayne Formation (Middle Castle Hayne Aquifer),
- the Comfort Member of the Castle Hayne Formation (Lower Castle Hayne Aquifer).

The Belgrade Formation is not present in the River Bend area. The CHAS may also include the Beaufort Formation where the confining layer separating it from the Castle Hayne Formation is absent.

In the River Bend area, the River Bend Formation has no basal confining layer, making it hydrostratigraphically indistinguishable from the Spring Garden Member. As such, in River Bend, the River Bend Formation and the Spring Garden Formation are designated as the Upper Castle Hayne Aquifer (UCHA). The Spring Garden Member is molluscan-mold biocalcirudite limestone formed with interbedded calcareous, clayey sands and sandy limestones. It becomes more clay-rich with depth. The Spring Garden Member serves as both the semi-confining layer overlying the Lower Castle Hayne Aquifer (LCHA) and as a permeable aquifer capable of producing significant well yields in its upper sections. The Spring Garden Member is the source of groundwater-supply to the Craven County Nanofiltration WTP located approximately 15 miles southeast of River Bend.

The Lower Castle Hayne Aquifer (the Comfort Member) is composed of fossiliferous limestone containing primary and secondary porosity. It is the primary source of groundwater-supply for the nearby New Bern WTP Wellfield located approximately 5 miles north of River Bend, as well as the Jones County WTP located approximately 3.5 miles southwest of River Bend. This aquifer is a very distinctive, high-permeability unit that is expected to range from 40 – 120 feet in thickness in the River Bend area.

D. Existing Groundwater Utilization

There are four community public water systems that withdraw and treat groundwater and distribute treated water for public consumption within the proximity of River Bend. These systems include the following:

1. Town of River Bend:

River Bend uses three wells that withdraw from the shallow freshwater zone of the Upper Castle Hayne Aquifer to produce a combined 12-hour supply of 0.9975 million gallons per day (MGD). According to the 2023 Local Water Supply Plan, the depth of the three wells ranges from 103 – 110 feet. The wells are screened as indicated in the following Table 7:

Table 7 Town of River Bend Existing Wells					
Well Number	**Diameter (In)**	**Depth (Ft)**	**Screen Settings (Ft)**	**Pump Intake (Ft)**	**12-Hour Supply (MGD)**
1	8	105	77 – 105	85	0.3675
2	6	110	81 – 110	65	0.2625
3	8	103	90 – 103	85	0.3675

The following raw water quality data is available from raw water well samples taken in February, 2020:

Table 8 Raw Water Quality Data Town of River Bend Existing Wells					
Well Number	**Iron (mg/L)**	**Manganese (mg/L)**	**pH**	**Hardness (mg/L)**	**Alkalinity (mg/L)**
1	2.20	0.063	7.26	185	240
2	2.61	0.068	7.17	253	240
3	1.23	0.047	7.35	189	220

Based on this data, the existing well supply from the Upper Castle Hayne, is rich in iron and hardness.

A site inspection of the Town's three (3) existing UCHA wells was conducted by GMA, Rivers and Public Works Director/ORC Brandon Mills on January 9, 2024. The water-supply wells are all relatively shallow, and are reaching the end of their useful life. Each of the well sites are being encroached on by land development, and do not meet modern day setback requirements which increases the risk of damage to the wellheads, and poses potential sources of contamination. These well sites appear to have been grandfathered by PWSS. The Town cannot be assured that these wells can be permitted for continued use to supply a new Water Treatment Plant.

On July 17, 2024, Mr. Clif Whitfield, P.G., Assistant Regional Engineer with NCDEQ PWSS of the Washington Regional Office, met with Brandon Mills to conduct a routine inspection of the Town's public water system. During this inspection, Mr. Whitfield noticed the deteriorating condition of the existing Water Treatment Plants and the marginal ability of the WTPs to adequately remove manganese. He subsequently wrote a letter to the Town recommending that the Town move forward with installation of new wells in order to evaluate water quality and determine the type of treatment required at a new WTP. *{See Appendix F - PWSS Letter 071824.pdf.}*

2. City of New Bern:

New Bern operates a 5.5 MGD groundwater treatment plant located at 521 NC-55 that began operation in May, 2010. Raw water to the WTP is supplied by 15 wells that draw water from the Lower Castle Hayne Aquifer/Comfort Member. Prior to construction of the current WTP, the City's water supply originated from the Black Creek Aquifer with five (5) production wells located in Cove City located approximately 10 miles west of New Bern. The City still consumes water from the Black Creek wells; however, the capacity is limited to only 2.0 MGD due to Central Coastal Plain Capacity Use Area (CCPCUA) restrictions. The wells are screened as indicated in the following table:

Table 9
City of New Bern Existing Lower Castle Hayne Aquifer Wells

Well Number	Diameter (In)	Depth (Ft)	Screen Settings (Ft)	Pump Intake (Ft)	12-Hour Supply (MGD)
1	16	250	225 – 245	200	0.252
2	12	265	233 – 263	212	0.252
3	12	231	196 – 226	175	0.252
4	12	237	207 – 232	185	0.2952
5	12	243	218 – 238	196	0.432
6	16	269	236 – 264	203	0.54
7	16	271	238 – 266	218	0.432
8	16	278	246 – 273	225	0.504
9	16	287	264 - 282	242	0.504
10	16	297	280 - 292	260	0.4824
11	16	269	239 - 264	217	0.72
12	12	269	244 - 264	220	0.504
13	12	274	234 - 269	210	0.3233
14	12	242	222 - 237	198	0.342
15	16	247	212 - 243	194	0.702

The following raw water quality data is available from original raw water well samples taken during the 2007-09 construction timeframe:

Table 10 Raw Water Quality Data City of New Bern Existing Lower Castle Hayne Aquifer Wells								
Well #	**Chloride (mg/L)**	**Iron (mg/L)**	**Manganese (mg/L)**	**pH**	**Hardness (mg/L)**	**Alkalinity (mg/L)**	**THMFP (ug/L)**	**HAAFP (ug/L)**
1	7	2.89	0.102	7.26	240	232	63	20
2	12	3.98	0.098	7.04	272	250	89	76
3	8	2.47	0.048	7.1	231	228	16	5
4	8	2.98	0.049	7.84	236	218	19	29
5	9	1.36	0.081	7.51	251	274	122	127
6	8	2.86	0.129	7.3	279	284	204	71
7	9	3.05	0.154	7.49	280	294	219	24
8	8	3.18	0.101	7.21	262	262	1543	89
9	6	2.90	0.044	6.94	265	275	190	165
10	12	1.53	0.058	7.12	289	270	3	82
11	13	4.02	0.106	7.16	277	294	146	43
12	11	2.16	0.09	7.11	255	276	142	194
13	7	1.5	0.07	7.19	277	293	311	363
14	6	0.155	0.019	7.4	258	250	96	49
15	9	3.02	0.108	7.11	223	224	74	58

The Lower Castle Hayne Aquifer/Comfort Member produces much greater quantities of water than the Black Creek; however, the raw water is lower quality. Black Creek well water only requires disinfection prior to distribution, while the Castle Hayne well water requires treatment to reduce iron and manganese, hydrogen sulfide, calcium and magnesium (hardness). The treatment process consists of greensand filtration/cationic softening. A two-million-gallon ground storage tank (GST) is located on the WTP site where low head transmission pumps transfer water on demand to the City's four-million-gallon blending GST located at 2825 Neuse Boulevard. High service pumps transfer blended water from the GST to the City's six elevated water tanks, three booster pump stations and distribution system for consumption by domestic, institutional and industrial customers.

3. Jones County Regional Water Treatment Plant:

Jones County operates a groundwater treatment plant that is currently rated to treat 0.3 MGD with expansion capability to 0.9 MGD. The WTP is located along Highway 17 between River Bend and Pollocksville, NC. The WTP began operation in 2022. Raw water to the WTP is currently supplied by 2 wells that draw water from the Lower Castle Hayne Aquifer/Comfort Member. Both wells are located on the site of the WTP, and are spaced approximately 875 feet apart.

The wells are screened as indicated in the following table:

Table 11 Jones County Existing Lower Castle Hayne Aquifer Wells					
Well Number	**Diameter (In)**	**Depth (Ft)**	**Screen Settings (Ft)**	**Pump Intake (Ft)**	**12-Hour Supply (MGD)**
9	12	260	225-255	142	0.216
10	12	254	219-249	142	0.216
Total Capacity					**0.432**

The following raw water quality data is available from original raw water well samples taken in 2020:

Table 12 Raw Water Quality Data Jones County Existing Lower Castle Hayne Aquifer Wells					
Well #	**Chloride (mg/L)**	**Iron (mg/L)**	**Manganese (mg/L)**	**pH**	**Alkalinity (mg/L)**
9	<28	0.27	0.014	7.4	403
10	<28	0.16	0.013	7.24	215

The Lower Castle Hayne/Comfort Member near the Jones County Regional WTP produces raw water exhibiting much lower iron and manganese than the current River Bend water supply. GMA has observed that the LCHA generally exhibits better water quality characteristics than the Upper Castle Hayne Aquifer in similar locations.

The treatment process consists of a cast-in-place raw water reservoir that is supplied groundwater from the Lower Castle Hayne Aquifer/Comfort Member. Raw water feeds greensand plus filters and ion exchange softeners.

Filter backwash water is transmitted to a cast-in-place Equalization Waste Tank where it is mixed with domestic wastewater from the WTP. The waste is discharged into the Town of Pollocksville's sewer system. A second cast-in-place waste holding tank provides storage of the softener regeneration waste. The supernatant waste pump station transmits treated waste supernatant to a single port discharge located approximately 30 feet from the bank of the Trent River, a Class C; Swamp, NSW subbasin within the Neuse River Basin.

4. Craven County Water Department:

Craven County operates a 3.0 MGD groundwater treatment plant located at 530 Lewis Farm Road that began operation in October, 2017. Raw water to the WTP is supplied by 8 wells that draw fresh groundwater from the Middle Castle Hayne Aquifer/Spring Garden Member. Although the groundwater supply is fresh, it is more susceptible to future saltwater migration due to its eastward location.

The treatment process is nanofiltration membrane skids with cartridge filters and chemical addition for pH adjustment, corrosion control and disinfection. The treatment plant can be expanded to produce 5.0 MGD of finished water. The use of nanofiltration membrane technology allows for easier transition to reverse osmosis membrane technology in the future should the groundwater supply turn brackish.

The WTP includes a one-million-gallon GST for storage of finished water and two 150 HP high service pumps. Ten (10) chemical storage tanks are provided for storage of various chemicals. Two cast-in-place waste holding tanks are provided to provide storage of contaminated waste from the contaminated waste pump station that include 2 - 1 HP pumps. The concentrated waste pump station includes 2 - 50 HP pumps to discharge membrane concentrate to a multiport diffuser located approximately 1000 feet from the shoreline of the Neuse River Estuary, a Class SB=Swamp, NSW waterway within the Neuse River Basin.

E. Available Groundwater Resources in the Town of River Bend

Two freshwater aquifers are believed to be suitable for future use to meet the projected raw water-supply requirements for the Town of River Bend: (1) the Upper Castle Hayne Aquifer/River Bend Strata, and (2) the underlying Lower Castle Hayne Aquifer/Comfort Member. GMA does not recommend the use of the brackish Beaufort Formation.

1. Existing Castle Hayne Formation/River Bend Strata:

The existing River Bend production wells tap into the Upper Castle Hayne/River Bend Strata. These wells are relatively shallow at 110 feet deep, and have limited yields due to minimal drawdown capability. Individual yields of these shallow wells average less than 250 gallons per minute (gpm). In addition, the water-quality tends to be high in iron, manganese and hardness. The Town of River Bend is the only municipal water system in the local area that utilizes the River Bend strata. Treatment is required in order to produce potable quality drinking water. Due to the shallow aquifer depth, this aquifer is much more susceptible to contamination than the LCHA.

Although the Upper Castle Hayne/River Bend Strata could be utilized as a future water supply for the Town of River, a better alternative is believed to exist. Should lack of funding force the Town to continue reliance on the current wells, the following cost estimate indicates that $2,626,000 would be required to rehabilitate the existing three (3) wells and transmit the water to a new WTP site.

Table 13 Supply Alternative 1 (Rehabilitate Existing UCHA River Bend Wells to serve New WTP) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Existing Well Rehabilitation:				
Mobilization and Bonding	1	LS	$70,900.00	$70,900.00
Well No. 1 Modifications, Generator and Auto-transfer Switch	1	LS	$423,500.00	$423,500.00
Well No. 2 Modifications, Generator and Auto-transfer Switch	1	LS	$423,500.00	$423,500.00
Well No. 3 Modifications, Generator and Auto-transfer Switch	1	LS	$423,500.00	$423,500.00
Raw Water Main Construction:				
6" PVC Raw Water Main	3,200	LF	$132.00	$422,400.00
10" PVC Raw Water Main	3,250	LF	$154.00	$500,500.00
WTP Tie-In	1	EA	$11,000.00	$11,000.00
6" Gate Valve w/ Box	3	EA	$3,300.00	$9,900.00
10" Gate Valve w/ Box	1	EA	$4,400.00	$4,400.00
Pressure Air Release Valve and Vault	1	EA	$11,000.00	$11,000.00
Additional Ductile Iron Fittings	1,500	LB	$22.00	$33,000.00
18" Steel Casing (Jack and Bore)	50	LF	$715.00	$35,750.00
Stabilization Stone (Trench)	100	CY	$110.00	$11,000.00
Class B Rip Rap	20	TN	$110.00	$2,200.00
Silt Fence	200	LF	$11.00	$2,200.00
Rock Silt Check Dam	5	EA	$440.00	$2,200.00
Erosion Control Matting	200	SY	$11.00	$2,200.00
Asphalt Pavement Replacement	200	LF	$220.00	$44,000.00
Sub-total				**$2,433,150.00**
Contingency @ (10%)				$242,850.00
Total Estimated Construction Cost				**$2,676,000.00**

2. Lower Castle Hayne Formation/Comfort Member:

The Lower Castle Hayne Aquifer produces greater yields averaging on the order of 500 – 1,000 gpm due to the greater depth and available drawdown. Historically, aquifer testing has shown that groundwater sampled from the Lower Castle Hayne Aquifer exhibits superior water quality to that contained in the shallower Upper Castle Hayne Aquifer at a similar location. As such, the water-quality of Lower Castle Hayne water is anticipated to be superior to that of the River Bend Strata expressed in the form of lower iron and reduced hardness. However, the aquifer can exhibit significant variability across the area. Treatment is required in order to produce potable quality drinking water.

3. Beaufort Formation:

Lying beneath the Lower Castle Hayne Aquifer is the Beaufort Aquifer. In this part of the North Carolina Coastal Plain, portions of the Beaufort Aquifer can be brackish. Given the presence of fresh groundwater sources, GMA does not recommend utilizing a brackish aquifer. A brackish water supply would require an increased level of treatment using Reverse Osmosis to produce a potable quality drinking water.

4. Recommended Aquifer:

If the Town pursues development of a new Water Treatment Plant, GMA and Rivers recommend the Town pursue the Lower Castle Hayne/Comfort Member as the water supply source based on our evaluation of available groundwater resources in the River Bend area. This recommendation is based on anticipated water-quality and water quantity estimates that must be validated through test well evaluation.

F. Potential Well Locations in the Town of River Bend:

It is anticipated that a single new treatment facility could be developed to meet the projected water-supply demands for the Town of River Bend. For planning purposes, an average design capacity of 380 – 415 gpm is suggested for each of two (2) new Lower Castle Hayne Aquifer wells supplying the treatment plant. The raw water demand for a Filter/Softener plant will be approximately 1.1 MGD while 1.2 MGD is required for a Nanofiltration Plant. This will provide approximately 10% and 20% waste/reject water respectively above the required finished water capacity of 0.95 MGD. To meet that demand in 12-hours of water supply, combined flows of 760 gpm and 830 gpm would be needed, respectively.

Several sites within the Town of River Bend are potentially available to locate new production wells to supply raw water to a new WTP. Requirements for the location of a public water well supply are outlined in 15A NCAC 18C .0203 – Public Well Water Supplies *{Appendix G}*. The rules are intended to protect potable drinking water wells from potential sources of contamination. Any property that is to be considered to site a public water supply well must be inspected and approved by an authorized representative of the DWR PWSS. The following is a list of potential locations:

- New WTP Site DB 3801 PG 0554 – West end of Plantation Drive
- Town Commons DB 2843 PG 0630 – Wildwood Drive
- Rocky Run DB 1531 PG 0619 – Southwest end of Wakefield Drive
- Proposed Aare Creek Community Subdivision Town Park – Intersection of North Carolina Drive and Massachusetts Drive

None of the sites listed above have been inspected by PWSS at this point in time.

1. New WTP Site:

This tract of land is already owned by the Town of River Bend. It is very practical and cost effective to incorporate a production well on the site of the new WTP. *{See Appendix H-Option 1.}* The location of the new WTP site immediately adjacent to the new Public Works Facility appears to provide space and proper separation to incorporate a production well that complies with PWSS rules. This site is the most favorable of the locations considered.

2. Town Commons:

This site is also owned by the Town of River Bend, but currently serves as a public gathering and recreational space. *{See Appendix H – Option 2.}* Conversion of a portion of the site to accommodate construction and protection of a well may require removal of the Town's existing sand volleyball court. A separate concern is that the nitrification field associated with the Town Library is located on this property. PWSS rules typically require 200 feet of separation from a subsurface sewage treatment and disposal system unless the well water source is from a confined aquifer. The Lower Castle Hayne Aquifer is confined and the production well casing will require proper grouting to prevent movement of groundwater from the surficial aquifer to lower aquifers. As such, this site appears viable, and is in a favorable

location relative to the new WTP site. It provides reasonable spacing from a well located at the WTP site while not being located too distant.

3. Rocky Run:

This site is located on the southwest end of Wakefield Drive and was originally purchased by the Town in 1996 to serve as a future production well site. *{See Appendix H– Option 3.}* Over the years, the site has remained a grassy field while at other times, it has served as a community garden. The location appears suitable for construction of a potable well; however, the site is somewhat distant from the new WTP site, and would require greater expense to extend a raw water transmission main. This site is not currently recommended for well development, but could be useful for the future, if and when additional water supply capacity is required by the Town.

4. Proposed Aare Creek Community Subdivision Town Park:

The Aare Creek Community residential subdivision has been proposed for development on property currently owned by Robert and Kimberly Dow within the Town Limits of River Bend. As part of the development requirements, a parcel of land has been designated for use as a Town Park at the proposed future intersection of Massachusetts Road and North Carolina Drive. *{See Appendix H – Option 4.}* The site appears to be suitable for use as production well site if the Town elected to use it for that purpose. This site is located approximately 1,100 feet from the new WTP well site. Depending on aquifer properties, this site may or may not be closer than desired to a WTP well to prevent developing a cone of depression and expedited drawdown within the Lower Castle Hayne Aquifer wellfield. This cannot be determined until a test well is installed and aquifer properties are ascertained. This site is not currently recommended for well development, given that infrastructure is not in yet in place to provide access. However, it could be useful for the future, if and when additional water supply capacity is required by the Town.

As noted previously, before construction of production wells, the desired well sites need to be evaluated and approved by PWSS. Following site approval, at least one test well should be installed to evaluate potential well capacity and water quality. GMA has recommended that a deep pilot hole be installed that penetrates through the Lower Castle Hayne Aquifer and into the Beaufort Aquifer. A zone test should be conducted to check water quality, especially salinity in the Beaufort Aquifer. Zone testing refers to chemical analysis of groundwater from the small diameter pilot hole prior to drilling a larger bore hole and installing the test well casing. This will help to ascertain how well protected the Lower Castle Hayne is from saltwater intrusion from below in this area. Once properties of the Beaufort Aquifer are known, the lower portion of the pilot hole should be grouted and construction of the test well completed, followed by pumping and sampling to determine and extrapolate water quantity and quality for the potential production wells.

G. Construction Cost Estimate – New In-Town LCHA Wellfield to Serve New WTP:

Table 13 below is a preliminary estimate of probable construction costs for a new in-town Lower Castle Hayne Aquifer/Comfort Member wellfield to serve a new 0.95 MGD WTP. The estimate includes the addition of one (1) Castle Hayne test well, two (2) 0.60 MGD Castle Hayne production wells and associated raw water piping to convey the raw water to the new water treatment plant. The total estimated construction cost for this water-supply alternative is $2,931,000.

Table 14
Supply Alternative 2 (LCHA Wellfield to serve New WTP)
Estimated Capital Costs for Construction

Item Description	Quantity	Unit	Unit Cost	Extended Cost
Well Construction:				
Mobilization and Bonding	1	LS	$82,300.00	$82,300.00
TW Pilot Hole, Driller's Log and Formation Samples	360	LF	$71.50	$25,740.00
TW Gamma and Electric Logs	360	LF	$13.20	$4,752.00
TW 12" Pit Casing	40	LF	$220.00	$8,800.00
6" Test Well Casing w/ Reducer	250	LF	$55.00	$13,750.00
4.5" Test Well Screen	70	LF	$220.00	$15,400.00
4.5" Test Well Tailpiece/Cellar	5	LF	$82.50	$412.50
Temporary Zone Testing	1	LS	$33,000.00	$33,000.00
TW Development and Water Quality Sampling	1	LS	$55,000.00	$55,000.00
TW Aquifer Pump Test	6	HR	$935.00	$5,610.00
TW Aquifer Recovery Test	0.5	HR	$550.00	$275.00
Abandon Lower Pilot Hole with Cement Grout	40	LF	$16.50	$660.00
PW Pilot Hole, Driller's Log and Formation Samples	640	LF	$82.50	$52,800.00
PW Gamma and Electric Logs	640	LF	$22.00	$14,080.00
PW 24" Pit Casing	80	LF	$550.00	$44,000.00
10" Production Well Casing	500	LF	$165.00	$82,500.00
10" Production Well Screen	140	LF	$440.00	$61,600.00
10" Production Well Tailpiece/Cellar	10	LF	$385.00	$3,850.00
PW Well Development and Water Quality Sampling	2	EA	$60,500.00	$121,000.00
PW Aquifer Pump Test	48	HR	$660.00	$31,680.00
PW Aquifer Recovery Test	6.0	HR	$275.00	$1,650.00
Temporary Access Matting	300	LF	$77.00	$23,100.00
Silt Fence	600	LF	$11.00	$6,600.00
Seeding and Mulching	2	EA	$6,600.00	$13,200.00
Temporary Ditch Crossing	2	EA	$7,700.00	$15,400.00
Site Clearing Allowance	1	LS	$11,000.00	$11,000.00
Testing Allowance (Chemical)	3	EA	$8,250.00	$24,750.00
Wellhead and Raw Water Main Construction:				
Wellhead, Pump, Electrical and Site Improvements	2	EA	$357,500.00	$715,000.00
Existing Raw Water Main Tie-In	1	EA	$11,000.00	$11,000.00
WTP Tie-In	1	EA	$11,000.00	$11,000.00
6" PVC Raw Water Main	400	LF	$132.00	$52,800.00
6" RJDIP Raw Water Main	50	LF	$165.00	$8,250.00
10" PVC Raw Water Main	3,850	LF	$154.00	$592,900.00
10" RJDIP Raw Water Main	100	LF	$242.00	$24,200.00
6" Gate Valve w/ Box	3	EA	$3,300.00	$9,900.00
10" Gate Valve w/ Box	1	EA	$4,400.00	$4,400.00
Pressure Air Release Valve and Vault	1	EA	$11,000.00	$11,000.00
Additional Ductile Iron Fittings	1,500	LB	$22.00	$33,000.00
18" Steel Casing (Jack and Bore)	50	LF	$715.00	$35,750.00
Stabilization Stone (Trench)	100	CY	$110.00	$11,000.00
Class B Rip Rap	20	TN	$110.00	$2,200.00
Silt Fence	500	LF	$11.00	$5,500.00
Rock Silt Check Dam	5	EA	$440.00	$2,200.00
Erosion Control Matting	200	SY	$11.00	$2,200.00
Asphalt Pavement Replacement	200	LF	$220.00	$44,000.00
Electrical Service Entrance	2	EA	$11,000.00	$22,000.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Telemetry Allowance	1	LS	$82,500.00	$82,500.00
150 KVA Emergency Standby Generator	1	EA	$220,000.00	$220,000.00
Sub-total				**$2,664,709.50**
Contingency @ (10%)				$266,290.50
Total Estimated Construction Cost				**$2,931,000.00**

Costs associated with the new WTP, finished water transmission and backwash waste treatment and disposal facilities are not included herein, but are detailed elsewhere in this report.

H. Bulk Water Supply Options:

An alternate to developing a new groundwater supply and treatment plant is for the Town to purchase potable water from one of the neighboring systems, New Bern, Jones County, or Craven County. These alternatives are addressed subsequently in Section VII.

IV. IN-TOWN WATER TREATMENT ALTERNATIVES

A. Filter/Softener (F/S) WTP

A combination of the following process improvements could be considered to treat groundwater from the Lower Castle Hayne Aquifer to provide potable water to the River Bend water system utilizing filtration and softening processes:

1. Greensand/Greensand Plus Filtration

One of the first types of filters to be used to treat water containing iron and manganese was the greensand filter. The active material in greensand is glauconite. Glauconite is a green clay mineral that contains iron and has ion exchange properties. The glauconite is mined, washed, screened and treated with various chemicals to produce a durable greenish-black filter media that is able to adsorb soluble iron and manganese. Greensand Plus is an artificially manufactured filter media that has all the same physical properties of manganese greensand.

As water passes through the greensand filter, soluble iron and manganese are pulled from solution and later react to form insoluble iron and manganese. Regular backwashing, as recommended by the manufacturer, is required to remove the insoluble forms of iron and manganese. In addition, the greensand filter must be regenerated continuously with potassium permanganate. Greensand Plus can be regenerated with chlorine or any strong oxidant. Greensand Plus is more durable than Greensand and can withstand higher differential pressure across the filter, resulting in less frequent backwashing and a lower percentage of backwash waste.

Most greensand filters are rated to be effective treating water with iron concentrations up to 10 mg/l. If the pH of the water is lower than 6.8, the greensand will not filter out the iron and manganese adequately, and the pH must be raised prior to filtration. Backwashing is used to remove particles collected in the filter. Regular backwashing is essential for effective filter performance and requires flow rates that are often three to four times the normal usage rate.

2. Ion Exchange (IE) Softening

Ion exchange softening is frequently used in municipal water treatment applications to reduce the hardness associated with raw water such as that from the Castle Hayne aquifer. It is quite common for Castle Hayne water treatment facilities to include both greensand filtration for iron and manganese removal followed by ion exchange softening to reduce hardness. Some raw waters that have lower amounts of iron and manganese can be treated by ion exchange softening only because dissolved iron and manganese can be exchanged for sodium on the anionic exchange resin or zeolite. The process of iron and manganese removal is the same ion exchange process that removes hardness or calcium and magnesium.

In the case of the Castle Hayne Aquifer, ion exchange softening would not be used without first reducing iron and manganese via filtration due to the typical concentrations present in the raw water. The use of ion exchange softening would eliminate the need for each customer to provide and maintain a residential water softener.

The ion exchange softener can be considered a polishing treatment step for iron and manganese removal when following filtration. Residual iron and manganese from the filters can be absorbed during normal operation of the water softeners. Iron, manganese, calcium and magnesium are subsequently removed from the exchange media during the softener regeneration and backwashing steps.

A greensand filter system followed by cationic softening would make for a high-quality water that is capable of consistently meeting secondary limits. *{See Appendix I – Process Schematic – Filter/Softener WTP.}* A similar water treatment process is utilized by the City of New Bern and Jones County.

3. Chemical Addition

Various chemicals are typically required to meet specific treatment needs based on the raw water.

- Chlorine and/or chloramines (chlorine followed by the addition of ammonia) are utilized for primary and residual disinfection. Raw water from the Castle Hayne Aquifer often is characterized by the presence of organic precursors that lead to formation of Disinfection Byproducts (DBPs) in the presence of chlorine. These DBPs are typically in the form of Total Trihalomethanes (TTHMs) or Total Haloacetic Acids (THAAs). Chloramines disinfection is commonly utilized to help curtail the formation of DBPs.
- Potassium Permanganate is often utilized to oxidize soluble iron and manganese, and to continuously regenerate the greensand filter media.
- Orthophosphates or polyphosphates are frequently utilized to provide corrosion control within the distribution system.
- Fluoride addition is sometimes utilized depending on the available concentration in the raw water supply to help prevent dental caries.
- Sodium bisulfite and/or calcium thiosulfate are frequently utilized for dechlorination of the treated backwash/regenerant waste supernatant prior to final discharge disposal.

B. Nanofiltration WTP

1. Nanofiltration (NF) Membranes

Nanofiltration makes use of partially permeable membranes to separate contaminants at a molecular level from a fresh water supply. Nanofiltration membranes are capable of removing organics, soluble iron, manganese, hardness and other contaminants, and produce a very high-quality drinking water.

For a nanofiltration WTP, it is necessary to keep chemical contaminants in a soluble form to prevent membrane fouling and to accommodate separation of the contaminant concentrate from the permeate. As such, submersible well pumps are typically utilized to minimize oxidation and precipitation of iron and manganese. A new water treatment plant building would house the nanofiltration pumps, cartridge filters, membrane skids, clean-in-pace system, chemical feed systems, and electrical gear. However, if iron concentration is too high, iron pre-filters may be required in lieu of cartridge filters. The use of iron pre-filters is similar to the filtration process described previously, and can contribute significantly to the cost of a nanofiltration WTP.

2. Chemical Addition

Various chemical feed systems may be required depending on raw water quality.

- Caustic is often required for pH control.
- Scale inhibitor is required to prevent membrane fouling.
- Calcium carbonate can be used to restore hardness.
- Polyphosphate is frequently used for corrosion control.
- Chlorine is typically used for primary and residual disinfection.

With nanofiltration, disinfection byproducts are not of concern since the organic precursors are removed. *{See Appendix J – Process Schematic – Nanofiltration WTP.}*

Although the cost of nanofiltration has decreased over time relative to the cost of more traditional filtration and softening, the cost for a nanofiltration treatment system may still be 20-25 percent greater than the more traditional filters and softeners.

Craven County makes use of a nanofiltration treatment process to produce potable water.

C. Potential In-Town WTP Location

On December 27, 2023, Rivers & Associates, Inc. was authorized by the Town of River Bend to perform a preliminary site assessment for approximately 4.5 acres of land to potentially site a new municipal Water Treatment Plant (WTP) facility. The preliminary assessment of the WTP Site included a Land Acquisition Site Evaluation Report (LASER) *{See Appendix K – Town of River Bend LASER Report}* and an accompanying Phase I

Environmental Assessment for the Brown Tract *{See Appendix K – Sub-Appendix C – Phase I Environmental Assessment}*.

The 4.5-acre site (proposed WTP Site) is located on the southernmost end of a larger 29.49-acre tract that was previously owned by Weldon Brown, Jr. and Naqueldon Brown (Brown Tract). The larger Brown Tract is identified as Parcel ID 8-200-028 on the Craven County Tax Parcel Maps *{See Appendix K - Sub-Appendix A – Craven County Tax Parcel Information}*. The 4.5-acre proposed WTP site is located in close proximity to the Town's recently constructed John R. Kirkland Public Works Facility and existing 300,000-gallon Elevated Storage Tank near the western terminus of Plantation Drive *{See Appendix K - Sub-Appendix B – Site Location Map}*.

The purpose of the site assessment was to describe the need for the project, summarize the permitting and zoning requirements, and determine suitability of the site for development as a proposed WTP.

The preliminary assessment for the WTP Site covered potential near surface geotechnical, environmental, drainage, utility and other developmental considerations, and incorporated the outcome of those considerations into a conceptual schematic site plan. *{See Appendix K - Sub-Appendix D – Conceptual Site Plan}*

As with any site to be considered for development of a municipal WTP, there are positive, negative and neutral characteristics and considerations.

The following were considered to be positive characteristics and considerations for the property under consideration:

- site location and accessibility are favorable relative to other municipal facilities, utility and roadway infrastructure,
- no previous development or site contamination is apparent on or near the property,
- zoning/setback requirements do not appear to be problematic.
- topographic relief is favorable for site drainage,
- the site is not subject to flooding,
- there is no critical habitat designated within the property for endangered or threatened species.

Alternately, the following were considered to be negative characteristics /considerations:

- site clearing and grubbing will be required to accommodate development,
- approximately a foot of soil will likely need to be replaced due to clearing and grubbing operations.

Finally, neutral characteristics and considerations included the following items:

- near surface soils appear acceptable for construction although an additional geotechnical investigation is required for foundation design purposes,

- a small quantity of wetlands exists on the site, but can be accommodated through regulatory permitting processes,
- the stream is not considered to be jurisdictional which eliminates a potential 50-feet buffer; however, confirmation is required.

On the whole, the positive and neutral aspects for development of this site were considered to outweigh the negative, which were somewhat minimal. As such, the preliminary evaluation indicated the 4.5-acre site located at the southernmost end of the Brown Tract was suitable to accommodate development of a new Water Treatment Plant for the Town of River Bend. In addition, the site appeared to accommodate the expected requirements for the WTP based on the preliminary size, layout and data that was available at the time.

On June, 7, 2024, the 4.5-acre parcel was purchased by the Town of River Bend with the approval of NCDEQ DWI following submittal of the LASER and Phase I Environmental Assessment. It is now identified as Parcel ID 8-200-29000 on the Craven County Tax Parcel Maps. *{See Appendix L – Craven County Tax Parcel Map.}*

D. Construction Cost Estimates – New In-Town Water Treatment Alternatives

1. North Carolina Special Appropriation

On May 17, 2023, the North Carolina State Legislature enacted Session Law (S.L.) 2023-134 which allocated Water and Sewer Infrastructure Funds to a number of North Carolina governmental units. The Town of River Bend received a special grant appropriation in the amount of $9,393,000. The appropriated funds are administered by the NCDEQ Division of Water Infrastructure. Initially, an administrative fee of 3.0% was allowed for use by DWI. This fee was subsequently reduced to 1.5% by S.L. 2024-1. As such, the grant funding available to the Town via this N.C. special appropriation is $9,252,105 pursuant to the Revised Letter of Intent to Fund dated July 1, 2024. *{See Appendix M - Revised Letter of Intent to Fund.}* The funding is intended to be utilized for construction of a new WTP; however, the funds can broadly be used for water and/or sewer infrastructure subject to approval of the DWI.

2. Construction Cost Estimate - New Filter Softener WTP

Table 15 below is a preliminary estimate of probable costs for a new Filter/Softener WTP on the 4.5-acre tract currently owned by the Town. The estimate includes construction of a new 0.95 MGD capacity Filter/Softener WTP complete with all associated structures, equipment and appurtenances, and finished water transmission main to transmit potable water into the adjacent 300,000-gallon Elevated Storage Tank. The total estimated project cost for this treatment alternative is $9,343,000.

Table 15 Treatment Alternative 1 (F/S WTP) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Mobilization and Bonding	1	LS	$247,500.00	$247,500.00
Site Work	1	LS	$570,000.00	$570,000.00
Water Treatment Plant	1	LS	$1,885,000.00	$1,885,000.00
WTP Equipment (Filters, Softeners, Face Piping, Valves, Chemical Feed Equipment, SCADA)	1	LS	$2,775,000.00	$2,775,000.00
Brine System	1	LS	$178,000.00	$178,000.00
Aeration/Detention Tank	1	LS	$566,000.00	$566,000.00
Yard Piping	1	LS	$277,000.00	$277,000.00
Electrical, WTP Generator, and ATS	1	LS	$1,275,000.00	$1,275,000.00
SCADA & Telemetry	1	LS	$400,000.00	$400,000.00
Testing Allowance	1	LS	$105,000.00	$105,000.00
Equipment Allowance	1	LS	$75,000.00	$75,000.00
Utility Service Entrance Allowance	1	LS	$40,000.00	$40,000.00
Undercut Excavation w/ Select Backfill	1	LS	$40,000.00	$40,000.00
Erosion Control Measures	1	LS	$60,000.00	$60,000.00
Sub-total				**$8,493,500.00**
Contingency @ (10%)				$849,500.00
Total Estimated Construction Cost				**$9,343,000.00**

Costs associated with the new wellfield and backwash waste treatment and disposal facilities are not included herein, but are detailed elsewhere in this report.

3. Construction Cost Estimate – New Nanofiltration WTP

Table 16 below is a preliminary estimate of probable costs for a new Nanofiltration (NF) WTP on the 4.5-acre tract currently owned by the Town. Iron pre-treatment is not included since the overall raw water iron concentration is anticipated to be acceptable for the use of standard cartridge filters ahead of the nanofiltration membranes. The estimate includes a new 0.95 MGD capacity NF WTP complete with all associated structures, equipment and appurtenances, and finished water transmission main to transmit potable water into the adjacent 300,000-gallon Elevated Storage Tank. The total estimated project cost for this treatment alternative is $11,680,000.

Table 16 Treatment Alternative 2 (NF WTP) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Mobilization and Bonding	1	LS	$318,000.00	$318,000.00
Site Work	1	LS	$1,170,000.00	$1,170,000.00
Water Treatment Plant	1	LS	$2,180,000.00	$2,180,000.00
WTP Equipment (Membrane Pumps, VFDs, Cartridge Filters, Membrane Skids, Clean-in-Place System, Membrane Face Piping, Valves, Chemical Feed Equipment, etc.)	1	LS	$3,750,000.00	$3,750,000.00
Aerator	1	LS	$307,000.00	$307,000.00
Yard Piping	1	LS	$277,000.00	$277,000.00
Electrical, WTP Generator, and ATS	1	LS	$1,895,000.00	$1,895,000.00
SCADA & Telemetry	1	LS	$400,000.00	$400,000.00
Testing Allowance	1	LS	$105,000.00	$105,000.00
Equipment Allowance	1	LS	$75,000.00	$75,000.00
Utility Service Entrance Allowance	1	LS	$40,000.00	$40,000.00
Undercut Excavation & Select Backfill	1	LS	$40,000.00	$40,000.00
Erosion Control Measures	1	LS	$60,000.00	$60,000.00
Sub-total				**$10,617,000.00**
Contingency @ (10%)				$1,063,000.00
Total Estimated Construction Cost				**$11,680,000.00**

Costs associated with the new wellfield and waste concentrate force main and disposal facilities are not included herein, but are detailed elsewhere in this report.

V. IN TOWN WTP WASTE TREATMENT/DISCHARGE ALTERNATIVES

A. Current WTP Backwash Waste Treatment

1. Existing Backwash Waste Treatment

The current WTPs make use of Birm Filters without the benefit of Softeners. As such, the backwash waste stream is comprised of freshwater only. The existing Birm filters at each WTP are periodically backwashed in order to remove the captured iron and manganese particles and clean the filter media to support further filtration. The backwash wastewater is directed to 5,000-gallon below ground settling tanks located on each of the WTP sites. These tanks promote quiescent settling of precipitated iron and manganese from the waste supernatant stream prior to discharge at the existing NPDES permitted locations.

2. Existing NPDES Discharge Locations

Effluent supernatant is pumped from the settling tanks to NPDES permitted surface water discharge locations currently regulated under NPDES Permit NC0086797 *{Appendix C}*. Outfall 001 discharges into the upper reach of Plantation Canal and Outfall 002 discharges into an unnamed tributary to Plantation Canal, both of which drain to the Trent River which is classified SB Swamp, NSW in sub-basin 03-04-11 [HUC: 030202040302] of the Neuse River Basin. The location of the WTP discharges have not changed since the initial permit was issued in 2000.

The location of Outfall 002 is a relatively narrow, low flow tributary to Plantation Canal that is unlikely to be approved in today's NPDES regulatory environment as an acceptable

discharge location from a new filter/softener or nanofiltration WTP. The location of Outfall 001 location is in the upper reach of Plantation Canal. However, Plantation Canal itself is not assigned a surface water classification based on the current N.C. Surface Water Classifications map. There is potential that Plantation Canal could be considered a suitable location for discharge from a new WTP; however, this would have to be addressed directly with the NPDES Unit, and is beyond the scope of this study. If it was acceptable, it would be preferable to discharge into the broader section of Plantation Canal rather than the narrower upper section or tributaries to the canal.

B. Proposed Waste Treatment and Disposal

1. Filter/Softener WTP Backwash Waste

Should the Town employ a Greensand Filtration/Ion Exchange Softening WTP process for treatment of Castle Hayne groundwater, iron and manganese will be precipitated for removal by the filters. Periodic backwashing and rinsing will clean the filter media for continued water processing. Ion Exchange Softeners would be employed to remove hardness from the groundwater. Calcium and magnesium ions in the raw water will be exchanged with sodium ions attached to the softener resin beads. Once the resin is expended, it is regenerated by saturating the resin bed with brine. Rinsing of the softeners will produce a brine waste stream.

A common backwash waste treatment method for Greensand Filters/Ion Exchange Softeners includes installation of holding basins operated in series to allow for settling of precipitated iron and manganese and mixing of the brine softener waste stream with the fresh filter backwash waste stream to produce a brackish discharge. Supernatant is drawn from the final holding basin and pumped to a regulatory mixing zone within the permitted receiving water to encourage mixing and dilution of waste constituents. *{See Appendix I – Process Schematic – Filter/Softener WTP.}*

2. Nanofiltration WTP Waste Concentrate

Should the Town employ a Nanofiltration WTP process for treatment of Castle Hayne groundwater, cartridge filters will provide protection to the nanofiltration membranes by removing solid precipitates prior to soluble molecules of metals, hardness and organics being separated into a concentrate from the clean permeate by the partially permeable membranes. Unlike Ion Exchange Softeners, Nanofiltration does not introduce brine into the water treatment process. As such the concentrate stream will be freshwater.

The soluble concentrate waste stream is typically discharged directly under the influence of the high-pressure membrane pumps into a regulatory mixing zone of the receiving water to encourage mixing and dilution of waste constituents. *{See Appendix J – Process Schematic Nanofiltration WTP.}*

C. Existing Sanitary Sewer Collection System

The NPDES Fact Sheet for the 2023 permit renewal indicates the Town's WTP NPDES permit was originally issued March 31, 2000 *{see Appendix N – NPDES Fact Sheet}*. The Town requested discharge permit coverage in order to remove the WTP discharge from their WWTP. The Town wanted to pursue wastewater connection for Town residences served by existing septic systems, and allow for additional new wastewater connections as well. The initial permit was issued for discharge of filter backwash with no treatment prior to discharge. The Division determined that the close proximity of the two treatment plant discharges allowed for the issuance of a single permit for the two plants.

Although the WWTP could again be considered as a means for disposal of the WTP treated backwash discharge, it would consume a significant portion of the WWTP capacity (10 – 58% depending on the treated water capacity and selected treatment method). In addition, it could potentially introduce a brackish waste stream into the WWTP which increases corrosivity and expedites degradation to the steel components of the WWTP tanks and equipment. Each of these reasons argues against discharging to River Bend's existing sanitary sewer collection system as a long-term solution.

The sanitary sewer collection system could be considered as a short-term disposal solution. The Town's current average day raw water demand is approximately 320,000 gpd. This production level in a Filter-Softener WTP would be expected to generate approximately 32,000 gpd of treated waste for disposal which is approximately 10% of the water produced, and 9.7% of the WWTP's 330,000 permitted capacity. As raw water demand increases to the 0.95 MGD WTP capacity, approximately 95,000 gpd of treated waste would require disposal which equates to 10% of water produced, and 28.8% of the WWTP permitted capacity.

A nanofiltration WTP generates approximately 20% waste concentrate from the water produced. As such, at the current 320,000 gpd average day raw water demand, approximately 64,000 gpd of waste concentrate will require disposal which is approximately 19.4% of the WWTP capacity. At the 0.95 MGD WTP capacity, approximately 190,000 gpd will require disposal which is approximately 57.6% of the WWTP permitted capacity.

Under initial conditions, the sanitary sewer collection system could potentially be employed as a short-term viable solution; however, it is not considered a viable long-term solution due to its impact on WWTP capacity, operations and maintenance requirements.

D. WTP Waste Discharge into Plantation Canal

The two (2) currently permitted discharge locations from the existing WTPs drain into and through the larger Plantation Canal that serves the River Bend Marina. Plantation Canal was initially dredged in the 1970's and serves as the main internal drainageway for the Town as well as the base of operations for the River Bend Marina which includes 102 boat slips, dockage, two boat ramps, fuel dock and restaurant. Plantation Canal also provides boating

access from Town residences to the Trent River. Plantation Canal is significantly larger than the existing receiving waters of the two (2) existing WTPs, and is approximately 100 feet to over 200 feet wide along the main channel run which is approximately 1.4 miles long prior to its discharge into the Trent River.

Plantation canal is a much larger waterbody than the current permitted tributary discharge locations. As such, it would seem to be preferable to that which currently exists. There is potential that Plantation Canal could be considered a suitable location for discharge from a new WTP; however, this would have to be addressed directly with the NPDES Unit, and is beyond the scope of this study. If it was acceptable, it would be preferable to discharge into the broader section of Plantation Canal rather than the narrower upper section or tributaries.

E. Combined WTP/WWTP Waste Discharge Diffuser into Trent River

One alternative considered feasible for the long-term to accommodate waste disposal from the new WTP is to combine the treated effluent discharge from the WTP with the treated effluent discharge from the Town's existing Wastewater Treatment Plant (WWTP). Effluent discharge from the River Bend WWTP is through an 8" diameter gravity outfall under the influence of driving head from the WWTP. The outfall extends approximately 725 feet from the WWTP into the Trent River. Approximately 200 feet of 8" diameter ductile iron pipe lays on the bottom of the river where it terminates in a 50 feet multiport diffuser located at a depth of approximately 6 feet.

The WWTP discharge is regulated under NPDES Permit NC0030406 *{Appendix O}* to discharge into the Trent River [Stream Index: 27-101-(31)], a waterbody currently classified SB Swamp, NSW waters in sub-basin 03-04-11 [HUC: 030202040302] of the Neuse River Basin.

The existing 8" diameter outfall hydraulically accommodates the current permitted monthly average discharge of 0.33 MGD with a 2.0 peaking factor for a peak discharge of 0.66 MGD. Should the discharge from the new WTP be directed to combine with the WWTP outfall, it is anticipated additional average flow could range from 0.10 - 0.20 MGD at 0.95 MGD net finished water capacity. A Filter/Softener WTP would produce waste flow on the lower end of the range, and a Nanofiltration WTP would produce waste flow on the higher end of the range. Using the higher limit, a total peak discharge of 0.86 MGD would be required through the outfall. Preliminary hydraulic calculations suggest a 6" diameter force main extended from the WTP to a new 10" common outfall with the WWTP should be able to accommodate the discharges from both plants without adverse impacts.

From a technical, environmental and permitting standpoint this option would appear to be the most favorable long-term solution.

F. Construction Cost Estimates for In-Town WTP Waste Discharge Alternatives

1. Construction Cost Estimate – Discharge to Existing Sanitary Sewer Collection System

Table 17 below is a preliminary estimate of probable costs for the Filter Softener Backwash Waste Treatment and Disposal facilities to discharge into the existing sanitary sewer collection system and WWTP. The total estimated construction cost for this alternative is $1,893,000.

Table 17
Disposal Alternative 1A (F/S WTP TO EXISTING SS COLLECTION SYSTEM)
Estimated Capital Costs for Construction

Item Description	Quantity	Unit	Unit Cost	Extended Cost
Settling Basin:				
Mobilization and Bonding	1	LS	$51,000.00	$51,000.00
Two (2) Geo-membrane-lined Backwash Waste Settling Basin	1	LS	$451,000.00	$451,000.00
Backwash Waste Force Main:				
Supernatant Pump Station	1	LS	$550,000.00	$550,000.00
6" PVC SDR 21 Force Main	2,715	LF	$121.00	$328,515.00
6" RJPVC SDR 21 Force Main	300	LF	$132.00	$39,600.00
6" DIP Force Main	225	LF	$198.00	$44,550.00
6" RJDIP Force Main	170	LF	$308.00	$52,360.00
12" Steel Casing (Jack and Bore)	140	LF	$456.50	$63,910.00
Core and Tie-in to Manhole	1	LS	$7,700.00	$7,700.00
Asphalt Removal and Replacement	195	LF	$220.00	$42,900.00
Automatic Combination ARV/Vacuum Valve	2	EA	$22,000.00	$44,000.00
Seeding and Mulching	0.4	AC	$2,750.00	$1,100.00
Additional DIP Fittings	850	LB	$22.00	$18,700.00
Silt Fence	500	LF	$11.00	$5,500.00
Straw Wattles	20	EA	$110.00	$2,200.00
Excelsior Matting	20	SY	$11.00	$220.00
Stabilization Stone	30	CY	$110.00	$3,300.00
Select Backfill	70	CY	$44.00	$3,080.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Sub-total				**$1,720,635.00**
Contingency @ (10%)				$172,365.00
Total Estimated Construction Cost				**$1,893,000.00**

Table 18 below is a preliminary estimate of probable costs for the Filter Softener Backwash Waste Treatment and Disposal facilities to discharge into the existing sanitary sewer collection system and WWTP. The total estimated construction cost for this alternative is $831,000.

Table 18 Disposal Alternative 2A (NF WTP TO EXISTING SS COLLECTION SYSTEM) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Waste Concentrate Force Main:				
Mobilization and Bonding (3% +/-)	1	LS	$22,000.00	$22,000.00
6" PVC C900 Force Main	2,810	LF	$137.50	$386,375.00
6" RJPVC C900 Force Main	315	LF	$148.50	$46,777.50
6" DIP Force Main	225	LF	$198.00	$44,550.00
6" RJDIP Force Main	170	LF	$308.00	$52,360.00
12" Steel Casing (Jack and Bore)	140	LF	$456.50	$63,910.00
Core and Tie-in to Manhole	1	LS	$7,700.00	$7,700.00
Asphalt Removal and Replacement	195	LF	$220.00	$42,900.00
Automatic Combination ARV/Vacuum Valve	2	EA	$22,000.00	$44,000.00
Seeding and Mulching	0.4	AC	$2,750.00	$1,100.00
Additional DIP Fittings	850	LB	$22.00	$18,700.00
Silt Fence	500	LF	$11.00	$5,500.00
Straw Wattles	20	EA	$110.00	$2,200.00
Excelsior Matting	20	SY	$11.00	$220.00
Stabilization Stone	30	CY	$110.00	$3,300.00
Select Backfill	70	CY	$44.00	$3,080.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Sub-total				**$755,672.50**
Contingency @ (10%)				$75,327.50
Total Estimated Construction Cost				**$831,000.00**

Costs associated with the new wellfield, WTP and transmission improvements are not included herein, but are detailed elsewhere in this report.

2. Construction Cost Estimate – Discharge to Plantation Canal

Table 19 below is a preliminary estimate of probable costs for the backwash waste treatment and disposal facilities to discharge into Plantation Canal. The total estimated project cost for this alternative is $2,024,000.

Table 19 Disposal Alternative 1B (FS WTP TO PLANTATION CANAL) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Settling Basin:				
Mobilization and Bonding	1	LS	$53,700.00	$53,700.00
Two (2) Geo-membrane-lined Backwash Waste Settling Basin	1	LS	$451,000.00	$451,000.00
Backwash Waste Force Main:				
Supernatant Pump Station	1	LS	$550,000.00	$550,000.00
6" PVC SDR 21 Force Main	3,045	LF	$121.00	$368,445.00
6" RJPVC SDR 21 Force Main	340	LF	$132.00	$44,880.00
6" DIP Force Main	225	LF	$198.00	$44,550.00
6" RJDIP Force Main	170	LF	$308.00	$52,360.00
12" Steel Casing (Jack and Bore)	140	LF	$456.50	$63,910.00
Asphalt Removal and Replacement	370	LF	$220.00	$81,400.00
Automatic Combination ARV/Vacuum Valve	1	EA	$22,000.00	$22,000.00
Seeding and Mulching	0.5	AC	$2,750.00	$1,375.00
Additional DIP Fittings	1,275	LB	$22.00	$28,050.00
Silt Fence	750	LF	$11.00	$8,250.00
Straw Wattles	25	EA	$110.00	$2,750.00
Excelsior Matting	20	SY	$11.00	$220.00
Stabilization Stone	30	CY	$110.00	$3,300.00
Select Backfill	75	CY	$44.00	$3,300.00
Testing Allowance	1	LS	$5,500.00	$5,500.00
Multi-port Diffuser	1	LS	$55,000.00	$55,000.00
Sub-total				**$1,839,990.00**
Contingency @ (10%)				$184,010.00
Total Estimated Construction Cost				**$2,024,000.00**

Table 20 below is a preliminary estimate of probable construction cost for the Nanofiltration WTP concentrate waste disposal facilities to discharge into Plantation Canal. The total estimated project cost for this alternative is $976,000.

Table 20 Disposal Alternative 2B (NF WTP TO PLANTATION CANAL) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Waste Concentrate Force Main:				
Mobilization and Bonding (3% +/-)	1	LS	$25,700.00	$25,900.00
6" PVC C900 Force Main	3,145	LF	$137.50	$432,437.50
6" RJPVC C900 Force Main	350	LF	$148.50	$51,975.00
6" DIP Force Main	225	LF	$198.00	$44,550.00
6" RJDIP Force Main	170	LF	$308.00	$52,360.00
12" Steel Casing (Jack and Bore)	140	LF	$456.50	$63,910.00
Asphalt Removal and Replacement	370	LF	$220.00	$81,400.00
Automatic Combination ARV/Vacuum Valve	1	EA	$22,000.00	$22,000.00
Seeding and Mulching	0.5	AC	$2,750.00	$1,375.00
Additional DIP Fittings	1,275	LB	$22.00	$28,050.00
Silt Fence	750	LF	$11.00	$8,250.00
Straw Wattles	25	EA	$110.00	$2,750.00
Excelsior Matting	20	SY	$11.00	$220.00
Stabilization Stone	30	CY	$110.00	$3,300.00
Select Backfill	75	CY	$44.00	$3,300.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Multiport Diffuser	1	LS	$55,000.00	$55,000.00
Sub-total				**$887,777.50**
Contingency @ (10%)				$88,222.50
Total Estimated Construction Cost				**$976,000.00**

Costs associated with the new wellfield, WTP and transmission improvements are not included herein, but are detailed elsewhere in this report.

3. Construction Cost Estimate - Combined WTP/WWTP Discharge Diffuser into Trent River

Table 21 below is a preliminary estimate of probable costs for the Filter Softener WTP Backwash Waste Treatment and Disposal facilities to discharge into a combined WTP/WWTP Outfall and Diffuser into the Trent River. The total estimated project cost for this alternative is $3,549.000.

Table 21 Disposal Alternative 1C (F/S WTP TO COMBINED WTP/WWTP DIFFUSER INTO TRENT RIVER) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Settling Basin:				
Mobilization and Bonding	1	LS	$94,000.00	$94,000.00
Two (2) Geo-membrane-lined Backwash Waste Settling Basin	1	LS	$451,000.00	$451,000.00
Backwash Waste Force Main:				
Supernatant Pump Station	1	LS	$550,000.00	$550,000.00
6" PVC SDR 21 Force Main	7,165	LF	$121.00	$866,965.00
6" RJPVC SDR 21 Force Main	820	LF	$132.00	$108,240.00
6" DIP Force Main	360	LF	$198.00	$71,280.00
6" RJDIP Force Main	130	LF	$308.00	$40,040.00
12" Steel Casing (Jack and Bore)	100	LF	$456.50	$45,650.00
200 LF 6" Fusible PVC Directional Bore	2	EA	$66,000.00	$132,000.00
700 LF 10" Fusible PVC Directional Bore	1	EA	$352,000.00	$352,000.00
Asphalt Removal and Replacement	310	LF	$220.00	$68,200.00
Asphalt Drive Removal and Replacement	520	LF	$110.00	$57,200.00
Concrete Drive Removal and Replacement	120	LF	$165.00	$19,800.00
Replace RCP Under Driveway	21	EA	$1,100.00	$23,100.00
Automatic Combination ARV/Vacuum Valve	4	EA	$22,000.00	$88,000.00
Seeding and Mulching	1.0	AC	$2,750.00	$2,750.00
Additional DIP Fittings	2,550	LB	$22.00	$56,100.00
Silt Fence	1,000	LF	$11.00	$11,000.00
Straw Wattles	45	EA	$110.00	$4,950.00
Excelsior Matting	40	SY	$11.00	$440.00
Stabilization Stone	50	CY	$110.00	$5,500.00
Select Backfill	170	CY	$44.00	$7,480.00
Construction Entrance	1	EA	$5,500.00	$5,500.00
Testing Allowance	1	LS	$16,500.00	$16,500.00
Tie-In to WWTP Discharge	1	EA	$11,000.00	$11,000.00
Remove Existing 8" Outfall	1	LS	$55,000.00	$55,000.00
Remove and Replace Multiport Diffuser	1	LS	$82,500.00	$82,500.00
Sub-total				**$3,226,195.00**
Contingency @ (10%)				$322,805.00
Total Estimated Construction Cost				**$3,549,000.00**

Table 22 below is a preliminary estimate of probable costs for the Filter Softener WTP Backwash Waste Treatment and Disposal facilities to discharge into a combined WTP/WWTP Outfall and Diffuser into the Trent River. The total estimated project cost for this alternative is $2,582.000.

Table 22 Disposal Alternative 2C (NF WTP TO COMBINED WTP/WWTP DIFFUSER INTO TRENT RIVER) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Waste Concentrate Force Main:				
Mobilization and Bonding (3% +/-)	1	LS	$68,370.00	$68,370.00
6" PVC C900 Force Main	7,265	LF	$137.50	$998,937.50
6" RJPVC C900 Force Main	835	LF	$148.50	$123,997.50
6" DIP Force Main	360	LF	$198.00	$71,280.00
6" RJDIP Force Main	130	LF	$308.00	$40,040.00
12" Steel Casing (Jack and Bore)	100	LF	$456.50	$45,650.00
200 LF 6" Fusible PVC Directional Bore	2	EA	$66,000.00	$132,000.00
700 LF 10" Fusible PVC Directional Bore	1	EA	$352,000.00	$352,000.00
Asphalt Removal and Replacement	310	LF	$220.00	$68,200.00
Asphalt Drive Removal and Replacement	520	LF	$110.00	$57,200.00
Concrete Drive Removal and Replacement	120	LF	$165.00	$19,800.00
Replace RCP Under Driveway	21	EA	$1,100.00	$23,100.00
Automatic Combination ARV/Vacuum Valve	4	EA	$22,000.00	$88,000.00
Seeding and Mulching	1.0	AC	$2,750.00	$2,750.00
Additional DIP Fittings	2,550	LB	$22.00	$56,100.00
Silt Fence	1,000	LF	$11.00	$11,000.00
Straw Wattles	45	EA	$110.00	$4,950.00
Excelsior Matting	40	SY	$11.00	$440.00
Stabilization Stone	50	CY	$110.00	$5,500.00
Select Backfill	170	CY	$44.00	$7,480.00
Construction Entrance	1	EA	$5,500.00	$5,500.00
Testing Allowance	1	LS	$16,500.00	$16,500.00
Tie-In to WWTP Discharge	1	EA	$11,000.00	$11,000.00
Remove Existing 8" Outfall	1	LS	$55,000.00	$55,000.00
Remove and Replace Multiport Diffuser	1	LS	$82,500.00	$82,500.00
Sub-total				**$2,347,295.00**
Contingency @ (10%)				$234,705.00
Total Estimated Construction Cost				**$2,582,000.00**

Costs associated with the new wellfield, WTP and transmission improvements are not included herein, but are detailed elsewhere in this report.

VI. SELECTION OF AN IN-TOWN WTP ALTERNATIVE

A. Monetary Factors (Present Value of Costs Analysis)

1. Total Estimated Filter Softener WTP Project Costs

Table 23 Water Supply, Treatment & Disposal Alternative 1 (F/S WTP) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Well Construction:				
Mobilization and Bonding	1	LS	$82,300.00	$82,300.00
TW Pilot Hole, Driller's Log and Formation Samples	360	LF	$71.50	$25,740.00
TW Gamma and Electric Logs	360	LF	$13.20	$4,752.00
TW 12" Pit Casing	40	LF	$220.00	$8,800.00
6" Test Well Casing w/ Reducer	250	LF	$55.00	$13,750.00
4.5" Test Well Screen	70	LF	$220.00	$15,400.00
4.5" Test Well Tailpiece/Cellar	5	LF	$82.50	$412.50
Temporary Zone Testing	1	LS	$33,000.00	$33,000.00
TW Development and Water Quality Sampling	1	LS	$55,000.00	$55,000.00
TW Aquifer Pump Test	6	HR	$935.00	$5,610.00
TW Aquifer Recovery Test	0.5	HR	$550.00	$275.00
Abandon Lower Pilot Hole with Cement Grout	40	LF	$16.50	$660.00
PW Pilot Hole, Driller's Log and Formation Samples	640	LF	$82.50	$52,800.00
PW Gamma and Electric Logs	640	LF	$22.00	$14,080.00
PW 24" Pit Casing	80	LF	$550.00	$44,000.00
10" Production Well Casing	500	LF	$165.00	$82,500.00
10" Production Well Screen	140	LF	$440.00	$61,600.00
10" Production Well Tailpiece/Cellar	10	LF	$385.00	$3,850.00
PW Well Development and Water Quality Sampling	2	EA	$60,500.00	$121,000.00
PW Aquifer Pump Test	48	HR	$660.00	$31,680.00
PW Aquifer Recovery Test	6.0	HR	$275.00	$1,650.00
Temporary Access Matting	300	LF	$77.00	$23,100.00
Silt Fence	600	LF	$11.00	$6,600.00
Seeding and Mulching	2	EA	$6,600.00	$13,200.00
Temporary Ditch Crossing	2	EA	$7,700.00	$15,400.00
Site Clearing Allowance	1	LS	$11,000.00	$11,000.00
Testing Allowance (Chemical)	3	EA	$8,250.00	$24,750.00
Wellhead and Raw Water Main Construction:				
Wellhead, Pump, Electrical and Site Improvements	2	EA	$357,500.00	$715,000.00
Existing Raw Water Main Tie-In	1	EA	$11,000.00	$11,000.00
WTP Tie-In	1	EA	$11,000.00	$11,000.00
6" PVC Raw Water Main	400	LF	$132.00	$52,800.00
6" RJDIP Raw Water Main	50	LF	$165.00	$8,250.00
10" PVC Raw Water Main	3,850	LF	$154.00	$592,900.00
10" RJDIP Raw Water Main	100	LF	$242.00	$24,200.00
6" Gate Valve w/ Box	3	EA	$3,300.00	$9,900.00
10" Gate Valve w/ Box	1	EA	$4,400.00	$4,400.00
Pressure Air Release Valve and Vault	1	EA	$11,000.00	$11,000.00
Additional Ductile Iron Fittings	1,500	LB	$22.00	$33,000.00
18" Steel Casing (Jack and Bore)	50	LF	$715.00	$35,750.00
Stabilization Stone (Trench)	100	CY	$110.00	$11,000.00
Class B Rip Rap	20	TN	$110.00	$2,200.00
Silt Fence	500	LF	$11.00	$5,500.00
Rock Silt Check Dam	5	EA	$440.00	$2,200.00
Erosion Control Matting	200	SY	$11.00	$2,200.00
Asphalt Pavement Replacement	200	LF	$220.00	$44,000.00
Electrical Service Entrance	2	EA	$11,000.00	$22,000.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Telemetry Allowance	1	LS	$82,500.00	$82,500.00
150 KVA Emergency Standby Generator	1	EA	$220,000.00	$220,000.00

Filter Softener WTP:				
Mobilization and Bonding	1	LS	$247,500.00	$247,500.00
Site Work	1	LS	$570,000.00	$570,000.00
Water Treatment Plant	1	LS	$1,885,000.00	$1,885,000.00
WTP Equipment (Filters, Softeners, Face Piping, Valves, Chemical	1	LS	$2,775,000.00	$2,775,000.00
Brine System	1	LS	$178,000.00	$178,000.00
Aeration/Detention Tank	1	LS	$566,000.00	$566,000.00
Yard Piping	1	LS	$277,000.00	$277,000.00
Electrical, WTP Generator, and ATS	1	LS	$1,275,000.00	$1,275,000.00
SCADA & Telemetry	1	LS	$400,000.00	$400,000.00
Testing Allowance	1	LS	$105,000.00	$105,000.00
Equipment Allowance	1	LS	$75,000.00	$75,000.00
Utility Service Entrance Allowance	1	LS	$40,000.00	$40,000.00
Undercut Excavation w/ Select Backfill	1	LS	$40,000.00	$40,000.00
Erosion Control Measures	1	LS	$60,000.00	$60,000.00
Settling Basin:				
Mobilization and Bonding	1	LS	$94,000.00	$94,000.00
Two (2) Geo-membrane-lined Backwash Waste Settling Basin	1	LS	$451,000.00	$451,000.00
Backwash Waste Force Main:				
Supernatant Pump Station	1	LS	$550,000.00	$550,000.00
6" PVC SDR 21 Force Main	7,165	LF	$121.00	$866,965.00
6" RJPVC SDR 21 Force Main	820	LF	$132.00	$108,240.00
6" DIP Force Main	360	LF	$198.00	$71,280.00
6" RJDIP Force Main	130	LF	$308.00	$40,040.00
12" Steel Casing (Jack and Bore)	100	LF	$456.50	$45,650.00
200 LF 6" Fusible PVC Directional Bore	2	EA	$66,000.00	$132,000.00
700 LF 10" Fusible PVC Directional Bore	1	EA	$352,000.00	$352,000.00
Asphalt Removal and Replacement	310	LF	$220.00	$68,200.00
Asphalt Drive Removal and Replacement	520	LF	$110.00	$57,200.00
Concrete Drive Removal and Replacement	120	LF	$165.00	$19,800.00
Replace RCP Under Driveway	21	EA	$1,100.00	$23,100.00
Automatic Combination ARV/Vacuum Valve	4	EA	$22,000.00	$88,000.00
Seeding and Mulching	1.0	AC	$2,750.00	$2,750.00
Additional DIP Fittings	2,550	LB	$22.00	$56,100.00
Silt Fence	1,000	LF	$11.00	$11,000.00
Straw Wattles	45	EA	$110.00	$4,950.00
Excelsior Matting	40	SY	$11.00	$440.00
Stabilization Stone	50	CY	$110.00	$5,500.00
Select Backfill	170	CY	$44.00	$7,480.00
Construction Entrance	1	EA	$5,500.00	$5,500.00
Testing Allowance	1	LS	$16,500.00	$16,500.00
Tie-In to WWTP Discharge	1	EA	$11,000.00	$11,000.00
Remove Existing 8" Outfall	1	LS	$55,000.00	$55,000.00
Remove and Replace Multiport Diffuser	1	LS	$82,500.00	$82,500.00
Sub-total				**$14,384,404.50**
Contingency @ (10%)				$1,438,595.50
Total Estimated Construction Cost				**$15,823,000.00**

Table 24 Water Supply, Treatment & Disposal Alternative 1 (F/S WTP) Total Estimated Capital Costs for Project		
Total Estimated Construction Cost	$	15,823,000.00
Preliminary Engineering Services		
Engineering Report	$	25,000.00
Environmental Information Document	$	10,000.00
NPDES EAA, CORMIX Dilution Model and Permitting	$	110,000.00
Boundary/Topgraphic Site/Route Survey	$	100,000.00
Hydrographic Survey	$	25,000.00
Wetlands Delineation/USACE Permitting	$	10,000.00
Test Well and Production Wells		
Design and Permitting - Wells	$	45,000.00
Bidding and Negotiation - Wells	$	15,000.00
Hydrogeological and Construction Phase - Wells	$	205,000.00
Design and Permitting - Well Head, Site, Electrical and Raw Water Mains	$	110,000.00
Bidding and Negotiation - Well Head, Site, Electrical and Raw Water Mains	$	20,000.00
Construction Administration - Well Head, Site, Electrical and Raw Water Mains	$	40,000.00
Construction Observation - Well Head, Site, Electrical and Raw Water Mains	$	90,000.00
WTP, Backwash Handling and Disposal		
Geotechnical Investigation	$	15,000.00
Engineering Design, Construction Plans and Specifications	$	700,000.00
Permitting	$	15,000.00
Bidding and Negotiation (3 Contracts)	$	40,000.00
Construction Administration	$	250,000.00
Resident Project Representation (15 months)	$	300,000.00
Operation and Maintenance Manual Preparation	$	40,000.00
Record Drawing Preparation	$	20,000.00
Administrative Costs		
Legal Costs	$	10,000.00
Land and Rights-of-Way	$	200,000.00
Permit Fees	$	10,000.00
Total	**$**	**18,228,000.00**

Table 25 Water Supply, Treatment & Disposal Alternative 1 (F/S WTP) Annual Recurring Costs	
Administration and Finance:	$507,000.00
Water Supply and Treatment:	
Testing	$6,440.00
Contracted Services	$13,100.00
Chemicals	$26,264.00
Supplies and Materials	$23,700.00
Utilities	$27,500.00
Maintenance and Repair - Buildings	$2,500.00
Maintenance and Repair - Equipment	$6,900.00
Permit Fees	$2,240.00
Miscellaneous	$2,956.00
Capital Outlay - Equipment	$10,000.00
Capital Outlay - Wells/Pumps	$10,000.00
Distribution:	$58,000.00
Total Annual Expenses	**$696,600.00**

2. Total Estimated Nanofiltration WTP Project Costs

Table 26 Water Supply, Treatment & Disposal Alternative 2 (NF WTP) Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Well Construction:				
Mobilization and Bonding	1	LS	$82,300.00	$82,300.00
TW Pilot Hole, Driller's Log and Formation Samples	360	LF	$71.50	$25,740.00
TW Gamma and Electric Logs	360	LF	$13.20	$4,752.00
TW 12" Pit Casing	40	LF	$220.00	$8,800.00
6" Test Well Casing w/ Reducer	250	LF	$55.00	$13,750.00
4.5" Test Well Screen	70	LF	$220.00	$15,400.00
4.5" Test Well Tailpiece/Cellar	5	LF	$82.50	$412.50
Temporary Zone Testing	1	LS	$33,000.00	$33,000.00
TW Development and Water Quality Sampling	1	LS	$55,000.00	$55,000.00
TW Aquifer Pump Test	6	HR	$935.00	$5,610.00
TW Aquifer Recovery Test	0.5	HR	$550.00	$275.00
Abandon Lower Pilot Hole with Cement Grout	40	LF	$16.50	$660.00
PW Pilot Hole, Driller's Log and Formation Samples	640	LF	$82.50	$52,800.00
PW Gamma and Electric Logs	640	LF	$22.00	$14,080.00
PW 24" Pit Casing	80	LF	$550.00	$44,000.00
10" Production Well Casing	500	LF	$165.00	$82,500.00
10" Production Well Screen	140	LF	$440.00	$61,600.00
10" Production Well Tailpiece/Cellar	10	LF	$385.00	$3,850.00
PW Well Development and Water Quality Sampling	2	EA	$60,500.00	$121,000.00
PW Aquifer Pump Test	48	HR	$660.00	$31,680.00
PW Aquifer Recovery Test	6.0	HR	$275.00	$1,650.00
Temporary Access Matting	300	LF	$77.00	$23,100.00
Silt Fence	600	LF	$11.00	$6,600.00
Seeding and Mulching	2	EA	$6,600.00	$13,200.00
Temporary Ditch Crossing	2	EA	$7,700.00	$15,400.00
Site Clearing Allowance	1	LS	$11,000.00	$11,000.00
Testing Allowance (Chemical)	3	EA	$8,250.00	$24,750.00
Wellhead and Raw Water Main Construction:				
Wellhead, Pump, Electrical and Site Improvements	2	EA	$357,500.00	$715,000.00
Existing Raw Water Main Tie-In	1	EA	$11,000.00	$11,000.00
WTP Tie-In	1	EA	$11,000.00	$11,000.00
6" PVC Raw Water Main	400	LF	$132.00	$52,800.00
6" RJDIP Raw Water Main	50	LF	$165.00	$8,250.00
10" PVC Raw Water Main	3,850	LF	$154.00	$592,900.00
10" RJDIP Raw Water Main	100	LF	$242.00	$24,200.00
6" Gate Valve w/ Box	3	EA	$3,300.00	$9,900.00
10" Gate Valve w/ Box	1	EA	$4,400.00	$4,400.00
Pressure Air Release Valve and Vault	1	EA	$11,000.00	$11,000.00
Additional Ductile Iron Fittings	1,500	LB	$22.00	$33,000.00
18" Steel Casing (Jack and Bore)	50	LF	$715.00	$35,750.00
Stabilization Stone (Trench)	100	CY	$110.00	$11,000.00
Class B Rip Rap	20	TN	$110.00	$2,200.00
Silt Fence	500	LF	$11.00	$5,500.00
Rock Silt Check Dam	5	EA	$440.00	$2,200.00
Erosion Control Matting	200	SY	$11.00	$2,200.00
Asphalt Pavement Replacement	200	LF	$220.00	$44,000.00
Electrical Service Entrance	2	EA	$11,000.00	$22,000.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Telemetry Allowance	1	LS	$82,500.00	$82,500.00
150 KVA Emergency Standby Generator	1	EA	$220,000.00	$220,000.00

Nanofiltration WTP:				
Mobilization and Bonding	1	LS	$318,000.00	$318,000.00
Site Work	1	LS	$1,170,000.00	$1,170,000.00
Water Treatment Plant	1	LS	$2,180,000.00	$2,180,000.00
WTP Equipment (Membrane Pumps, VFDs, Cartridge Filters, Membrane	1	LS	$3,750,000.00	$3,750,000.00
Aerator	1	LS	$307,000.00	$307,000.00
Yard Piping	1	LS	$277,000.00	$277,000.00
Electrical, WTP Generator, and ATS	1	LS	$1,895,000.00	$1,895,000.00
SCADA & Telemetry	1	LS	$400,000.00	$400,000.00
Testing Allowance	1	LS	$105,000.00	$105,000.00
Equipment Allowance	1	LS	$75,000.00	$75,000.00
Utility Service Entrance Allowance	1	LS	$40,000.00	$40,000.00
Undercut Excavation & Select Backfill	1	LS	$40,000.00	$40,000.00
Erosion Control Measures	1	LS	$60,000.00	$60,000.00
Waste Concentrate Force Main:				
Mobilization and Bonding (3% +/-)	1	LS	$68,370.00	$68,370.00
6" PVC C900 Force Main	7,265	LF	$137.50	$998,937.50
6" RJPVC C900 Force Main	835	LF	$148.50	$123,997.50
6" DIP Force Main	360	LF	$198.00	$71,280.00
6" RJDIP Force Main	130	LF	$308.00	$40,040.00
12" Steel Casing (Jack and Bore)	100	LF	$456.50	$45,650.00
200 LF 6" Fusible PVC Directional Bore	2	EA	$66,000.00	$132,000.00
700 LF 10" Fusible PVC Directional Bore	1	EA	$352,000.00	$352,000.00
Asphalt Removal and Replacement	310	LF	$220.00	$68,200.00
Asphalt Drive Removal and Replacement	520	LF	$110.00	$57,200.00
Concrete Drive Removal and Replacement	120	LF	$165.00	$19,800.00
Replace RCP Under Driveway	21	EA	$1,100.00	$23,100.00
Automatic Combination ARV/Vacuum Valve	4	EA	$22,000.00	$88,000.00
Seeding and Mulching	1.0	AC	$2,750.00	$2,750.00
Additional DIP Fittings	2,550	LB	$22.00	$56,100.00
Silt Fence	1,000	LF	$11.00	$11,000.00
Straw Wattles	45	EA	$110.00	$4,950.00
Excelsior Matting	40	SY	$11.00	$440.00
Stabilization Stone	50	CY	$110.00	$5,500.00
Select Backfill	170	CY	$44.00	$7,480.00
Construction Entrance	1	EA	$5,500.00	$5,500.00
Testing Allowance	1	LS	$16,500.00	$16,500.00
Tie-In to WWTP Discharge	1	EA	$11,000.00	$11,000.00
Remove Existing 8" Outfall	1	LS	$55,000.00	$55,000.00
Remove and Replace Multiport Diffuser	1	LS	$82,500.00	$82,500.00
Sub-total				**$15,629,004.50**
Contingency @ (10%)				$1,563,995.50
Total Estimated Construction Cost				**$17,193,000.00**

Table 27 Water Supply, Treatment & Disposal Alternative 2 (NF WTP) Total Estimated Capital Costs for Project		
Total Estimated Construction Cost	$	17,193,000.00
Preliminary Engineering Services		
Engineering Report	$	25,000.00
Environmental Information Document	$	10,000.00
NPDES EAA, CORMIX Dilution Model and Permitting	$	110,000.00
Boundary/Topgraphic Site/Route Survey	$	100,000.00
Hydrographic Survey	$	25,000.00
Wetlands Delineation/USACE Permitting	$	10,000.00
Test Well and Production Wells		
Design and Permitting - Wells	$	45,000.00
Bidding and Negotiation - Wells	$	15,000.00
Hydrogeological and Construction Phase - Wells	$	205,000.00
Design and Permitting - Well Head, Site, Electrical and Raw Water Mains	$	110,000.00
Bidding and Negotiation - Well Head, Site, Electrical and Raw Water Mains	$	20,000.00
Construction Administration - Well Head, Site, Electrical and Raw Water Mains	$	40,000.00
Construction Observation - Well Head, Site, Electrical and Raw Water Mains	$	90,000.00
WTP, Backwash Handling and Disposal		
Geotechnical Investigation	$	15,000.00
Engineering Design, Construction Plans and Specifications	$	900,000.00
Permitting	$	15,000.00
Bidding and Negotiation (3 Contracts)	$	40,000.00
Construction Administration	$	250,000.00
Resident Project Representation (15 months)	$	300,000.00
Operation and Maintenance Manual Preparation	$	40,000.00
Record Drawing Preparation	$	20,000.00
Administrative Costs		
Legal Costs	$	10,000.00
Land and Rights-of-Way	$	200,000.00
Permit Fees	$	10,000.00
Total	**$**	**19,798,000.00**

Table 28 Water Supply, Treatment & Disposal Alternative 1 (NF WTP) Annual Recurring Costs	
Administration and Finance:	$507,000.00
Water Supply and Treatment:	
Testing	$6,440.00
Contracted Services	$13,100.00
Chemicals	$52,528.00
Supplies and Materials	$23,700.00
Utilities	$49,500.00
Maintenance and Repair - Buildings	$2,500.00
Maintenance and Repair - Equipment	$20,700.00
Permit Fees	$2,240.00
Miscellaneous	$2,956.00
Capital Outlay - Equipment	$10,000.00
Capital Outlay - Wells/Pumps	$10,000.00
Distribution:	$58,000.00
Total Annual Expenses	**$758,664.00**

3. Computation of Estimated Future Salvage Values

Table 29
Future Salvage Value Estimations - Water Supply, Treatment & Disposal Alternative 1 (F/S WTP)

	Item	Years of Life Expectancy	Number of Units	Capital Cost Per Unit	Salvage Value
Alt. 1	PW 24" Pit Casing	40	80	$ 550.00	$ 22,000.00
	10" Production Well Casing	40	500	$ 165.00	$ 41,250.00
	10" Production Well Screen	40	140	$ 400.00	$ 28,000.00
	10" Production Well Tailpiece/Cellar	40	10	$ 385.00	$ 1,925.00
	Wellhead, Pump, Electrical and Site Improvements	20	2	$ 357,500.00	$ -
	6" PVC Raw Water Main	60	400	$ 132.00	$ 35,200.00
	6" RJDIP Raw Water Main	60	50	$ 165.00	$ 5,500.00
	10" PVC Raw Water Main	60	3,850	$ 154.00	$ 395,266.67
	10" RJDIP Raw Water Main	60	100	$ 242.00	$ 16,133.33
	Pressure Air Relief Valve and Vault	20	1	$ 11,000.00	$ -
	18" Steel Casing	60	50	$ 715.00	$ 23,833.33
	Telemetry	20	1	$ 82,500.00	$ -
	150 KVA Emergency Standby Generator	20	1	$ 220,000.00	$ -
	Site Work	40	1	$ 570,000.00	$ 285,000.00
	Water Treatment Plant	40	1	$ 1,885,000.00	$ 942,500.00
	WTP Equipment (Filters, Softeners, Face Piping, Valves, Chemical)	20	1	$ 2,775,000.00	$ -
	Brine System	20	1	$ 178,000.00	$ -
	Aeration/Detention Tank	20	1	$ 566,000.00	$ -
	Yard Piping	60	1	$ 277,000.00	$ 184,666.67
	Electrical, WTP Generator and ATS	20	1	$ 1,275,000.00	$ -
	Two (2) Geo-membrane-lined Backwash Waste Settling Basin	20	1	$ 451,000.00	$ -
	Supernatant Pump Station	20	1	$ 550,000.00	$ -
	6" PVC Force Main (SDR 21)	60	7,165	$ 121.00	$ 577,976.67
	6"RJPVC Force Main (SDR 21)	60	820	$ 132.00	$ 72,160.00
	6" DIP Force Main	60	360	$ 198.00	$ 47,520.00
	6" RJDIP Force Main	60	130	$ 308.00	$ 26,693.33
	12" Steel Casing	60	100	$ 456.50	$ 30,433.33
	6" Fusible PVC Directional Bore	60	2	$ 66,000.00	$ 88,000.00
	10" Fusible PVC Directional Bore	60	1	$ 352,000.00	$ 234,666.67
	Total Salvage Value for Water Supply, Treatment & Disposal Alternative 1 (F/S WTP) =				**$ 3,036,725.00**

Table 30
Future Salvage Value Estimations - Water Supply, Treatment & Disposal Alternative 2 (NF WTP)

	Item	Years of Life Expectancy	Number of Units	Capital Cost Per Unit	Salvage Value
Alt. 2	TW 12" Pit Casing	40	40	$ 220.00	$ 4,400.00
	PW 24" Pit Casing	40	80	$ 550.00	$ 22,000.00
	10" Production Well Casing	40	500	$ 165.00	$ 41,250.00
	10" Production Well Screen	40	140	$ 440.00	$ 30,800.00
	10" Production Well Tailpiece/Cellar	40	10	$ 385.00	$ 1,925.00
	Wellhead, Pump, Electrical and Site Improvements	20	2	$ 357,500.00	$ -
	6" PVC Raw Water Main	60	400	$ 132.00	$ 35,200.00
	6" RJDIP Raw Water Main	60	50	$ 165.00	$ 5,500.00
	10" PVC Raw Water Main	60	3,850	$ 154.00	$ 395,266.67
	10" RJDIP Raw Water Main	60	100	$ 242.00	$ 16,133.33
	Pressure Air Release Valve and Vault	20	1	$ 11,000.00	$ -
	18" Steel Casing (Jack and Bore)	60	50	$ 715.00	$ 23,833.33
	Telemetry	20	1	$ 82,500.00	$ -
	150 KVA Emergency Standby Generator	20	1	$ 220,000.00	$ -
	Site Work	40	1	$ 1,170,000.00	$ 585,000.00
	Water Treatment Plant	40	1	$ 2,180,000.00	$ 1,090,000.00
	WTP Equipment (Membrane Pumps, VFDs, Cartridge Filters, Membrane Skids,	20	1	$ 3,750,000.00	$ -
	Aerator	20	1	$ 307,000.00	$ -
	Yard Piping	60	1	$ 277,000.00	$ 184,666.67
	Electrical, WTP Generator, and ATS	20	1	$ 1,895,000.00	$ -
	SCADA & Telemetry	20	1	$ 400,000.00	$ -
	6" PVC C900 Force Main	60	7,265	$ 137.50	$ 665,958.33
	6" RJPVC C900 Force Main	60	835	$ 148.50	$ 82,665.00
	6" DIP Force Main	60	360	$ 198.00	$ 47,520.00
	6" RJDIP Force Main	60	130	$ 308.00	$ 26,693.33
	12" Steel Casing (Jack and Bore)	60	100	$ 456.50	$ 30,433.33
	200 LF 6" Fusible PVC Directional Bore	60	2	$ 66,000.00	$ 88,000.00
	700 LF 10" Fusible PVC Directional Bore	60	1	$ 352,000.00	$ 234,666.67
	Automatic Combination ARV/Vacuum Valve	20	4	$ 22,000.00	$ -
	Multiport Diffuser	40	1	$ 82,500.00	$ 41,250.00
	Total Salvage Value for Water Supply, Treatment & Disposal Alternative 2 (NF WTP) =				**$ 3,653,161.67**

4. Net Present Value of Costs Summary: In-Town WTP Alternatives

Table 31 Net Present Value of Costs Analysis Water Supply, Treatment & Disposal Alternatives			
Discount rate (r) =	5.50%	The "real" discount rate is used from Appendix C of OMB circular A-94: http://www.whitehouse.gov/omb/circulars_a094/a94_appx-c	
Number of Years (n)=	20	The planning period is 20 years.	
		Alternative 1	Alternative 2
Initial Capital Costs (Co)=		$ 18,228,000.00	$ 19,798,000.00
Annual Recurring Costs (C) =		$ 696,600.00	$758,664.00
Future Salvage Value (S) =		$ 3,036,725.00	$ 3,653,161.67
Present Value of (n) years of Annual Recurring Costs = [PV=((C)*(1+r)^(n)-1)/r*(1+r)^n]		$ 8,324,636.44	$ 9,066,324.98
Present Value of (n) year Future Salvage Value = [PW=(S)/(1+i)^n]		$ 1,040,773.61	$ 1,252,044.31
Present Value = [PV=(Co)+PV(C)+PV(S)]		**$ 25,511,862.83**	**$ 27,612,280.67**

Based on the Net Present Value of Costs Analysis summarized in Table 31 above, the Filter Softener Water Supply, Treatment and Disposal Alternate is more cost effective than the Nanofiltration alternative over the 20-year planning period. The Net Present Value of Costs for the Alternative 1 – F/S WTP is $25,511,864 which is approximately 92% of the Present Value of Costs for Alternative 2 – NF WTP. As such, the F/S WTP alternative is considered to be the most economical of the technologically feasible in-town water supply alternatives.

B. Non-Monetary Factors

Although, Alternative 1 – F/S WTP appears to be more cost-effective than Alternative 2 – NF WTP, complete and thorough evaluation includes considerations other than cost alone. A decision matrix is often utilized to comparatively score various non-monetary parameters for each alternative to assist in forming the basis for recommendations. Parameters impacting the selection of the preferred option for the water system could also include factors such as the following :

- sustainability (future availability and quality) of the raw water supply,
- treatability to primary and secondary drinking water standards,
- residual waste treatment and disposal requirements/NPDES discharge permitting capability
- disinfection byproducts requirements
- land requirements
- vulnerability due to test well/pilot plant/dilution study results
- environmental and permitting concerns
- ease of operations

Each of these parameters was assigned a rating from 1 – 9, which represents least to most favorable. A value of 5 is neutral while values of 1 and 9 represent highly unfavorable and highly favorable scores, respectively.

A. Aquifer Sustainability:

In developing a new water supply for the Town of River Bend, the primary concern is locating a sustainable and abundant supply of good quality ground water that is sufficient for treatment. Based on the preliminary evaluation conducted by Groundwater Management Associates, the Lower Castle Hayne Aquifer/Comfort Member appears to offer a more secure long-term water supply than the current Upper Castle Hayne/River Bend Strata or any of the other groundwater-supply sources considered in the River Bend area. This area is located a sufficient distance from the salt water transition zone so that salt water intrusion is not anticipated to be a concern in the foreseeable future. In addition, the LCHA is less susceptible to surficial contamination due to its increased depth from the ground surface as compared to the UCHA. The greater depth provides the added benefit of greater drawdown capability which increases the potential capacity from a given well. The LCHA is a prolific aquifer in the area of River Bend, and is currently utilized by the neighboring City of New Bern to the north and Jones County to the south. It is not believed that brackish water encroachment will be a concern for the UCHA in the River Bend vicinity for many decades into the future. However, testing of the underlying Beaufort Aquifer should be integrated into the Test Well program as previously described in order to provide additional data for confirmation.

Siting and installation of new groundwater wells will require proper approvals and permitting from NCDEQ DWR Public Water Supply Section, as well as the Groundwater Resources

Section; however, this is not considered to be an onerous path, and unusual hurdles are not anticipated.

1. Filter/Softener WTP:

The Greensand Filtration/Zeolite Softening treatment process and the Nanofiltration treatment process are both capable of treating LCHA/Comfort Member groundwater. However, the Greensand Filtration/Zeolite Softening WTP process consumes less raw water than the Nanofiltration WTP process to produce the same quantity of finished water. Given this, Greensand Filtration/Zeolite Softening scores slightly higher at an 8.

2. Nanofiltration WTP:

Since the Nanofiltration treatment process consumes a greater quantity of LCHA/Comfort Member groundwater, the Nanofiltration process scores slightly lower than the Greensand Filtration/Zeolite Softening WTP alternative with a 7.

B. Treatability:

With regard to treatability, two (2) distinct water treatment processes have been evaluated including associated system improvements. The associated system improvements include: (1) additional groundwater-supply wells; (2) new transmission mains to transport raw water to the WTP; and (3) waste handling facilities and force mains to convey treated waste effluent to the discharge location.

1. Filter/Softener WTP:

The first treatment alternative considered is construction of a new 0.95 MGD WTP utilizing pressure filtration and ion exchange softening. Pressure filter and zeolite softener treatment technology is a proven and reliable method for removal of minerals and hardness. A drawback to this treatment process is its inability to remove organic precursors that form disinfection byproducts (DBP) following contact with chlorine. Two alternates that can be incorporated into a Filter/Softener WTP design are (1) the use of chloramines for the residual disinfectant, or (2) the addition of anionic resin pressure vessels for total organic carbon reduction. Transition from the existing chlorine disinfection system to chloramines disinfection is the most cost-effective of these options, and is included with the Filter/Softener cost estimate previously presented. Chloramines disinfection involves the addition of chlorine followed by ammonia to form a very stable disinfectant with a longer effective life that helps to curtail the formation of DBPs.

The F/S alternative including chloramines disinfection scores an 8 as a tried and tested treatment method commonly utilized in the region.

2. Nanofiltration WTP:

The second treatment alternative considered is construction of the 0.95 MGD utilizing nanofiltration membrane technology. Benefits associated with the nanofiltration treatment process include (1) elimination of the chlorides backwash since softener regeneration is not required, and (2) organics and hardness are removed, eliminating the issues associated with disinfection byproducts. Although chlorides are eliminated from the waste concentrate stream, that may be considered detrimental as the fresh concentrate stream could be introduced into brackish receiving waters.

A concern related to nanofiltration is the substantive cost associated with pre-treatment if iron concentrations are higher than anticipated. The iron concentration in the Lower Castle Hayne Aquifer/Comfort Member can be quite variable depending on location. Until specific water quality testing is conducted from a test well sample drawn from the Lower Castle Hayne Aquifer, the specific iron concentration is unknown. If the iron concentration is elevated, then iron filters may be required in advance of the nanofiltration membranes which can add significant cost to this alternative. The concentration of iron in River Bend's existing Upper Castle Hayne/River Bend Strata wells is fairly low. In addition, the iron concentration in the Jones County Lower Castle Hayne/Comfort Member wells is quite low. Given this information, we anticipate that the iron concentration in new LCHA wells for River Bend will not require iron filter pretreatment, and that a standard cartridge filter will be acceptable. The cost of iron pre-filters is not included in the nanofiltration cost estimates, as we anticipate that they will not be required. However, this cannot be known for certain until test well construction, sampling and testing are complete.

The NF alternative also scores an 8 due to its ability to remove iron, DBP organic precursors, and hardness albeit while discharging fresh concentrate to a brackish receiving water.

C. Residual Waste Treatment and Disposal/NPDES Permitting:

1. Filter/Softener WTP:

The F/S WTP is anticipated to generate precipitated iron and manganese from filter backwash and chlorides from softener regeneration. The backwash waste treatment system will consist of dual geomembrane lined settling basins, associated supernatant pump station, effluent force main, and NPDES permitted discharge.

Three (3) discharge options have been previously discussed:

- Short-term discharge to the existing sanitary sewer system,
- Discharge to Plantation Canal,
- Discharge to a common WTP/WWTP diffuser into the Trent River.

The optimal long-term solution, and most expensive, that is believed to have the most favorable opportunity for permitting is the common WTP/WWTP outfall and diffuser into the Trent River. This places the WTP discharge into a larger brackish waterbody where

dilution of waste constituents can be achieved via a regulatory mixing zone comprising a relatively small footprint. Permitting further downstream in a large waterbody is typically perceived more favorably by the NPDES Unit. An Engineering Alternatives Analysis, CORMIX dilution model and application will be required to confirm proper dilution of the most limiting waste constituent to gain approval for the increased discharge flow.

It might be possible to obtain a discharge permit into Plantation Canal; however, further investment would be required by the Town to gain greater certainty. As a minimum, the Town would need to request speculative limits from the NCDEQ NPDES Unit, potentially followed by preparation of an Engineering Alternatives Analysis, CORMIX dilution modeling, and permit application. This location would appear superior to the currently permitted discharge locations for the existing WTPs since they are both tributary to Plantation Canal in smaller water bodies. However, Plantation Canal would likely be ruled out as a viable alternative if the NPDES Unit required dilution modeling due to its limited flushing capability.

Connection to the existing sanitary sewer system could be considered a short-term solution if insufficient funds are available to pursue one of the other alternatives. There are disadvantages over the long-term related to available WWTP capacity, potential degradation of WWTP infrastructure, and potential impact to the activated sludge process. This is the least expensive of the readily available options, but would require the Town give up the current NPDES discharge permit without a new discharge permit in place.

The F/S alternative scores a favorable 6 because a new NPDES permit can likely be obtained, albeit, the specific location is not yet known.

2. Nanofiltration WTP:

The reject stream from the NF WTP will consist of concentrated groundwater. The NF waste concentrate, however, will be freshwater since the raw water is fresh and no brine regenerant is required with softening membranes. The waste discharge capacity of the NF WTP is approximately twice the amount as that of the F/S WTP. The membrane feed pumps would be sized to provide sufficient total dynamic head to drive the concentrate water from the membrane skids to the discharge location without the requirement for further treatment or intermediate pumping. Handling of the concentrate would consist of an effluent force main with discharge to one of the potential NPDES permitted locations described above. An Engineering Alternatives Analysis, CORMIX dilution model and application will be required to reflect proper dilution of the most limiting waste constituent to gain approval for the increased discharge flow.

The NF alternative scores a 5 given that freshwater will ultimately discharge into the brackish receiving waters of the Trent River which could present an additional challenge to gaining proper dilution and a permit.

D. Disinfection Byproducts Requirements:

1. Filter/Softener WTP:

A conventional F/S WTP does not incorporate the capability to remove organic precursors that are typically present in the raw water supply of the Lower Castle Hayne Aquifer. In the presence of chlorine, organics present in the raw water can form disinfection byproducts (DBPs) such as Trihalomethanes and Haloacetic Acid. Formation of these DBPs becomes problematic when their concentrations exceed the regulatory thresholds. Chloramines is a proven disinfection technology, and it is the alternate that is recommended for incorporation into the Filter/Softener WTP design to reduce DBP production. Chloramination is used locally in the City of New Bern which draws from the LCHA and also utilizes the F/S treatment process. Chloramination is a relatively inexpensive addition to the treatment system. It has the capability to successfully control DBPs, but can increase operational complexity and require greater attention to detail than membrane WTP options.

The chloramine disinfection option for the F/S alternative scores a 7 since it is a proven method that can effectively control disinfection byproducts within the distribution system.

2. Nanofiltration WTP:

Nanofiltration membranes have a small enough pore space to remove organics from the raw water. As such, formation of DBPs is not a concern, and chlorine can continue to be utilized as the primary and residual disinfectant. Relative to DBP concerns, the NF WTP alternative receives a highly favorable score of 9.

E. Land Requirements:

1. Filter/Softener WTP:

For this alternative, the new WTP will be located on the site recently purchased by the Town of River Bend located immediately west of the John R. Kirkland Public Works Facility and the 300,000-gal Elevated Storage Tank.

A preliminary evaluation, including environmental and permitting considerations for the proposed WTP site, were discussed in the Land Acquisition Site Evaluation Report (LASER) included as *Appendix K*. The assessment indicated the 4.5-acre site was suitable to accommodate development of a new Water Treatment Plant for the Town of River Bend. In addition, the site appeared to accommodate the expected requirements for the WTP based on the preliminary size, layout and data that was available. As with any site to be considered for development of a municipal WTP, there were positive, negative and neutral characteristics and considerations.

The following were considered to be positive characteristics and considerations for the property under consideration:

- site location and accessibility are favorable relative to other municipal facilities, utility and roadway infrastructure,
- no previous development or site contamination is apparent on or near the property,
- zoning/setback requirements do not appear to be problematic.
- topographic relief is favorable for site drainage,
- the site is not subject to flooding,
- there is no critical habitat designated within the property for endangered or threatened species.

Alternately, the following were considered to be negative characteristics /considerations:

- site clearing and grubbing will be required to accommodate development,
- approximately a foot of soil will likely need to be replaced due to clearing and grubbing operations.

Finally, neutral characteristics and considerations included the following items:

- near surface soils appear acceptable for construction although an additional geotechnical investigation is required for foundation design purposes,
- a small quantity of wetlands exists on the site, but can be accommodated through regulatory permitting processes,
- the stream is not considered to be jurisdictional which eliminates a potential 50-feet buffer; however, confirmation is required.

On the whole, the positive and neutral aspects for development of this site were considered to outweigh the negative, which were somewhat minimal. As such, the 4.5-acre parcel was subsequently purchased by the Town of River Bend with the approval of NCDEQ DWI following submittal of the LASER and Phase I Environmental Assessment.

This site is ideally located for further development of a new wellfield. Two (2) additional well sites will be required; however, the proposed locations are on properties already owned by the Town. In addition, a number of easements may be required to allow installation of raw water transmission mains, as well as a treated waste effluent force main and discharge. The F/S alternative and associated treatment requirements score a 7 as favorable.

2. Nanofiltration WTP:

The Nanofiltration alternative can also make use of the same 4.5 acre site already owned by the Town, as well as the two (2) proposed well sites. Similar effort will be required to obtain easements for the raw water transmission mains, waste concentrate force main, and effluent discharge. The NF alternative also scores a favorable 7.

F. Study Vulnerabilities:

The well, treatment and waste disposal alternatives require additional testing and permitting prior to detailed planning, design and implementation. Significant efforts are required to perform test well studies, pilot plant treatability studies, and CORMIX dilution modeling

studies to validate recommendations and determine design parameters. As such some of the treatment alternatives are more susceptible to modifications than others. Such modifications that could impact the viability and cost of the alternative.

1. Filter Softener WTP:

The Filter Softener alternative to a large degree is proven. It is being utilized successfully to treat groundwater from the same aquifer in the City of New Bern and Jones County. However, a test well will be required to confirm the water quantity and quality, which will drive the final number and location of wells, raw water mains, pump sizes, etc. Likewise, a CORMIX dilution model study will drive decisions regarding acceptability of a discharge location and force main routing for a NPDES discharge permit. There is more data available currently regarding the F/S alternative than any other alternative; however, disinfection byproducts requirements remain with this alternative. Given the track record and available data for this alternative, it receives a score of 8.

2. Nanofiltration WTP:

The Nanofiltration alternative introduces greater uncertainty than the F/S option. Not only are the test well studies and CORMIX dilution modeling required, but a pilot plant study will also be required to confirm the expected performance and design parameters associated with the NF membranes. The NF alternative receives a less favorable score of 4 due to the decreased certainties that exist prior to the performance of pilot studies.

G. Environmental/Permitting Concerns:

1. Filter Softener WTP:

Development of this alternative results in a project that is somewhat similar to the existing River Bend WTPs except that softening will be incorporated. WTP capacity will be limited to the total existing capacity of the two (2) existing WTPs. New well sites and transmission improvements will be required, and a treated waste effluent force main will need to be extended to a NPDES permitted discharge location. The following permits are anticipated:

- USACE Nationwide 58 Permit
- 401 Water Quality Certification – NCDEQ DEMLR,
- Approval of Plans and Specifications – NCDEQ DWR PWSS,
- Erosion and Sedimentation Control Permit – NCDEQ DEMLR,
- State Stormwater Permit – NCDEQ DEMLR,
- Compliance with Neuse River Riparian Buffer Rules – NCDEQ DWR
- CAMA General Permit – NCDEQ DCM,
- Sewer Extension Permit – NCDEQ DWR
- NPDES Discharge Permit – NCDEQ DWR NPDES,
- NCDEQ DWR Authorization to Construct

Environmental issues or concerns will have to be addressed as they arise during the design and permitting process; however, none are anticipated that are considered insurmountable. This alternative is scored a 6 relative to environmental concerns.

2. Nanofiltration WTP:

From an environmental and permitting perspective, the Nanofiltration alternative is practically identical to the F/S alternative. As such, environmental concerns are very similar. However, the NF alternative will produce a greater volume of fresh waste concentrate which may not be perceived as favorable for discharge into the brackish receiving waters of the Trent River. The NF alternative receives a neutral score of 5.

H. Ease of Operation:

1. Filter Softener WTP:

The Filter Softener WTP is a very common type of water treatment technology which is similar in many ways to the Town's current pressure filter WTPs. A softening process will be incorporated, and chloramines disinfection will likely be required. Although the chloramines modification is commonly utilized for residual disinfection in many eastern North Carolina water systems, it is less forgiving than chlorine disinfection. It requires diligence to ensure that sufficient chloramine residual is present in the distal portions of the distribution system to ensure that nitrification does not occur. A system "burn out" is performed on an annual basis for a several week period. This requires conversion to chlorine disinfection and performing systemwide flushing to ensure that nitrification does not gain a foothold in the distribution system; however, for a Town of the size of River Bend, this modification should not be daunting to operate. River Bend has operational staff who are familiar with operations of a similar type plant. As such, the F/S alternative is scored as a neutral 5.

2. Nanofiltration WTP:

Membrane treatment plants are generally recognized to be easier operationally than F/S WTPs. However, the River Bend operators are not familiar with the operations of this type WTP. As such, this option is scored as a 4.

I. Social Impact:

All of the water customers in River Bend stand to benefit from any of the treatment improvements alternatives selected. However, there will always be individuals and/or communities who are more or less directly or indirectly impacted by development of a new water treatment plant.

1. Filter Softener WTP:

The F/S WTP alternative usually incorporates a forced draft aerator as an initial step toward reducing hydrogen sulfide and precipitating soluble iron and manganese in the raw water.

At times, depending on the concentration of hydrogen sulfide in the groundwater, mild odors can emanate from the WTP site. Additionally, the F/S WTP requires treatment of the filter backwash and softener regeneration waste prior to discharging the effluent supernatant. The treatment involves dual geomembrane lined settling ponds to promote a quiescent environment to encourage precipitated iron and manganese to settle out. At times, these ponds may be referred to as lagoons which can have a poor connotation relative to odor, i.e. hog lagoon. However, there is no odor associated with a backwash waste holding pond. There are existing residential homes located in the near vicinity of the proposed WTP site, and there are likely to be more constructed in the future. Misinformation or a lack of complete understanding can sometimes lead to opposition of WTP construction near one's residence. Similarly, at times, objections might be raised by local homeowners or residents to the location of the effluent supernatant discharge from the WTP. However, these discharges are regulated via NPDES permit to minimize impact to receiving waters and aquatic life. In general, the F/S WTP is a quiet, nonobtrusive workhorse that receives a favorable score of 6 for social impact.

2. Nanofiltration WTP:

The Nanofiltration WTP could be slightly better received than the F/S WTP option since it includes an odor control system to augment the hydrogen sulfide stripping tower. In addition, there is no additional treatment step required for the soluble waste concentrate. The NF WTP alternative would still contend with potential objections related to its NPDES permitted discharge. On the whole, it receives a slightly more favorable score of 7.

J. Non-monetary Factor Summary:

Greensand filtration with ion exchange softening is a long-standing and proven groundwater treatment technology that has a significant history and continued presence in eastern North Carolina. It is being utilized successfully for the Lower Castle Hayne Aquifer/Comfort Member just a few miles north and south of River Bend along Hwy 17 BUS in the City of New Bern and Jones County. A high level of confidence exists regarding its successful use for the Town of River Bend.

Nanofiltration and other similar membrane treatment processes are becoming much more common in eastern North Carolina, and are quite operator friendly. Due to the increased cost of membrane systems they are typically utilized in areas where the groundwater is brackish or may transition due to saltwater intrusion. Reverse Osmosis membrane systems are utilized for brackish and salty groundwater, while nanofiltration systems are more likely to be utilized for fresh groundwater supplies that might experience future salt water intrusion. Nanofiltration is successfully utilized by the Craven County Water Department on the east side of the County where the Middle Castle Hayne Aquifer/Spring Garden Member is more susceptible to brackish water intrusion.

Environmental and permitting considerations for the proposed WTP site are practically identical to those discussed for the Filter/Softener WTP alternative.

The following are considered to be positive characteristics and considerations for nanofiltration treatment process:

- nanofiltration plants are becoming more common,
- no unique or unusual permitting requirements,
- less expensive cartridge filters can be utilized in lieu of iron filters when raw water iron concentrations are low,
- nanofiltration membranes provide softening without the need for brine regenerant as hardness ions are removed from the permeate,
- contaminants within the concentrate stream are kept in solution for final disposal and no additional waste treatment is required.

Alternately, the following are considered to be negative characteristics /considerations:

- more expensive iron filters are required for pretreatment when raw water concentrations are high,
- the cost to design and construct a nanofiltration plant is greater than a comparably sized filter/softener plant,
- electrical costs tend to be greater due to the high pressure required to drive the permeate flux across the membranes.

For the River Bend WTP, there are no overriding concerns associated with the nanofiltration process. Nanofiltration, rather, is not considered as favorable as the Filter/Softener process due to the expected availability of the fresh groundwater supply from the Lower Castle Hayne Aquifer/Comfort Member that does not appear jeopardized in the near-term by saltwater intrusion. Additionally, the nanofiltration process is more expensive than the Filter/Softener process.

K. Decision Matrix:

Table 32 is a composite decision matrix that summarizes and compares the relative favorability of each alternative based on the parameters described above. The decision matrix is a useful tool in providing an objective recommendation.

Table 32 Decision Matrix for In-Town Water Supply, Treatment and Disposal Alternatives		
Parameter	Alt. 1 - F/S	Alt 2. - NF
Sustainability (Aquifer)	8	7
Treatability	8	8
Residual Waste Disposal/NPDES Permitting	6	5
DBP concerns	7	9
Land Requirements	7	7
Study Vulnerabilities	8	4
Environmental/Permitting Concerns	6	5
Operational Ease	5	4
Social Impact	6	7
Cost of Implementation	5	4
Total	66	60

Based upon the results of this decision matrix, the Filter/Softener WTP alternative received the highest and most favorable score. In addition, it is the more affordable alternative based on the Present Value of Costs Analysis. If River Bend chooses to move forward with design, permitting and construction of a new in-town WTP, the recommended long-term water supply alternative is to design and construct a single new Filter/Softener WTP as described in Tables 23, 24 and 25 above. This alternative includes construction of a new Lower Castle Hayne Aquifer wellfield with raw water transmission mains to supply the new WTP site. Filter backwash and softener regeneration waste would be treated in dual geomembrane-lined settling basins with a supernatant pump station and force main to discharge into a combined WTP/WWTP multiport diffuser in the Trent River.

If the Town is unable to secure sufficient funding for all portions of this alternative, the Town could realize some savings by rehabilitating the existing Upper Castle Hayne Aquifer wells and installing raw water mains to the new WTP site. Similarly, the Town as a short-term solution could discharge the treated backwash and softener regeneration waste to the existing sanitary sewer collection system to combine with the existing treated WWTP discharge to the Trent River.

VII. BULK WATER ALTERNATIVES & TRANSMISSION REQUIREMENTS

Other water supply alternatives could also be available to the Town of River Bend beyond the in-town WTP options evaluated above. Specifically, this includes purchasing potable drinking water in bulk from a neighboring system. Several public water systems are located in near proximity to the Town of River Bend. These include the City of New Bern, Jones County Regional Water System and Craven County Water Department.

This section of the Water Supply Study includes a User Rate Impact Analysis to compare user charge requirements for the In-Town WTP alternatives against a Bulk Water Supply Alternative. The evaluation was conducted on an "equivalent user" basis to convert commercial and institutional users to equivalent residential users. Table 33 indicates that the Town's 1,497 actual residential, commercial and institutional customers equate to approximately 1,816 equivalent residential users.

Table 33
Town of River Bend
Equivalent Number of Residential Customers

Objective: Determine the equivalent number of residential customers based on total consumption from all uses.

Type of Use *	No. Customers *	Total Metered Average Use (MGD) *	Metered Average Use per Customer (gpd)	Equivalent No. of Residential Customers	Total No. of Equivalent Residential Users at 96 gpd/user
Residential	1483	0.1426	96	1483	1483
Commercial	13	0.02	1538	16	208
Institutional	1	0.012	12000	125	125
Total Number of Equivalent Residential Customers =					1816

* Data from River Bend 2023 Local Water Supply Plan

A. Town of River Bend Residual User Charge Rate Requirements

If the Town purchases water in bulk from a neighboring water system, a portion of the Town's recurring costs associated with water supply and treatment will no longer be required. However, the Town will still need to continue operating its water distribution system. As such, the Town will continue to incur costs associated with administration and operations of the water storage and distribution systems. Table 34 includes an evaluation and summary of the Town's budget to estimate the existing administrative and operational costs that are required even if their wells and water treatment plant are replaced by purchasing from a bulk water provider. The evaluation indicates that approximately 91% of the overall expenses associated with operating the water distribution system will still be required.

Table 34
Water Fund
Town of River Bend
Based on 2024-25 Actual Budget

Objective: Estimate how much of the current Water Fund Budget is still required to cover expenses if the Town ceased operating their own WTP.

Item No.	Account Activity	Current Budget	Estimated Percent Reduction if No WTP *	Estimated Budget if No WTP	
Administration and Finance		**$507,000**	0%	**$507,000**	
Water Supply and Treatment					
398	Testing	$9,200	90%	$920	
399	Contracted Services	$6,550	90%	$655	
298	Chemicals	$13,132	90%	$1,313	
299	Supplies & Materials	$15,800	90%	$1,580	
330	Utilities	$11,000	90%	$1,100	
351	Maintenance & Repair - Buildings	$2,500	90%	$250	
352	Maintenance & Repair - Equipment	$4,600	90%	$460	
430	Building & Equipment Rental	$0	100%	$0	
496	Permit Fees	$2,240	50%	$1,120	
499	Miscellaneous	$1,478	0%	$1,478	
550	Capital Outlay - Equipment	$0	100%	$0	
580	Capital Outlay - Grounds & Buildings	$2,500	100%	$0	
595	Capital Outlay - Wells/Pumps	$0	100%	$0	
	SUBTOTAL	**$69,000**		**$8,876**	
Distribution		**$58,000**	0%	**$58,000**	
	TOTAL BUDGET	**$634,000**		**$573,876**	**90.52%**
					Use 91%

Approximately 91 percent of the current Water Fund budget is still required if the Town no longer operated their own WTP.

As such, approximately 91% of the revenue generated by the current water rates will still be required. Based on the size of the current customer base, current average water sales and current average collections rate, the average monthly water bill per customer would be $25.08 per Table 35.

Table 35
Estimated Theoretical Water Rates - No Water Treatment Plant
Town of River Bend

Objective: Determine theoretical water rates if River Bend ceased operating their own WTP.

Current Consumption =				174,600	gpd (metered sales)	
Equivalent No. of Residential Customers =				1,816		
Average Consumption/day/equivalent customer =				96	gpd/equivalent customer	
Average Consumption/year/equivalent customer =				35,040	gal/year/equivalent customer	
Average Consumption/mo/equivalent customer =				2920	gal/mo/equivalent customer	
Revenue Generated from Current Rates:						
	Base Charge =	$15.24		$15.24		
	Water Rate =	$4.22	/kgal (0 - 4,000 gal)	$12.32		
		$4.50	/kgal (4,001 - 20,000 gal)			
				$27.56	/mo/equivalent customer	
Estimated Total Revenue Generated =				$600,639.82	(based on 100% utility bill collections)	
River Bend Average Utility Bill Collections Rate =				88%		
Estimated Total Revenue Collected =				**$528,563.04**		
Water Fund 2024-25 Budget: Total Revenue Required =				$654,000.00		
Water Fund 2024-25 Budget: Total Revenue Required from Utility Usage Charges =				**$518,268.00**		
Estimated Total Revenue Collected Exceeds Total Revenue Required from Utility Charges, i.e.:				**$528,563.04**	**>**	**$518,268.00**
If River Bend ceased operating their own WTP, rates could theoretically be reduced to 91% of current, i.e.:						
	Base Charge =	$13.87		$13.87	91.00%	of current rate
	Water Rate =	$3.84	/kgal (0 - 4,000 gal)	$11.21	91.00%	of current rate
		$4.10	/kgal (4,001 - 20,000 gal)			
				$25.08	/mo/equivalent customer	
Estimated Total Revenue Generated at Reduced Rates =				**$546,604.38**		
River Bend Average Utility Bill Collections Rate =				88%		
Estimated Total Revenue Collected at Reduced Rates=				**$481,011.85**		
Water Fund 2024-25 Budget: Total Revenue Required from Utility Usage Charges =				**$518,268.00**		
Approximately 91% of current budgeted revenue is needed if the Town did not operate their own WTP.				91%		
Total Revenue Required from Utility Usage Charges =				**$471,623.88**		
				$481,011.85	**>**	**$471,623.88**

If the Town of River Bend no longer operated a WTP, water rates are estimated to be reduced to 91% of current to approximately $25.08/month/equivalent residential user.

In addition to the costs required to continue operating the Town's distribution system, the Town's user rates will be increased by the cost to purchase water in bulk, as well as any capital

improvements required to fund transmission improvements between the bulk supplier's system and the Town of River Bend.

B. City of New Bern

An alternate to designing and constructing a new water treatment facility for the Town of River Bend is to consider purchasing bulk treated water supplied by the City of New Bern. The City's WTP produces a high-quality drinking water, and its distribution system includes an 8" water main that extends along US Hwy 17 BUS past the River Bend corporate limits, as well as another 8" water main that extends somewhat parallel along Rocky Run Road.

The City of New Bern is currently working toward design and installation of transmission and elevated water tank improvements to serve the western side of their service area. This western loop and elevated tank will connect from the US Hwy 70/NC Hwy 43 Interchange to the Trent Creek Road/ Bus Hwy 17 intersection. Installation of these water system improvements is expected to be complete within the next two years. Those improvements will improve the capability for New Bern to supply a community like River Bend.

1. Emergency Interconnect

Based on preliminary hydraulic evaluation, the existing 8" water mains, including the New Bern western elevated storage tank and transmission improvements, appear capable of supplying the current average day demand with reduced pressures, but insufficient to supply the current maximum day demand and fire flow. As such, interconnection with the City of New Bern's water system could be an asset to the Town of River Bend for purposes of an emergency interconnection, but not as a long-term water supply source unless additional transmission improvements are made.

The City of New Bern has previously indicated a willingness to allow an emergency interconnect between the two (2) independent systems. *{See Appendix P - Emergency Interconnect Plan and Agreement.}*

The total estimated project cost for an emergency interconnect is $499,000.00 as indicated in Tables 36 and 37 below:

Table 36 Emergency Interconnect with City of New Bern Estimated Capital Costs for Construction				
Item Description	**Quantity**	**Unit**	**Unit Cost**	**Extended Cost**
Mobilization and Bonding	1	LS	$12,500.00	$12,200.00
6" Compound Meter Station w/ Associated Piping, Valves, etc.	1	LS	$154,000.00	$154,000.00
Clearing and Site Work	1	LS	$11,000.00	$11,000.00
6" PVC Water Main	520	LF	$125.00	$65,000.00
8" PVC Water Main	400	LF	$135.00	$54,000.00
8" RJDIP Raw Water Main	60	LF	$200.00	$12,000.00
6" Gate Valve w/ Box	3	EA	$3,300.00	$9,900.00
8" Gate Valve w/ Box	1	EA	$3,800.00	$3,800.00
8" Tapping Tee and Valve w/ Box	1	EA	$15,750.00	$15,750.00
Additional Ductile Iron Fittings	2,000	LB	$22.00	$44,000.00
Thrust Collar	2	EA	$5,200.00	$10,400.00
Asphalt Pavement Replacement	30	LF	$220.00	$6,600.00
Silt Fence	100	LF	$11.00	$1,100.00
Rock Silt Check Dam	2	EA	$440.00	$880.00
Electrical Service Entrance	1	EA	$11,000.00	$11,000.00
Testing Allowance	1	LS	$5,500.00	$5,500.00
Sub-total				**$417,130.00**
Contingency @ (10%)				$41,870.00
Total Estimated Construction Cost				**$459,000.00**

Table 37 Emergency Interconnect with City of New Bern Total Estimated Capital Costs for Project		
Total Estimated Construction Cost	$	459,000.00
*Engineering Services***		
Boundary/Topgraphic Site/Route Survey	$	10,000.00
Design and Permitting	$	15,000.00
Informal Bidding	$	5,000.00
Construction Administration/Part-time Inspection	$	10,000.00
Total	**$**	**499,000.00**

2. Bulk Water Supply User Charge

Jordan Hughes, City of New Bern Public Utilities Director, was approached to determine the feasibility, willingness and preliminary estimate of costs to supply drinking water to the Town. The City of New Bern certainly has the available capacity to serve the Town of River Bend, and Mr. Hughes believes that the City would be very willing to serve as a bulk supplier to sell water to the Town. Mr. Hughes has indicated that a reasonable preliminary estimate of the charges would be no greater than 150% of the current "In-City" water rates. For the purposes of this evaluation, 150% will be utilized for preliminary estimates.

The average daily consumption based on the Town's 2023 LWSP is approximately 174,600 gpd based on 1,816 "equivalent user" customers. This equates to approximately 96 gpd/customer.

The City of New Bern's current Water Rates schedule is attached as *Appendix Q*. The following rates are applicable for customers located inside the City of New Bern:

Readiness to Serve Charge – 6" Water Meter = $1,210.23
Consumptive Charge = $3.103 per 1,000 gallons (under 10,000 gallons)
Consumptive Charge = $4.09 per 1,000 gallons (over 10,000 gallons)

On this basis, the estimated average monthly water bill per equivalent user at current average day consumption equals $18.67 computed as indicated in Table 36.

Table 38
Estimate Bulk Water Charge - City of New Bern

Objective: Estimate Bulk Water Charge per residential equivalent user if River Bend purchased bulk water from the City of New Bern.

Current Consumption =	174,600	gpd (metered sales)
Equivalent No. of Residential Customers =	1,816	
Average Consumption/day/equivalent customer =	96	gpd/equivalent customer
Average Consumption/year/equivalent customer =	35,040	gal/year/equivalent customer
Average Consumption/mo/equivalent customer =	2920	gal/mo/equivalent customer
Bulk Water Charge - New Bern:		
Readiness to Serve (6" Master Meter) = ($1,210.23 x 1.50) x 12/365	$59.68	/day
Consumptive Charge (First 10,000 gallons) = $3.03 x 1.50 x 10 =	$45.45	/day
Consumptive Charge Over 10,000 gallons) = $4.09 x 1.50 x 164.6 =	$1,009.82	/day
	$1,114.95	/day
	$18.67	/mo/equivalent customer

The estimated average monthly charge per equivalent user to purchase bulk water from the City of New Bern is $18.67.

This estimated cost excludes debt service for any required transmission and interconnection capital improvements and other required distribution system operation, maintenance and debt costs.

In order for the City to serve as a reliable source of water supply to River Bend, transmission and interconnection requirements must also be considered. In order to provide a comparable future water supply solution, an interconnect with the City of New Bern would need to supply a future maximum day demand in River Bend equal to 0.95 MGD. Preliminary hydraulic modelling indicates that the extension of a large diameter transmission main from the Trent Creek Road/Bus Hwy 17 intersection to the River Bend 100,000-gallon elevated storage tank is incapable of meeting future maximum day demand and fire flow conditions at appropriate residual pressures. As such, a booster pump station and transmission main would likely be required between the City's new western elevated storage tank to the River Bend elevated tank. *{See Appendix R.}* Unless the Town of River Bend is willing to pay for these improvements to the New Bern and River Bend water systems through fund balance or grant funds, additional debt service would be generated to repay a new loan to cover the costs of these capital improvements. The cost for this additional debt service would also increase the user rates for River Bend customers.

The estimated project cost for required transmission improvements to interconnect the Town of River Bend's water system to the City of New Bern as a permanent bulk water supplier is estimated at $5,113,000 as indicated in Tables 39 and 40 below:

Table 39
Bulk Water Supply Interconnect with City of New Bern
Estimated Capital Costs for Construction

Item Description	Quantity	Unit	Unit Cost	Extended Cost
Mobilization and Bonding	1	LS	$109,000.00	$109,000.00
Packaged Booster Pump Station	1	LS	$528,000.00	$528,000.00
Booster Pump Station Generator & Electrical	1	LS	$368,500.00	$368,500.00
SCADA and Telemetry	1	LS	$82,500.00	$82,500.00
Site Work	1	LS	$149,050.00	$149,050.00
6" Compound Meter Station w/ Associated Piping, Valves, etc.	1	LS	$154,000.00	$154,000.00
10" PVC C900 Water Main	9,245	LF	$143.00	$1,322,035.00
10" RJPVC C900 Water Main	1,030	LF	$220.00	$226,600.00
10" DIP Water Main	180	LF	$198.00	$35,640.00
10" RJDIP Water Main	45	LF	$308.00	$13,860.00
10" Gate Valve w/ Box	5	EA	$7,700.00	$38,500.00
18" Steel Casing (Jack and Bore)	65	LF	$715.00	$46,475.00
400 LF 10" Fusible PVC Bore Under US 17 BUS	1	LS	$200,200.00	$200,200.00
Tap and Tie-in to Existing 8" Water Main	2	EA	$11,000.00	$22,000.00
Tap and Tie-in to Existing 10" Water Main	1	EA	$13,200.00	$13,200.00
Asphalt Pavement Removal and Replacement	120	LF	$220.00	$26,400.00
Gravel Drive Removal and Replacement	325	LF	$38.50	$12,512.50
Asphalt Drive Removal and Replacement	330	LF	$110.00	$36,300.00
Concrete Drive Removal and Replacement	360	LF	$165.00	$59,400.00
Concrete Curb & Gutter Removal and Replacement	50	LF	$132.00	$6,600.00
Decorative Brick Wall Removal and Replacement	4	EA	$4,400.00	$17,600.00
Replace RCP Under Driveway	46	EA	$1,100.00	$50,600.00
Manual Air Release Valve and Vault	5	EA	$6,600.00	$33,000.00
Seeding and Mulching	1.5	AC	$2,750.00	$4,125.00
Additional Ductile Iron Fittings	5,700	LB	$22.00	$125,400.00
Silt Fence	1,200	LF	$11.00	$13,200.00
Straw Wattles	55	EA	$110.00	$6,050.00
Excelsior Matting	50	SY	$11.00	$550.00
Stabilization Stone	50	TN	$110.00	$5,500.00
Select Backfill	215	CY	$44.00	$9,460.00
Construction Entrance	1	EA	$5,500.00	$5,500.00
Testing Allowance	1	LS	$11,000.00	$11,000.00
Electrical Service Entrance	1	LS	$11,000.00	$11,000.00
Sub-total				**$3,743,757.50**
Contingency @ (10%)				$374,242.50
Total Estimated Construction Cost				**$4,118,000.00**

Table 40 Bulk Water Supply Interconnect with City of New Bern Total Estimated Capital Costs for Project		
Total Estimated Construction Cost	$	4,118,000.00
Engineering Services		
Engineering Report	$	10,000.00
Environmental Informaiton Document	$	10,000.00
Boundary/Topgraphic Site/Route Survey	$	85,000.00
Geotechnical Investigation	$	10,000.00
Wetlands/USACE Permitting	$	10,000.00
Engineering Design, Construction Plans and Specifications	$	295,000.00
Permitting	$	10,000.00
Bidding and Negotiation	$	15,000.00
Construction Administration	$	200,000.00
Resident Project Representative (12 months)	$	240,000.00
Record Drawing Preparation	$	10,000.00
Administrative Costs	$	5,000.00
Legal Costs	$	10,000.00
Land and Rights-of-Way	$	75,000.00
Permit Fees	$	10,000.00
Total	**$**	**5,113,000.00**

Of the transmission improvements cost indicated above, approximately $2,814,000 are improvements required to the City of New Bern distribution system while the remaining $1,300,000 are improvements required to the Town of River Bend distribution system.

If the Town of River Bend utilizes the N.C. Special Appropriation funds to pay the capital improvements costs for the transmission and interconnection to both the New Bern or River Bend systems, then there would be no new debt service to be repaid. Under those circumstances, the estimated monthly utility charge is approximately $43.76 per month per equivalent customer which is the sum of $25.08 River Bend charge plus $18.67 bulk water charge as depicted in Table 41 below.

Table 41
Estimated Debt Service and User Charge - Bulk Water Supply from New Bern

Objective: Estimate debt service requirement and associated user charge per equivalent customer for a loan to cover the cost of required transmission improvements for the City of New Bern to reliably and permanently provide bulk water service to the Town of River Bend.

		Principal =	$5,113,000.00				
		Interest =	3.25%				
		Term =	20	years			
			May		November		
Term	Year	Principal Balance	Principal Pmt	Interest Pmt	Interest Pmt		
1	2025	$5,113,000.00	$255,650.00	$83,086.25	$83,086.25	$421,822.50	First Year
2	2026	$4,857,350.00	$255,650.00	$78,931.94	$78,931.94		Repayment
3	2027	$4,601,700.00	$255,650.00	$74,777.63	$74,777.63		
4	2028	$4,346,050.00	$255,650.00	$70,623.31	$70,623.31		
5	2029	$4,090,400.00	$255,650.00	$66,469.00	$66,469.00		
6	2030	$3,834,750.00	$255,650.00	$62,314.69	$62,314.69		
7	2031	$3,579,100.00	$255,650.00	$58,160.38	$58,160.38		
8	2032	$3,323,450.00	$255,650.00	$54,006.06	$54,006.06		
9	2033	$3,067,800.00	$255,650.00	$49,851.75	$49,851.75		
10	2034	$2,812,150.00	$255,650.00	$45,697.44	$45,697.44		
11	2035	$2,556,500.00	$255,650.00	$41,543.13	$41,543.13		
12	2036	$2,300,850.00	$255,650.00	$37,388.81	$37,388.81		
13	2037	$2,045,200.00	$255,650.00	$33,234.50	$33,234.50		
14	2038	$1,789,550.00	$255,650.00	$29,080.19	$29,080.19		
15	2039	$1,533,900.00	$255,650.00	$24,925.88	$24,925.88		
16	2040	$1,278,250.00	$255,650.00	$20,771.56	$20,771.56		
17	2041	$1,022,600.00	$255,650.00	$16,617.25	$16,617.25		
18	2042	$766,950.00	$255,650.00	$12,462.94	$12,462.94		
19	2043	$511,300.00	$255,650.00	$8,308.63	$8,308.63		
20	2044	$255,650.00	$255,650.00	$4,154.31	$4,154.31		
						Grand Total Pmt =	
Totals:		$0.00	$5,113,000.00	$872,405.63	$872,405.63	$6,857,811.25	

Current Consumption =	174,600	gpd (metered sales)
No. Equivalent Residential Customers =	1,816	
Average Consumption/day/equivalent customer =	96	gpd/equivalent customer
Average Consumption/year/equivalent customer =	35,040	gal/year/equivalent customer
Average Consumption/mo/equivalent customer =	2920	gal/mo/ equivalent customer
First Year Repayment Minimum User Charge Required =	$19.36	/mo/equivalent customer
River Bend Required User Charge =	$25.08	/mo/equivalent customer
Bulk Water Charge - New Bern =	$18.67	/mo/equivalent customer
Total Estimated User Charge =	$43.76	/mo/equivalent customer to purchase bulk water from New Bern if grant is used to pay for transmission improvements.
Total Estimated User Charge =	$63.11	/mo/equivalent customer to purchase bulk water from New Bern if grant is not used to pay for transmission improvements.

If, however, the N.C. Special Appropriation cannot be used to pay for the transmission and interconnection costs for New Bern and River Bend, then the Town may need to borrow some or all of the money and repay it over a period of time. Assuming the worst case, that $5,113,000 is borrowed to finance the cost of the capital improvements through a 20-year Division of Water Infrastructure low interest loan at 3.25% half-market-rate interest, the first year's annual debt service is approximately $421,823 which equates to approximately $19.36 per month per customer. As such, the total estimated monthly cost to purchase drinking water from the City of New Bern under this circumstance is approximately $63.11/month/equivalent user.

C. Craven County Water Department

Craven County operates a 3.0 MGD groundwater treatment plant located in the eastern part of the County at 530 Lewis Farm Road that began operation in October, 2017. Raw water to the WTP is supplied by 8 wells that draw water from the Middle Castle Hayne Aquifer/Spring Garden Member. In addition, the County has 5 Black Creek Aquifer wells located in the western part of the County near Cove City and Fort Barnwell. The capacity from these wells have been reduced by 75% due to the Central Coastal Plain Capacity Use Area (CCPCUA rules). The systems operate somewhat independently, but interconnected by a Booster Pump Station and transmission main located at Lawson Creek Park adjacent to the Trent River. The Pump Station originally supplied water beneath the River from the west to the east, but after startup of the WTP and reduction in the Black Creek well supply, flow has been reversed from east to west.

The water treatment process is nanofiltration membrane skids with cartridge filters and chemical addition for pH adjustment, corrosion control and disinfection. The treatment plant can be expanded to produce 5.0 MGD of finished water.

The WTP includes a one million-gallon GST for storage of finished water and two 150 HP high service pumps. Ten (10) chemical storage tanks are provided for storage of various chemicals. Two cast-in-place waste holding tanks are provided to provide storage of contaminated waste from the contaminated waste pump station that include 2 - 1 HP pumps. The concentrated waste pump station includes 2 - 50 HP pumps to discharge membrane concentrate to a multiport diffuser located approximately 1000 feet from the shoreline of the Neuse River Estuary, a Class SB=Swamp, NSW waterway within the Neuse River Basin.

Craven County currently has a ADF of approximately 1.6 MGD with a MDD that occasionally exceeds 3.0 MGD. Dail Booth, Superintendent, has indicated that he is uncomfortable with providing water supply to the Town of River Bend until their WTP is expanded. He expects the expanded capacity to be in service during the next 5 – 7 years.

Craven County has a 6" diameter distribution main that extends southward on Tuscarora Rhems Road and terminates close to US Hwy 17 BUS. The 6" water main is supplied from a 250,000-gallon elevated water tank at the Craven County Industrial Park on Executive Parkway. The County has 8" and 6" water mains that extend southward along Clarks Road.

Mr. Booth indicates they already have low pressure issues in the system closest to River Bend. Approximately 6.5 miles of water transmission improvements would likely be required in order to supply the Town of River Bend's MDD plus fire flow.

Since the Craven County WTP does not have available water supply and treatment capacity to serve the Town of River Bend at present, it would have to be developed in similar manner to what would be required by the Town independently. In addition, significant transmission improvements would be required to serve the River Bend water system. Given this, the Craven County Regional is not considered a viable alternative worth further evaluation.

D. Jones County Regional Water System

Jones County operates a filter softener groundwater treatment plant located along Highway 17 near Pollocksville, NC that began operation in 2022. According to Gareth Harvell, Public Works Director, the current capacity of the WTP is 0.3 MGD although it was constructed for ultimate expansion to 0.9 MGD. Raw water to the WTP is supplied by 2 wells that draw water from the Lower Castle Hayne Aquifer/Comfort Member.

The treatment process consists of a cast-in-place raw water reservoir that is supplied groundwater from the Castle Hayne Aquifer. Raw water feeds mixed media filters consisting of anthracite over greensand followed by ion exchange softeners.

Mr. Harvell indicates that Jones County is already committed to expanding the WTP to 0.6 MGD in order to supply water to the Jones-Craven Industrial Park. As such, the Jones County WTP does not have available water supply and treatment capacity to serve the Town of River Bend at present, and it would have to be developed in similar manner to what would be required by the Town independently. In addition, transmission improvements will be required between the Jones County system and the River Bend water system. Given this, the Jones County Regional is not considered a viable alternative worth additional evaluation.

E. Bulk Water Supply Alternatives Summary

Of the three (3) neighboring public water supply systems located near the Town of River Bend, only one currently has the treatment capacity available to supply the Town's water needs. That is the City of New Bern. The City has previously indicated a willingness to allow an emergency interconnect between the adjacent water systems. In addition, the City's Public Utilities Director has indicated his belief that New Bern officials and staff would be willing to serve as a bulk water supplier to the Town of River Bend.

In order to accommodate the transmission of bulk water to the Town and maintain demand and residual pressure requirements, preliminary hydraulic evaluation suggests that a booster pump station and 10" transmission main would require installation between the City's planned western elevated storage tank and the Town of River Bend's existing 100,000-gallon elevated storage tank. Construction of the western EST is expected within the next couple of years.

The additional cost to purchase bulk potable water from the City of New Bern is estimated to be approximately $18.67/month/equivalent customer. In addition, approximately $19.36/month/equivalent customer would be required if the Town took on additional debt service to pay for the required transmission improvements. That charge could be avoided if the Town were to pay the capital cost out of fund balance or grant funds.

F. Bulk Water Supply Pros and Cons

There are advantages and disadvantages when deciding whether to produce water with an in-town WTP versus purchasing bulk water from an out-of-town supplier. A partial list of pros and cons is summarized below. However, there may be other considerations that are known only to the officials and staffs of the Town and City.

1. Pros

- The Town of River Bend would no longer be responsible for operations and maintenance of a WTP,
- Additional staff time may become available to focus on other Town Public Utility/Public Works needs or priorities,
- Town staff would no longer be responsible for continued WTP and NPDES discharge permitting and compliance.

2. Cons

- The Town of River Bend will lose some autonomy to set and control water rates,
- Potential growth within the Town could be impacted by the magnitude of water rates that are controlled by an outside political body,
- Reliance on the City of New Bern, rate negotiation, etc. could create political animosity between Municipal neighbors.

VIII. RECOMMENDATIONS

The Town of River Bend has successfully operated their own in-town water and sanitary sewer systems for almost three decades. The expertise and willingness to continue doing certainly appear to exist. The biggest hurdle confronting the Town is the ability to generate sufficient revenue to address significant capital costs and potential associated debt service with a small customer base.

The Town has previously secured a significant grant to help offset a portion of the potential debt service and the resulting impact to water rates. The ability to pursue design, permitting, construction and operation of a new in-town WTP will be based on the Town's capability to secure additional grant funding.

Based on 2024-25 Actual Budget				
Objective: Estimate how much increase to the current Water Fund Budget is required to cover expenses if the Town constructs and operates a single new Filter-Softener WTP.				
	Current Budget	**Percent Increase (or Reduction) if New WTP**	**Estimated Budget if No WTP**	
Administration and Finance	**$507,000**	0%	**$507,000**	
Water Supply and Treatment				
398 Testing	$9,200	-30%	$6,440	
399 Contracted Services	$6,550	100%	$13,100	
298 Chemicals	$13,132	100%	$26,264	
299 Supplies & Materials	$15,800	50%	$23,700	
330 Utilities	$11,000	150%	$27,500	
351 Maintenance & Repair - Buildings	$2,500	0%	$2,500	
352 Maintenance & Repair - Equipment	$4,600	50%	$6,900	
430 Building & Equipment Rental	$0	-100%	$0	
496 Permit Fees	$2,240	0%	$2,240	
499 Miscellaneous	$1,478	100%	$2,956	
550 Capital Outlay - Equipment	$0		$10,000	
580 Capital Outlay - Grounds & Buildings	$2,500	-100%	$0	
595 Capital Outlay - Wells/Pumps	$0		$10,000	
SUBTOTAL	**$69,000**		**$131,600**	
Distribution	**$58,000**	0%	**$58,000**	
TOTAL BUDGET	**$634,000**		**$696,600**	**109.87%**
				Say 110%
Approximately 110 percent of the current Water Fund budget is estimated to be required if the Town constructs and operates a new Filter Softener WTP.				

Table 43
Estimated User Charge - New Filter Softener WTP
Town of River Bend

Objective: Determine theoretical water rates if River Bend constructed and operated a new Filter Softener WTP.

Current Consumption =				174,600	gpd (metered sales)		
Equivalent No. of Residential Customers =				1,816			
Average Consumption/day/equivalent customer =				96	gpd/equivalent customer		
Average Consumption/year/equivalent customer =				35,040	gal/year/equivalent customer		
Average Consumption/mo/equivalent customer =				2920	gal/mo/equivalent customer		
Revenue Generated from Current Rates:							
	Base Charge =	$15.24		$15.24			
	Water Rate =	$4.22	/kgal (0 - 4,000 gal)	$12.32			
		$4.50	/kgal (4,001 - 20,000 gal)				
				$27.56	/mo/equivalent customer		
Estimated Total Revenue Generated =				$600,639.82	(based on 100% utility bill collections)		
River Bend Average Utility Bill Collections Rate =				88%			
Estimated Total Revenue Collected =				**$528,563.04**			
Water Fund 2024-25 Budget: Total Revenue Required =				$654,000.00			
Water Fund 2024-25 Budget: Total Revenue Required from Utility Usage Charges =				**$518,268.00**			
Estimated Total Revenue Collected Exceeds Total Revenue Required from Utility Charges, i.e.:				**$528,563.04**	**>**	**$518,268.00**	
If River Bend constructed a new F/S WTP, rates would theoretically need to be increased to 110% of current, i.e.:							
	Base Charge =	$16.76		$16.76	110.00%	of current rate	
	Water Rate =	$4.64	/kgal (0 - 4,000 gal)	$13.55	110.00%	of current rate	
		$4.95	/kgal (4,001 - 20,000 gal)				
				$30.31	/mo/equivalent customer		
Estimated Total Revenue Generated at Reduced Rates =				**$660,489.37**			
River Bend Average Utility Bill Collections Rate =				88%			
Estimated Total Revenue Collected at Reduced Rates=				**$581,230.65**			
Water Fund 2024-25 Budget: Total Revenue Required from Utility Usage Charges =				**$518,268.00**			
Approximately 110% of current budgeted revenue is needed if the Town constructed and operated a new F/S WTP.				110%			
Total Revenue Required from Utility Usage Charges =				**$570,094.80**			
				$581,230.65	**>**	**$570,094.80**	

If the Town of River Bend constructed and operated a new F/S WTP, water rates are estimated to be increased to 110% of current to approximately $30.31/month/equivalent residential user.

The estimated cost for the recommended long-term water supply alternative is $18,228,000. The Town currently has Special Legislative Grant appropriation of $9,252,105. As such, the current shortfall is estimated to be $8,975,895. Ideally, if the Town could secure an additional $8,975,895 in grant, the Town could pursue design, permitting and construction of the long-term recommended water supply improvements.

On the basis of the preliminary estimates included herein and computations summarized in Table 44, the Town should borrow no more than $3,544,000 based on securing a low interest NCDEQ DWI loan with a 20-year term at 3.25% interest rate. The first-year principal and interest would equal $293,205 which translates to $13.45/month/equivalent customer. Approximately $30.31/month/equivalent user is estimated for operation and maintenance of the water system with a new F/S WTP in place. These two incremental costs added together equal the estimated cost of $43.76/month/equivalent customer such that the average user charge for the long-term water supply alternative does not exceed that required to purchase bulk water from the City of New Bern as indicated in Table 44 below.

Table 44
Estimated Debt Service and User Charge - New Filter Softener WTP
Town of River Bend

Objective: Estimate the loan principal amount that the Town of River Bend could borrow for a Filter Softener WTP such that debt service and associated user charge would not exceed the user charge required to purchase bulk water from the City of New Bern.

		Principal =	$3,554,000.00					
		Interest =	3.25%					
		Term =	20	years				
			May		November			
Term	Year	Principal Balance	Principal Pmt	Interest Pmt	Interest Pmt			
1	2025	$3,554,000.00	$177,700.00	$57,752.50	$57,752.50		$293,205.00	First Year
2	2026	$3,376,300.00	$177,700.00	$54,864.88	$54,864.88			Repayment
3	2027	$3,198,600.00	$177,700.00	$51,977.25	$51,977.25			
4	2028	$3,020,900.00	$177,700.00	$49,089.63	$49,089.63			
5	2029	$2,843,200.00	$177,700.00	$46,202.00	$46,202.00			
6	2030	$2,665,500.00	$177,700.00	$43,314.38	$43,314.38			
7	2031	$2,487,800.00	$177,700.00	$40,426.75	$40,426.75			
8	2032	$2,310,100.00	$177,700.00	$37,539.13	$37,539.13			
9	2033	$2,132,400.00	$177,700.00	$34,651.50	$34,651.50			
10	2034	$1,954,700.00	$177,700.00	$31,763.88	$31,763.88			
11	2035	$1,777,000.00	$177,700.00	$28,876.25	$28,876.25			
12	2036	$1,599,300.00	$177,700.00	$25,988.63	$25,988.63			
13	2037	$1,421,600.00	$177,700.00	$23,101.00	$23,101.00			
14	2038	$1,243,900.00	$177,700.00	$20,213.38	$20,213.38			
15	2039	$1,066,200.00	$177,700.00	$17,325.75	$17,325.75			
16	2040	$888,500.00	$177,700.00	$14,438.13	$14,438.13			
17	2041	$710,800.00	$177,700.00	$11,550.50	$11,550.50			
18	2042	$533,100.00	$177,700.00	$8,662.88	$8,662.88			
19	2043	$355,400.00	$177,700.00	$5,775.25	$5,775.25			
20	2044	$177,700.00	$177,700.00	$2,887.63	$2,887.63			
							Grand Total Pmt =	
Totals:		$0.00	$3,554,000.00	$606,401.25	$606,401.25		$4,766,802.50	
Current Consumption =			174,600	gpd (metered sales)				
No. Equivalent Customers =			1,816					
Average Consumption/day/equivalent customer =			96	gpd/equivalent customer				
Average Consumption/year/equivalent customer =			35,040	gal/year/equivalent customer				
Average Consumption/mo/equivalent customer =			2920	gal/mo/ equivalent customer				
First Year Repayment Minimum User Charge Required =			$13.45	/mo/equivalent customer				
User Charge Rquired to meet new FS WTP Budget =			$30.31	/mo/equivalent customer				
Total Estimated User Charge by Equivalent Customer =			$43.76	/mo/equivalent customer for River Bend debt service.		=	$43.76	/mo/equivalent customer for New Bern bulk water purchase.

The Town of River Bend could borrow approximately $3,554,000 at 3.25% for 20 years on a simple interest loan to augment additional grant funding such that user rates do not exceed that required to support bulk water purchase from the City of New Bern.

In order to pursue the recommended long-term F/S WTP alternative, it is estimated that a minimum of $5,421,895 ($8,975,895 - $3,554,000) of additional grant should be pursued in order to maintain a monthly water bill/equivalent user that is no greater than that required to purchase bulk water from the City of New Bern.

Other reasons may exist that justify the user charge requirements for the Town to operate and maintain a new F/S WTP to exceed the estimated cost to purchase bulk water.

Based on the evaluation conducted, and the efforts made already by the Town of River Bend, we recommend that the Town pursue additional grant money to allow construction of a new 0.95 MGD Filter Softener WTP with associated Lower Castle Hayne Aquifer/Comfort Member wellfield, raw water transmission mains, and backwash waste discharge into a common WTP/WWTP diffuser into the Trent River.

IX. POTENTIAL RATE IMPACT

The Town's current water rates equate to $36.62/month for a 5,000 gal/month customer. This is below the State median of $40.01. However, when viewed in combination with sewer rates, the Town monthly rate of $107.30 far exceeds the State median of $89.71.

The Town does not average 5,000 gal/month per user based on water sales. In 2023, the average consumption was only 2,920 gal/month per equivalent customer. As such, the average water bill was $27.56/month/equivalent customer. Required revenues must be generated based on the actual quantity of water sold.

The impact to water rates for constructing a new F/S WTP is a function of the grant funds available to offset potential debt service plus the inherent cost to operate and maintain the new WTP and the remainder of the water system.

- If the Town is able to secure 100% grant funding, then monthly water rates are estimated to increase from $27.56 to $30.31/month/equivalent customer in order to cover the additional operating costs associated with the new F/S WTP (Table 43).
- On the other hand, if the Town is unable to secure any additional grant funding, the monthly water rates are estimated to increase to $64.29/month/equivalent customer which far exceeds the cost to purchase bulk water from the City of New Bern (Table 45 below).
- If the Town limits their debt service to not exceed that required to purchase bulk water from New Bern, water rates could increase to $43.76/month/equivalent user.

Table 45
Estimated Debt Service and User Charge - New Filter Softener WTP
Town of River Bend

Objective: Estimate the user charge required to support the loan principal required to fund the remaining capital cost for the Filter Softener WTP.

Estimated Project Cost =	$18,228,000	
Current Grant Available =	$9,252,105	
Additional Loan Required =	$8,975,895	
Principal =	$8,975,895.00	
Interest =	3.25%	
Term =	20	years

Term	Year	Principal Balance	May Principal Pmt	May Interest Pmt	November Interest Pmt		
1	2025	$8,975,895.00	$448,794.75	$145,858.29	$145,858.29	$740,511.34	First Year Repayment
2	2026	$8,527,100.25	$448,794.75	$138,565.38	$138,565.38		
3	2027	$8,078,305.50	$448,794.75	$131,272.46	$131,272.46		
4	2028	$7,629,510.75	$448,794.75	$123,979.55	$123,979.55		
5	2029	$7,180,716.00	$448,794.75	$116,686.64	$116,686.64		
6	2030	$6,731,921.25	$448,794.75	$109,393.72	$109,393.72		
7	2031	$6,283,126.50	$448,794.75	$102,100.81	$102,100.81		
8	2032	$5,834,331.75	$448,794.75	$94,807.89	$94,807.89		
9	2033	$5,385,537.00	$448,794.75	$87,514.98	$87,514.98		
10	2034	$4,936,742.25	$448,794.75	$80,222.06	$80,222.06		
11	2035	$4,487,947.50	$448,794.75	$72,929.15	$72,929.15		
12	2036	$4,039,152.75	$448,794.75	$65,636.23	$65,636.23		
13	2037	$3,590,358.00	$448,794.75	$58,343.32	$58,343.32		
14	2038	$3,141,563.25	$448,794.75	$51,050.40	$51,050.40		
15	2039	$2,692,768.50	$448,794.75	$43,757.49	$43,757.49		
16	2040	$2,243,973.75	$448,794.75	$36,464.57	$36,464.57		
17	2041	$1,795,179.00	$448,794.75	$29,171.66	$29,171.66		
18	2042	$1,346,384.25	$448,794.75	$21,878.74	$21,878.74		
19	2043	$897,589.50	$448,794.75	$14,585.83	$14,585.83		
20	2044	$448,794.75	$448,794.75	$7,292.91	$7,292.91		
						Grand Total Pmt =	
Totals:		$0.00	$8,975,895.00	$1,531,512.08	$1,531,512.08	$12,038,919.17	

Current Consumption =	174,600	gpd (metered sales)
No. Equivalent Customers =	1,816	
Average Consumption/day/equivalent customer =	96	gpd/equivalent customer
Average Consumption/year/equivalent customer =	35,040	gal/year/equivalent customer
Average Consumption/mo/equivalent customer =	2920	gal/mo/ equivalent customer
First Year Repayment Minimum User Charge Required =	$33.98	/mo/equivalent customer
User Charge Rquired to meet new FS WTP Budget =	$30.31	/mo/equivalent customer
Total Estimated User Charge by Equivalent Customer =	$64.29	/mo/equivalent customer for River Bend debt service.

> $43.76 /mo/equivalent customer for New Bern bulk water purchase.

If the Town of River Bend could borrow approximately $8,975,895 at 3.25% for 20 years on a simple interest loan to construct and operate a new Filter Softener WTP, user rates are estimated at $64.29/mo/equivalent customer which far exceeds the cost to purchase bulk water from the City of New Bern.

X. POTENTIAL FUNDING OPPORTUNITIES

Given that the Town of River Bend has already secured a substantial amount of Special Legislative Grant funding for the project, additional funding efforts should proceed in parallel with the planning, design and permitting efforts required for the new WTP project.

The Town of River Bend has worked previously with NCDEQ Division of Water Infrastructure (DWI) State Revolving Fund (SRF) program for various grant and loan funded projects. The SRF program provides ½ market interest rate loans with a limited amount of principal forgiveness. The maximum loan amount is $20 million (DW Unit) and $30 million (WW Unit) with a payback term of 20 years. A 2.0% closing fee applies.

The DWI SRF funding process is competitive. The opportunity for the Town to be funded depends on numerous factors, including the availability of funds, the number of applications submitted, and final scoring/ranking of the applications. Given this, it is recommended that the Town proceed with the Drinking Water application at the first available opportunity. In this manner, the Town will have the best opportunity to receive funding for the project.

The SRF Program has two funding cycles per year, typically in March and September. The Town, working with their engineering consultant, should begin preparation of the applications and supporting documents to support a funding request for the proposed alternative. If the Town's application is selected for funding, the Town should expect to be notified and receive a Letter of Intent to Fund (LOIF) letter from DWI approximately five months following application.

Due to significant capital costs, the discussion on financing dictates a need to secure grant funding from as many sources as possible in order to keep the cost of water at as reasonable a level as possible. Drinking Water State Revolving Fund (SRF), USDA-Rural Development and Revenue Bonds appear to be the most promising source of project financing. However, other available sources of revenue could also be pursued.

A. Potential Funding Options for Water Utility Improvements:

The following are potential sources of grant and/or loan funding for the water utility improvements project:

- NCDEQ - DWI, Drinking Water State Revolving Fund (DWSRF)
- USDA-RD Environmental Water/Waste Program
- Commercial Financing, Revenue Bonds
- Commercial Financing, General Obligation (GO) Bonds

B. Drinking Water State Revolving Fund:

The Drinking Water State Revolving Fund (DWSRF) is a Federal program administered in North Carolina by the NC Department of Environmental Quality – Division of Water Infrastructure. The program was created with the 1996 amendments to the Federal Safe Drinking Water Act. With the DWSRF being federally-seeded, the loans are subject to additional federal regulations regarding environmental review, outreach for disadvantaged business enterprises, payroll (Davis Bacon and related Acts), etc.

Funding of drinking water projects is dependent upon congressional funding administered by individual states. The State typically provides 20% matching funds. The type of funding available is in the form of low-interest loans (1/2 of market interest rates) and a limited amount of principal forgiveness loans.

Some program components include: loan maximum of $20 million; construction must start within 24 months of Letter of Intent to Fund; closing fee of 2% ; and the Local Government Commission (LGC) must review and approve all loans. Applications for funding from the DWSRF Program are received over two funding cycles per year, typically in March and September.

C. Commercial Revenue Bonds:

Revenue bonds are a type of municipal bond in which the repayment of the debt obligation is primarily guaranteed by the operating revenues of the applicant. These bonds are primarily utilized by government entities to finance projects to improve existing infrastructure. No voter approval is required to obtain a revenue bond. Typically, the term for a revenue bond is 10-25 years.

The Local Government Commission must review and approve applications for Revenue Bond financing.

D. USDA-RD, Environmental Water/Waste Program:

This involves a two-step process governed by USDA. An interim Bond Anticipation Not (BAN) is sold with consideration that proceeds from a USDA approved long-term loan will be utilized to repay the BAN at the end of construction. BAN maturity is typically within 18-24 months. The USDA loan is secured by either a GO or Revenue Bond. The loan recipient must abide by USDA requirements for bidding, project funding, documentation, etc. The long-term loan is underwritten by USDA with a term of 40-years.

The Local Government Commission must review and approve applications to sell the BAN as well as enter into the long-term loan agreements.

E. Commercial General Obligation Bonds

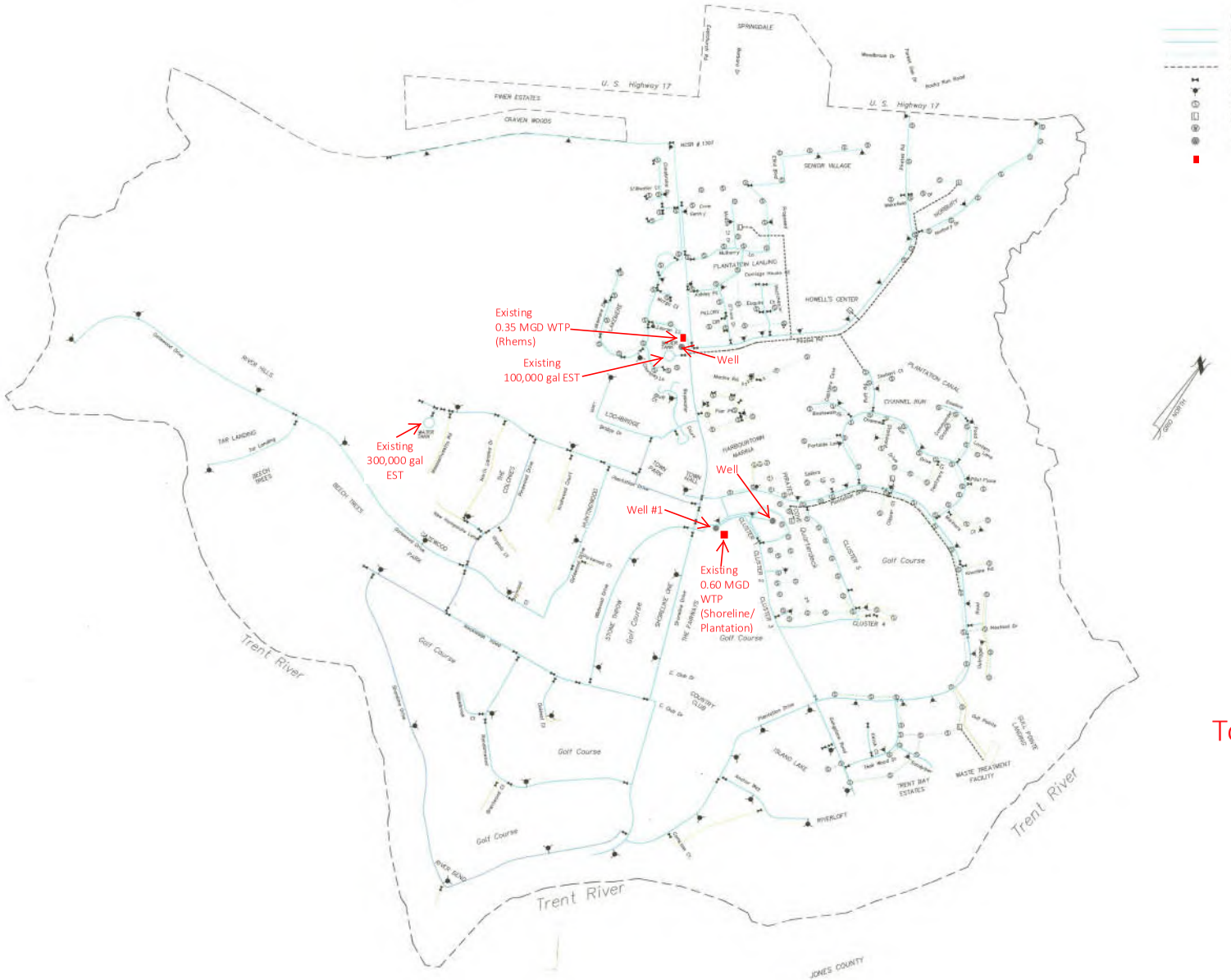
A General Obligation, or GO Bond is a type of municipal bond that is backed entirely by the issuers creditworthiness and ability to levy taxes on its taxable property. The term is typically 10-20 years. Unlike revenue bonds, GO bonds are not backed by collateral and do not pay creditors back on the basis of income generated from funded projects. The amount of taxation available by a particular GO bond may be specified as either limited or unlimited. In the case of an unlimited GO bond, a municipality may increase property taxes accordingly to cover its payments and obligations. Voter approval is required for a GO Bond. Typically, an entity that utilizes a GO Bond to finance a water or sewer project will utilize revenue derived from user rates to pay associated annual debt service.

The Local Government Commission must review and approve applications for GO Bond financing.

APPENDIX

A

Town of River Bend
Existing Water Distribution System



NO.	DESCRIPTION	DATE

Revisions

6" WATER MAIN
6" WATER MAIN
8" WATER MAIN
8" GRAVITY SEWER
SEWER FORCE MAIN
VALVE
HYDRANT
SEWER MANHOLE
LIFT STATION
WATER TOWER
WELL
Water Treatment Plant

Town of River Bend Water System

GRAPHIC SCALE

(IN FEET)
1 inch = 500 ft.

PROJECT NO. 05017
SCALE: AS NOTED
DRAWN BY TDM
CHECKED BY JKA
DATE:

AVOLIS ENGINEERING, P.A.
Civil and Environmental Engineering
PO BOX 15564, NEW BERN, NC 28561
(252)633-0068, FAX (252)633-6507

AS-BUILT WATER AND SEWER SYSTEM
TOWN OF RIVER BEND
CRAVEN COUNTY, NORTH CAROLINA
OVERALL EXISTING CONDITIONS

C1

05017C1.DWG

APPENDIX

B

Town of River Bend Water System
Photo Log

Well House No. 1 (WTP Site) – Exterior

Well No. 1

Well No. 1 Generator

Well House No. 2 (Quarterdeck Townhouses) – Exterior

Well No. 2

Water Treatment Plant (Shoreline/Plantation) - Exterior

WTP - Interior

WTP – Chlorine Room

WTP – Filters and Face Piping

WTP – Electrical

WTP – Bisulfite Feed

WTP - Backwash Waste Holding/Pump Tank

WTP/WWTP Laboratory

Water Treatment Plant (Rhems Fire Station) - Exterior

Well No. 3 and WTP Interior

WTP – Filter Face Piping

WTP – Face Piping/Backwash Waste Sump

WTP - Electrical

WTP – Backwash Waste Holding/Pump Tank

APPENDIX

C

Town of River Bend
WTP NPDES Permit NC 0086797

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ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

1/4/2024

Delane Jackson, Town Manager
Town of River Bend
45 Shoreline Drive
New Bern, NC 28562

Subject: Final NPDES Permit NC0086797
Town of River Bend WTP 1 & 2
Grade I Physical/Chemical WPCS
Craven County

Mr. Jackson:

Division personnel have reviewed and approved your application for renewal of the subject permit. Accordingly, we are forwarding the attached final NPDES discharge permit. This permit is issued pursuant to the requirements of North Carolina General Statute 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated October 15, 2007 (or as subsequently amended).

The final permit has no major changes from the draft permit that was previously sent to you dated November 14, 2023. Please refer to the cover letter for the November draft for a specific discussion of permit changes. One minor change to note is the return of your Whole Effluent Toxicity (WET) testing requirements to Monitoring status. This is consistent with your previous permit. The draft permit had included language for a limited WET requirement. Based on the results of your WET testing, further review by the Division has determined that the monitoring requirement is sufficient at this time.

If any parts, measurement frequencies or sampling requirements contained in this permit are unacceptable to you, you have the right to an adjudicatory hearing upon written request within thirty (30) days following receipt of this letter. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings (6714 Mail Service Center, Raleigh, North Carolina 27699-6714). Unless such demand is made, this permit shall be final and binding.

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Please note that this permit is not transferable except after notice to the Division. The Division may require modification or revocation and reissuance of the permit. This permit does not affect the legal requirements to obtain any other Federal, State, or Local governmental permit that may be required.

If you have any questions or need additional information, please do not hesitate to contact Bradley Bennett of my staff at (919) 707-3629 or bradley.bennett@deq.nc.gov.

Sincerely,

DocuSigned by:

8328B44CE9EB4A1...

John Hennessy
Division of Water Resources

cc: Brandon Mills – Town of River Bend - electronic
NPDES Files - electronic
Washington Regional Office / Water Quality – electronic
Aquatic Toxicology / Cindy Moore and Molly Nicholson – Electronic

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STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

PERMIT

TO DISCHARGE WASTEWATER UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended, the

Town of River Bend

is hereby authorized to discharge wastewater from a facility located at the

Town of River Bend WTP 1 & 2
Shoreline Drive, River Bend
Craven County

to receiving waters designated as Plantation Canal from Outfall 001 and as unnamed tributary to Plantation Canal from Outfall 002 in the Neuse River Basin in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective March 1, 2024

This permit and authorization to discharge shall expire at midnight on May 31, 2028.
If the permittee intends to continue discharging at the facility beyond the term of this permit, a renewal application must be submitted no later than December 3, 2027 (180 days before the expiration of this permit)

Signed this day January 1, 2024

DocuSigned by:
John E Hennessy
8328B44CE9EB4A1...

John Hennessy
Division of Water Resources
By Authority of the Environmental Management Commission

DocuSign Envelope ID: 7AE1D51F-CC9A-4FC9-8262-3AB71155413A

SUPPLEMENT TO PERMIT COVER SHEET

All previous NPDES Permits issued to this facility, whether for operation or discharge are hereby revoked. As of this permit issuance, any previously issued permit bearing this number is no longer effective. Therefore, the exclusive authority to operate and discharge from this facility arises under the permit conditions, requirements, terms, and provisions included herein.

Town of River Bend

is hereby authorized to:

1. Continue to operate a Water Treatment Plant (WTP#1) with a discharge of treated backwash/rinse wastewater from Sand Filtration units through Outfall 001. This water treatment plant currently has a design potable flow rate of 0.60 MGD and a maximum, monthly average wastewater discharge of 0.014 MGD. This facility is located at Town of River Bend WTP#1, 52 Shoreline Dr., River Bend in Craven County and water and wastewater treatment consist of:

    - Raw well water caustic addition systems
    - Raw well air injection systems
    - One (1) 8 ft. diameter sand filter tank
    - One (1) 10 ft. diameter sand filter tank
    - Potable water ortho phosphate addition system
    - Potable water chlorination system
    - Wastewater dechlorination system
    - 5,000-gallon backwash/rinse wastewater settling basin with pump
    - Effluent meter

2. Continue to operate a Water Treatment Plant (WTP#2) with a discharge of treated backwash/rinse wastewater from Sand Filtration units through Outfall 002. This water treatment plant currently has a design potable flow rate of 0.35 MGD and a maximum, monthly average wastewater discharge of 0.011 MGD. This facility is located at Town of River Bend WTP#2, 27 Shoreline Dr., River Bend in Craven County and water and wastewater treatment consist of:

    - Raw well water caustic addition system
    - Raw well air injection system
    - Two (2) 4.5 ft. diameter sand filter tanks
    - Two (2) 6 ft. diameter sand filter tanks
    - Potable water ortho phosphate addition system
    - Potable water chlorination system
    - Wastewater dechlorination system
    - 5,000-gallon backwash/rinse wastewater settling basin with pump
    - Effluent meter

3. Discharge from said treatment works at the locations specified on the attached map, Outfall 001 into Plantation Canal and Outfall 002 into an unnamed tributary to Plantation Canal, both receiving streams draining to the Trent River [Stream Index: 27-101-(31)], and classified SB Swamp, NSW waters in sub-basin 03-04-11 [HUC: 030202040302] of the Neuse River Basin.

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PART I.

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS-DRAFT

[15A NCAC 02B.0400 et seq., 15A NCAC 02B.0500 et seq.]
Grade I Physical / Chemical WPCS [15A NCAC 08G .0306]

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge treated sand filtration backwash/rinse wastewater from *Outfalls 001 and 002.* Such discharges shall be limited and monitored[1] by the Permittee as specified below for each outfall:

EFFLUENT CHARACTERISTICS		EFFLUENT LIMITATIONS		MONITORING REQUIREMENTS		
	eDMR CODES	**Monthly Average**	**Daily Maximum**	**Measurement Frequency**	**Sample Type**	**Sample Location**
Flow [2], MGD	50050			2/Month	Instantaneous	Effluent
Duration of Flow (Hours)	81381			2/Month	Instantaneous	Effluent
Total Suspended Solids (TSS)	CO310	30 mg/L	45 mg/L	2/Month	Grab	Effluent
Total Residual Chlorine [3] (TRC)	50060		13 µg/L	2/Month	Grab	Effluent
pH	00400	≥6.8 and ≤ 8.5 Standard Units		2/Month	Grab	Effluent
Turbidity, NTU	00070	Monitor & Report		2/Month	Grab	Effluent
Total Manganese, µg/L	01055	Monitor & Report		Quarterly	Grab	Effluent
Total Nitrogen [4] (TN), mg/ L	CO600	Monitor & Report		Semi-annual	Grab	Effluent
Total Phosphorus, mg/L	CO665	Monitor & Report		Semi-annual	Grab	Effluent
Acute WET testing [5]	TGE3E	Monitor & Report		Quarterly	Grab	Effluent

Footnotes:

1. The permittee shall submit discharge monitoring reports electronically using the NC DWR's eDMR application system [see A. (4)].
2. For instantaneous flow monitoring, the duration of the discharge must be reported in addition to the total flow.
3. The Division shall consider all effluent TRC values reported below 50 µg/L to be in compliance with the permit. However, the Permittee shall continue to record and submit all values reported by a North Carolina certified laboratory (including field certified), even if these values fall below 50 µg/L.
4. TN = TKN + NO_3-N + NO_2-N, where TN is Total Nitrogen, TKN is Total Kjeldahl Nitrogen, and NO_3-N + NO_2-N are Nitrate and Nitrite Nitrogen respectively.
5. Whole Effluent Toxicity (WET) testing - testing of *Mysidopsis bahia* shall be performed as 24-day pass/fail test at **90%** effluent concentration, during **March, June, September and December** [See A. (2.)].

All samples collected must be from a representative discharge event.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

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A. (2.) ACUTE TOXICITY PASS/FAIL MONITORING (QUARTERLY)

[NCAC 02B .0200 et seq.] [NCAC 02B .0500 et seq.]

The permittee shall conduct acute toxicity tests on a quarterly basis using protocols defined in the North Carolina Procedure Document entitled "Pass/Fail Methodology for Determining Acute Toxicity In A Single Effluent Concentration" (Revised-December 2010, or subsequent versions). The monitoring shall be performed as a Mysid Shrimp (Mysidopsis bahia) 24-hour static test. The effluent concentration at which there may be at no time significant acute mortality is **90%** (defined as treatment two in the procedure document). The tests will be performed **during the months of March, June, September and December.** These months signify the first month of each three-month toxicity testing quarter assigned to the facility. Effluent sampling for this testing must be obtained during representative effluent discharge and shall be performed at the NPDES permitted final effluent discharge below all treatment processes.

All toxicity testing results required as part of this permit condition will be entered electronically using the Division's eDMR system for the month in which it was performed, using the parameter code **TGE3E**. Additionally, DWR Form **AT-2** (original) is to be sent to the following address:

North Carolina Division of Water Resources
Water Sciences Section/Aquatic Toxicology Branch
1621 Mail Service Center
Raleigh, NC 27699-1621

Or, results can be sent to the email, ATForms.ATB@deq.nc.gov.

Completed Aquatic Toxicity Test Forms shall be filed with the Water Sciences Section no later than 30 days after the end of the reporting period for which the report is made.
Test data shall be complete, accurate, include all supporting chemical/physical measurements and all concentration/response data, and be certified by laboratory supervisor and ORC or approved designate signature.

Total residual chlorine of the effluent toxicity sample must be measured and reported if chlorine is employed for disinfection of the waste stream.

Should there be no discharge of flow from the facility during a month in which toxicity monitoring is required, the permittee will complete the information located at the top of the aquatic toxicity (AT) test form indicating the facility name, permit number, pipe number, county, and the month/year of the report with the notation of "No Flow" in the comment area of the form. The report shall be submitted to the Water Sciences Section at the address cited above.

Should the permittee fail to monitor during a month in which toxicity monitoring is required, then monthly monitoring will begin immediately. Upon submission of a valid test, this monthly test requirement will revert to quarterly in the months specified above.

Should any test data from either these monitoring requirements or tests performed by the North Carolina Division of Water Resources indicate potential impacts to the receiving stream, this permit may be re-opened and modified to include alternate monitoring requirements or limits.

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NOTE: Failure to achieve test conditions as specified in the cited document, such as minimum control organism survival and appropriate environmental controls, shall constitute an invalid test and will require immediate follow-up testing to be completed no later than the last day of the month following the month of the initial monitoring.

A. (3.) PERMIT RE-OPENER: NUTRIENT MANAGEMENT

[NCGS 143-215.1 (b)]

a) Pursuant to N.C. General Statues Section 143-215.1 and implementing rules found in Title 15A of North Carolina Administrative Code, Subchapter 02H, specifically, 15A NCAC 02H.0112(b)(1) and 02H.0114(a), and Part II, Sections B.12 and B.13. of this Permit, the Director of DWR may reopen this permit to require nutrient management measures for the discharge. The results of water quality monitoring, modelling or other evaluations may require that conditions for total nitrogen and total phosphorus control be imposed on this permit.
b) The Division may, upon written notification to the permittee, re-open this permit in order to incorporate or modify effluent limits, monitoring and reporting requirements, and other permit conditions when it deems such action is necessary to implement TMDL(s) approved by the USEPA.

A. (4.) ELECTRONIC REPORTING OF DISCHARGE MONITORING REPORTS

[G.S. 143-215.1(b)]

Federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and program reports. The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.

NOTE: This special condition supplements or supersedes the following sections within Part II of this permit (*Standard Conditions for NPDES Permits*):

- Section B. (11.) Signatory Requirements
- Section D. (2.) Reporting
- Section D. (6.) Records Retention
- Section E. (5.) Monitoring Reports

1. **<u>Reporting Requirements [Supersedes Section D. (2.) and Section E. (5.) (a)]</u>**
   The permittee shall report discharge monitoring data electronically using the NC DWR's Electronic Discharge Monitoring Report (eDMR) internet application.

   Monitoring results obtained during the previous month(s) shall be summarized for each month and submitted electronically using eDMR. The eDMR system allows permitted facilities to enter monitoring data and submit DMRs electronically using the internet. The eDMR system may be accessed at: https://deq.nc.gov/about/divisions/water-resources/edmr.

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If a permittee is unable to use the eDMR system due to a demonstrated hardship or due to the facility being physically located in an area where less than 10 percent of the households have broadband access, then a temporary waiver from the NPDES electronic reporting requirements may be granted and discharge monitoring data may be submitted on paper DMR forms (MR 1, 1.1, 2, 3) or alternative forms approved by the Director. Duplicate signed copies shall be submitted to the following address:

NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

See "How to Request a Waiver from Electronic Reporting" section below.

Monitoring results obtained during the previous month(s) shall be summarized for each month and reported via the eDMR system no later than the last calendar day of the month following the completed reporting period. Regardless of the submission method, the first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge.

Starting on **December 21, 2025**, the permittee must electronically report the following compliance monitoring data and reports, when applicable:

- Sewer Overflow/Bypass Event Reports;
- Pretreatment Program Annual Reports; and
- Clean Water Act (CWA) Section 316(b) Annual Reports.

The permittee may seek an electronic reporting waiver from the Division (see "How to Request a Waiver from Electronic Reporting" section below).

2. Electronic Submissions

In accordance with 40 CFR 122.41(l)(9), the permittee must identify the initial recipient at the time of each electronic submission. The permittee should use the EPA's website resources to identify the initial recipient for the electronic submission.
Initial recipient of electronic NPDES information from NPDES-regulated facilities means the entity (EPA or the state authorized by EPA to implement the NPDES program) that is the designated entity for receiving electronic NPDES data [see 40 CFR 127.2(b)].
EPA plans to establish a website that will also link to the appropriate electronic reporting tool for each type of electronic submission and for each state. Instructions on how to access and use the appropriate electronic reporting tool will be available as well. Information on EPA's NPDES Electronic Reporting Rule is found at:

https://www.federalregister.gov/documents/2015/10/22/2015-24954/national-pollutant-discharge-elimination-system-npdes-electronic-reporting-rule

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Electronic submissions must start by the dates listed in the "Reporting Requirements" section above.

3. **How to Request a Waiver from Electronic Reporting**
The permittee may seek a temporary electronic reporting waiver from the Division. To obtain an electronic reporting waiver, a permittee must first submit an electronic reporting waiver request to the Division. Requests for temporary electronic reporting waivers must be submitted in writing to the Division for written approval at least sixty (60) days prior to the date the facility would be required under this permit to begin submitting monitoring data and reports. The duration of a temporary waiver shall not exceed 5 years and shall thereupon expire. At such time, monitoring data and reports shall be submitted electronically to the Division unless the permittee re-applies for and is granted a new temporary electronic reporting waiver by the Division. Approved electronic reporting waivers are not transferrable. Only permittees with an approved reporting waiver request may submit monitoring data and reports on paper to the Division for the period that the approved reporting waiver request is effective.

Information on eDMR and the application for a temporary electronic reporting waiver are found on the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

4. **Signatory Requirements [Supplements Section B. (11.) (b) and Supersedes Section B. (11.) (d)]**
All eDMRs submitted to the permit issuing authority shall be signed by a person described in Part II, Section B. (11.)(a) or by a duly authorized representative of that person as described in Part II, Section B. (11.)(b). A person, and not a position, must be delegated signatory authority for eDMR reporting purposes.

For eDMR submissions, the person signing and submitting the DMR must obtain an eDMR user account and login credentials to access the eDMR system. For more information on North Carolina's eDMR system, registering for eDMR and obtaining an eDMR user account, please visit the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

Certification. Any person submitting an electronic DMR using the state's eDMR system shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

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

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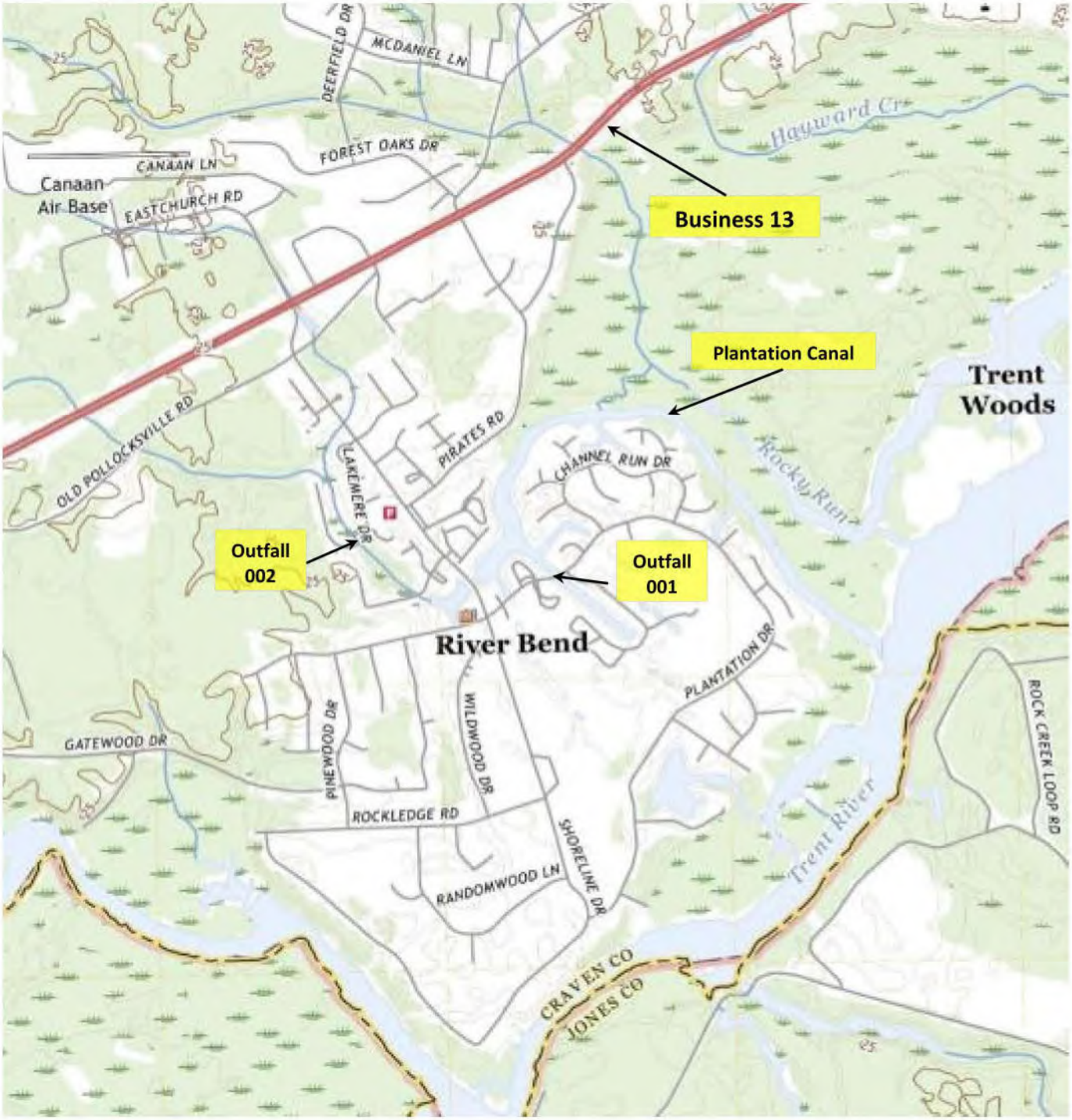
5. **Records Retention [Supplements Section D. (6.)]**
   The permittee shall retain records of all Discharge Monitoring Reports, including eDMR submissions. These records or copies shall be maintained for a period of at least 3 years from the date of the report. This period may be extended by request of the Director at any time [40 CFR 122.41].



Town of River Bend
River Bend WTPs 1 & 2

Receiving Stream:	Trent River	**Stream Class:**	SB; Sw; NSW
River Basin:	Neuse	**Sub-Basin:**	03-04-011
Outfall 1 Latitude:	35° 04' 27"	**Outfall 2 Latitude:**	35° 04' 31"
Longitude:	77° 08' 43"	**Longitude:**	77° 09' 10"
Discharge to:	Plantation Canal	**Discharge to:**	UT to Plantation Canal
Stream Segment	27-101-(31)	**HUC#:**	030202040302
Grid/Quad:	G30SW/Pollocksville	**County:**	Craven

North

Facility
LOCATION
(*not to scale*)

NPDES Permit NC0086797

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PART II
STANDARD CONDITIONS FOR NPDES PERMITS

Section A. Definitions

2/Month
Samples are collected twice per month with at least ten calendar days between sampling events. These samples shall be representative of the wastewater discharged during the sample period.

3/Week
Samples are collected three times per week on three separate calendar days. These samples shall be representative of the wastewater discharged during the sample period.

Act or "the Act"
The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), as amended, 33 USC 1251, et. seq.

Annual Average
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar year. In the case of fecal coliform, the geometric mean of such discharges.

Arithmetic Mean
The summation of the individual values divided by the number of individual values.

Bypass
The known diversion of waste streams from any portion of a treatment facility including the collection system, which is not a designed or established or operating mode for the facility.

Calendar Day
The period from midnight of one day until midnight of the next day. However, for purposes of this permit, any consecutive 24-hour period that reasonably represents the calendar day may be used for sampling.

Calendar Week
The period from Sunday through the following Saturday.

Calendar Quarter
One of the following distinct periods: January through March, April through June, July through September, and October through December.

Composite Sample
A sample collected over a 24-hour period by continuous sampling or combining grab samples of at least 100 mL in such a manner as to result in a total sample representative of the wastewater discharge during the sample period. The Director may designate the most appropriate method (specific number and size of aliquots necessary, the time interval between grab samples, etc.) on a case-by-case basis. Samples may be collected manually or automatically. Composite samples may be obtained by the following methods:

(1) Continuous: a single, continuous sample collected over a 24-hour period proportional to the rate of flow.
(2) Constant time/variable volume: a series of grab samples collected at equal time intervals over a 24 hour period of discharge and combined proportional to the rate of flow measured at the time of individual sample collection, or
(3) Variable time/constant volume: a series of grab samples of equal volume collected over a 24 hour period with the time intervals between samples determined by a preset number of gallons passing the sampling point. Flow measurement between sample intervals shall be determined by use of a flow recorder and totalizer, and the preset gallon interval between sample collection fixed at no greater than 1/24 of the expected total daily flow at the treatment system, or

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(4) Constant time/constant volume: a series of grab samples of equal volume collected over a 24-hour period at a constant time interval. Use of this method requires prior approval by the Director. This method may only be used in situations where effluent flow rates vary less than 15 percent. The following restrictions also apply:

- Influent and effluent grab samples shall be of equal size and of no less than 100 milliliters
- Influent samples shall not be collected more than once per hour.
- Permittees with wastewater treatment systems whose detention time < 24 hours shall collect effluent grab samples at intervals of no greater than 20 minutes apart during any 24-hour period.
- Permittees with wastewater treatment systems whose detention time exceeds 24 hours shall collect effluent grab samples at least every six hours; there must be a minimum of four samples during a 24-hour sampling period.

Continuous flow measurement
Flow monitoring that occurs without interruption throughout the operating hours of the facility. Flow shall be monitored continually except for the infrequent times when there may be no flow or for infrequent maintenance activities on the flow device.

Daily Discharge
The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants measured in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (40 CFR 122.2; see also "Composite Sample," above.)

Daily Maximum
The highest "daily discharge" during the calendar month.

Daily Sampling
Parameters requiring daily sampling shall be sampled 5 out of every 7 days per week unless otherwise specified in the permit. Sampling shall be conducted on weekdays except where holidays or other disruptions of normal operations prevent weekday sampling. If sampling is required for all seven days of the week for any permit parameter(s), that requirement will be so noted on the Effluent Limitations and Monitoring Page(s).

DWR or "the Division"
The Division of Water Resources, Department of Environmental Quality.

Effluent
Wastewater discharged following all treatment processes from a water pollution control facility or other point source whether treated or untreated.

EMC
The North Carolina Environmental Management Commission

EPA
The United States Environmental Protection Agency

Facility Closure
Cessation of all activities that require coverage under this NPDES permit. Completion of facility closure will allow this permit to be rescinded.

Geometric Mean
The Nth root of the product of the individual values where N = the number of individual values. For purposes of calculating the geometric mean, values of "0" (or "< [detection level]") shall be considered = 1.

Grab Sample
Individual samples of at least 100 mL collected over a period of time not exceeding 15 minutes. Grab samples can be collected manually. Grab samples must be representative of the discharge (or the receiving stream, for instream samples).

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Hazardous Substance
Any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Instantaneous flow measurement
The flow measured during the minimum time required for the flow measuring device or method to produce a result in that instance. To the extent practical, instantaneous flow measurements coincide with the collection of any grab samples required for the same sampling period so that together the samples and flow are representative of the discharge during that sampling period.

Monthly Average (concentration limit)
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar month. In the case of fecal coliform or other bacterial parameters or indicators, the geometric mean of such discharges.

Permit Issuing Authority
The Director of the Division of Water Resources.

Quarterly Average (concentration limit)
The arithmetic mean of all samples taken over a calendar quarter.

Severe property damage
Substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage excludes economic loss caused by delays in production.

Toxic Pollutant:
Any pollutant listed as toxic under Section 307(a)(1) of the CWA.

Upset
An incident beyond the reasonable control of the Permittee causing unintentional and temporary noncompliance with permit effluent limitations and/or monitoring requirements. An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Weekly Average (concentration limit)
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar week. In the case of fecal coliform or other bacterial parameters or indicators, the geometric mean of such discharges.

Section B. General Conditions

1. Duty to Comply
   The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application [40 CFR 122.41].

   a. The Permittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

   b. The CWA provides that any person who violates section[s] 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $37,500 per day for each violation. [33 USC 1319(d) and 40 CFR 122.41(a)(2)]

   c. The CWA provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or

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imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. [33 USC 1319(c)(1) and 40 CFR 122.41(a)(2)]

d. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. [33 USC 1319(c)(2) and 40 CFR 122.41(a)(2)]

e. Any person who *knowingly* violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions. [40 CFR 122.41(a)(2)]

f. Under state law, a civil penalty of not more than $25,000 per violation may be assessed against any person who violates or fails to act in accordance with the terms, conditions, or requirements of a permit. [North Carolina General Statutes § 143-215.6A]

g. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $37,500. Penalties for Class II violations are not to exceed $16,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $177,500. [33 USC 1319(g)(2) and 40 CFR 122.41(a)(3)]

2. Duty to Mitigate
The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit with a reasonable likelihood of adversely affecting human health or the environment [40 CFR 122.41(d)].

3. Civil and Criminal Liability
Except as provided in permit conditions on "Bypassing" (Part II.C.4), “Upsets” (Part II.C.5) and "Power Failures" (Part II.C.7), nothing in this permit shall be construed to relieve the Permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6 or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the Permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

4. Oil and Hazardous Substance Liability
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USG 1321. Furthermore, the Permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

5. Property Rights
The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations [40 CFR 122.41(g)].

6. Onshore or Offshore Construction
This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

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7. Severability
The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby [NCGS 150B-23].

8. Duty to Provide Information
The Permittee shall furnish to the Permit Issuing Authority, within a reasonable time, any information which the Permit Issuing Authority may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee shall also furnish to the Permit Issuing Authority upon request, copies of records required by this permit [40 CFR 122.41(h)].

9. Duty to Reapply
If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit [40 CFR 122.41(b)].

10. Expiration of Permit
The Permittee is not authorized to discharge after the expiration date. In order to receive automatic authorization to discharge beyond the expiration date, the Permittee shall submit such information, forms, and fees as are required by the agency authorized to issue permits no later than 180 days prior to the expiration date unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.) [40 CFR 122.21(d)] Any Permittee that has not requested renewal at least 180 days prior to expiration, or any Permittee that does not have a permit after the expiration and has not requested renewal at least 180 days prior to expiration, will subject the Permittee to enforcement procedures as provided in NCGS 143-215.6 and 33 USC 1251 et. seq.

11. Signatory Requirements
All applications, reports, or information submitted to the Permit Issuing Authority shall be signed and certified [40 CFR 122.41(k)].

   a. All permit applications shall be signed as follows:

      (1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (b) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures .

      (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

      (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official [40 CFR 122.22].

   b. All reports required by the permit and other information requested by the Permit Issuing Authority shall be signed by a person described in paragraph a. above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

      (1) The authorization is made in writing by a person described above;

      (2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

      (3) The written authorization is submitted to the Permit Issuing Authority [40 CFR 122.22]

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c. Changes to authorization: If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative [40 CFR 122.22]

d. Certification. Any person signing a document under paragraphs a. or b. of this section shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

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

12. Permit Actions
This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition [40 CFR 122.41(f)].

13. Permit Modification, Revocation and Reissuance, or Termination
The issuance of this permit does not prohibit the permit issuing authority from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 02H .0100; and North Carolina General Statute 143.215.1 et. al.

14. Annual Administering and Compliance Monitoring Fee Requirements
The Permittee must pay the annual administering and compliance monitoring fee within thirty days after being billed by the Division. Failure to pay the fee in a timely manner in accordance with 15A NCAC 02H .0105(b)(2) may cause this Division to initiate action to revoke the permit.

Section C. Operation and Maintenance of Pollution Controls

1. Certified Operator
Owners of classified water pollution control systems must designate operators, certified by the Water Pollution Control System Operators Certification Commission (WPCSOCC), of the appropriate type and grade for the system, and, for each classification must [T15A NCAC 08G .0201]:

a. designate one Operator In Responsible Charge (ORC) who possesses a valid certificate of the type and grade at least equivalent to the type and grade of the system;

b. designate one or more Back-up Operator(s) in Responsible Charge (Back-up ORCs) who possesses a valid certificate of the type of the system and no more than one grade less than the grade of the system, with the exception of no backup operator in responsible charge is required for systems whose minimum visitation requirements are twice per year; and

c. submit a signed completed "Water Pollution Control System Operator Designation Form" to the Commission (or to the local health department for owners of subsurface systems) countersigned by the designated certified operators, designating the Operator in Responsible Charge (ORC) and the Back-up Operator in Responsible Charge (Back-up ORC):

(1) 60 calendar days prior to wastewater or residuals being introduced into a new system; or

(2) within 120 calendar days following:

- receiving notification of a change in the classification of the system requiring the designation of a new Operator in Responsible Charge (ORC) and Back-up Operator in Responsible Charge (Back-up ORC) of the proper type and grade; or
- a vacancy in the position of Operator in Responsible Charge (ORC) or Back-up Operator in Responsible Charge (Back-up ORC).

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(3) within seven calendar days of vacancies in both ORC and Back-up ORC positions replacing or designating at least one of the responsibilities.

The ORC of each Class I facility (or the Back-up ORC, when acting as surrogate for the ORC) must:

- Visit the facility as often as is necessary to insure proper operation of the treatment system; the treatment facility must be visited at least weekly
- Comply with all other conditions of 15A NCAC 08G .0204.

The ORC of each Class II, III and IV facility (or the Back-up ORC, when acting as surrogate for the ORC) must:

- Visit the facility as often as is necessary to insure proper operation of the treatment system; the treatment facility must be visited at least five days per week, excluding holidays
- Properly manage and document daily operation and maintenance of the facility
- Comply with all other conditions of 15A NCAC 08G .0204.

2. Proper Operation and Maintenance
The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the Permittee to install and operate backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit [40 CFR 122.41(e)].

NOTE: Properly and officially designated operators are fully responsible for all proper operation and maintenance of the facility, and all documentation required thereof, whether acting as a contract operator [subcontractor] or a member of the Permittee's staff.

3. Need to Halt or Reduce not a Defense
It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this permit [40 CFR 122.41(c)].

4. Bypassing of Treatment Facilities
   a. Bypass not exceeding limitations [40 CFR 122.41(m)(2)]
      The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Paragraphs b. and c. of this section.
   b. Notice [40 CFR 122.41(m)(3)]
      (1) Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.
      (2) Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required in Part II.E.6. (24-hour notice).
   c. Prohibition of Bypass
      (1) Bypass from the treatment facility is prohibited and the Permit Issuing Authority may take enforcement action against a Permittee for bypass, unless:
         (A) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
         (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         (C) The Permittee submitted notices as required under Paragraph b. of this section.
      (2) Bypass from the collection system is prohibited and the Permit Issuing Authority may take enforcement action against a Permittee for a bypass as provided in any current or future system-wide collection system permit associated with the treatment facility.

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(3) The Permit Issuing Authority may approve an anticipated bypass, after considering its adverse effects, if the Permit Issuing Authority determines that it will meet the three conditions listed above in Paragraph c. (1) of this section.

5. Upsets
   a. Effect of an upset [40 CFR 122.41(n)(2)]: An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph b. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset: Any Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

      (1) An upset occurred and that the Permittee can identify the cause(s) of the upset;

      (2) The Permittee facility was at the time being properly operated; and

      (3) The Permittee submitted notice of the upset as required in Part II.E.6.(b) of this permit.

      (4) The Permittee complied with any remedial measures required under Part II.B.2. of this permit.
   c. Burden of proof [40 CFR 122.41(n)(4)]: The Permittee seeking to establish the occurrence of an upset has the burden of proof in any enforcement proceeding.

6. Removed Substances
   Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be utilized/disposed of in accordance with NCGS 143-215.1 and in a manner such as to prevent any pollutant from such materials from entering waters of the State or navigable waters of the United States except as permitted by the Commission. The Permittee shall comply with all applicable state and Federal regulations governing the disposal of sewage sludge, including 40 CFR 503, Standards for the Use and Disposal of Sewage Sludge; 40 CFR Part 258, Criteria For Municipal Solid Waste Landfills; and 15A NCAC Subchapter 2T, Waste Not Discharged To Surface Waters. The Permittee shall notify the Permit Issuing Authority of any significant change in its sludge use or disposal practices.

7. Power Failures
   The Permittee is responsible for maintaining adequate safeguards (as required by 15A NCAC 02H .0124) to prevent the discharge of untreated or inadequately treated wastes during electrical power failures either by means of alternate power sources, standby generators or retention of inadequately treated effluent.

Section D. Monitoring and Records

1. Representative Sampling
   Samples collected and measurements taken, as required herein, shall be representative of the permitted discharge. Samples collected at a frequency less than daily shall be taken on a day and time that is representative of the discharge for the period the sample represents. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Permit Issuing Authority [40 CFR 122.41(j)].

2. Reporting
   Monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a monthly Discharge Monitoring Report (DMR) Form (MR 1, 1.1, 2, 3) or alternative forms approved by the Director, postmarked no later than the last calendar day of the month following the completed reporting period.

   The first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the following address:

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NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

3. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from the true discharge rates throughout the range of expected discharge volumes. Flow measurement devices shall be accurately calibrated at a minimum of once per year and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. The Director shall approve the flow measurement device and monitoring location prior to installation.

Once-through condenser cooling water flow monitored by pump logs, or pump hour meters as specified in Part I of this permit and based on the manufacturer's pump curves shall not be subject to this requirement.

4. Test Procedures
Laboratories used for sample analysis must be certified by the Division. Permittees should contact the Division's Laboratory Certification Section (919 733-3908) or visit https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch for information regarding laboratory certifications.

Facilities whose personnel are conducting testing of field-certified parameters only must hold the appropriate field parameter laboratory certifications.

Test procedures for the analysis of pollutants shall conform to the EMC regulations (published pursuant to NCGS 143-215.63 et. seq.), the Water and Air Quality Reporting Acts, and to regulations published pursuant to Section 304(g), 33 USC 1314, of the CWA (as amended), and 40 CFR 136; or in the case of sludge use or disposal, approved under 40 CFR 136, unless otherwise specified in 40 CFR 503, unless other test procedures have been specified in this permit [40 CFR 122.41].

To meet the intent of the monitoring required by this permit, all test procedures must produce minimum detection and reporting levels that are below the permit discharge requirements and all data generated must be reported down to the minimum detection or lower reporting level of the procedure. If no approved methods are determined capable of achieving minimum detection and reporting levels below permit discharge requirements, then the most sensitive (method with the lowest possible detection and reporting level) approved method must be used.

5. Penalties for Tampering
The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both [40 CFR 122.41].

6. Records Retention
Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR 503), the Permittee shall retain records of all monitoring information, including:

- all calibration and maintenance records
- all original strip chart recordings for continuous monitoring instrumentation
- copies of all reports required by this permit
- copies of all data used to complete the application for this permit

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These records or copies shall be maintained for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time [40 CFR 122.41].

7. Recording Results
For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information [40 CFR 122.41]:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

8. Inspection and Entry
The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to;

   a. Enter, at reasonable times, upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
   d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location [40 CFR 122.41(i)].

Section E Reporting Requirements

1. Change in Discharge
All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

2. Planned Changes
The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility [40 CFR 122.41(l)]. Notice is required only when:

   a. The alteration or addition to a permitted facility may meet one of the criteria for new sources at 40 CFR 122.29(b); or
   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1); or
   c. The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

3. Anticipated Noncompliance
The Permittee shall give advance notice to the Director of any planned changes to the permitted facility or other activities that might result in noncompliance with the permit [40 CFR 122.41(l)(2)].

4. Transfers
This permit is not transferable to any person without prior written notice to and approval from the Director in accordance with 40 CFR 122.61. The Director may condition approval in accordance with NCGS 143-215.1, in

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particular NCGS 143-215.1(b)(4)b.2., and may require modification or revocation and reissuance of the permit, or a minor modification, to identify the new permittee and incorporate such other requirements as may be necessary under the CWA [40 CFR 122.41(l)(3), 122.61] or state statute.

5. Monitoring Reports
Monitoring results shall be reported at the intervals specified elsewhere in this permit [40 CFR 122.41(l)(4)].

   a. Monitoring results must be reported on a Discharge Monitoring Report (DMR) (See Part II.D.2) or forms provided by the Director for reporting results of monitoring of sludge use or disposal practices.
   b. If the Permittee monitors any pollutant more frequently than required by this permit using test procedures approved under 40 CFR Part 136 and at a sampling location specified in this permit or other appropriate instrument governing the discharge, the results of such monitoring shall be included in the calculation and reporting of the data submitted on the DMR.

6. Twenty-four Hour Reporting
   a. The Permittee shall report to the Director or the appropriate Regional Office any noncompliance that potentially threatens public health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance, and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [40 CFR 122.41(l)(6)].
   b. The Director may waive the written report on a case-by-case basis for reports under this section if the oral report has been received within 24 hours.
   c. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 858-0368 or (919) 733-3300.

7. Other Noncompliance
The Permittee shall report all instances of noncompliance not reported under Part II.E.5 and 6. of this permit at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.E.6. of this permit [40 CFR 122.41(l)(7)].

8. Other Information
Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information [40 CFR 122.41(l)(8)].

9. Noncompliance Notification
The Permittee shall report by telephone to either the central office or the appropriate regional office of the Division as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

   a. Any occurrence at the water pollution control facility which results in the discharge of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a sludge digester; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances.
   b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.
   c. Any failure of a pumping station, sewer line, or treatment facility resulting in a by-pass without treatment of all or any portion of the influent to such station or facility.

   Persons reporting such occurrences by telephone shall also file a written report within 5 days following first knowledge of the occurrence. Also see reporting requirements for municipalities in Part IV.C.2.c. of this permit.

10. Availability of Reports
Except for data determined to be confidential under NCGS 143-215.3 (a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices

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of the Division. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NCGS 143-215.1(b)(2) or in Section 309 of the Federal Act.

11. Penalties for Falsification of Reports
The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation, or by imprisonment for not more than two years per violation, or by both [40 CFR 122.41].

12. Annual Performance Reports
Permittees who own or operate facilities that primarily collect or treat municipal or domestic wastewater and have an average annual flow greater than 200,000 gallons per day shall provide an annual report to the Permit Issuing Authority and to the users/customers served by the Permittee (NCGS 143-215.1C). The report shall summarize the performance of the collection or treatment system, as well as the extent to which the facility was compliant with applicable Federal or State laws, regulations and rules pertaining to water quality. The report shall be provided no later than sixty days after the end of the calendar or fiscal year, depending upon which annual period is used for evaluation.

The report shall be sent to:

NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

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PART III
OTHER REQUIREMENTS

Section A. Construction

a. The Permittee shall not commence construction of wastewater treatment facilities, nor add to the plant's treatment capacity, nor change the treatment process(es) utilized at the treatment plant unless (1) the Division has issued an Authorization to Construct (AtC) permit or (2) the Permittee is exempted from such AtC permit requirements under Item b. of this Section.

b. In accordance with NCGS 143-215.1(a5) [SL 2011-394], no permit shall be required to enter into a contract for the construction, installation, or alteration of any treatment work or disposal system or to construct, install, or alter any treatment works or disposal system within the State when the system's or work's principle function is to conduct, treat, equalize, neutralize, stabilize, recycle, or dispose of industrial waste or sewage from an industrial facility and the discharge of the industrial waste or sewage is authorized under a permit issued for the discharge of the industrial waste or sewage into the waters of the State. Notwithstanding the above, the permit issued for the discharge may be modified if required by federal regulation.

c. Issuance of an AtC will not occur until Final Plans and Specifications for the proposed construction have been submitted by the Permittee and approved by the Division.

Section B. Groundwater Monitoring

The Permittee shall, upon written notice from the Director, conduct groundwater monitoring as may be required to determine the compliance of this NPDES permitted facility with the current groundwater standards.

Section C. Changes in Discharges of Toxic Substances

The Permittee shall notify the Permit Issuing Authority as soon as it knows or has reason to believe (40 CFR 122.42):

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels";

   (1) One hundred micrograms per liter (100 µg/L);

   (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

   (3) Five times the maximum concentration value reported for that pollutant in the permit application.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels";

   (1) Five hundred micrograms per liter (500 µg/L);

   (2) One milligram per liter (1 mg/L) for antimony;

   (3) Ten times the maximum concentration value reported for that pollutant in the permit application.

Section D. Facility Closure Requirements

The Permittee must notify the Division at least 90 days prior to the closure of any wastewater treatment system covered by this permit. The Division may require specific measures during deactivation of the system to prevent adverse impacts to waters of the State. This permit cannot be rescinded while any activities requiring this permit continue at the permitted facility.

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PART IV
SPECIAL CONDITIONS FOR MUNICIPAL FACILITIES

Section A. Definitions

In addition to the definitions in Part II of this permit, the following definitions apply to municipal facilities:

Indirect Discharge or Industrial User
Any non-domestic source that discharges wastewater containing pollutants into a POTW regulated under section 307(b), (c) or (d) of the CWA. [40 CFR 403.3 (i) and (j) and 15A NCAC 02H .0903(b)(11)]

Interference
Inhibition or disruption of the POTW treatment processes; operations; or its sludge process, use, or disposal which causes or contributes to a violation of any requirement of the Permittee's (or any satellite POTW's if different from the Permittee) NPDES, collection system, or non-discharge permit or prevents sewage sludge use or disposal in compliance with specified applicable State and Federal statutes, regulations, or permits. [15A NCAC 02H .0903(b)(14)]

Pass Through
A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or with discharges from other sources, causes a violation, including an increase in the magnitude or duration of a violation, of the Permittee's (or any satellite POTW's, if different from the Permittee) NPDES, collection system, or non-discharge permit. [15A NCAC 02H .0903(b)(23)]

Publicly Owned Treatment Works (POTW)
A treatment works as defined by Section 212 of the CWA, which is owned by a State or local government organization. This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes the collection system, as defined in 15A NCAC 2T .0402, only if it conveys wastewater to a POTW treatment plant. The term also means the local government organization, or municipality, as defined in section 502(4) of the CWA, which has jurisdiction over indirect discharges to and the discharges from such a treatment works. In this context, the organization may be the owner of the POTW treatment plant or the owner of the collection system into which an indirect discharger discharges. This second type of POTW may be referred to as a "satellite POTW organization." [15A NCAC 02H .0903(b)(26)]

"Significant Industrial User" or "SIU"
An Industrial User that discharges wastewater into a publicly owned treatment works and that [15A NCAC 02H .0903(b)(33)]:

1. Discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewaters); or
2. Contributes process wastewater which makes up five percent or more of the NPDES or non-discharge permitted flow limit or organic capacity of the POTW treatment plant. In this context, organic capacity refers to BOD, TSS and ammonia; or
3. Is subject to categorical standards under 40 CFR Part 403.6 and 40 CFR Parts 405-471; or
4. Is designated as such by the Permittee on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, or the POTW's effluent limitations and conditions in its NPDES or non-discharge permit, or to limit the POTW's sludge disposal options;
5. Subject to approval under 15A NCAC 02H .0907(b), the Permittee may determine that an Industrial User meeting the criteria in paragraphs 1 or 2 of this definition above has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the POTW's effluent limitations and conditions in its NPDES or non-discharge permit, or to limit the POTW's sludge disposal options, and thus is not a Significant Industrial User (SIU); or
6. Subject to approval under 15A NCAC 02H .0907(b), the Permittee may determine that an Industrial User meeting the criteria in paragraph 3 of this definition above meets the requirements of 40 CFR Part 403.3(v)(2) and thus is a non-significant categorical Industrial User.

Section B. Publicly Owned Treatment Works (POTWs)

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All POTWs must provide adequate notice to the Director of the following [40 CFR 122.42(b)]:

1. Any new introduction of pollutants into the POTW from an indirect discharger, regardless of the means of transport, which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; and
2. Any substantial change in the volume or character of pollutants being introduced by an indirect discharger as influent to that POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on (1) the quality and quantity of effluent introduced into the POTW, and (2) any anticipated impact that may result from the change of the quantity or quality of effluent to be discharged from the POTW.

Section C. Municipal Control of Pollutants from Industrial Users.

1. Effluent limitations are listed in Part I of this permit. Other pollutants attributable to inputs from Industrial Users discharging to the POTW may be present in the Permittee's discharge. At such time as sufficient information becomes available to establish limitations for such pollutants, this permit may be revised to specify effluent limitations for any or all of such other pollutants in accordance with best practicable technology or water quality standards.
2. Prohibited Discharges
   a. The Permittee shall develop and enforce their Pretreatment Program to implement the prohibition against the introduction of pollutants or discharges into the waste treatment system or waste collection system which cause or contribute to Pass Through or Interference as defined in 15A NCAC 02H .0900 and 40 CFR 403. [40 CFR 403.5(a)(1)]
   b. The Permittee shall develop and enforce their Pretreatment Program to implement the prohibitions against the introduction of the following wastes in the waste treatment or waste collection system [40 CFR 403.5(b)]:
      (1) Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;
      (2) Pollutants which cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such discharges;
      (3) Solid or viscous pollutants in amounts which cause obstruction to the flow in the POTW resulting in Interference;
      (4) Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a Discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;
      (5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40°C (104°F) unless the Division, upon request of the POTW, approves alternate temperature limits;
      (6) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;
      (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; or
      (8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.
   c. The Permittee shall investigate the source of all discharges into the POTW, including slug loads and other unusual discharges, which have the potential to adversely impact the Permittee's Pretreatment Program and/or the operation of the POTW.

      The Permittee shall report such discharges into the POTW to the Director or the appropriate Regional Office. Any information shall be provided orally within 24 hours from the time the Permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the discharge; the investigation into possible sources; the period of the discharge, including exact dates and times; if the discharge has not ceased, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance,

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3. With regard to the effluent requirements listed in Part I of this permit, it may be necessary for the Permittee to supplement the requirements of the Federal Pretreatment Standards (40 CFR, Part 403) to ensure compliance by the Permittee with all applicable effluent limitations. Such actions by the Permittee may be necessary regarding some or all of the industries discharging to the municipal system.
4. The Permittee shall require any Industrial User (IU) discharging to the POTW to meet Federal Pretreatment Standards developed under Section 307(b) of the Act as amended (which includes categorical standards and specific local limits, best management practices and narrative requirements). Prior to accepting wastewater from any Significant Industrial User (SIU), the Permittee shall either develop and submit to the Division a new Pretreatment Program or, as necessary, a modification of an existing Pretreatment Program, for approval as required under section D below as well as 15A NCAC 02H .0907(a) and (b). [40 CFR 122.44(j)(2)]
5. This permit shall be modified, or alternatively, revoked and reissued, to incorporate or modify an approved POTW Pretreatment Program or to include a compliance schedule for the development of a POTW Pretreatment Program as required under Section 402 (b)(8) of the CWA and implementing regulations or by the requirements of the approved State pretreatment program, as appropriate.

Section D. Pretreatment Programs

Under authority of sections 307 (b) and (c) and 402(b)(8) of the CWA and implementing regulations 40 CFR 403, North Carolina General Statute 143-215.3(14) and implementing regulations 15A NCAC 02H .0900, and in accordance with the approved pretreatment program, all provisions and regulations contained and referenced in the pretreatment program submittal are an enforceable part of this permit. [40 CFR 122.44(j)(2)]

The Permittee shall operate its approved pretreatment program in accordance with Section 402(b)(8) of the CWA, 40 CFR 403, 15A NCAC 02H .0900, and the legal authorities, policies, procedures, and financial provisions contained in its pretreatment program submission and Division approved modifications thereof. Such operation shall include but is not limited to the implementation of the following conditions and requirements. Terms not defined in Part II or Part IV of this permit are as defined in 15A NCAC 02H .0903 and 40 CFR 403.3.

1. Sewer Use Ordinance (SUO)
   The Permittee shall maintain adequate legal authority to implement its approved pretreatment program. [15A NCAC 02H .0903(b)(32), .0905 and .0906(b)(1); 40 CFR 403.8(f)(1) and 403.9(b)(1) and (2)]

2. Industrial Waste Survey (IWS)
   The Permittee shall implement an IWS consisting of the survey of users of the POTW collection system or treatment plant, as required by 40 CFR 403.8(f)(2)(i-iii) and 15A NCAC 02H .0905 [also 40 CFR 122.44(j)(1)], including identification of all Industrial Users that may have an impact on the POTW and the character and amount of pollutants contributed to the POTW by these Industrial Users and identification of those Industrial Users meeting the definition of SIU. Where the Permittee accepts wastewater from one or more satellite POTWs, the IWS for the Permittee shall address all satellite POTW services areas, unless the pretreatment program in those satellite service areas is administered by a separate Permittee with an approved Pretreatment Program. The Permittee shall submit a summary of its IWS activities to the Division at least once every five years, and as required by the Division. The IWS submission shall include a summary of any investigations conducted under paragraph C.2.c. of this Part. [15A NCAC 02H .0903(b)(13), .0905 and .0906(b)(2); 40 CFR 403.8(f)(2) and 403.9]

3. Monitoring Plan
   The Permittee shall implement a Division-approved Monitoring Plan for the collection of facility specific data to be used in a wastewater treatment plant Headworks Analysis (HWA) for the development of specific pretreatment local limits. Effluent data from the Plan shall be reported on the DMRs (as required by Parts II.D and II.E.5.). [15A NCAC 02H .0903(b)(16), .0906(b)(3) and .0905]

4. Headworks Analysis (HWA) and Local Limits
   The Permittee shall obtain Division approval of a HWA at least once every five years, and as required by the Division. Within 180 days of the effective date of this permit (or any subsequent permit modification) the Permittee shall submit to the Division a written technical evaluation of the need to revise local limits (i.e., an updated HWA or documentation of why one is not needed) [40 CFR 122.44]. The Permittee shall develop, in accordance with 40 CFR 403.5(c) and 15A NCAC 02H .0909, specific Local Limits to implement the prohibitions listed in 40 CFR 403.5(a) and (b) and 15A NCAC 02H .0909. Pursuant to 40 CFR 403.5, local limits are

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enforceable Pretreatment Standards as defined by 40 CFR 403.3(1). [15A NCAC 02H .0903(b)(10), .0905, and .0906(b)(4)]

5. Industrial User Pretreatment Permits (IUP) & Allocation Tables
In accordance with NCGS 143-215.1, the Permittee shall issue to all Significant Industrial Users, permits for operation of pretreatment equipment and discharge to the Permittee's collection system or treatment works. These permits shall contain limitations, sampling protocols, reporting requirements, appropriate standard and special conditions, and compliance schedules as necessary for the installation of treatment and control technologies to assure that their wastewater discharge will meet all applicable pretreatment standards and requirements. The Permittee shall maintain a current Allocation Table (AT) which summarizes the results of the HWA and the limits from all IUPs. Permitted IUP loadings for each parameter cannot exceed the treatment capacity of the POTW as determined by the HWA. [15A NCAC 02H .0906(b)(6), .0909, .0916, and .0917; 40 CFR 403.5, 403.8(f)(1)(iii); NCGS 143-215.67(a)]

6. Authorization to Construct (AtC)
The Permittee shall ensure that an Authorization to Construct permit (AtC) is issued to all applicable Industrial Users for the construction or modification of any pretreatment facility. Prior to the issuance of an AtC, the proposed pretreatment facility and treatment process must be evaluated for its capacity to comply with all Industrial User Pretreatment Permit (IUP) limitations. [15A NCAC 02H .0906(b)(7) and .0905; NCGS 143-215.1(a)(8)]

7. POTW Inspection & Monitoring of their IUs
The Permittee shall conduct inspection, surveillance, and monitoring activities as described in its Division approved pretreatment program in order to determine, independent of information supplied by Industrial Users, compliance with applicable pretreatment standards. [15A NCAC 02H .0908(e); 40 CFR 403.8(f)(2)(v)] The Permittee must:

   a. Inspect all Significant Industrial Users (SIUs) at least once per calendar year;
   b. Sample all Significant Industrial Users (SIUs) at least once per calendar year for all SIU permit-limited parameters including flow except as allowed under 15A NCAC .0908(e); and
   c. At least once per year, document an evaluation of any non-significant categorical Industrial User for compliance with the requirements in 40 CFR 403.3(v)(2), and either continue or revoke the designation as non-significant.

8. IU Self Monitoring and Reporting
The Permittee shall require all Industrial Users to comply with the applicable monitoring and reporting requirements outlined in the Division-approved pretreatment program, the industry's pretreatment permit, or in 15A NCAC 02H .0908. [15A NCAC 02H .0906(b)(5) and .0905; 40 CFR 403.8(f)(1)(v) and (2)(iii); 40 CFR 122.44(j)(2) and 40 CFR 403.12]

9. Enforcement Response Plan (ERP)
The Permittee shall enforce and obtain appropriate remedies for violations of all pretreatment standards promulgated pursuant to section 307(b) and (c) of the CWA (40 CFR 405 et. seq.), prohibitive discharge standards as set forth in 40 CFR 403.5 and 15A NCAC 02H .0909, specific local limitations, and other pretreatment requirements. All remedies, enforcement actions and other, shall be consistent with the Enforcement Response Plan (ERP) approved by the Division. [15A NCAC 02H .0903(b)(7), .0906(b)(8) and .0905; 40 CFR 403.8(f)(5)]

10. Pretreatment Annual Reports (PAR)
The Permittee shall report to the Division in accordance with 15A NCAC 02H .0908. In lieu of submitting annual reports, Modified Pretreatment Programs developed under 15A NCAC 02H .0904 (b) may be required to submit a partial annual report or to meet with Division personnel periodically to discuss enforcement of pretreatment requirements and other pretreatment implementation issues.

    For all other active pretreatment programs, the Permittee shall submit two copies of a Pretreatment Annual Report (PAR) describing its pretreatment activities over the previous calendar year to the Division at the following address:

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NC DEQ / Division of Water Resources / Water Quality Permitting Section
Pretreatment, Emergency Response, and Collection Systems (PERCS) Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

These reports shall be submitted by March 1 of each year and shall contain the following:

a. Narrative
A narrative summary detailing actions taken, or proposed, by the Permittee to correct significant non-compliance and to ensure compliance with pretreatment requirements;

b. Pretreatment Program Summary (PPS)
A pretreatment program summary (PPS) on forms or in a format provided by the Division;

c. Significant Non-Compliance Report (SNCR)
A list of Industrial Users (IUs) in significant noncompliance (SNC) with pretreatment requirements, and the nature of the violations on forms or in a format provided by the Division;

d. Industrial Data Summary Forms (IDSF)
Monitoring data from samples collected by both the POTW and the Significant Industrial Users (SIUs). These analytical results must be reported on Industrial Data Summary Forms (IDSF) or on other forms or in a format provided by the Division;

e. Other Information
Copies of the POTW's allocation table, new or modified enforcement compliance schedules, public notice of IUs in SNC, a summary of data or other information related to significant noncompliance determinations for IUs that are not considered SIUs, and any other information, upon request, which in the opinion of the Director is needed to determine compliance with the pretreatment implementation requirements of this permit;

11. Public Notice
The Permittee shall publish annually a list of Industrial Users (IUs) that were in significant noncompliance (SNC) as defined in the Permittee's Division-approved Sewer Use Ordinance with applicable pretreatment requirements and standards during the previous twelve month period. This list shall be published within four months of the applicable twelve-month period. [15A NCAC 02H .0903(b)(34), .0908(b)(5) and .0905 and 40 CFR 403.8(f)(2)(viii)]

12. Record Keeping
The Permittee shall retain for a minimum of three years records of monitoring activities and results, along with support information including general records, water quality records, and records of industrial impact on the POTW and shall retain all other Pretreatment Program records as required by 15A NCAC 02H .0908(f). [15A NCAC 02H .0908(f); 40 CFR 403.12(o)]

13. Pretreatment Program Resources
The Permittee shall maintain adequate funding and qualified personnel to accomplish the objectives of its approved pretreatment program. and retain a written description of those current levels of inspection. [15A NCAC 02H .0906(b)(9) and (10) and .0905; 40 CFR 403.8(f)(3), 403.9(b)(3)]

14. Modification to Pretreatment Programs
Modifications to the approved pretreatment program including but not limited to local limits modifications, POTW monitoring of their Significant Industrial Users (SIUs), and Monitoring Plan modifications, shall be considered a permit modification and shall be governed by 40 CFR 403.18, 15 NCAC 02H .0114 and 15A NCAC 02H .0907.

APPENDIX

D

Town of River Bend
2023 Local Water Supply Plan

River Bend

2023

The Division of Water Resources (DWR) provides the data contained within this Local Water Supply Plan (LWSP) as a courtesy and service to our customers. DWR staff does not field verify data. Neither DWR, nor any other party involved in the preparation of this LWSP attests that the data is completely free of errors and omissions. Furthermore, data users are cautioned that LWSPs labeled **PROVISIONAL** have yet to be reviewed by DWR staff. Subsequent review may result in significant revision. Questions regarding the accuracy or limitations of usage of this data should be directed to the water system and/or DWR.

1. System Information

Complete

Contact Information

Water System Name:	River Bend	PWSID:	04-25-113
Mailing Address:	45 Shoreline Drive River Bend, NC 28562	Ownership:	Municipality
Contact Person:	Brandon Mills	Title:	Public Works Director
Phone:	252-638-3540	Cell/Mobile:	252-617-2893

Distribution System

Line Type	Size Range (Inches)	Estimated % of lines
Ductile Iron	6-8	2.00 %
Polyvinyl Chloride	2-8	98.00 %

What are the estimated total miles of distribution system lines? 19 Miles

How many feet of distribution lines were replaced during 2023? 0 Feet

How many feet of new water mains were added during 2023? 0 Feet

How many meters were replaced in 2023? 832

How old are the oldest meters in this system? 1 Year(s)

How many meters for outdoor water use, such as irrigation, are not billed for sewer services? 6

What is this system's finished water storage capacity? 0.4000 Million Gallons

Has water pressure been inadequate in any part of the system since last update? *Line breaks that were repaired quickly should not be included.* No

Programs

Does this system have a program to work or flush hydrants? Yes, Annually

Does this system have a valve exercise program? Yes, Annually

Does this system have a cross-connection program? Yes

Does this system have a program to replace meters? Yes

Does this system have a plumbing retrofit program? No

Does this system have an active water conservation public education program? Yes

Does this system have a leak detection program? No

Water Conservation

What type of rate structure is used? Uniform

How much reclaimed water does this system use? 0.0000 MGD For how many connections? 0

Does this system have an interconnection with another system capable of providing water in an emergency? No

2. Water Use Information

Service Area

Sub-Basin(s)	% of Service Population	County(s)	% of Service Population
Trent River (10-3)	100 %	Craven	100 %

What was the year-round population served in 2023? 2,695

Has this system acquired another system since last report? No

Water Use by Type

Type of Use	Metered Connections	Metered Average Use (MGD)	Non-Metered Connections	Non-Metered Estimated Use (MGD)
Residential	1,483	0.1426	0	0.0000
Commercial	13	0.0200	0	0.0000
Industrial	0	0.0000	0	0.0000
Institutional	1	0.0120	0	0.0000

How much water was used for system processes (backwash, line cleaning, flushing, etc.)? 0.0960 MGD

3. Water Supply Sources

Monthly Withdrawals & Purchases

	Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)
Jan	0.2910	0.4190	May	0.3076	0.5170	Sep	0.3234	0.5200
Feb	0.3001	0.5390	Jun	0.3423	0.6760	Oct	0.3109	0.5170
Mar	0.2916	0.3840	Jul	0.3384	0.5610	Nov	0.3107	0.3720
Apr	0.3378	0.8540	Aug	0.3498	0.6820	Dec	0.3080	0.3770

Ground Water Sources

Name or Number	Average Daily Withdrawal (MGD)		Max Day Withdrawal (MGD)	12-Hour Supply (MGD)	CUA Reduction	Year Offline	Use Type
	MGD	Days Used					
1	0.1677	365	0.3940	0.3675	CUA0		Regular
2	0.0638	363	0.1960	0.2625	CUA0		Regular
3	0.0882	362	0.2640	0.3675	CUA0		Regular

Ground Water Sources (continued)

Name or Number	Well Depth (Feet)	Casing Depth (Feet)	Screen Depth (Feet)		Well Diameter (Inches)	Pump Intake Depth (Feet)	Metered?
			Top	Bottom			
1	105		77	105	8	85	Yes
2	110		81	110	6	65	Yes
3	103		90	103	8	85	Yes

Are ground water levels monitored? Yes, Monthly

Does this system have a wellhead protection program? Yes

Water Treatment Plants

Plant Name	Permitted Capacity (MGD)	Is Raw Water Metered?	Is Finished Water Ouput Metered?	Source
River Bend WTP	0.3500	Yes	No	Well #3
River Bend WTP	0.6000	Yes	No	Wells 1 and 2

Did average daily water production exceed 80% of approved plant capacity for five consecutive days during 2023? No

If yes, was any water conservation implemented?

Did average daily water production exceed 90% of approved plant capacity for five consecutive days during 2023? No

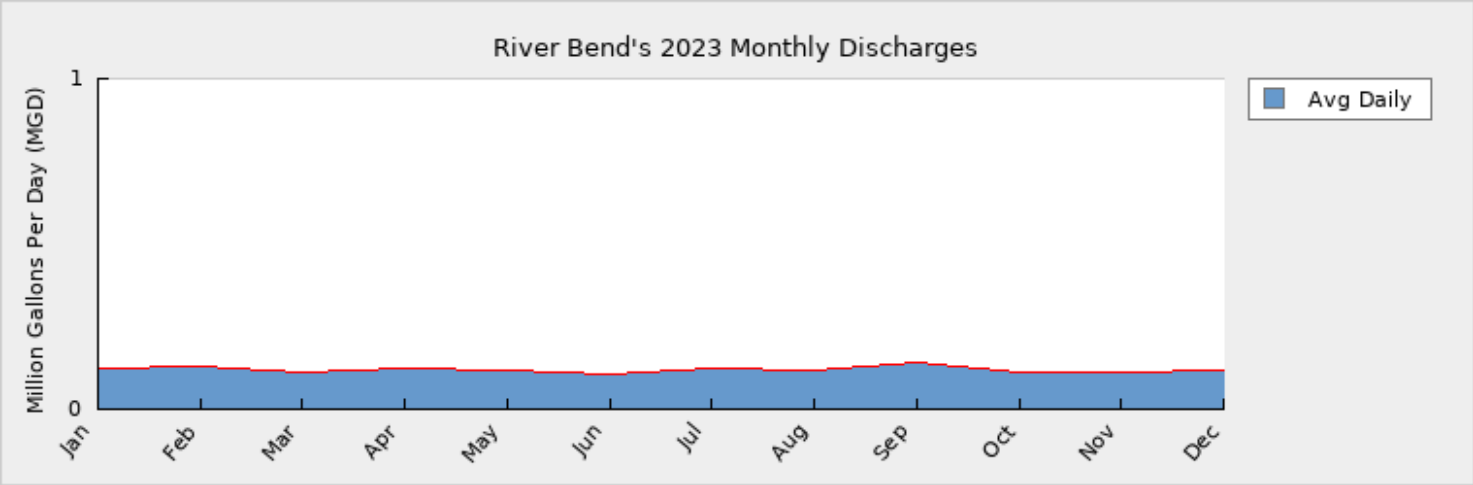
If yes, was any water conservation implemented?

Are peak day demands expected to exceed the water treatment plant capacity in the next 10 years? No

4. Wastewater Information

Monthly Discharges

	Average Daily Discharge (MGD)		Average Daily Discharge (MGD)		Average Daily Discharge (MGD)
Jan	0.1210	May	0.1180	Sep	0.1420
Feb	0.1280	Jun	0.1080	Oct	0.1100
Mar	0.1140	Jul	0.1210	Nov	0.1120
Apr	0.1210	Aug	0.1160	Dec	0.1170



How many sewer connections does this system have? 930

How many water service connections with septic systems does this system have? 497

Are there plans to build or expand wastewater treatment facilities in the next 10 years? No

Wastewater Permits

Permit Number	Type	Permitted Capacity (MGD)	Design Capacity (MGD)	Average Annual Daily Discharge (MGD)	Maximum Day Discharge (MGD)	Receiving Stream	Receiving Basin
NC0030406	WWTP	0.3300	0.3300	0.1020	0.3000	Trent River	Trent River (10-3)
NC0086797	WTP	0.0270	0.0270	0.0170		Plantation Canal	Trent River (10-3)

5. Planning

Projections

	2023	2030	2040	2050	2060	2070
Year-Round Population	2,695	2,709	2,736	2,796	2,883	2,994
Seasonal Population	0	0	0	0	0	0
Residential	0.1426	0.1424	0.1439	0.1470	0.1516	0.1574
Commercial	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200
Industrial	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Institutional	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120
System Process	0.0960	0.0960	0.0960	0.0960	0.0960	0.0960
Unaccounted-for	0.0480	0.0487	0.0489	0.0495	0.0503	0.0514

Demand v/s Percent of Supply

	2023	2030	2040	2050	2060	2070
Surface Water Supply	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ground Water Supply	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Purchases	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Future Supplies		0.0000	0.0000	0.0000	0.0000	0.0000
Total Available Supply (MGD)	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Service Area Demand	0.3186	0.3191	0.3208	0.3245	0.3299	0.3368
Sales	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Future Sales		0.0000	0.0000	0.0000	0.0000	0.0000
Total Demand (MGD)	0.3186	0.3191	0.3208	0.3245	0.3299	0.3368
Demand as Percent of Supply	32%	32%	32%	32%	33%	34%

The purpose of the above chart is to show a general indication of how the long-term per capita water demand changes over time. The per capita water demand may actually be different than indicated due to seasonal populations and the accuracy of data submitted. Water systems that have calculated long-term per capita water demand based on a methodology that produces different results may submit their information in the notes field.

Your long-term water demand is 53 gallons per capita per day. What demand management practices do you plan to implement to reduce the per capita water demand (i.e. conduct regular water audits, implement a plumbing retrofit program, employ practices such as rainwater harvesting or reclaimed water)? If these practices are covered elsewhere in your plan, indicate where the practices are discussed here.

Are there other demand management practices you will implement to reduce your future supply needs?

What supplies other than the ones listed in future supplies are being considered to meet your future supply needs?

How does the water system intend to implement the demand management and supply planning components above?

Additional Information

Has this system participated in regional water supply or water use planning? No

What major water supply reports or studies were used for planning?

Please describe any other needs or issues regarding your water supply sources, any water system deficiencies or needed improvements (storage, treatment, etc.) or your ability to meet present and future water needs. Include both quantity and quality considerations, as well as financial, technical, managerial, permitting, and compliance issues:

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APPENDIX

E

Groundwater Management Associates, Inc.
Evaluation of Groundwater Resources near
the River Bend Water System
July 22, 2024

Groundwater Management Associates, Inc.
4300 Sapphire Court, Suite 100
Greenville, North Carolina 27834
Telephone 252-758-3310
www.gma-nc.com

July 22, 2024

Mr. Greg Churchill, P.E.
Rivers & Associates, Inc.
PO Box 929
Greenville, NC 27835

Re: Evaluation of Groundwater Resources near the River Bend Water System, Town of River Bend, Craven County, North Carolina

Mr. Churchill,

Groundwater Management Associates, Inc. (GMA) is pleased to provide this Groundwater Resources Study report for the Town of River Bend (Town). GMA understands that Rivers and Associates (Rivers) will be evaluating water-supply options for the existing public water system. One of the options includes the possibility of constructing new water-supply wells. Rivers contracted with GMA to evaluate the groundwater resources near River Bend and to consider the options available to meet the future water-supply needs for the Town.

Introduction

GMA understands that the Town of River Bend currently operates three wells that supply raw water to two water treatment plants (WTPs) (Figure 1). Each of these three water-supply wells withdraws groundwater from the Upper Castle Hayne Aquifer (UCHA). The current volume of groundwater withdrawal meets the Town's demands. However, two of the three wells are beginning to age, and consideration for constructing new water-supply wells for the public water system has become a priority. Additionally, development within River Bend has encroached on the existing well sites, and it is unlikely that current setback requirements for new wells could be met at the current well locations.

Wells #1 and #2 provide raw water to the water treatment facility located at the northeast corner of the intersection of Shoreline Drive and Plantation Drive (Figure 1). Well #1 has a wellhead enclosed in a wood frame pump house located immediately beside the water treatment building. Well #1 has a 12-hour supply rating of 0.252 MGD (Rivers, 2020). Well #2 is located near the entrance to Quarterdeck Townhomes in a wood frame pump house approximately 700 feet from the WTP. The pump house sits in a grassy area in the middle of a residential parking lot (Figure 1). The 12-hour supply of Well #2 is 0.285 MGD (Rivers, 2020). The total capacity of the WTP that Wells #1 and #2 supply is 0.60 MGD (Rivers, 2020). Backwash effluent from the filters of the WTP is periodically discharged to an NPDES-permitted surface water discharge point located near the wooden seawall at the community boating canal near Plantation Drive bridge (Figure 1).

Well #3 supplies raw water to the WTP located adjacent to the Rhems Fire Department on Shoreline Drive. The Well #3 wellhead is housed inside the wood frame water treatment building. Well #3 has a 12-hour supply rating of 0.252 MGD and the WTP has a total capacity of 0.35 MGD (Rivers, 2020). Backwash water is directed to a floor sump for discharge to a buried steel waste holding

tank. Duplex submersible pumps periodically transfer the backwash supernatant to a NPDES-permitted surface water discharge point located in a ditch that is a tributary to the community boating canal.

Site Inspection

On January 9th, 2024, two GMA hydrogeologists (Cody Shell and James Holley) traveled to River Bend to observe the existing water-supply wells and WTPs. GMA traveled with Greg Churchill of Rivers, and we met with Brandon Mills (Public Works Director) from the Town of River Bend. GMA's initial stop was at water-supply Well #3 and the associated WTP located at the Rhems Fire Department on Shoreline Drive. Information about the well's performance and operation, water treatment for the raw water, and filter backwash effluent discharge was provided to GMA. The largest potential concern identified at Well #3 was the proximity of the wellhead to the fire department building. In early 2024, the Environmental Protection Agency (EPA) finalized a National Primary Drinking Water Regulation (NPDWR) for Per- and Polyfluoroalkyl Substances (PFAS). PFAS has been commonly used in firefighting foams and can migrate into the soil, water, and air. Proximity between the wellhead and the Rhems Fire Department building could potentially lead to a source of contamination in Well #3 if Aqueous Film Forming Foam containing PFAS has been used for firefighting training at the site.

The second stop was at Well #1 and the associated WTP immediately adjacent to the wellhead. The same general information about operation, treatment, and discharge was provided to GMA. No significant concern was identified at this location, although nearby surface waters could potentially cause flooding during large storm events. The Town representative assured GMA that the large diesel generator onsite could maintain a pumping well and water-supply even during severe storm events.

Located near the entrance to Quarterdeck Townhomes is Well #2. This water-supply well is in a grassy area surrounded by a residential parking lot. A new wellhouse had been constructed around the wellhead to establish better security and provide protection from potential damage from vehicles. The largest concern, however, was potential sources of contamination from the nearby vehicles. Wrecks, oil spills, and gasoline contaminants are all potential sources of contamination from the surrounding parking lot that is situated close to the wellhead. Modern setback rules for new wells require a minimum of one hundred feet of control around a wellhead, and the minimum setback would not be met at Well #2's current location due to the proximity of paved areas.

After visiting all the Town's wells and WTPs, GMA briefly visited the discharge location for backwash supernatant at the community boating canal and the wastewater treatment plant before being given a tour of the new public utilities building that was recently constructed. The new public utilities building is located across the street from the newer 300,000-gallon water tower (Figure 1). Adjacent to the Public Utilities building is a plot of land that the Town is currently negotiating to procure, and that property can likely be used as a location for a future water-supply well, if the Town chooses to replace any of the older wells. The proximity to the new water tower would be an ideal location for a new water-supply well. Lastly, GMA visited a city park located near the Town Commons as a potential site for a new well. The location would likely not be the top priority for a new well, as it would eliminate a significant area of the park from future public use and would likely not meet setback criteria due to the proximity to a septic tank and nitrification field. Other potential locations considered for a water-supply well are: a property that River Bend owns on Wakefield Drive, and a planned park area in a new residential development. GMA did not visit either potential location during our site investigation.

Summary of Aquifers Available for Fresh Water Supply

The Town of River Bend lies within the central portion of North Carolina's Coastal Plain, a broad, nearly flat region separating the hilly Piedmont region from the Atlantic Ocean. Coastal Plain topography and subsurface geology have been shaped by numerous large fluctuations in sea level that caused repeated lateral transgressions and regressions of the Atlantic Shoreline over the past ~90 million years. The Coastal Plain is formed by near-shore deposition of sediments that occurred during those fluctuations in sea level, and the land surface of the Coastal Plain reflects ancient coastal environments that previously existed. In general, these deposits occur as sedimentary wedges that thicken seaward. Geologists have described and mapped these depositional units, and they have subdivided the strata into various geological formations and groups (Table 1) based upon their ages and composition (lithology).

Beneath the modern land surface at River Bend is a complex sequence of marine, estuarine, and terrestrial sediments and sedimentary rocks that are the framework of the groundwater system. The groundwater system includes distinctive sequences of permeable sediments and sedimentary rocks (aquifers) separated by strata with low permeability (confining layers) that restrict vertical movement of groundwater between aquifers. The hydrostratigraphic units that comprise the aquifers and confining layers in the Coastal Plain are summarized in Table 1. In the vicinity of the Town of River Bend, no units younger than the River Bend Formation are present, with the exception of a relatively modern, unnamed surficial aquifer.

The Coastal Plain Aquifers that exist beneath the Town of River Bend include from oldest to youngest (deepest to shallowest): 1) the Lower Cape Fear Aquifer (Cretaceous, 90-94 million years ago (Ma)), 2) the Upper Cape Fear Aquifer (Cretaceous, 86-90 Ma), 3) the Black Creek Aquifer (Cretaceous, 72-84 Ma), 4) the Peedee Aquifer (Cretaceous, 66-72 Ma), 5) The Beaufort Aquifer (Paleocene, 56-66 Ma), and 6) the Castle Hayne Aquifer (Eocene and Oligocene, 56 to 23 Ma). Of these available aquifers, State-mandated reductions on the use of the Cretaceous Aquifer System (Specifically, the Black Creek, Upper Cape Fear, and Lower Cape Fear Aquifers) have been imposed with North Carolina's Central Coastal Plain Capacity Use (CCPCUA) rules. Reductions in withdrawals and permitting for use of these aquifers have forced public water systems to rely upon unrestricted aquifers such as the Castle Hayne, Beaufort, and Peedee Aquifers. Additionally, all aquifers with exception of the Castle Hayne Aquifer and Surficial Aquifer are brackish (i.e., have elevated salinity). Usage of groundwater from the brackish aquifers would require additional water treatment and include additional associated costs. Therefore, GMA concludes that the Castle Hayne Aquifer System (CHAS) is the best choice for the Town of River Bend for any future replacement or expansion of their public water system.

The Castle Hayne Aquifer System (CHAS) is a group of permeable sediments and sedimentary rocks with variable ages and lithologies (Winner and Coble, 1996). From oldest to youngest, there are four distinctive lithologic units comprising the CHAS in and near the Town of River Bend: The Comfort Member of the Castle Hayne Formation (Lower Castle Hayne Aquifer), the Spring Garden Member of the Castle Hayne Formation (Middle Castle Hayne Aquifer), the River Bend Formation, and the Belgrade Formation (NCGS 1988). Together, the River Bend and Belgrade Formations comprise the Upper Castle Hayne Aquifer. The CHAS may also include the underlying Paleocene-aged Beaufort Formation, where the Beaufort may lack a confining layer separating it from the Castle Hayne Formation. The three Castle Hayne Aquifer units (Lower, Middle, and Upper) differ distinctively in their lithology, permeability, and water quality.

The lowermost unit of the Castle Hayne Formation (the Comfort Member) is composed of gray to tan, fossiliferous (bryozoan and echinoid) limestone containing primary and secondary porosity. The Comfort Member is the primary source of water for the nearby New Bern Wellfield and several

communities in neighboring Jones County. GMA commonly designates the Comfort Member as the Lower Castle Hayne Aquifer (LCHA) because it is a very distinctive, high-permeability unit that is readily recognized in drill cuttings and on geophysical logs. The LCHA is expected to range from 40 to 120 feet in thickness in the River Bend area, and it is overlain by a semi-confining layer assigned to the lower portion of the Spring Garden Member of the Castle Hayne Formation.

The Spring Garden Member is a tan to gray, molluscan-mold biocalcirudite limestone formed with interbedded calcareous, clayey sands and sandy limestones. The unit becomes more clay-rich with depth. The Spring Garden Member serves as both the semi-confining layer overlying the LCHA and as a permeable aquifer capable of producing significant well yields in the upper sections of the formation. In some areas of the Coastal Plain (e.g., Onslow County) the Spring Garden Member can be designated as the Middle Castle Hayne Aquifer, but in the area of River Bend the overlying River Bend Formation has little to no basal confining layer, making the two formations hydrostratigraphically indistinguishable. In the current study, GMA has designated the Spring Garden Member and the River Bend Formation as the Upper Castle Hayne Aquifer (UCHA). The Belgrade Formation which is generally accepted as part of the UCHA is not present in the River Bend locale.

Existing Wells Serving River Bend

The Upper Castle Hayne Aquifer currently supplies the Town of River Bend with fresh water; however, existing water-supply wells are reaching the end of their lifespan, and well sites are being encroached on by land development, increasing the risks of damage to the wellheads and posing potential sources of contamination. River Bend is assessing the need to replace some or all of the current wells with new water-supply wells.

In March of 2020, Rivers produced a report of the status of the existing water system. The focus of the study was to evaluate the existing treatment systems and to present options for improved treatment in the future. As a part of their study, Rivers sampled the raw water from each of the three existing wells. These samples demonstrated that the Upper Castle Hayne Aquifer produces water with high hardness, elevated manganese, and iron that requires treatment. Tables 2 and 3 presents well construction details and corresponding water quality, respectively, of the existing wells serving River Bend as reported by Rivers in 2020.

The three existing water-supply wells in River Bend are all relatively shallow (less than 110 ft in depth), which limits available drawdown resulting in limited pumping rates. The current production wells have 12-hour supply ratings of 400 GPM or less. Targeting the LCHA could potentially increase any well yields by double or more, making it feasible to replace the current well system (3 wells) with only 2 deeper wells while simultaneously having extra yield for future growth. Nearby well fields in New Bern and Jones County (Table 4) that have built larger wells into the LCHA have yields between 500 and 1,000 GPM. The top of the LCHA is approximately 260 ft below land surface (BLS) in the vicinity of River Bend (Figure 2), and other regional wells are usually screened in varying intervals from 200 to 300 ft BLS (Table 4).

The LCHA also generally has better water quality than the UCHA with less iron and manganese (Table 3 and 4) which may result in lower costs associated with water treatment. For example, the two LCHA wells that supply the nearby Jones County wellfield located on US HWY 17S Business, approximately 3.5 miles southwest of River Bend, produce water with iron and manganese concentrations that are below the maximum contaminant levels (MCLs) for these constituents (Table 4). The LCHA wells that supply the New Bern wellfield located to the northwest of River Bend have comparable or worse water quality than River Bend's UCHA wells (Table 3 and 4). However, the New Bern wells in the LCHA have much better water quality than the UCHA wells in the same

vicinity. If regional trends hold, the LCHA in the vicinity of River Bend should have better water quality than the UCHA with regards to iron and manganese. Test well exploration should be used to verify the quality of raw water from the LCHA.

Conclusions and Recommendations

GMA has evaluated the lithology and hydrostratigraphy of underlying aquifers, including the Castle Hayne Aquifer, in the vicinity of the Town of River Bend. We conclude the Lower Castle Hayne Aquifer has significant, fresh, groundwater resource potential capable of meeting the current and projected future demands of River Bend's residents, and it may have better water quality than the UCHA currently being utilized. Additionally, a pair of wells withdrawing from the LCHA placed a reasonable distance apart and pumped individually for 12-hour cycles might supply the Town's needs while also being capable of handling increased withdrawals and expansion in the future. Another option would be to construct a shallow and deep well at the same site. Combining withdrawals from both wells (shallow and deep) could potentially replace all three of the Town's current wells and improve overall water quality through mixing.

It is GMA's assessment that a new water-supply well would have a more beneficial placement in relation to the upgraded distribution system (newer 300,000-gallon water tower) and would help mitigate risks (security, contamination sources, etc.) associated with current well sites. Additionally, utilizing the deeper LCHA, instead of the UCHA, would likely provide increased yield potential. Based upon available data, new well construction for a high-yield water-supply well into the LCHA would likely consist of a 10 to 12-inch diameter screen and casing, and the well would be approximately 280 to 320 feet in total depth. Verification of the yield potential and water quality of the LCHA at River Bend would require test well exploration before proceeding with design and construction of new production wells.

The water quality of the Lower Castle Hayne Aquifer is likely better than the Upper Castle Hayne Aquifer in the vicinity of River Bend. Raw water from both aquifers is hard, however, and softening would be recommended to meet typical water-quality expectations for potable use. We understand that the Town of River Bend does not currently soften the raw groundwater from the Upper Castle Hayne Aquifer. Instead, softening is accomplished preferentially by some customers on an individual basis through use of residential water softeners. Additionally, water from the Lower Castle Hayne Aquifer may has potential to form disinfection byproducts. Evaluation of the disinfection byproduct formation potential should be included in water quality testing of future test wells to characterize the potential of the LCHA to form excessive disinfection byproducts.

The water from the LCHA is expected to be fresh, and there are no indications of elevated salinity near the Town of River Bend. However, the underlying Beaufort Aquifer likely contains elevated chloride concentrations. The confining layer between the LCHA and the Beaufort Aquifers is often relatively thin, and the Beaufort Aquifer may be somewhat leaky. The NCDWR's Clarks Research Station (located about 4 miles north of River Bend) includes a monitoring well screened within the Beaufort Aquifer that has a reported chloride concentration of about 1000 mg/L. However, the underlying Peedee Aquifer monitoring well at the Clarks Research Station also has a chloride concentration of 1000 mg/L. The NCDWR Clark's Research Station has been the subject of debate for years due to concerns over cross-connecting aquifers via the monitoring well boreholes, and it is likely that the chloride concentrations indicated for the Beaufort Aquifer monitoring well at that station are erroneously elevated due to aquifer interconnection.

If test well exploration of the LCHA is conducted at River Bend, GMA recommends that an exploratory borehole should be extended into the top of the Beaufort Aquifer, and a temporary zone test sample should be collected to verify the salinity of the Beaufort Aquifer. Upon completion of the

zone test, GMA recommends that the driller should permanently abandon the lower borehole with cement before enlarging the upper portion of the borehole to allow construction of a LCHA test well. If elevated salinity is confirmed in the Beaufort Aquifer beneath River Bend, GMA would advise River Bend to monitor chloride concentrations during any future operation of wells in the LCHA to discern if drawdown induced by the wells causes increases in chloride concentrations in the LCHA over time.

At this time, GMA recommends that River Bend should select a potential well site near the new Public Utilities building and a second alternative site. Test well exploration of the sites are recommended to include:

1) Pilot hole drilling to approximately 360 feet depth in at least one of the exploratory wells.
2) Geophysical logging of the pilot holes (Natural Gamma, SP, and Resistivity).
3) Temporary zone testing of the water quality of the Beaufort Aquifer at about 350 feet depth, followed by permanent abandonment of the lower pilot hole with cement grout.
4) Construction of a test well at each location equipped with a 4-inch screen from about 250-320 feet and a 6-inch PVC casing from land surface to about 250 feet.
5) Conducting 6-hour pumping tests at a constant rate of about 200 gpm.
6) Collecting water samples for New Well Series and disinfection byproduct formation potential (THMFP and HAAFP analysis).

The results of the test well program will guide final decisions on future well construction for the Town. The LCHA test well should provide critical data on yield potential of the aquifer and water quality attributes that will guide decisions on future water treatment for the water system.

Report Certification

This report was prepared by Groundwater Management Associates, Inc. (GMA). GMA is a professional corporation licensed to practice geology (#C-121) and engineering (#C-0854) in North Carolina. I, Cody J. Shell, a North Carolina Licensed Geologist for GMA, do certify that the information contained in this report is correct and accurate to the best of my knowledge

If you have any questions, or if we may be of further assistance, please feel free to contact us.

Best regards,

Groundwater Management Associates, Inc.

Cody J. Shell

James K. Holley

Cody J. Shell, P.G.
Project Hydrogeologist

James K. Holley, P.G.
Senior Hydrogeologist

CC: Richard Spruill, Ph.D., P.G.

Enclosures: Figure 1
Figure 2
Table 1, 2, 3, and 4

LEGEND

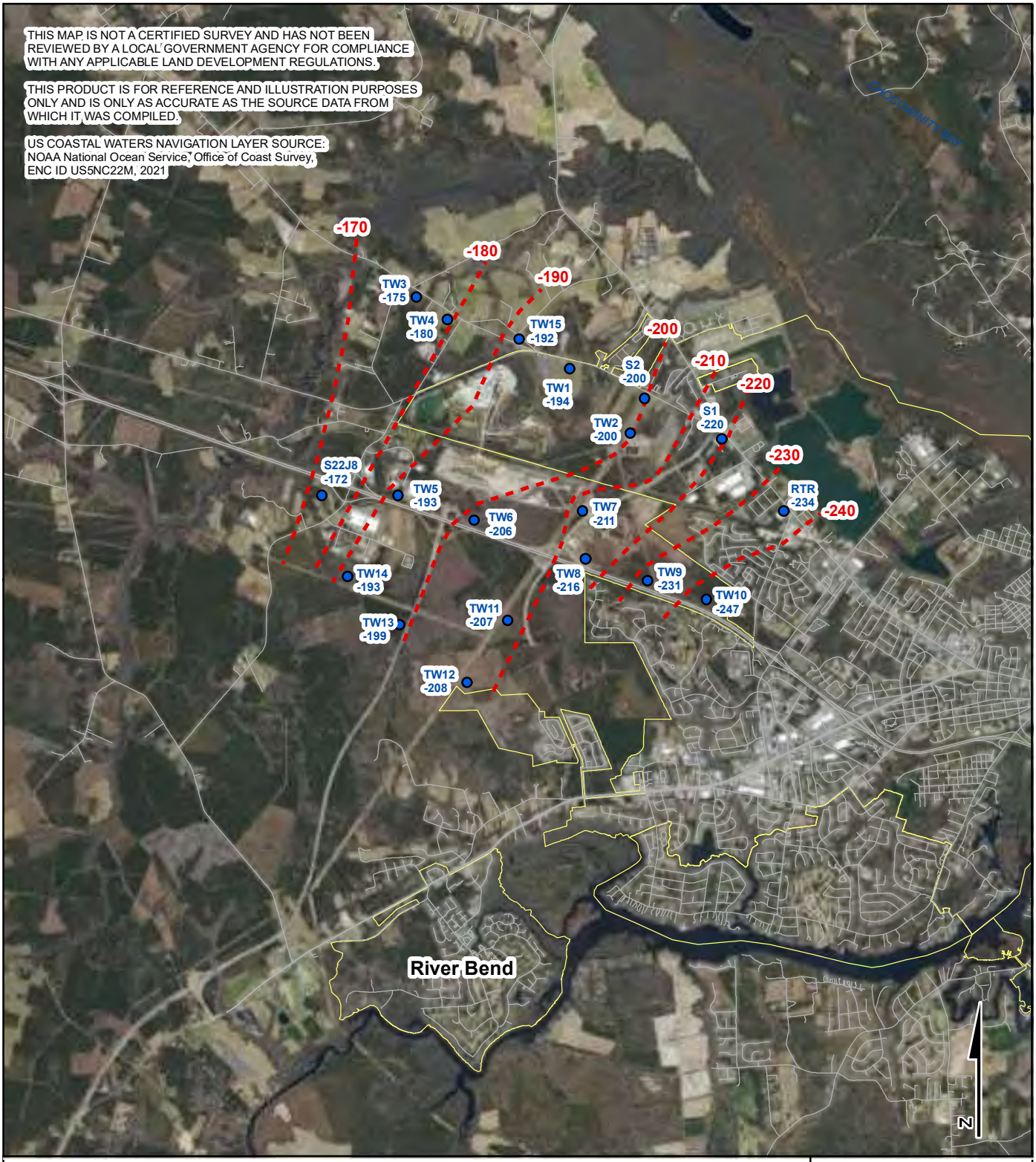
- Existing Well Locations
- Potential Well Location
- Elevated Storage Tanks
- Roads
- City Limits

SCALE IN FEET

0 — 3000'

GMA

File: DRAWINGS/21347/ FIG1_SITEMAP	GENERAL SITE MAP	DATE: 6/24/2024
PROJECT NO. 21351	TOWN OF RIVER BEND, CRAVEN COUNTY, NC	FIGURE 1



LEGEND

- Well Locations
- Elevation Contours
- Roads
- City Limits

SCALE IN FEET

0 3000 6000'

GMA

File: DRAWINGS/21347/ FIG2_TopLCHA	Elevation of the Top of the Lower Castle Hayne Aquifer	DATE: 7/22/2024
PROJECT NO. 21351	TOWN OF RIVER BEND, CRAVEN COUNTY, NC	FIGURE 2

Table 1. Hydrostratigraphic Units in the North Carolina Coastal Plain

Period	Ma	Geologic Age	Formation Name	Hydrostratigraphic Units
Quaternary	0 - 2.5	Recent to Pleistocene	Unnamed Holocene James City Fm.	Surficial Aquifer Upper Castle Hayne CL
Neogene	2.5 - 5	Pliocene	Duplin Fm.	Yorktown Aquifer Upper Castle Hayne CL
	5 - 23	Miocene	Pungo River Fm.	Upper Castle Hayne CL
Paleogene	23 - 34	Oligocene	Belgrade Fm. River Bend Fm.	Upper Castle Hayne Aquifer Upper Castle Hayne Aquifer Middle Castle Hayne CL
	34 - 56	Eocene	Castle Hayne Fm. (Spring Garden Mbr.) (Comfort Member)	Middle Castle Hayne Aquifer Lower Castle Hayne CL Lower Castle Hayne Aquifer
	56 - 66	Paleocene	Beaufort Fm. Yaupon Beach Fm.	Beaufort CL Beaufort Aquifer Peedee CL
Cretaceous	66 - 72	Upper Cretaceous (Maastrichtian)	Peedee Fm.	Peedee CL Peedee Aquifer
	72 – 84	Upper Cretaceous (Campanian)	Black Creek Group	Black Creek CL Black Creek Aquifer
	84 – 86	Upper Cretaceous (Santonian)	Middendorf Fm. (Pleasant Creek Fm.)	Black Creek Aquifer Upper Cape Fear CL
	86 – 90 90 – 94	Upper Cretaceous (Coniacian to possibly Turonian)	Cape Fear Fm.	Upper Cape Fear CL Upper Cape Fear Aquifer Lower Cape Fear CL Lower Cape Fear Aquifer
	>252	Paleozoic and Late Proterozoic	Crystalline Basement	Bedrock Aquifer

Ma – Million Years (mega-annum) CL – Confining Layer Fm. – Formation Mbr. – Member

Table 2: Production Well Construction - River Bend, Craven County NC

Well Id	Well Construction						
	Land Surface Elevation (ft)	Diameter (in)	Pump Capacity (GPM)	Well Depth (ft)	Screen Interval Depth (ft)	Aquifer Top Depth (ft)	Aquifer
PW1	10	8	350	105	77-105	47	UCHA
PW2	8	6	250	110	81-110	37	UCHA
PW3	18	8	350	103	90-103	38	UCHA

UCHA = Upper Castle Hayne Aquifer

Table 3: Water Quality Results of Production Wells - River Bend, Craven County NC

Parameter	PW1		PW2		PW3	
	Raw	Finished	Raw	Finished	Raw	Finished
Iron (mg/L)	2.2	0.06	2.61	0.13	1.23	<0.060
Manganese (mg/L)	0.063	0.038	0.068	0.044	0.047	0.034
pH	7.26	7.87	7.17	7.69	7.35	7.53
Temperature (^{o}C)	18.8	18.6	18.5	18.6	18.8	18.3
Hardness	185	217	253	211	189	197
Alkalinity	240	240	240	250	220	240

Table 4: Well Construction and Water Qaulity of Wellfields in the Vicinity of River Bend

Well ID	City	Date Constructed	Elevation (ft)	Pilot Hole Depth (ft)	Lower Castle Hayne Top Depth (ft)	Screen Interval (ft)	Pumping Rate (gpm)	Static Water Level Depth (ft)	Specific Capacity (gpm/ft)	Chloride (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium (mg/L)	pH	Alkalinity (mg/L)
PW1	New Bern	11/5/2008	27.36	270	255	225 - 245	350	32.42	8.3	7	2.89	0.102	102	7.26	232
PW2	New Bern	9/11/2008	25.13	270	233	233 - 263	350	27.67	6.1	12	3.98	0.098	120	7.04	250
PW3	New Bern	12/5/2007	--	230	196	196 - 226	350	21.6	2.645	8	2.47	0.048	83.2	7.1	228
PW4	New Bern	10/22/2007	--	240	205	207 - 232	410	25.44	3.274	8	2.98	0.049	96.8	7.84	218
PW5	New Bern	1/29/2008 - 1/30/2008	--	250	216	218 - 238	600	35.3	4.568	9	1.36	0.081	94	7.51	274
PW6	New Bern	8/11/2008	30.68	275	236	236 - 264	750	36.82	5.04	8	2.86	0.129	127	7.3	284
PW7	New Bern	4/29/2008	28.12	290	238	238 - 248; 256 - 266	600	32.27	3.75	9	3.05	0.154	144	7.49	294
PW8	New Bern	7/21/2008	29.51	285	246	246 - 273	700	23.68	4.08	8	3.18	0.101	128	7.21	262
PW9	New Bern	7/4/2008	31.56	290	264	264 - 282	700	22.1	3.56	6	2.9	0.044	144	6.94	265
PW10	New Bern	3/6/2008	--	299	280	280 - 292	670	23.81	4.2	12	1.53	0.058	128	7.12	289
PW11	New Bern	11/5/2008	30.07	270	239	239 - 264	1000	24.45	6.32	13	4.02	0.106	119	7.16	277
PW12	New Bern	7/18/2008	--	270	240	244 - 264	700	16.55	4.48	11	2.16	0.09	115	7.11	255
PW13	New Bern	12/15/2008	29.7	280	234	234 - 269	449	19.47	3.01	7	1.5	0.07	125	7.19	277
PW14	New Bern	3/12/2008	30.69	250	222	222 - 237	475	18.44	2.99	10	0.155	0.019	97.5	7.4	258
PW15	New Bern	2/5/2008	24.43	250	211	212 - 242	975	24.5	7.01	9	3.02	0.108	98	7.11	223
PW9	Jones Co.	3/3/2021	--	274	225	225 - 255	--	18.41	7.79	<28	0.27	0.014	84.8	7.4	403
PW10	Jones Co.	2/24/2021	--	266	219	219 - 249	--	17.32	7.11	<28	0.16	0.013	72.5	7.24	215

APPENDIX

F

NCDEQ DWR Public Water Supply Section
Public Water System Inspection
Letter Dated July 18, 2024

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

July 18, 2024

Town of River Bend
Attn: Delane Jackson
45 Shoreline Drive
River Bend, NC 28562

Re: Public Water System Inspection
Town of River Bend
PWSID: NC0425113
Craven County

Dear Mr. Jackson:

On July 17, 2024, I met with Mr. Brandon Mills, ORC, to complete an inspection of the Town of River Bend public water system. The inspection consisted of a records review, discussions of operational practices, and a visual inspection of the water system components.

Both water treatment plants are showing their age and corrosion is slowly spreading throughout the treatment works. Also, the ability of this treatment to adequately remove manganese is questionable as routine sampling shows manganese levels just below the secondary Maximum Contaminant Level of 0.05 mg/L. I would normally recommend the treatment works be refurbished and the filter media evaluated to see if it needs replacing. However, Mr. Mills indicated the town had secured a substantial portion of money to invest in new wells and a new treatment plant the end of Plantation Drive. As such, I recommend moving forward with the installation of new wells so water quality may be evaluated to determine the type of treatment that will be required at a new water treatment plant. Any production wells will need to be permitted by this office prior to their construction.

Overall, the Town of River Bend public water system appears to be well run. All sampling plans and operational documents were readily available for review. Backflow prevention records were up to date, well organized, and readily available. The distribution system is routinely flushed at dead ends and a scouring unidirectional flush is completed yearly. I appreciate the assistance of Mr. Mills as he was very helpful. If you have any questions regarding this letter or the NC Rules Governing Public Water Systems, please contact me at 252-948-3887.

Sincerely,

Clif Whitfield, PG
Assistant Regional Engineer
Public Water Supply Section

Cc: Central Files
WaRO Files

APPENDIX

G

15A NCAC 18C .0203
Public Well Water Supply Requirements

15A NCAC 18C .0203 PUBLIC WELL WATER SUPPLIES

(a) A site or sites for a water supply well to be used as a community or non-transient, non-community water system shall be investigated by an authorized representative of the Department prior to approval. Approval by the Department is required in addition to any approval or permit issued by any other state agency. The site shall meet the following requirements at the time of approval:

(1) The well shall be located on a lot so that the area within 100 feet of the well is owned or controlled by the person supplying the water. The supplier of water shall be able to protect the well lot from potential sources of pollution and to construct landscape features for drainage and diversion of pollution.

(2) The minimum horizontal separation between the well and known potential sources of pollution shall be as follows:

(A) 100 feet from any sanitary sewage disposal system, sewer, or a sewer pipe unless the sewer is constructed of water main materials and joints, in which case the sewer pipe shall be at least 50 feet from the well;

(B) 200 feet from a subsurface sanitary sewage treatment and disposal system designed for 3000 or more gallons of wastewater a day flows, unless the well water source is from a confined aquifer;

(C) 500 feet from a septage disposal site;

(D) 100 feet from buildings, mobile homes, permanent structures, animal houses or lots, or cultivated areas to which chemicals are applied;

(E) 100 feet from surface water;

(F) 100 feet from a chemical or petroleum fuel underground storage tank with secondary containment;

(G) 500 feet from a chemical or petroleum fuel underground storage tank without secondary containment;

(H) 500 feet from the boundary of a ground water contamination area;

(I) 500 feet from a sanitary landfill or non-permitted non-hazardous solid waste disposal site;

(J) 1000 feet from a hazardous waste disposal site or in any location that conflicts with the North Carolina Hazardous Waste Management Rules cited as 15A NCAC 13A;

(K) 300 feet from a cemetery or burial ground; and

(L) 100 feet from any other potential source of pollution.

(3) The Department may require greater separation distances or impose other protective measures if necessary to protect the well from pollution, taking into consideration factors such as:

(A) the hazard or health risk associated with the source of pollution;

(B) the proximity of the potential source to the well;

(C) the type of material, facility, or circumstance that poses the source or potential source of pollution;

(D) the volume or size of the source or potential source of pollution;

(E) hydrogeological features of the site that could affect the movement of contaminants to the source water;

(F) the effect that well operation might have on the movement of contamination; and

(G) the feasibility of providing additional separation distances or protective measures.

(4) The lot shall be graded or sloped so that surface water is diverted away from the wellhead. The well shall not have greater than a one percent annual chance of flooding.

(5) If a supplier of water demonstrates that it is impracticable, taking into consideration feasibility and cost, to locate water from any other approved source and an existing well can no longer provide water that meets the requirements of this Subchapter, a representative of the Division may approve a variance for a smaller well lot and reduced separation distances to meet existing demands. Additional monitoring under this Part or other conditions shall be imposed if necessary to mitigate the increased risk from the variance.

(b) The Division of Water Resources may grant a variance from the minimum horizontal separation distances for public water supply wells set out in Parts (a)(2)(D) and (E) of this Rule.

(1) Such variance shall require the following findings:

(A) the well supplies water to a non-community water system as defined in G.S. 130A-313(10)(b) or supplies water to a business or institution, such as a school, that has

become a non-community water system through an increase in the number of people served by the well;

(B) it is impracticable, taking into consideration feasibility and cost, for the public water system to comply with the minimum horizontal separation distance set out in Parts (a)(2)(D) and (E) of this Rule;

(C) there is no reasonable alternative source of drinking water available to the public water supply system and;

(D) the granting of the variance will not result in an unreasonable risk to public health.

(2) Such variance shall require that the non-community public water supply well meet the following requirements:

(A) the well shall comply with the minimum horizontal separation distances set out in Parts (a)(2)(D) and (E) of this Rule to the maximum extent practicable;

(B) the well shall meet a minimum horizontal separation distance of 25 feet from a building, mobile home, or other permanent structure that is not used primarily to house animals;

(C) the well shall meet a minimum horizontal separation distance of 100 feet from any animal house or feedlot and from cultivated areas to which chemicals are applied;

(D) the well shall meet a minimum horizontal separation distance of 50 feet from surface water; and

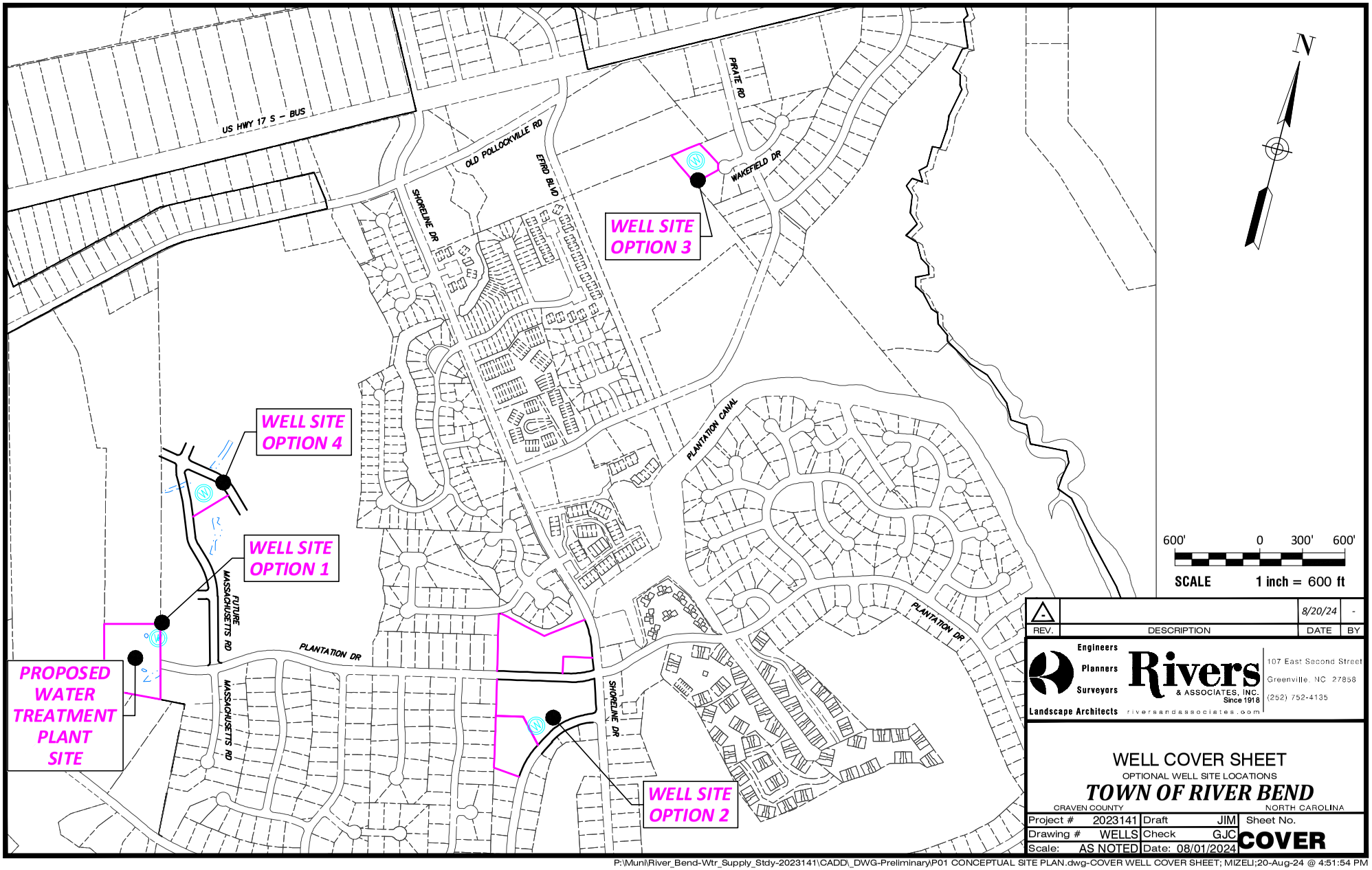
(E) the well shall comply with all other requirements for public well water supplies set out in Paragraph (a) of this Rule.

History Note: *Authority G.S. 130A-315; 130A-318; P.L. 93-523; S.L. 2011-394;*
Eff. January 1, 1977;
Readopted Eff. December 5, 1977;
Amended Eff. July 7, 2014; July 1, 1994; September 1, 1990; September 1, 1979;
Readopted Eff. July 1, 2019.

APPENDIX

H

Town of River Bend
Potential Production Well Sites



REV.	DESCRIPTION	DATE	BY
-		8/20/24	-

Rivers & ASSOCIATES, INC. Since 1918
Engineers Planners Surveyors Landscape Architects
107 East Second Street
Greenville, NC 27858
(252) 752-4135
riversandassociates.com

WELL COVER SHEET

OPTIONAL WELL SITE LOCATIONS

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

Project #	2023141	Draft	JIM	Sheet No.
Drawing #	WELLS	Check	GJC	COVER
Scale:	AS NOTED	Date:	08/01/2024	

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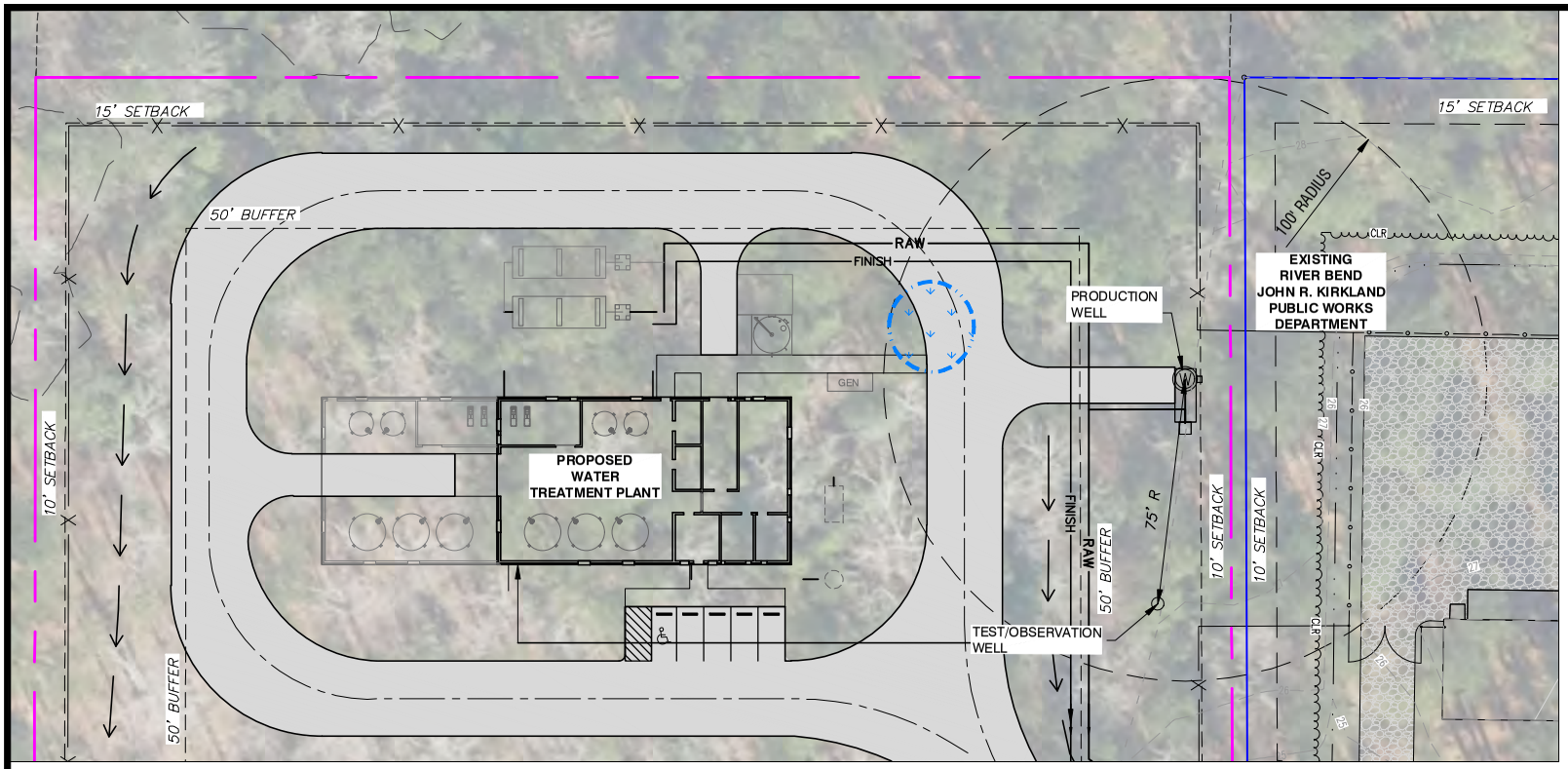

N

40' 0 20' 40'

SCALE 1 inch = 40 ft

REV.	DESCRIPTION	DATE	BY
-		8/20/24	-

Rivers & ASSOCIATES, INC. Since 1918
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Surveyors
Landscape Architects
riversandassociates.com
107 East Second Street
Greenville, NC 27858
(252) 752-4135

WELL SITE OPTION 1

OPTIONAL WELL SITE LOCATIONS

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

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Drawing #	WELLS	Check	GJC	1
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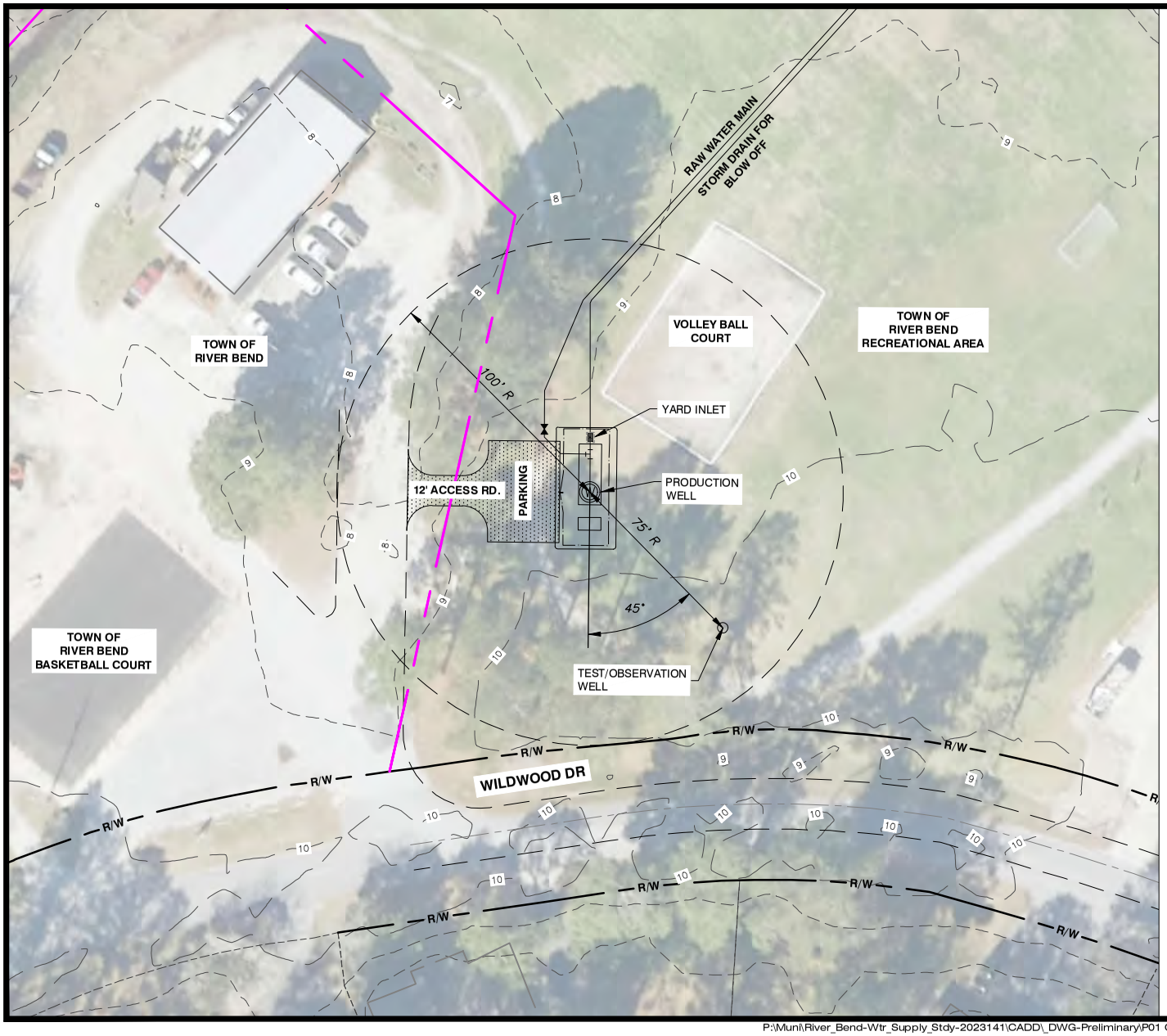

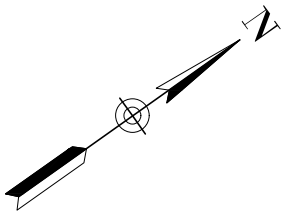

40' 0 20' 40'

SCALE 1 inch = 40 ft

REV.	DESCRIPTION	DATE	BY
1		8/20/24	-

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WELL SITE OPTION 2

OPTIONAL WELL SITE LOCATIONS

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

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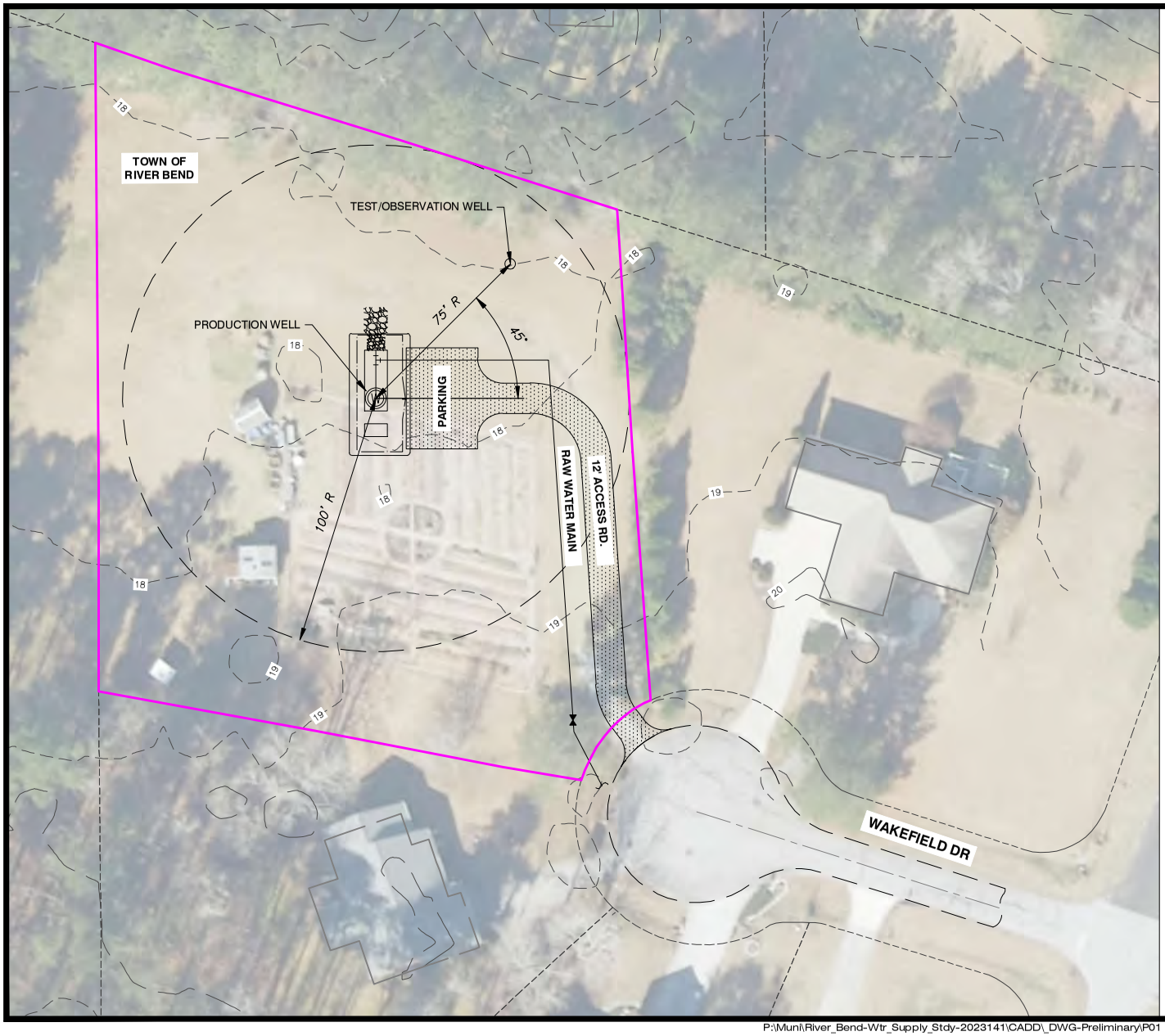

N

40' 0 20' 40'

SCALE 1 inch = 40 ft

REV.	DESCRIPTION	DATE	BY
1		8/20/24	-

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107 East Second Street
Greenville, NC 27858
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WELL SITE OPTION 3

OPTIONAL WELL SITE LOCATIONS

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

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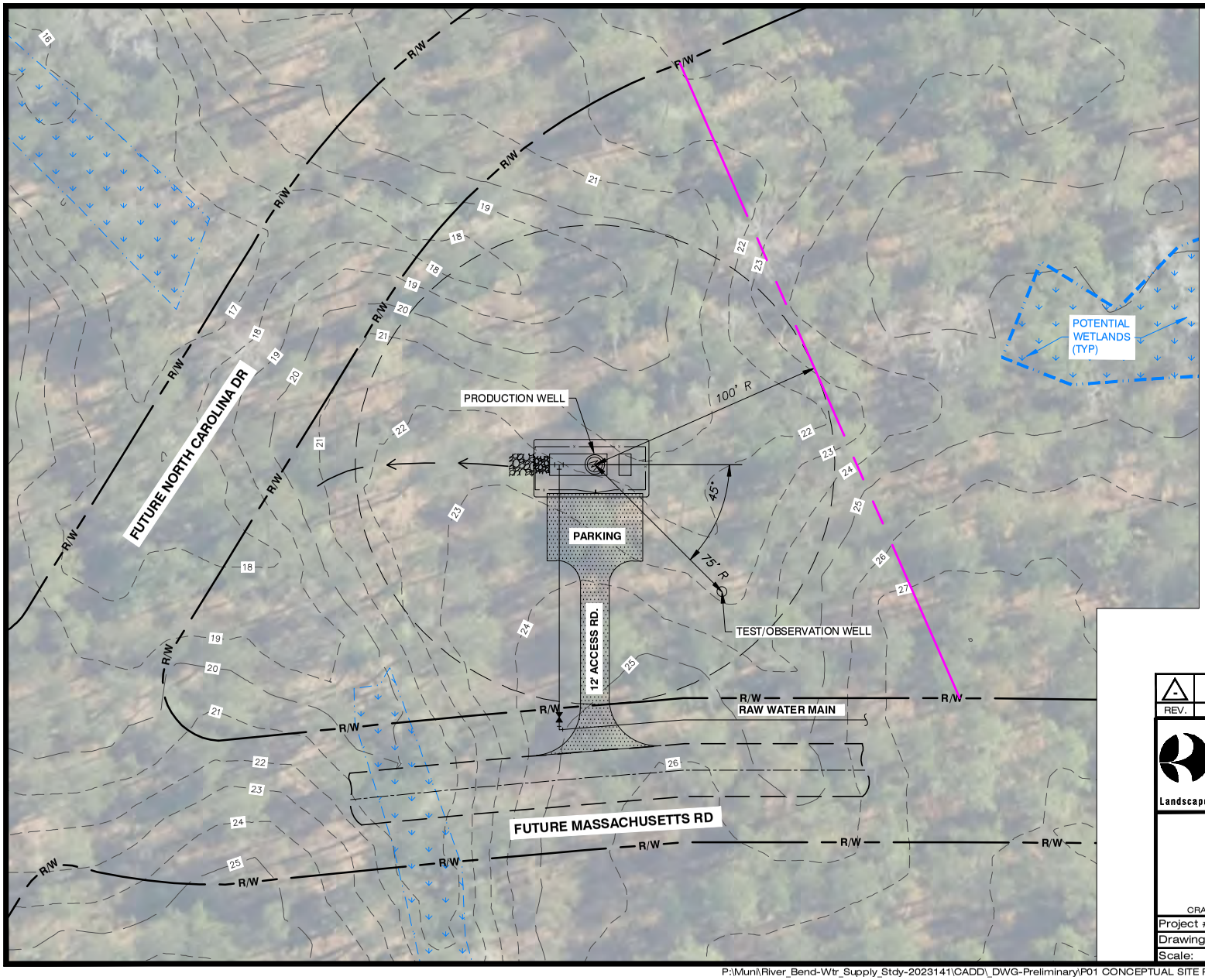

N

40' 0 20' 40'

SCALE 1 inch = 40 ft

REV.	DESCRIPTION	DATE	BY
-		8/20/24	-

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107 East Second Street
Greenville, NC 27858
(252) 752-4135

WELL SITE OPTION 4

OPTIONAL WELL SITE LOCATIONS

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

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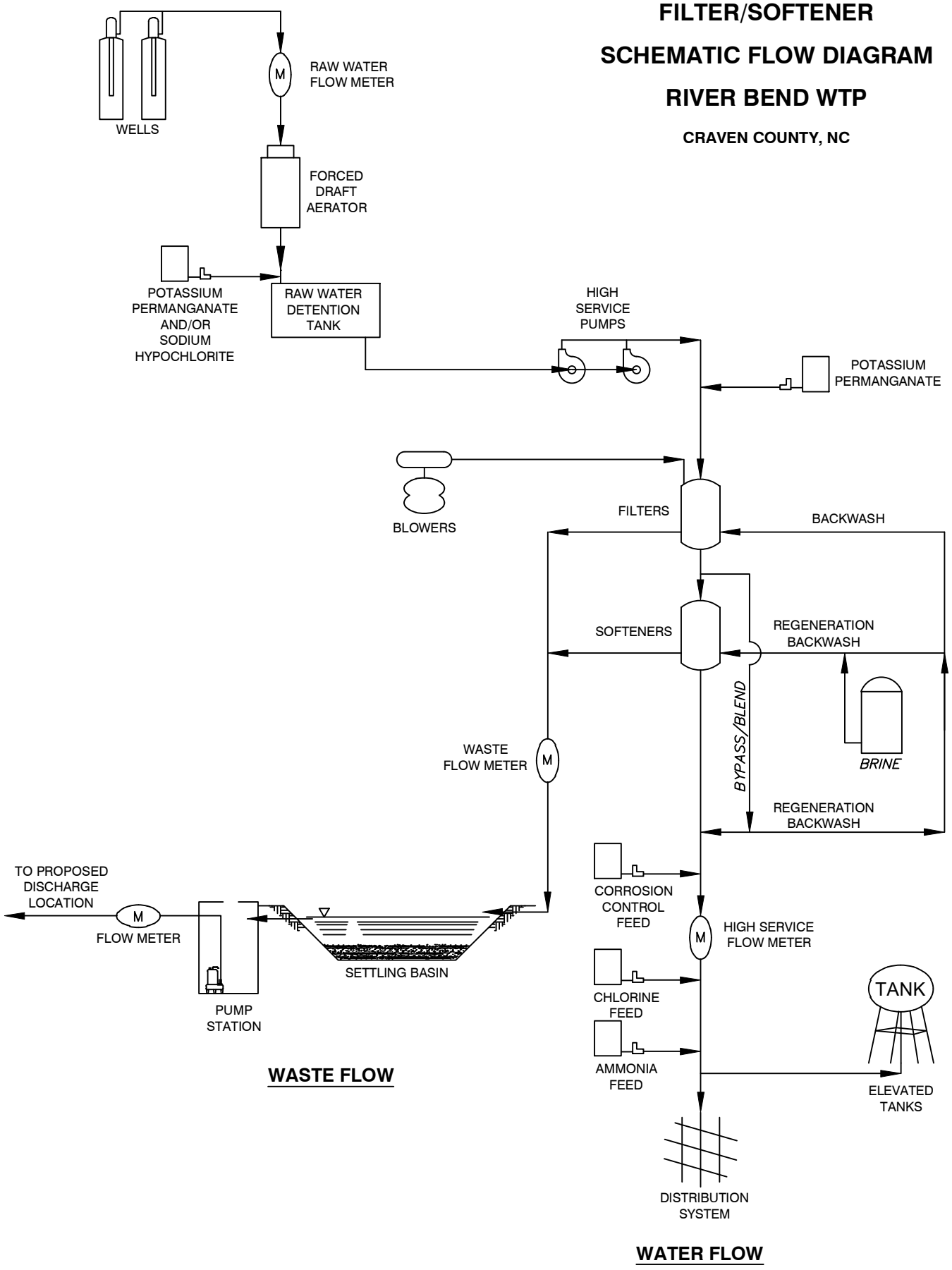
APPENDIX

I

Town of River Bend
Filter Softener WTP Process Schematic
Conceptual Site Plan
Conceptual Building Plan

FILTER/SOFTENER
SCHEMATIC FLOW DIAGRAM
RIVER BEND WTP

CRAVEN COUNTY, NC



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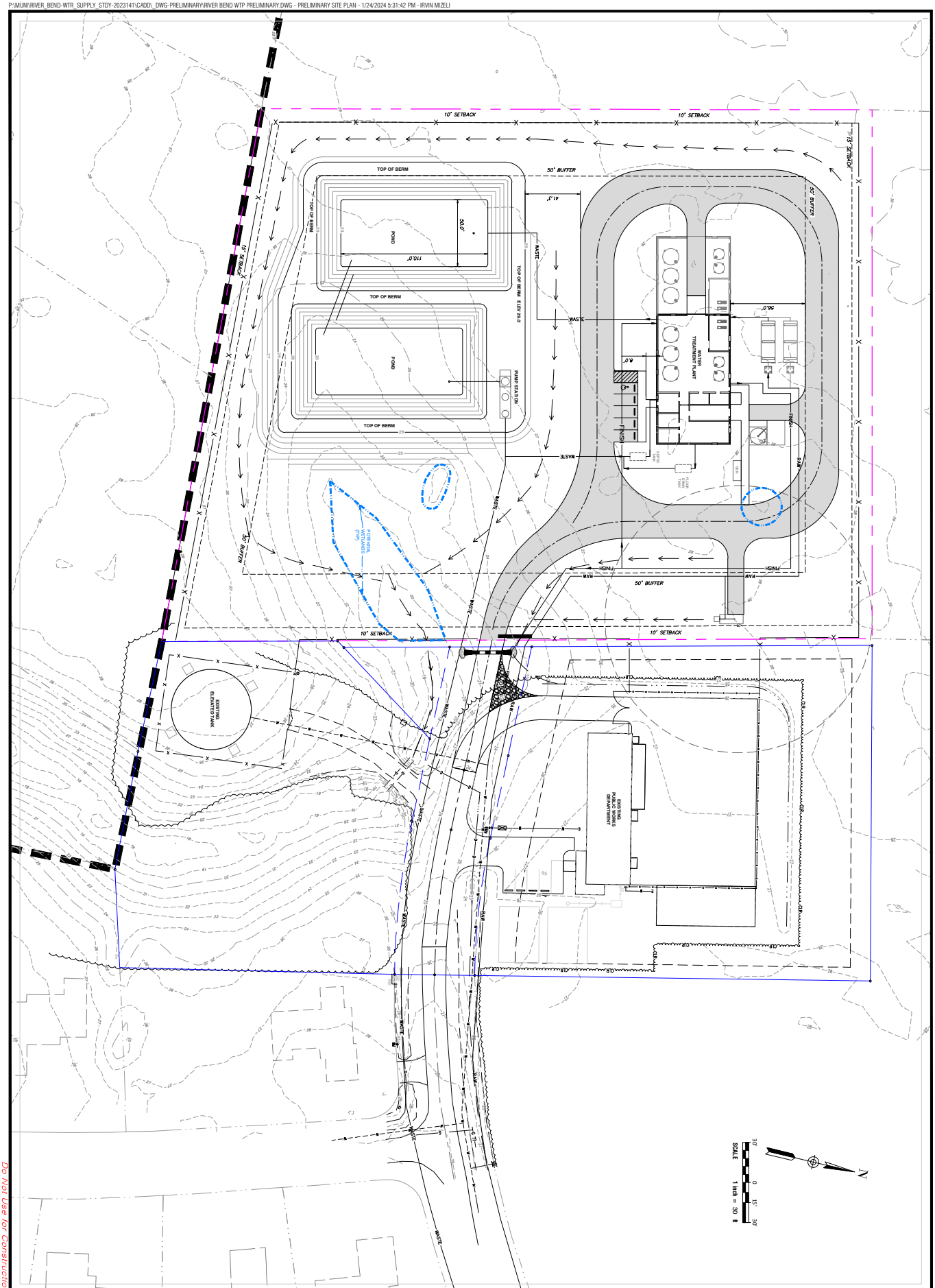

Do Not Use for Construction - PRELIMINARY

DATE	JANUARY 12, 2024
DESIGNED BY:	GJC
DRAWN BY:	JIM
CHECKED BY:	GJC
PROJECT No.	2023141
DRAWING No.	W-4153
SCALE	AS NOTED
SHEET No.	P01

WATER SUPPLY STUDY

TOWN OF RIVER BEND

CITY COUNTY STATE

PRELIMINARY SITE PLAN

NO.	DESCRIPTION	DATE	BY

REVISIONS:

Rivers & ASSOCIATES, INC.
NC License: F-0934
riversandassociates.com Since 1918
107 East Second Street
Greenville, NC 27858
(252) 752-4135
Engineers
Planners
Surveyors
Landscape Architects

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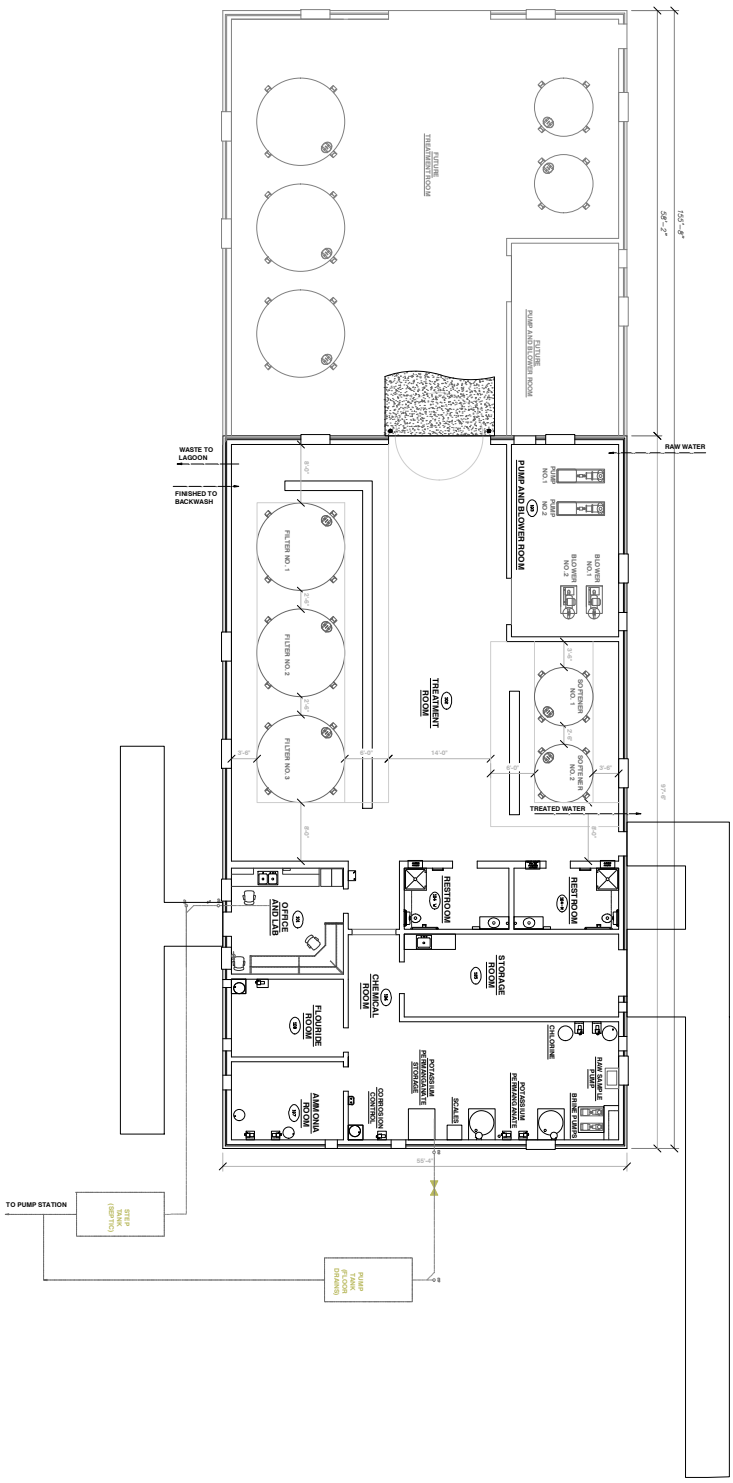


Do Not Use for Construction - PRELIMINARY

DATE:	JANUARY 12, 2024
DESIGNED BY:	GJC
DRAWN BY:	JIM
CHECKED BY:	GJC
PROJECT No.	2023141
DRAWING No.	W-4153
SCALE:	AS NOTED
SHEET No.	P02

WATER SUPPLY STUDY

TOWN OF RIVER BEND

CITY COUNTY STATE

PRELIMINARY WTP BUILDING

NO.	DESCRIPTION	DATE	BY

REVISIONS:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27 JAN 2024 GREGORY J. CHURCHILL

TOWN OF RIVER BEND

Rivers & ASSOCIATES, INC.
riversandassociates.com
Since 1918
107 East Second Street
Greenville, NC 27858
(252) 752-4135
NC License: F-0334
Engineers
Planners
Surveyors
Landscape Architects

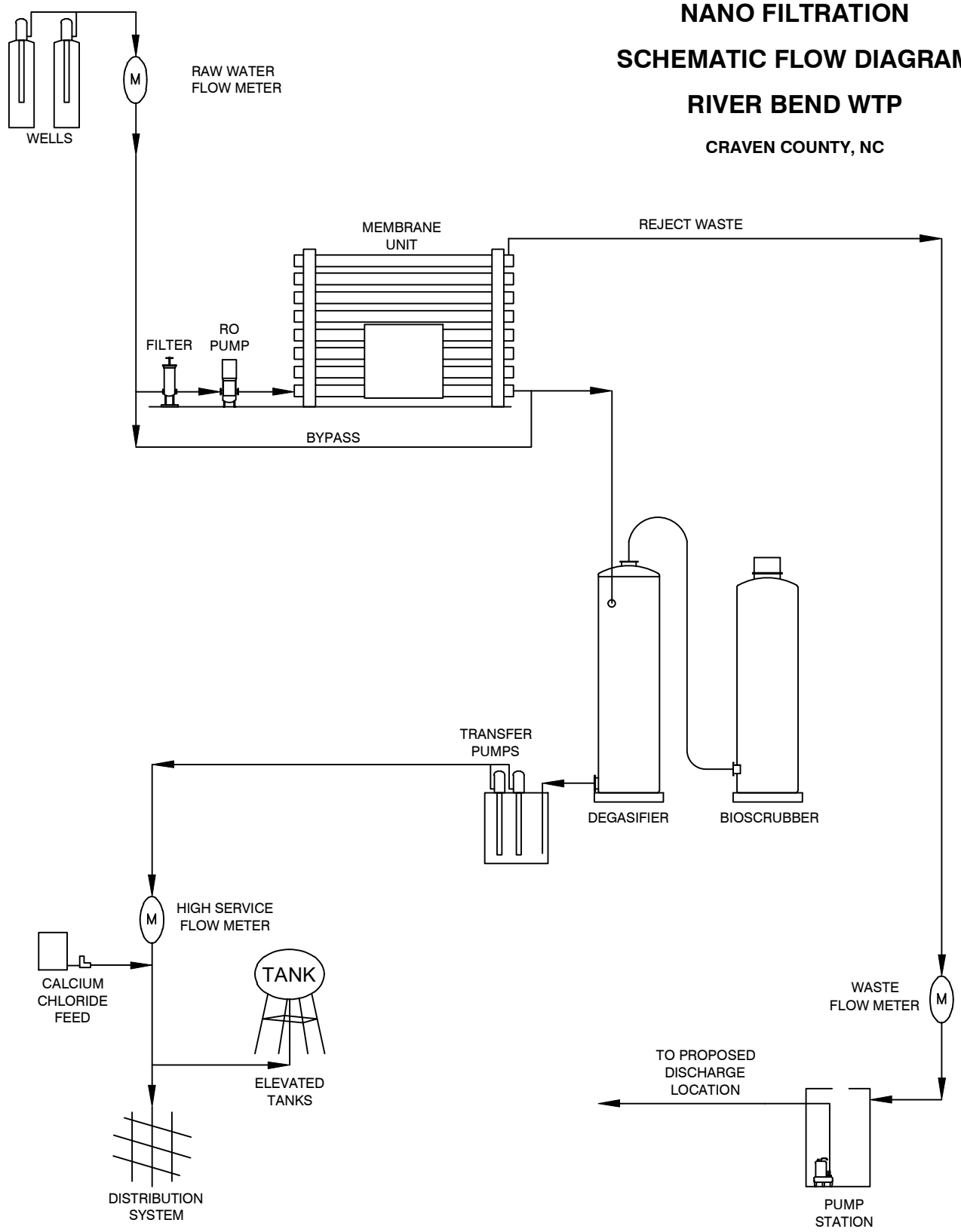
APPENDIX

J

Town of River Bend
Nanofiltration WTP Process Schematic
Conceptual Site Plan
Conceptual Building Plan

NANO FILTRATION
SCHEMATIC FLOW DIAGRAM
RIVER BEND WTP

CRAVEN COUNTY, NC



WATER FLOW

WASTE FLOW

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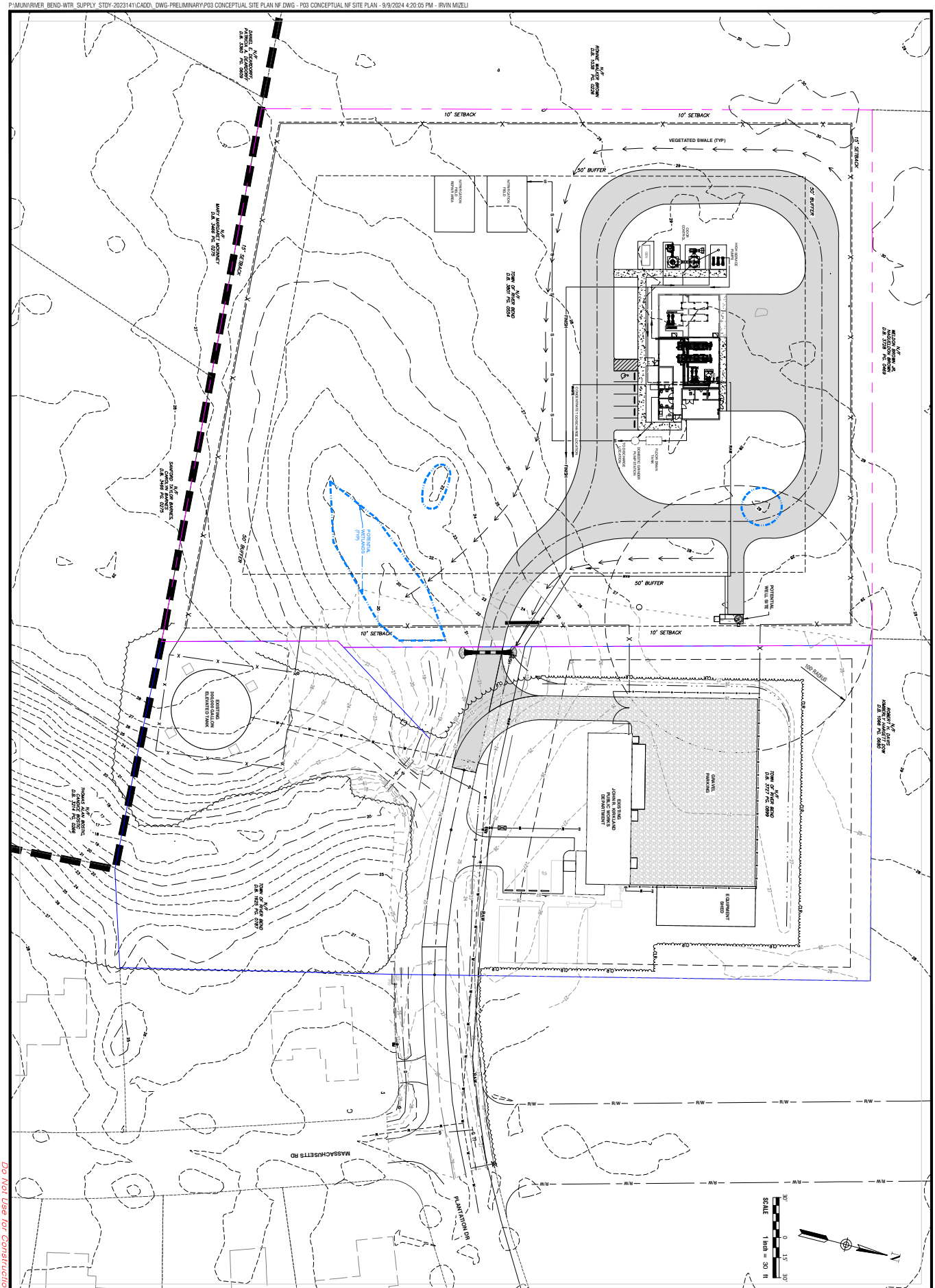


Do Not Use for Construction - PRELIMINARY

DATE	AUGUST 29, 2024
DESIGNED BY:	GJC
DRAWN BY:	JIM
CHECKED BY:	GJC
PROJECT No.	2023141
DRAWING No.	W-4153
SCALE	AS NOTED
SHEET No.	P03

LAND ACQUISITION SITE EVALUATION REPORT

TOWN OF RIVER BEND

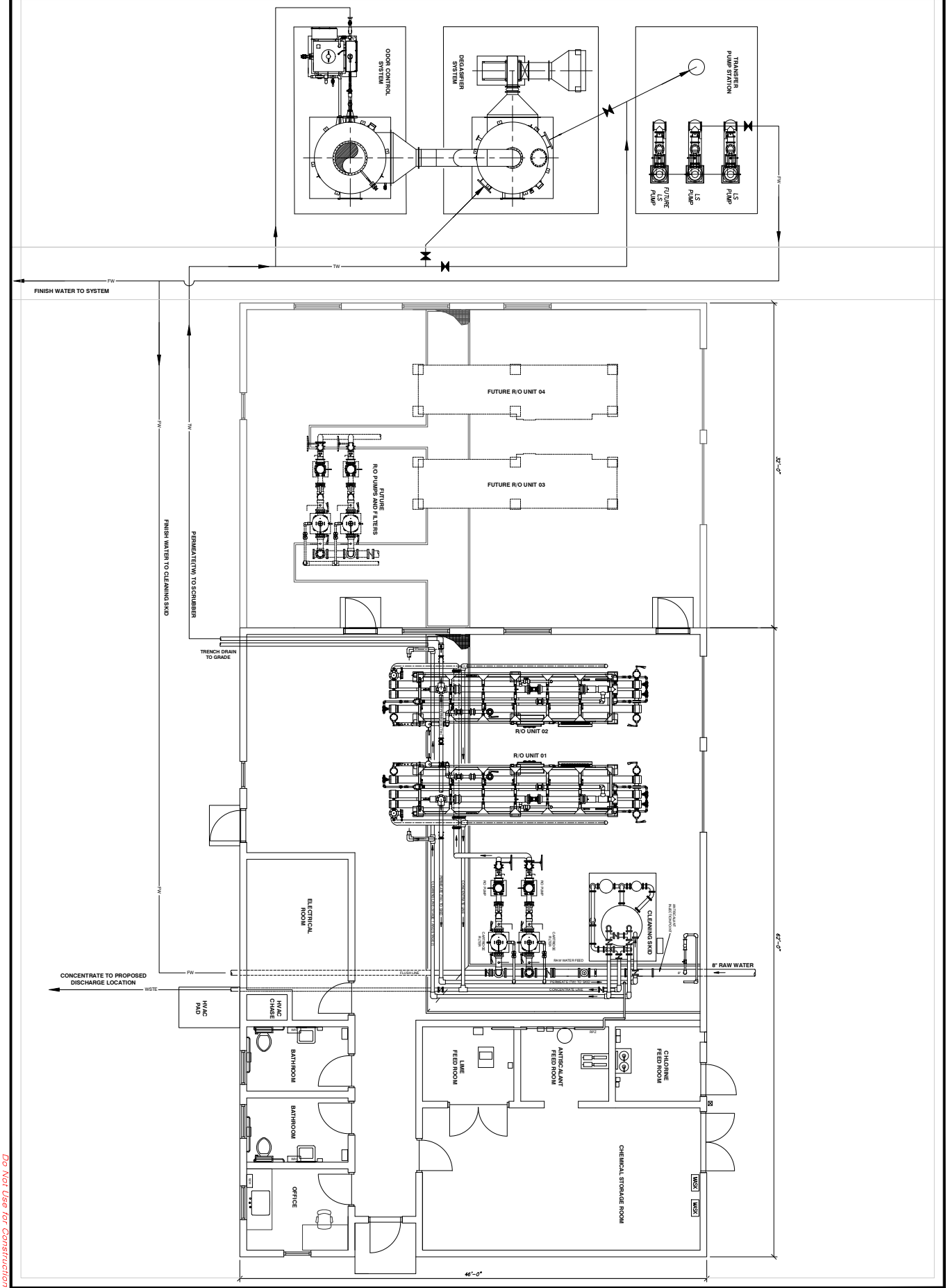
TOWN OF RIVER BEND CRAVEN COUNTY NORTH CAROLINA

CONCEPTUAL NF SITE PLAN

NO.	DESCRIPTION	DATE	BY

REVISIONS:

Rivers & ASSOCIATES, INC.
NC License: F-0934
riversandassociates.com Since 1918
107 East Second Street
Greenville, NC 27858
(252) 752-4135
Engineers
Planners
Surveyors
Landscape Architects



LAND ACQUISITION SITE EVALUATION REPORT

TOWN OF RIVER BEND

TOWN OF RIVER BEND CRAVEN COUNTY NORTH CAROLINA

CONCEPTUAL NF WTP BUILDING

DATE	AUGUST 29, 2024
DESIGNED BY	GJC
DRAWN BY	JIM
CHECKED BY	GJC
PROJECT No.	2023141
DRAWING No.	W-4153
SCALE	1/4"=1'-0"
SHEET No.	P04

NO.	DESCRIPTION	DATE	BY

REVISIONS

NC License: F-0834
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107 East Second Street
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Engineers
Planners
Surveyors
Landscape Architects

Do Not Use for Construction

APPENDIX

K

Town of River Bend
Land Acquisition Site Evaluation Report (LASER)
Phase I Environmental Assessment

TOWN OF RIVER BEND

Land Acquisition Site Evaluation Report (LASER)
For Potential WTP Site

4.5 +/- Acre Site Located at the South End of
509 Old Pollocksville Road (Brown Tract)
at Western Terminus of Plantation Drive

January 26, 2024

Prepared by:

Rivers & ASSOCIATES, INC.

Engineers, Planners, Surveyors
107 East Second Street
Greenville, North Carolina 27858

TOWN OF RIVER BEND

Land Acquisition Site Evaluation Report (LASER)
For Potential WTP Site

4.5 +/- Acre Site Located at the South End of
509 Old Pollocksville Road (Brown Tract)
at Western Terminus of Plantation Drive

January 26, 2024

Prepared by:

Rivers & ASSOCIATES, INC.

Engineers, Planners, Surveyors
107 East Second Street
Greenville, North Carolina 27858

NORTH CAROLINA PROFESSIONAL SEAL 16744 ENGINEER GREGORY J. CHURCHILL

1-26-24

Gregory J. Churchill, P.E.
President

Haleigh Robinson
Planner

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	**1**
INTRODUCTION	6
I. PROJECT NEED	
A. Background	7
B. Existing Water Treatment System	7
C. Existing System Capacity	9
D. Proposed Development Activity	9
II. DESCRIPTION OF EXISTING CONDITIONS OF PROPOSED WTP SITE	
A. Location	9
B. Zoning Requirement	10
C. General Characteristics of Site and Vicinity	10
D. Topography	11
E. Current use of the Property	11
F. Descriptions of Structures, Roads, Other Improvements on the Site	12
G. Site Utilities	12
III. SITE RESEARCH AND RECONNAISSANCE	
A. Soils	13
B. Wetlands	14
C. Streams	14
D. Floodplain	15
E. Endangered and Threatened Species	15
1. Mammals	16
2. Birds	17
3. Fishes	17
4. Reptiles	18
5. Amphibians	18
6. Insects	19
7. Plants	19

8. Designated Critical Habitat 20
F. Stormwater Control Measures 20
IV. PROPOSED DEVELOPMENT ACTIVITY
A. Site Development Considerations 21
1. Clearing & Grubbing 21
2. Site Grading/Topography 21
3. Soils 21
4. Setback Requirements 22
5. Wetland and Jurisdictional Streams 22
6. Stormwater Requirements 23
7. Utility Service 23
V. CONCLUSION 24
VI. REFERENCES 25
VII. APPENDICES:
Appendix A – Craven County Tax Parcel Information
Appendix B – Site Location Map
Appendix C – Phase I Environmental Assessment
Appendix D – Conceptual Site Plan
Appendix E – Site Photographs
Appendix F – FEMA Effective Flood Insurance Rate Map
Appendix G – USGS Topographic Map
Appendix H – Craven County Soils Map
Appendix I – National Wetlands Inventory Map
Appendix J – Existing Water System Map
Appendix K – 2022 Local Water Supply Plan
Appendix L – Historical Aerial Photographs
Appendix M – Soil Resource Report
Appendix N – US Fish & Wildlife Service Official Species List

TOWN OF RIVER BEND
Land Acquisition Site Evaluation Report (LASER)
Proposed 4.5-Acre WTP Site
(Southernmost Portion of Brown Tract)

EXECUTIVE SUMMARY

On December 27, 2024, Rivers & Associates, Inc. was authorized by the Town of River Bend to perform a preliminary site assessment for approximately 4.5 acres of land to potentially site a new municipal Water Treatment Plant (WTP) facility. The 4.5-acre site (proposed WTP Site) is located on the southernmost end of a larger 29.49-acre tract owned by Weldon Brown, Jr. and Naqueldon Brown (Brown Tract). The larger Brown Tract is identified as Parcel ID 8-200-028 on the Craven County Tax Parcel Maps, and is located at 509 Old Pollocksville Road *{See Appendix A – Craven County Tax Parcel Information}*. The 4.5-acre area of interest for the proposed WTP site is located in close proximity to the Town's recently constructed John R. Kirkland Public Works Facility and existing 300,000-gallon Elevated Storage Tank near the western terminus of Plantation Drive *{See Appendix B – Site Location Map}*.

The preliminary assessment of the WTP Site includes this Land Acquisition Site Evaluation Report (LASER) and an accompanying Phase I Environmental Assessment for the Brown Tract *{See Appendix C – Phase I Environmental Assessment}*. This report was prepared for the exclusive use of the Town of River Bend, North Carolina, but may be released to others by the Town as necessary for informational purposes only.

The purpose of the assessment is to describe the need for the project, summarize the permitting and zoning requirements, and determine suitability of the site for development as a proposed WTP.

The preliminary assessment for the WTP Site covers potential near surface geotechnical, environmental, drainage, utility and other developmental considerations, and incorporates the outcome of those considerations into a conceptual schematic site plan. *{See Appendix D – Conceptual Site Plan}*

Proposed Development Activity: The Town's existing WTPs and associated pumping and treatment equipment have outlived their useful service lives, and the Town desires to replace both existing WTPs with a single new WTP located at the proposed 4.5-acre site described above. The final treatment process is still under consideration, but is anticipated to include design and construction of a new greensand filtration and zeolite softening WTP to enhance removal of iron, manganese and hardness to improve overall potable water quality.

The proposed WTP capacity is recommended to be 1.0 MGD which is approximately equivalent to the total capacities of the existing well field and WTPs. Consideration should be given during the planning and design phases for future expansion capability. Raw water

transmission mains will be extended as required from Castle Hayne raw water wells to serve the new WTP site.

Lined waste settling lagoons and supernatant pumps will be installed on the new WTP site for enhanced settling of waste constituents. A waste effluent force main will be extended from the WTP site to the existing gravity sanitary sewer collection system, such that the effluent will be diluted through the sanitary sewer collection and treatment process, followed by discharge with the existing WWTP effluent. After the new WTP is commissioned and operational, the Town will properly abandon the two existing WTPs and voluntarily forfeit their associated NPDES discharge permits.

Description of Existing Conditions of Proposed WTP Site: The Brown Tract is located in Craven County at 509 Old Pollocksville Road. The proposed WTP Site is located on the southernmost end of the Brown Tract in close proximity to the Town's newly constructed Public Works Facility and existing 300,000-gallon Elevated Storage Tank near the western terminus of Plantation Drive. The logical access point for the WTP Site is from the western terminus of Plantation Drive.

The location of the site adjacent to the new Public Works Facility and existing Elevated Storage Tank make it convenient for development of the new WTP. However, Robert Davis and Kimberly Dow retained a five-feet (5') wide strip of property on the west side of the Public Works lot which would segregate the WTP site from the site of the Public Works Facility. If the Town pursues purchase of the proposed WTP Site, the additional 5' wide strip of land should also be acquired by the Town from Davis and Dow such that River Bend has contiguous ownership of the Public Works, Elevated Tank and WTP sites. This could help to facilitate location of a future raw water well on the WTP Site. One of the conditions for well site approval by NCDEQ DWR Public Water Supply Section is that the well owner must own or control development of the land within a 100-feet radius of the well.

The proposed WTP Site is currently an unattended forest consisting of a mixed stand of Loblolly Pine, American Holly, White Oak, Water Oak, Yellow Poplar, etc. Aerial photographs suggest the site was last logged in the early 1990s. The forest appears not to have been re-planted, rather it appears to have re-vegetated naturally. There is no indication that the property has been farmed over the past six decades. To the north and west, the WTP Site is surrounded by forest land. The property to the northeast of the WTP Site and new Public Works Facility is forest that was logged in 2023, and there is reportedly interest in development as a residential subdivision. Single family residences occupy the property located to the south of the WTP Site with the homes fronting southward and accessed from Gatewood Drive *{See Appendix E – Site Photographs}*.

Site Research and Reconnaissance: Desktop research was conducted by analyzing published governmental documents combined with field reconnaissance of on-site conditions conducted by Rivers' staff. The LASER includes information related to physical site characteristics including topography, soils, wetlands, streams,

floodplains, and vegetation; plus, regulatory limitations imposed on use related to specific characteristics of the site.

Preliminary reconnaissance and investigation by Rivers reveal the presence of no structures, roads or related accessories to suggest any previous development has occurred on the site. There are no man-made or machine-excavated ditches although there are some indications of very shallow swales present that likely remain from previous logging activities.

Clearing & Grubbing: The WTP Site is currently an unattended forest consisting of a mixed tree stand that generally range up to 30 years old. The majority of the site will require clearing and grubbing to facilitate development. Existing trees and vegetation may be able to remain within buffers, setbacks and undisturbed portions of wetlands.

Floodplain: As shown by *Appendix F – FEMA Effective FIRM Map*, Flood Insurance Rate Map Community Panel 3720545800K dated June 15, 2022 and published by the Federal Emergency Management Agency (FEMA), there are no areas of the WTP Site located within either the 100-year or 500-year flood zones. The current panel depicts the 100-year flood elevation at 9' MSL. The ground elevations for the WTP Site vary from approximately 19' – 30' MSL which are well above the 100-year and 500-year flood levels.

Topography and Drainage: The WTP Site is located within the Neuse River Basin, and the majority of the site drains southeastward toward an unnamed tributary of the Trent River. This site has greater topographic relief than many areas within Craven County, with site elevations ranging from a high elevation of 30' MSL in the southwest corner to a low elevation at the southeast boundary line of 19' MSL. Approximate representation of the existing topographic relief is illustrated by *Appendix G – USGS Quadrangle Topographic Map* and *Appendix D - Conceptual Site Plan*.

The unnamed tributary that receives surface water runoff from the WTP Site does not appear to be a jurisdictional "blue line" stream. The tributary is not represented as blue line on the USGS Quad Map or the Craven County Soil Survey maps *{See Appendix H – Craven County Soils Map}*. Field reconnaissance by Rivers suggests the tributary is non-jurisdictional at the point it reaches the WTP Site. A jurisdictional determination should be made to confirm whether it is regulated or not. A jurisdictional stream requires a 50-feet buffer on either side. To the extent that the WTP Site can be developed without disturbing the receiving stream, less impact and permitting effort will be required.

The Trent River is classified as a SB, Sw, NSW (Tidal Salt Water, Swamp, Nutrient Sensitive Water) located within the Neuse River Basin.

Soils: Near surface soils on the proposed WTP Site are comprised predominantly by Goldsboro (GoA) and Onslow (On) soils series which are moderately well drained . The depth to water table is generally between 18" – 36" below ground level. Minor components of Rains and Muckalee "hydric" soils are present within a small flat of wetlands that occur near the head of the drainage way. The dominant soil types have

some limitations regarding suitability for development activity. The Goldsboro and Onslow soils are classified as having "seasonal wetness" relative to shallow excavations and commercial building construction. Wetness, however, can be reduced by drainage system improvements including surface grading, and open or piped stormwater conveyances. As such, the soil types do not appear prohibitive for the type of construction activities required for development of the municipal WTP.

Deeper subsurface geotechnical investigation is recommended by a licensed geotechnical engineering firm to properly evaluate foundation design considerations or other soil limitations.

Wetlands and Jurisdictional Streams: Rivers' field reconnaissance suggests that minor areas of wetlands are present on the site despite the fact that the Nationwide Wetland Inventory does not indicate such *{See Appendix I – Nationwide Wetland Inventory}*. The wetland areas are relatively small with total acreage less than 0.2-acres; however, they extend as much as 150 feet into the WTP site. Some portions of the wetlands will likely need to be filled to accommodate construction. This should be feasible by securing a Nationwide 58 permit from the US Army Corps of Engineers which allows filling up to 0.5-acres. A mitigation fee will be required in order to purchase mitigation credits from an eligible mitigation bank for the Neuse River Basin.

Rivers' research and field reconnaissance also suggests that the location of the receiving stream where it crosses onto the WTP site is non-jurisdictional. However, if regulatory authorities determine this to be otherwise, then the Neuse River Riparian Buffer Protection Rules and the Coastal Stormwater Regulations require a 50-feet wide buffer on either side of a jurisdictional stream.

Concurrence from USACE and NCDEQ DWR will be required relative to jurisdictional features, and permitting may subsequently be needed. Final determination regarding wetlands and streams will provide more information pertaining to any possible wetland mitigation and/or adverse stream setbacks.

Threatened and Endangered Species: Current and/or prior existence of threatened or endangered species in the Neuse River Basin are well documented by numerous governmental agencies and publications. An official species report was obtained from the Fish and Wildlife Service to identify threatened, endangered, proposed and candidates species, as well as proposed and final designated critical habitat, that may occur within the boundary of the proposed project and/or may be affected by the proposed project.

Although a number of threatened, endangered, proposed and candidate species are identified, U.S. Fish and Wildlife Service have not designated any critical habitat in the potential project location for currently listed threatened and endangered species.

Stormwater Requirements: The WTP Site drains to the Class SB; Sw, NSW receiving waters of the Trent River which is part of the Neuse River Basin. Since Craven County is

one of the twenty designated coastal counties in North Carolina, the Coastal Stormwater Rules apply.

Based on the preliminary layout, it appears that the site can be developed utilizing the low-density stormwater option (maximum Built Upon Area <24%). As such, the site will be drained principally via vegetated swales.

A French drain system will likely be required beneath the lined backwash settling ponds to ensure that whaling (floating) of the geotextile liner does not occur when pond water levels are low.

Conclusion: As with any site to be considered for development of a municipal WTP, there are positive, negative and neutral characteristics and considerations.

The following are considered to be positive characteristics and considerations for the property under consideration:

- site location and accessibility are favorable relative to other municipal facilities, utility and roadway infrastructure,
- no previous development or site contamination is apparent on or near the property,
- zoning/setback requirements do not appear to be problematic.
- topographic relief is favorable for site drainage,
- the site is not subject to flooding,
- there is no critical habitat designated within the property for endangered or threatened species.

Alternately, the following are considered to be negative characteristics /considerations:

- site clearing and grubbing will be required to accommodate development,
- approximately a foot of soil will likely need to be replaced due to clearing and grubbing operations.

Finally, neutral characteristics and considerations include the following items:

- near surface soils appear acceptable for construction although an additional geotechnical investigation is required for foundation design purposes,
- a small quantity of wetlands exists on the site, but can be accommodated through regulatory permitting processes,
- the stream is not considered to be jurisdictional which eliminates a potential 50-feet buffer; however, confirmation is required.

On the whole, we consider the positive and neutral aspects for development of this site to outweigh the negative, which are somewhat minimal. As such, this preliminary evaluation indicates the 4.5-acre site located at the southernmost end of the Brown Tract is suitable to accommodate development of a new Water Treatment Plant for the Town of River Bend. In addition, the site appears to accommodate the expected requirements for the WTP based on the preliminary size, layout and data that is available at this time.

TOWN OF RIVER BEND
Land Acquisition Site Evaluation Report (LASER)
Proposed 4.5-Acre WTP Site
(Southernmost Portion of Brown Tract)

INTRODUCTION: On December 27, 2024, Rivers & Associates, Inc. was authorized by the Town of River Bend to perform a preliminary site assessment for approximately 4.5 acres of land to potentially site a new municipal Water Treatment Plant (WTP) facility. The 4.5-acre site (proposed WTP Site) is located on the southernmost end of a larger 29.49-acre tract owned by Weldon Brown, Jr. and Naqueldon Brown (Brown Tract). The larger Brown Tract is identified as Parcel ID 8-200-028 on the Craven County Tax Parcel Maps, and is located at 509 Old Pollocksville Road *{See Appendix A – Craven County Tax Parcel Information}*. The 4.5-acre area of interest for the potential WTP site is located in close proximity to the Town's recently constructed John R. Kirkland Public Works Facility and existing 300,000-gallon Elevated Storage Tank near the western terminus of Plantation Drive *{See Appendix B – Site Location Map}*.

The preliminary assessment of the WTP Site includes this Land Acquisition Site Evaluation Report (LASER) and an accompanying Phase I Environmental Assessment for the Brown Tract *{See Appendix C – Phase I Environmental Assessment}*. This report was prepared for the exclusive use of the Town of River Bend, North Carolina, but may be released to others by the Town as necessary for informational purposes only.

The purpose of the assessment is to describe the need for the project, summarize the permitting and zoning requirements, and determine suitability of the site for development as a potential Water Treatment Plant (WTP).

The preliminary assessment for the WTP Site covers potential near surface geotechnical, environmental, drainage, utility and other developmental considerations, and incorporates the outcome of those considerations into a conceptual schematic site plan. *{See Appendix D – Conceptual Site Plan}*

The schematic plan illustrates the preliminary expected size and site layout for a new Water Treatment Plant for the Town of River Bend. The potential layout for the WTP was generated by Rivers & Associates, Inc. based on preliminarily expected sizing and experience from design, permitting and construction of similar WTP facilities in eastern North Carolina. A Water Supply Study is currently being conducted by Rivers & Associates, Inc. for the Town to evaluate potential water supply options, water treatment processes, and backwash waste treatment/disposal options. The Water Supply Study is expected to be completed prior to the Town proceeding with preliminary and final design of water supply, treatment, transmission and waste handling improvements. As such, final recommendations have not yet been made by

Rivers, nor have they been accepted by the Town and/or regulatory authorities having jurisdiction.

Probable stormwater treatment requirements are projected based on review of the current Stormwater Regulations pertinent to Coastal Counties, as well as the Neuse River Riparian Buffer Protection Rules. Should the Town elect to procure and develop the Site for the stated use, the final site plan will likely vary from the schematic. However, the schematic plan is intended to show that the site is sufficiently sized for the intended use.

This Land Acquisition Site Evaluation Report (LASER) details our findings from analysis of published documents combined with field reconnaissance of on-site conditions. The LASER includes information related to physical site characteristics, including topography, soils, wetlands, streams, floodplains, and vegetation; plus, regulatory limitations imposed on the use of the Site related to specific characteristics of the site.

I. PROJECT NEED

A. Background

Prior to the Town of River Bend being incorporated, the area was originally developed as a retirement community known as River Bend Plantation. Construction of the development began in the late 1960's and continued to expand in subsequent years. The homeowners living in River Bend Plantation elected to pursue incorporation in the late 1970's, and the Town was subsequently chartered in 1981.

The water and sewer systems were originally constructed to support the River Bend Plantation development 40-50 years ago, and were later sold by the original developer to Carolina Water Service (CWS). In 1995, the Town of River Bend purchased the water and sanitary sewer utilities from CWS. Shortly afterward, the Town extended water service to customers throughout the Town, and constructed an additional 300,000-gallon elevated tank at the southern terminus of Plantation Drive. Portions of the original River Bend Plantation water system remain in service today.

B. Existing Water Treatment System

The existing water system currently consists of three (3) raw water wells that draw water from the Castle Hayne Aquifer. The combined 12-hour capacity of the wells is approximately 1.0 MGD. The raw water is characterized by elevated iron, manganese and hardness. Wells #1 and #2 supply raw water to the 0.60 MGD water treatment plant (WTP) located at the northeast corner of the intersection of Shoreline Drive and Plantation Drive – *Appendix J – Existing Water System*. Well #3 supplies raw water to the 0.35 MGD WTP located adjacent to the Rhems Fire Department on Shoreline Drive. The primary treatment provided for by both treatment plants is removal of iron and manganese by way

of pH adjustment, oxidation and filtration. The plants are not equipped for softening of the hard raw water. Individual customers provide residential softeners within their homes as desired.

The treatment plants utilize chemical addition plus pressure filters to provide treatment and disinfection. Caustic soda is utilized to raise the pH of the raw water, and compressed air is injected to increase dissolved oxygen content to optimize oxidation of soluble iron ahead of the pressure filters. The filters incorporate Birm© sand filter media to capture oxidized iron particles. Polyphosphate is added post-filtration to act as a sequestering agent for any remaining soluble iron, as well as a scale inhibitor to reduce precipitation within the distribution system. Gas chlorine feeders are utilized to provide primary and residual disinfection of the finished water as it is introduced into the distribution system. The distribution system includes approximately 19 miles of 2" – 8" diameter water mains. Approximately 98% of the water mains are constructed of PVC while the remaining 2% are ductile iron pipe. The water system includes two (2) elevated storage tanks: the older 100,000-gallon tank was erected in 1981 adjacent to the Rhems Fire Department, and the newer 300,000-gallon tank referenced earlier.

The water treatment filters are periodically backwashed in order to remove the captured iron and manganese particles and clean the filter media to support further filtration. The backwash wastewater is directed to below ground settling tanks located on each of the WTP sites. These tanks allow for quiescent settling of precipitated iron and manganese. The effluent supernatant is pumped from the top of the tanks to NPDES permitted surface water discharge locations within (1) the community boating canal at Plantation Drive and (2) a tributary to the boating canal located behind the Rhems Fire Department.

The current 8" Well #1 was installed in 1985 by Craven Well Drilling Service to replace the original Well #1 which was installed in the late 1960's – early 1970's. Well #2 is a 6" well that was installed in 1977 by Craven Well Drilling Service. These initial wells were supplying raw water to the original WTP located at the Shoreline Drive/Plantation Drive intersection. Since the water system was owned and operated by Carolina Water Service at that time, the Town of River Bend does not have plans or specifications to document these early installations. In 1988, a larger well pump was installed in Well #1 and additional filters were installed in the original WTP serving both Wells #1 and #2. The current 8" Well #3 was installed in 1983 by Craven Well Drilling Service. The associated WTP serving Well #3 was constructed in 1984. Portions of the existing WTP facilities are 34 – 50 years old. The well pumps and associated electrical equipment are 34 – 45 years old.

The Town has experienced periodic customer complaints regarding random emergence of red or reddish-brown water at various locations throughout the distribution system. A Preliminary Water System Evaluation was conducted by Rivers & Associates, Inc. in 2020. The study suggests that the red/brown water issues are a result of limitations with the current water treatment process, and suggests WTP upgrades be considered moving forward.

C. Existing System Capacity

The 2022 Local Water Supply Plan for the River Bend Water System - *Appendix K– 2022 Local Water Supply Plan* indicates that the Town served 1,492 customers consisting of 1,477 residential customers, 14 commercial customers and 1 institutional customer. For 2022, the average metered use to supply water to the customer base was 0.17 MGD. During the same timeframe, the Town withdrew 0.283 MGD from their wells with the maximum day withdrawal equal to 0.703 MGD. The difference between the average well withdrawal rate and the average metered water use rate equals 0.113 MGD which would reflect non-metered uses such as filter backwash water, line cleaning, flushing, etc. as well as meter inconsistencies.

D. Proposed Development Activity

The Town's existing WTPs and associated pumping and treatment equipment have outlived their useful service lives, and the Town desires to replace both existing WTPs with a single new WTP located near the northwest terminus of Plantation Drive adjacent to the new Public Works Facility and the existing 300,000-gallon elevated water storage tank. The final treatment process is still under consideration, but is anticipated to include design and construction of a new greensand filtration and zeolite softening WTP to enhance removal of iron, manganese and hardness to improve overall potable water quality.

The proposed WTP capacity is recommended to be 1.0 MGD which is approximately equivalent to the total capacities of the existing well field and WTPs. Consideration should be given during the planning and design phases for future expansion capability. Raw water transmission mains will be extended as required from Castle Hayne raw water wells to serve the new WTP site.

Lined waste settling lagoons and supernatant pumps will be installed on the new WTP site for enhanced settling of waste constituents. A waste effluent force main will be extended from the WTP site to the existing gravity sanitary sewer collection system at the Shoreline Drive/Plantation Drive intersection, such that the effluent will be diluted through the sanitary sewer collection and treatment process, followed by discharge with the existing WWTP effluent into the Trent River. After the new WTP is commissioned and operational, the Town will properly abandon the two existing WTPs and voluntarily forfeit their associated NPDES discharge permits.

II. DESCRIPTION OF EXISTING CONDITIONS OF PROPOSED WTP SITE

A. Location

The Brown tract on which the WTP Site property is located is identified as follows:

Parcel Number	Craven County Tax PIN	Owner	Total Acreage
1	8-200-028	Weldon Brown, Jr. and Naqueldon Brown	29.49 acres

The Brown Tract is located in Craven County at 509 Old Pollocksville Road. The WTP Site is located on the southernmost end of the Brown Tract in close proximity to the newly constructed River Bend Public Works Facility and existing 300,000-gallon Elevated Storage Tank near the western terminus of Plantation Drive. Latitude and longitude coordinates for a point physically located on the *Tract* are (N 35.07101111° W 77.15863056°).

B. Zoning Requirements

The proposed WTP Site is located within the existing Town limits, and is zoned R20A (Residential-Agricultural 20,000 Sq Ft). The typical use within the R20A zoning district is single family residential with a minimum lot area of 20,000 square feet.

Public Utility uses, such as the WTP, are allowed in the R20A zoning district by Special Exception (SE). Special Exception use is permitted upon approval by the River Bend Board of Adjustment after recommendation of the Planning Board.

The proposed site of the WTP is located immediately adjacent to the new Public Works Facility and the existing 300,000-gallon Elevated Storage Tank. The Public Works Facility is located within the R20 zoning district while the EST is located within the R20A zoning district. We understand Town staff and officials to be supportive of siting the new WTP at this proposed location.

Setback and dimensional lot requirements within the R20A zoning district are as follows:

Minimum Lot Area	20,000 SF
Minimum Front Lot Line	90 feet
Minimum Building Setback	30 feet
Minimum Side Yard Setback (Main Building)	10 feet
Minimum Rear Yard Setback (Main Building)	15 feet
Maximum Lot Coverage	24%
Maximum Building Height	34 feet

Based upon the Preliminary WTP Site Layout, these setback and dimensional requirements can be readily accommodated.

C. General Characteristics of Site and Vicinity

The WTP Site is currently forested, and the property appears to have not been used other than silviculture for decades, with the most recent logging activity in the early 1990s.

To the north and west, the WTP Site is surrounded by forest land. The property to the northeast of the WTP Site and new Public Works Facility is forest that was logged in 2023, and there is reportedly interest in development of a residential subdivision. Single family residences occupy the property located to the south of the WTP Site with the homes fronting southward and accessed from Gatewood Drive. The logical access point for the WTP Site is from the western terminus of Plantation Drive *{See Appendix E – Site Photographs}*.

D. Topography

The WTP Site is located within the Neuse River Basin, and the majority of the site drains southeastward toward an unnamed tributary of the Trent River. This site has greater topographic relief than many areas within Craven County. Based on Light Detection and Ranging (LIDAR) remote sensing data, the highest portion of the property is located in the northwest with an approximate elevation of 30' MSL while the lowest elevation is on the southeast with an approximate elevation of 19' MSL. Approximate representation of the existing topographic relief is illustrated by *Appendix G - USGS Quadrangle Topographic Map* and *Appendix D – Conceptual Site Plan*.

The unnamed tributary that receives surface water runoff from the WTP Site does not appear to be a jurisdictional blue line stream. The tributary is not represented as blue line on the USGS Quad Map or the Craven County Soil Survey maps *{See Appendix H – Craven County Soils Map}*. Field reconnaissance by Ben Williams, AICP and Greg Churchill, P.E. on January 18, 2023 suggests the tributary is non-jurisdictional at the point it reaches the WTP Site. A jurisdictional determination will need to be made to confirm whether it is regulated or not. A jurisdictional stream requires a 50-feet buffer on either side. To the extent that the WTP Site can be developed without disturbing the receiving stream, less impact and permitting effort will be required.

The Trent River is classified as a SB, Sw, NSW located within the Neuse River Basin.

E. Current Use of the Property

The WTP Site is currently an unattended forest consisting of a mixed stand of Loblolly Pine, American Holly, White Oak, Water Oak, Yellow Poplar, etc. Aerial photographs suggest the site was last logged in the early 1990s *{See Appendix L – Historical Aerial Photographs}*. The forest appears not to have been re-planted, rather it appears to have re-vegetated naturally. There is no indication that the property has been farmed over the past six decades.

The site is located in close proximity to the Town's new Public Works Facility which makes it convenient for development of the new WTP. The Town purchased the site of the Public Works Facility from Robert Davis and Kimberly Dow in 2022. Davis and Dow retained a five-feet (5') wide strip of property on the west side of the Public Works lot

which would segregate the WTP site from the site of the Public Works Facility. This 5' wide strip of land should be acquired by the Town from Davis and Dow such that River Bend has contiguous ownership of the Public Works, Elevated Tank and WTP sites. This could help to facilitate location of a future raw water well on the WTP Site. One of the conditions for well site approval by NCDEQ DWR Public Water Supply Section is that the well owner must own or control development of the land within a 100-feet radius of the well.

F. Descriptions of Structures, Roads, Other Improvements on the Site

Preliminary reconnaissance and investigation by Rivers indicate there are no existing structure, roads or man-made improvements to suggest previous development has occurred on the WTP site. There is indication of very shallow swales that likely remain from previous logging activities.

G. Site Utilities

Underground electric service is provided along Plantation Drive to both the new Public Works Facility and the existing Elevated Storage Tank located adjacent to the proposed WTP Site by Duke Energy. Electrical service will require extension from the existing underground service on Plantation Drive to provide a new dedicated electrical service entrance to the WTP Site along with emergency backup generator and automatic transfer switch.

A new raw water main will need to be extended along Plantation Drive from the Castle Hayne groundwater wells to the new WTP site. The WTP Site could potentially serve as a site for a new potable water supply well in the future. The proposed location will require review and site approval by NCDEQ DWR Public Water Supply Section.

The Town's potable water system extends along Plantation Drive from the existing 300,000-gallon elevated storage tank located adjacent to the WTP site. Water level in this EST controls operation of the existing WTPs, and will serve to control operation of the new WTP. Finished water from the proposed WTP can be readily connected to the existing storage and distribution system.

The Town's public wastewater system does not provide service to residents along Plantation Drive. As such, domestic wastewater generated from the WTP will need to be disposed by one of two options: (1) septic tank and nitrification field similar to that recently permitted and constructed at the new Public Works Facility, or (2) grinder pump tank that discharges into a common waste force main with the backwash waste supernatant pump station that serves the settling ponds. The common force main would extend eastward on Plantation Drive, and discharge into the existing gravity sanitary sewer collection system located at the intersection of Shoreline Drive and Planation Drive.

III. SITE RESEARCH AND RECONNAISSANCE

A. Soils

Research: Desktop research was conducted to evaluate the characteristics of near surface onsite soils based on readily available geotechnical resources. This preliminary evaluation does not reduce the need for a detailed professional onsite geotechnical investigation for proper foundation consideration, soil limitations, and recommendations prior to design.

A custom soil resource report was created using information published by the United States Department of Agriculture, Natural Resource Conservation Service. It indicates the shallow soils on the site consist predominantly (greater than 85%) Goldsboro loamy fine sand (GoA) soils series. The remaining dominant soil series appears to be of the Onslow loamy sand (On) series. *{See Appendix M –Soil Resource Report}*

According to the Soil Survey, the Goldsboro (GoA) and Onslow (On) soils are moderately well drained with depth to the nearest restrictive feature more than 80 inches. Goldsboro loamy fine sand has a depth to water table between 24" – 36" below ground level, while Onslow loamy sand has a depth to water table between 18" – 36" below ground level. Minor components of Rains and Muckalee "hydric" soils are present within a small flat of wetlands that occur near the head of the drainage way.

The Craven County Soil Survey (1989) indicates that the dominant soil types have some limitations regarding suitability for development activity. Table 10 provides information regarding suitability of dominant soil types for various types of development, e.g. shallow excavations, dwellings with or without basements, commercial buildings, roads, and lawns and landscaping. In reference to shallow excavations and commercial building construction, the Goldsboro (GoA) and Onslow (On) soils are classified as having "wetness". Seasonal wetness is the main limitation to use of this soil as a site for buildings and shallow excavations. However, wetness can be reduced by drainage system improvements that includes surface grading, and open or piped stormwater conveyances. As such, the soil types present on the site do not appear to be prohibitive for the type of construction activities required for development of the municipal WTP.

Reconnaissance: Field reconnaissance was conducted by Ben Williams, AICP and Greg Churchill, P.E. to assess the characteristics of the near surface onsite soils, drainage, etc. Rivers utilized a 54" hand auger and 48" probe rod to sample and characterize the soil strata to a depth of approximately 4 feet at multiple locations across the site of interest. The soil profile appears to be consistent with the characteristics identified in the Soil Survey. For the majority of the site, the upper strata generally consist of 6 – 10" of root mat, organics, and loamy fine sands. Beneath this stratum are fine sandy loam and sandy clay loam in the 10 – 20" depth. Below these strata, in the 20 – 48" depth, the soils gravitate toward a predominance of sandy clay loam and/or clay loam. The soil survey

suggests that the Goldsboro series becomes clay loam at greater depth down to 80" while the Onslow series becomes sandy loam at greater depth down to 80".

The water table was not encountered to a depth of approximately 48" in the Goldsboro and Onslow soil locations at the time of auger withdrawal. The water table was less prevalent than should be expected during the wet season as the expected water table depth is 18 – 36". Near surface soils are characterized by low plasticity, moisture sensitive soils due to the presence of fines and organics. This is conducive to the ponding of water on the site, and rutting under rubber-tired traffic during wetter times of the year. Ideally, clearing and grubbing of the site, as well as subsequent grading, should occur during the summer months to limit the degree of repair required.

Deeper subsurface geotechnical investigation is recommended by a licensed geotechnical engineering firm to properly evaluate foundation design considerations or other soil limitations.

B. Wetlands

Research: Desktop research was conducted utilizing government publications to evaluate the presence of wetland features on the site. No wetland features are shown on the property according to *Appendix I - National Wetlands Inventory map*.

Reconnaissance: Based on Rivers' field reconnaissance, it is our opinion that a small amount of wetlands is present on the site. Minor areas of Rains and Muckalee "hydric" soils are present within a small flat of wetlands that occur near the head of the drainage way. In addition, a couple of small pockets of isolated wetland depressions exist across the site. Should site development require that a portion of the wetlands be filled, it is expected that a US Army Corps of Engineers Nationwide Permit 58 can be obtained to fill up to a maximum of 0.50 acres. A mitigation fee will be required in order to purchase mitigation credits from an eligible Neuser River Basin mitigation bank for any wetlands that are filled. To specifically determine the presence and/or extent of wetlands, an official delineation and jurisdictional determination would need to be conducted, and verified by the U.S. Army Corps of Engineers.

C. Streams

Research: Desktop research was conducted utilizing government publications to evaluate the presence of jurisdictional streams on or near the site. Intermittent or perennial streams, ditches and drainage ways may fall under the jurisdiction of NCDEQ – Division of Water Resources if depicted on the most recent versions of the USGS Topographic Quadrangle Map and/or County Soil Survey. The 2022 USGS Topographic Quadrangle Map does not include any indication of a "blue line" stream on the proposed WTP Site; neither is an intermittent or perennial stream depicted on the WTP Site based on the 1989 Craven County Soil Survey.

The site is not characterized by man-made excavated ditches although there are some indications of very shallow swales present that likely remain from previous logging activities. In general, the site slopes to a natural drainage feature on the southeast side of the property. The upstream end of this drainage way appears to head up into a wetland flat where drainage is collected at the southeast corner of the WTP site. The drainage way collects stormwater runoff from the potential WTP site, as well as the new Public Works Facility, existing Elevated Tank site, and existing residential development, and discharges into the Trent River approximately 0.6 mile downstream.

Reconnaissance: Based on Rivers' field reconnaissance, it appears that the drainage way transitions from an intermittent to ephemeral stream downstream of the WTP Site. An ephemeral stream only conveys stormwater in direct response to precipitation, and despite having a well-defined channel it lacks the biological, hydrological and physical characteristics of intermittent or continuous conveyances of water. Ephemeral streams are non-jurisdictional. To specifically determine the point of transition where jurisdictional buffer setbacks become effective, a formal stream call would be required with concurrence by the U.S. Army Corps of Engineers. The specific location of the jurisdictional portion of this drainage way will dictate the location of 50-feet wide buffers as required by the Neuse River Riparian Buffer Protection Rules and Coastal Stormwater Rules. Based on our preliminary review, we do not believe stream buffers will be required on the WTP Site.

D. Floodplain

As shown by *Appendix F – FEMA Effective FIRM Map*, Flood Insurance Rate Map Community Panel 3720545800K dated June 15, 2022 and published by the Federal Emergency Management Agency (FEMA), there are no areas of the WTP Site located within either the 100-year or 500-year flood zones. The current panel depicts the 100-year flood elevation at 9' MSL. As indicated previously the ground elevations for the WTP Site vary from approximately 19' – 30' MSL which are well above the 100-year and 500-year flood levels.

E. Threatened and Endangered Species

Current and/or prior existence of threatened or endangered species in the Neuse River Basin are well documented by the NCDEQ Basinwide Water Quality Plan, US Fish and Wildlife Service, NC Wildlife Resources Commission, and NC Natural Heritage Program. An official species report was obtained from the Fish and Wildlife Service to identify threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of the proposed project and/or may be affected by the proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The official species report can be found in *{Appendix N – U.S. Fish & Wildlife Service Official Species List}*.

Definitions for each of these classifications are as follows:

- Endangered species are in danger of extinction throughout all or a significant portion of its range.
- A threatened species is likely to become an endangered species in the foreseeable future.
- Special concern species require monitoring, but may be taken or collected under specific regulatory requirements.
- A significantly rare species is rare in North Carolina, but has no official state status as such.
- A federal species of concern refers to a species that is under consideration for listing, but at present insufficient information exists to support listing.

E.1 Mammals

The Northern Long-eared Bat, *Myotis septentrionalis*, is federally listed as an endangered species. This bat has a medium sized body of 3 – 3.7 inches, a wingspan of 9 - 10 inches, and long ears when compared to other bats of the same genus. In winter, the bats hibernate in caves and mines where constant temperatures, high humidity and no air current prevail. During summer, Northern Long-eared Bats roost singly or in colonies beneath bark or in cavities of live and dead trees. Rarely, does this species roost in structures such as barns or sheds. The bat's range extends through much of eastern and north central United States, as well as all Canadian provinces. Populations of the Northern Long-eared Bat have declined primarily due to a disease known as white-nose syndrome. This disease has quickly spread from the Northeast to the Midwest and Southeast U.S. Numbers of the bats have declined by as much as 99 percent in the Northeast, and that decline is expected to continue in the foreseeable future as white-nose syndrome spreads throughout the species' range. No critical habitat has been designated for this species.

The Tricolored Bat, *Perimyotis subflavus*, is proposed endangered and is one of the smallest bats native to North America. The once common species is wide ranging across the eastern and central United States and portions of southern Canada, Mexico and Central America. During the winter, tricolored bats are found in caves and mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts. During the spring, summer and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves. As its name suggests, the tricolored bat is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle and dark at the tip. White-nose syndrome, a disease that impacts bats, is caused by a fungal pathogen. It has led to 90 to 100% declines in tricolored bat winter colony abundance at sites impacted by the disease. Since white-nose syndrome was first observed in New York in 2006, it has spread rapidly across the majority of the tricolored bat range. No critical habitat has been designated for this species.

The West Indian Manatee, *Trichechus manatus*, is federally listed as a threatened marine mammal. The West Indian manatee is a large, aquatic mammal. There are two subspecies of West Indian manatees: the Antillean manatee (Trichechus manatus manatus) and the

Florida manatee (Trichechus manatus latirostris). Due to their eating habits, manatees are nicknamed "sea cows", because they eat seagrasses and other aquatic plants. The range-wide population is estimated to be at least 13,000 manatees, with more than 6,500 in the southeastern United States and Puerto Rico. When aerial surveys began in 1991, there were an estimated 1,267 manatees in Florida. Today there are more than 6,300 in Florida, representing a significant increase over the past 25 years.
There is a final critical habitat for this species; however, this project area does not overlap the critical habitat.

E.2 Birds

The Eastern Black Rail, *Laterallus jamaicensis ssp.jamaicensis*, is federally listed as threatened. The Eastern Black Rail is a sparrow-sized, secretive marsh bird, and the smallest rail in North America. Adults have an average length of 4 – 6 inches and a wingspan of 8.7 – 11 inches. Black rails require dense vegetative cover that allows movement under the canopy. They are found in a variety of salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced. North Carolina presently shows a severe decline in the number of occupied sites. No critical habitat has been designated for this species.

Among avians, only one (1) species is federally classified as endangered, the Red-cockaded Woodpecker, *Picoides borealis* (RCW). The RCW is a territorial, non-migratory species that excavate roosts and nest cavities in living pine trees. Longleaf pine is the preferred species for excavation; however, loblolly, shortleaf, slash and pond pine are also used depending on availability. Mature trees are required such that sufficient heartwood is available for a sap-free cavity. RCW is a primary cavity nester since it constructs the cavity in which it resides. Other secondary cavity nesters benefit from the RCW's construction. These include other birds, snakes, lizards, squirrels and frogs. No critical habitat has been designated for this species.

The Red Knot, *Calidris canutus rufa*, is federally listed as threatened. The Red Knot is a medium-sized shorebird which breeds in tundra and Arctic Cordillera in the far north of Canada, Europe and Russia. It makes one of the largest annual migrations of any bird traveling 9,300 miles from its Arctic breeding grounds to the southern part of South America. The species is regularly sighted along the NC coast during winter migration. However, the number have been reduced due to the decline/over-harvest of crabs in the Delaware Bay. Knots favor tidal water for foraging, and crab eggs laid on Delaware beaches fuel their flight to the northern breeding grounds. There is a proposed critical habitat for this species.

E.3 Fishes

There are no endangered or threatened fish species within this area.

E.4 Reptiles

The American Alligator, *Alligator Mississippiensis*, is federally protected as threatened due to similarity of appearance with other listed crocodile or caiman species. The American Alligator was depleted from many parts of their range as a result of market-hunting and habitat loss, and was listed as endangered in 1967. However, the combined efforts of US Fish and Wildlife and State Wildlife Agencies saved these animals. In 1987, US FWS declared the American Alligator to be fully recovered, and removed the animal from the list of endangered species, but continues to offer protection as threatened due to similarity of appearance. No critical habitat has been designated for this species.

The Green Sea Turtle, *Chelonia mydas*, is federally listed as threatened. This turtle is the largest of all hard-shelled sea turtles, but has a comparatively small head. A typical adult is 3 – 4 feet long and weighs 300 – 350 pounds. They have dark brown, grey, or olive colored shells and a much lighter, yellow-to-white underside. Green Sea Turtle must surface to breathe and lay their eggs on land. They migrate hundreds to thousands of miles each way between their foraging grounds and nesting beaches. They are solitary, night-time nesters. Their diet consists of algae and seagrasses, though they also forage on sponges, invertebrates, and discarded fish. They are found worldwide in subtropical and temperate regions of the Atlantic, Pacific and Indian Oceans, as well as the Mediterranean Sea. In the U.S., Green Sea Turtles are found in inshore and nearshore waters from Texas to Maine. There is a final critical habitat for this species; however, this project location does not overlap the critical habitat.

The Leatherback Sea Turtle, *Dermochelys coriacea*, is the largest turtle in the world. It is federally listed as endangered. They are the only species of sea turtle that lack scales and a hard shell. They are named for their tough rubbery skin and have existed in their current form since the age of the dinosaurs. Leatherbacks are highly migratory, some swimming over 10,000 miles a year between nesting and foraging grounds. They are also accomplished divers with the deepest recorded dive reaching nearly 4,000 feet—deeper than most marine mammals. The leatherback turtle has the widest global distribution of any reptile, with nesting mainly on tropical or subtropical beaches. Once prevalent in every ocean except the Arctic and Antarctic, the leatherback population is rapidly declining in many parts of the world. They face threats on both nesting beaches and in the marine environment. The greatest of these threats worldwide are incidental capture in fishing gear (bycatch), hunting of turtles, and collection of eggs for human consumption. There is a final critical habitat for this species; however, this project location does not overlap the critical habitat.

E.5 Amphibians

The Neuse River Waterdog, *Necturus lewisi*, is one of the rarest salamanders in the Southeastern U.S. This permanently aquatic salamander is federally protected as threatened due to habitat degradation which affects water quality, water quantity, instream

habitat suitability, and habitat connectivity. The remaining populations are small, isolated, with a contracted range that makes them vulnerable to catastrophic and natural events. The Neuse River waterdog is extremely susceptible to the effects of siltation or the deposit of sediments in freshwater. The major threats to this species arise from water development project such as the construction of impoundments and stream channelization. Pollution from industrial and urban development can also cause loss of habitat by lowering dissolved oxygen levels and increasing suspended solids and sediments in streams. There is a final critical habitat for this species; however, this project location does not overlap the critical habitat.

E.6 Insects

The Monarch Butterfly, *Danaus plexippus*, is a candidate threatened or endangered species. The large and brilliantly-colored monarch butterfly is among the most easily recognizable of the butterfly species that call North America home. They have two sets of wings and a wingspan of three to four inches. Their wings are a deep orange with black borders and veins, and white spots along the edges. The underside of the wings is pale orange. Male monarchs have two black spots in the center of their hind wings, which females lack. These spots are scent glands that help males attract female mates. Females have thicker wing veins than males. The butterfly's body is black with white markings. Monarch butterflies are found across North America wherever suitable feeding, breeding, and overwintering habitat exists. They are broken into two populations separated by the Rocky Mountains, called the eastern and the western populations. Whether monarchs are present in a given area within their range depends on the time of year. They are one of the few migratory insects, traveling great distances between summer breeding habitat and winter habitat where they spend several months inactive. In the summer they range as far north as southern Canada. In the fall the eastern population migrates to the cool, high mountains of central Mexico and the western population migrates to coastal California, where they spend the entire winter. No critical habitat has been designated for this species.

E.7 Plants

Site vegetation was observed during Rivers' site visit. The site is covered primarily with mature trees including Loblolly Pine, American Holly, White Oak, Water Oak, Yellow Poplar, etc. that generally range up to 30 or more years old. The mature vegetative overstory reduces sunlight and understory growth which makes a fairly thin forest which is relatively easy to traverse. Review of historical aerial photographs over the past several decades shows logging of the site and the regrowth of vegetation since the early 1990s *{See Appendix L – Historical Aerial Photographs}*. The existing vegetation is a result of several decades of growth on the unattended site.

The Rough-leaved Loosestrife, *Lysimachia asperulaifolia*, is federally listed as endangered. Rough-leaf loosestrife is a perennial herb that grows 11.8 – 23.6 inches tall. The triangular shaped leaves are often opposite on shorter stems and tend to be arranged in whorls of three or four encircling taller stems. The leaves are widest at the base (0.3 – 0.8 in wide) and

have three prominent veins. Contrary to the common name, the leaf surfaces are smooth to the touch. The yellow flowers are 0.6 inches across with yellow-orange anthers and occur on terminal racemes that are 1.2 – 3.9 in long. Flowering occurs from mid-May through June, with fruits present from July through October. This species generally occurs on the edges between longleaf pine uplands and pond pine pocosins on moist to seasonally saturated sands and on shallow organic soils overlaying sand. Rough-leaf loosestrife has also been found on deep peat in the low shrub community of large Carolina bays. No critical habitat has been designated for this species.

E.8 Designated Critical Habitat

Critical habitat as defined and used in the Endangered Species Act is "specific geographic areas that contain features essential to the conservation of endangered or threatened species and that may require special management and protection". Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

U.S. Fish and Wildlife Service have not designated any critical habitat in the potential project location for currently listed threatened and endangered species.

F. Stormwater Requirements

The WTP Site is located within Craven County which is one of the designated 20 Coastal Counties for which the N.C. Coastal Stormwater Rules apply. In addition, the WTP Site discharges via an unnamed tributary into the Trent River, class SB; Sw, Nutrient Sensitive Waters (NSW) of the Neuse River Basin. As such, the Neuse River Nutrient Sensitive Waters Management Strategy will also be applicable for development of the proposed site.

Based on the preliminary site layout, the WTP project would appear to meet the requirements for low density development under the Coastal Stormwater Rules since (1) Built Upon Area (BUA) is less than 24% of the total site area and (2) the project site does not drain to SA or HQW receiving water classifications. With low density development requirements, surface water can be conveyed with vegetated swales in lieu of other stormwater control measures for nutrient removal. In addition, a 50 feet vegetated setback is required from perennial and intermittent streams. As noted earlier, our preliminary review suggests that the receiving unnamed tributary is non-jurisdictional, and stream buffer setbacks would not be required on the WTP Site.

IV. PROPOSED DEVELOPMENT ACTIVITY

A. Site Development Considerations

The Town of River Bend has expressed an interest in purchasing and developing the southernmost 4.5-acres of the Brown Tract to construct a new Water Treatment Plant. Rivers' investigation of the proposed site, leads us to the opinion it can be developed for the Town's intended purpose. As with any property, there are specific site considerations that could impact overall development cost. The following items do not preclude development of the property, but may impact development cost. The magnitude of the impact for some costs cannot be determined until more detailed investigations associated with design are accomplished.

1. Clearing & Grubbing

The WTP Site is currently an unattended forest consisting of a mixed stand of Loblolly Pine, American Holly, White Oak, Water Oak, Yellow Poplar, etc. that generally range up to 30 years old. The majority of the site will require clearing and grubbing to facilitate development. Existing trees and vegetation may be able to remain within buffers, setbacks and undisturbed portions of wetlands.

Approximately a foot of soil material can be lost (removed with root mat) from wooded or forested land during clearing and grubbing operations associated with site development. As such, select and suitable offsite fill materials will likely need to be imported to replace some of the lost material and to restore grade.

2. Site Grading/Topography

This site has greater topographic relief than most sites in eastern North Carolina. This is advantageous from the standpoint of providing positive drainage. However, it will be important to balance the cuts and fills, particularly in the vicinity of the earthen backwash waste settling ponds to optimize the use of onsite soils while minimizing excess fill or waste materials.

Select material will likely be imported to raise the proposed finished floor to a proper elevation to ensure positive site drainage particularly since piped stormwater conveyances are not allowed with the low-density development option under the Coastal Stormwater Rules.

3. Soils

The near surface soils on the WTP site are comprised almost exclusively of Goldsboro and Onslow soil series. Seasonal wetness is the main limitation to use of this soil as a site for commercial buildings and shallow excavations. However, wetness can be reduced by drainage system improvements that includes surface grading, and open or piped stormwater conveyances. Piped conveyances will need to be kept to a minimum

to comply with low-density Coastal Stormwater Regulations. The near surface soils are characterized by low plasticity, moisture sensitive soils due to the presence of fines and organics. This is conducive to the ponding of water on the site, and rutting under rubber-tired traffic during the wetter times of the year. Ideally, clearing and grubbing of the site, as well as subsequent grading, should occur during the summer months to limit the degree of repair required.

In order to determine building and equipment foundation requirements, a deeper subsurface geotechnical investigation will be required by a licensed geotechnical engineering firm. The geotechnical recommendations will help to ascertain whether additional improvements are required to address soil limitations. Such limitations could include the need for pre-loading to offset potential settlement of compressible soils, the need for driven piles to provide deeper foundational support, the need for undercutting and replacing existing soils, etc.

4. Setback Requirements

This site will be subject to a number of setback requirements. Zoning Ordinance regulations include a 30-feet main building setback, 10-feet side yard setback and 15-feet rear yard setback. These zoning setbacks should not be difficult to achieve on the subject site.

NCDEQ Rules for Waste Not Discharged to Surface Waters (Subchapter 2T) require a 50-feet setback for treatment and storage units from any property line. The primary impact is on the location/arrangement of the backwash waste settling ponds. However, we believe the site is sufficiently sized to accommodate the ponds outside of the setback.

Additional regulatory buffers and site development restrictions can also come into play based upon the presence of wetlands and jurisdictional streams as discussed below.

5. Wetlands and Jurisdictional Streams

Rivers' field reconnaissance suggests that minor areas of wetlands are present on the site despite the fact that the Nationwide Wetland Inventory does not indicate such. The wetland areas are relatively small with total acreage less than 0.2-acres; however, they extend as much as 150 feet into the WTP site. Some portions of the wetlands will likely need to be filled to accommodate construction. This should be feasible by securing a Nationwide 58 permit from the US Army Corps of Engineers which allows filling up to 0.5-acres. A mitigation fee will be required in order to purchase mitigation credits from an eligible mitigation bank for the Neuse River Basin.

Rivers' research and site reconnaissance also suggests that the location of the receiving stream where it crosses onto the WTP site is non-jurisdictional. However, if regulatory authorities determine this to be otherwise, then the Neuse River Riparian Buffer

Protection Rules and the Coastal Stormwater Regulations require a 50-feet wide buffer on either side of a jurisdictional stream.

Concurrence from USACE and NCDEQ DWR will be required relative to jurisdictional features, and permitting may subsequently be needed. Final determination regarding streams and wetlands will provide more information pertaining to any adverse stream setbacks and possible wetland mitigation.

6. Stormwater Requirements

The WTP Site drains to the Class SB; Sw, NSW receiving waters of the Trent River which is part of the Neuse River Basin. Since Craven County is one of the twenty designated coastal counties in North Carolina, the Coastal Stormwater Rules apply.

Based on the preliminary layout, it appears that the site can be developed utilizing the low-density stormwater option (maximum Built Upon Area <24%). As such, the site will be drained principally via vegetated swales. Piped culverts are disallowed other than to minimally pass beneath a driveway.

A French drain system will likely be required beneath the lined backwash settling ponds to ensure that whaling (floating) of the geotextile liner does not occur when pond water levels are low.

7. Utility Service

The Town's potable water system extends westward on Plantation Drive from the existing 300,000-gallon elevated storage tank located adjacent to the WTP site. As such, finished water from the proposed WTP can readily connect to the existing storage and distribution system.

The Town's public wastewater system does not provide service to residents along Plantation Drive. As such, domestic wastewater generated from the WTP will need to be disposed by one of two options: (1) septic tank and nitrification field similar to that recently permitted and constructed at the new Public Works Facility, or (2) grinder pump tank that discharges into a common waste force main with the backwash waste supernatant pump station that serves the settling ponds. The common force main would extend eastward on Plantation Drive, and discharge into the existing gravity sanitary sewer collection system located at the intersection of Shoreline Drive and Planation Drive.

A new electrical service entrance will be required at the WTP Site along with emergency generator and automatic transfer switch. The electrical service will be extended from Duke Energy's existing underground service on Plantation Drive.

A new raw water main will be extended along Plantation Drive from the Castle Hayne groundwater wells to the new WTP site. The WTP Site could potentially serve as a site for a new potable water supply well in the future. The proposed location will require review and site approval by NCDEQ DWR Public Water Supply Section.

V. CONCLUSION

Conclusion: As with any site to be considered for development of a municipal WTP, there are positive, negative and neutral characteristics and considerations.

The following are considered to be positive characteristics and considerations for the property under consideration:

- site location and accessibility are favorable relative to other municipal facilities, utility and roadway infrastructure,
- no previous development or site contamination is apparent on or near the property,
- zoning/setback requirements do not appear to be problematic.
- topographic relief is favorable for site drainage,
- the site is not subject to flooding,
- there is no critical habitat designated within the property for endangered or threatened species.

Alternately, the following are considered to be negative characteristics /considerations:

- site clearing and grubbing will be required to accommodate development,
- approximately a foot of soil will likely need to be replaced due to clearing and grubbing operations.

Finally, neutral characteristics and considerations include the following items:

- near surface soils appear acceptable for construction although additional geotechnical investigation is required for foundation design purposes,
- a small quantity of wetlands exists on the site, but can be accommodated through regulatory permitting processes,
- the stream is not considered to be jurisdictional which eliminates a potential 50-feet buffer; however, confirmation is required.

On the whole, we consider the positive and neutral aspects for development of this site to outweigh the negative, which are somewhat minimal. As such, this preliminary evaluation indicates the 4.5-acre site located at the southernmost end of the Brown Tract is suitable to accommodate development of a new Water Treatment Plant for the Town of River Bend. In addition, the site appears to accommodate the expected requirements for the WTP based on the preliminary size, layout and data that is available at this time.

Additional professional investigations will be required to provide the necessary data for future design purposes.

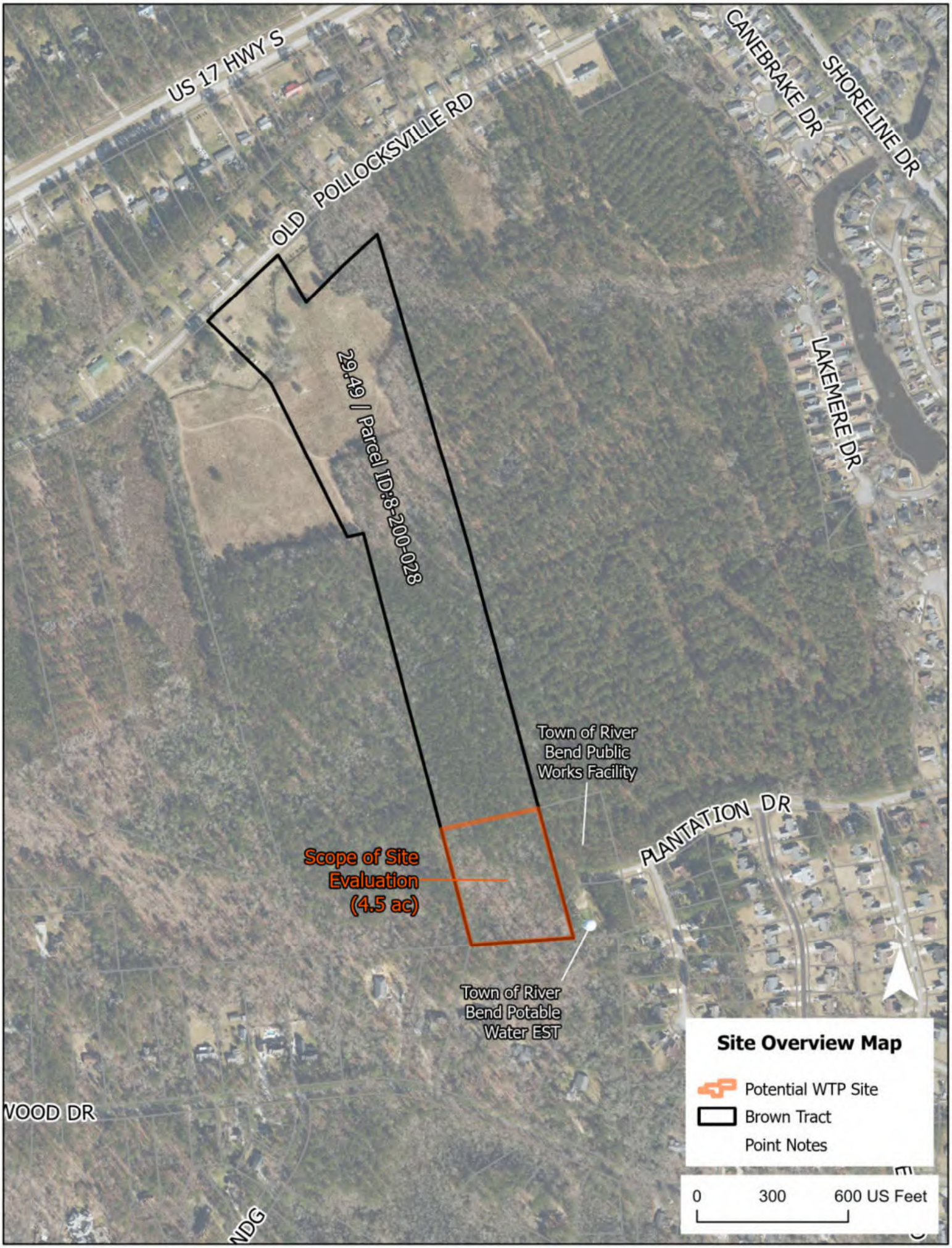
VI. REFERENCES

Rivers reviewed various government publications and other reputable sources to obtain information regarding the physical setting and other characteristics of the Brown Tract and potential WTP as follows:

- Craven County Online Parcel Information System taken in 2024;
- Pollocksville, NC 7.5 minute quadrangle published in 2022 at a scale of 1:24,000 by the United States Geologic Survey (USGS);
- Soil Survey of Craven County, North Carolina, published in 1989 by the Soil Conservation Service of the United States Department of Agriculture;
- Custom Soil Resource Report from United States Department of Agriculture – Natural Resources Conservation Service
- Flood Insurance Rate Map Community Panel 3720545800K dated June 15, 2022, published by the Federal Emergency Management Agency (FEMA).
- National Wetlands Inventory (NWI) map prepared by the U.S. Department of Interior Fish and Wildlife Service for the Pollocksville, NC Southeast 7.5 minute quadrangle.
- Official Species List provided by the U.S. Department of Interior Fish and Wildlife Service for the subject site.
- Aerial Imagery taken from Google Earth database from the years 1993, 1998, 2004, 2009, 2013, 2017, 2022.

APPENDIX A

Craven County Tax Parcel Information

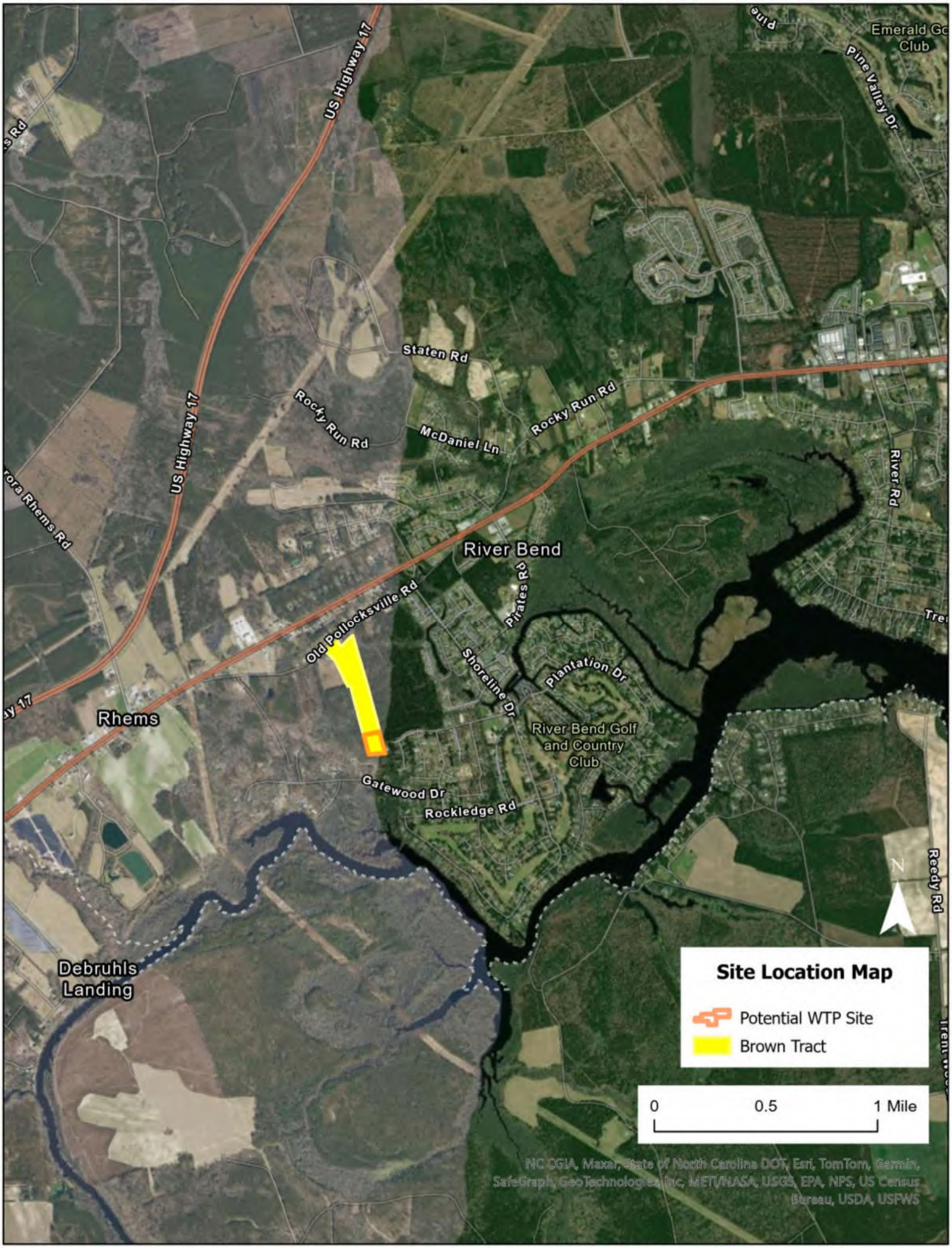

US 17 HWY S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
LAKEMERE DR
29.49 | Parcel ID:8-200-028
Town of River Bend Public Works Facility
PLANTATION DR
Scope of Site Evaluation (4.5 ac)
Town of River Bend Potable Water EST
VOOD DR
NDG
Site Overview Map
Potential WTP Site
Brown Tract
Point Notes
0
300
600 US Feet

PARCEL ID : 8-200 -028

Owner :	BROWN, WELDON JR & BROWN, NAQUELDON		
Mailing Address :	8010 OWENS WAY BRANDYWINE, MD 20613		
Address of Property :	509 OLD POLLOCKSVILLE RD		
Subdivision :			
Property Description :	HENDERSON LD		
Assessed Acreage :	29.49		
Deed Book Page :	3728 0469	**Deed Recording Date :**	6 1 2022
Land Value :	$245,920	**Recorded Survey :**	
Total Improvement(s) Value :	$50,070	**Life Estate Deed :**	
Total Assessed Value :	$295,990	**Estate File Year-E-Folder :**	
Number of Improvements:	1	**Tax Exempt :**	No
City Name :	RIVER BEND	**Fire Tax District :**	
Drainage District :		**Lot Dimension :**	
Special District :		**Land Use :**	VACANT - TRACT SUITABLE FOR RESIDENTIAL DEVELOPMENT

APPENDIX B

Site Location Map


Site Location Map
Potential WTP Site
Brown Tract
0
0.5
1 Mile
N
US Highway 17
Staten Rd
Rocky Run Rd
McDaniel Ln
River Bend
Old Pollocksville Rd
Pirates Rd
Shoreline Dr
Plantation Dr
River Bend Golf and Country Club
Gatewood Dr
Rockledge Rd
Rhems
Debruhls Landing
Pine Valley Dr
Emerald Golf Club
River Rd
Reedy Rd
NC OGIA, Maxar, State of North Carolina DOT, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

APPENDIX C

Phase I Environmental Assessment

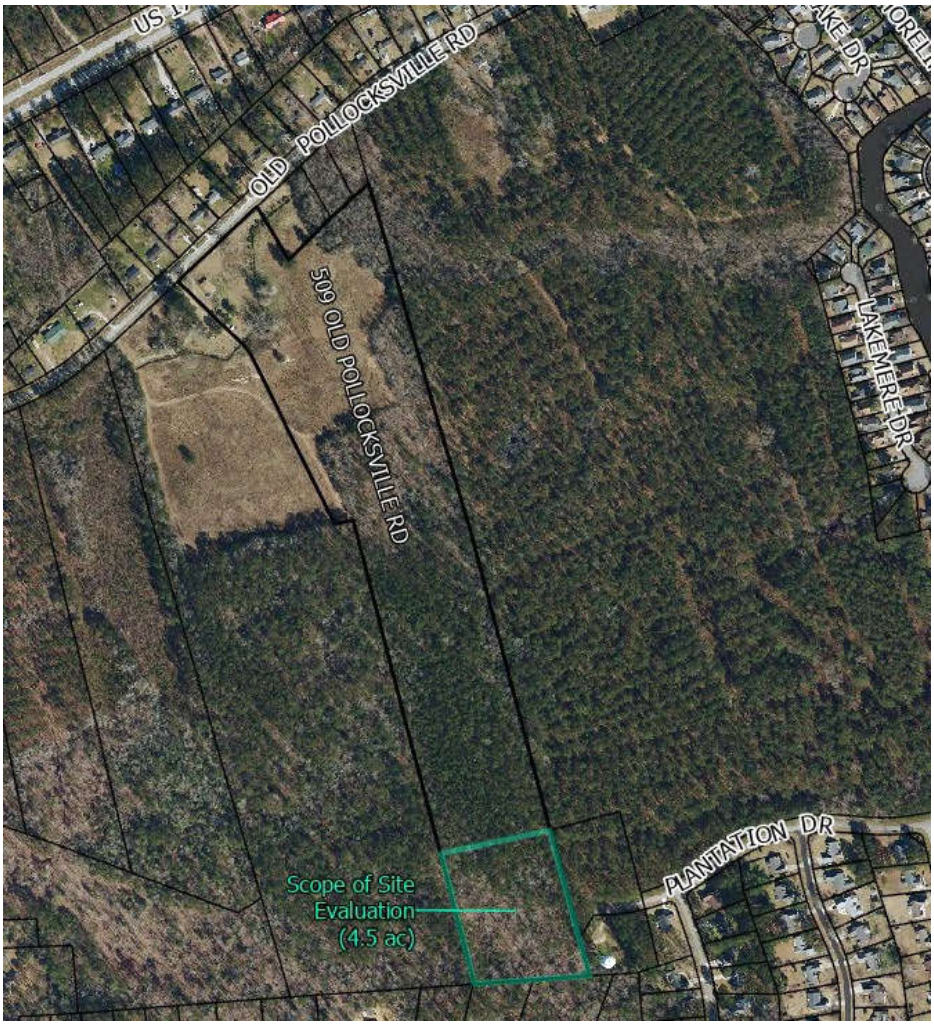
PHASE I ENVIRONMENTAL SITE ASSESSMENT

FOR

TOWN OF RIVER BEND

SITE: 509 OLD POLLOCKSVILLE ROAD, RIVER BEND, NC 28562

REPORT DATE: January 2024



PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

SITE: 509 OLD POLLOCKSVILLE ROAD, RIVER BEND, NC 28562

PROJECT NO. 2023141

BY

Rivers and Associates, Inc.
107 East 2nd Street
Greenville, NC 27858

THIS REPORT WAS PREPARED FOR THE SOLE USE AND BENEFIT OF OUR CLIENT, TOWN OF RIVER BEND AND IS BASED, IN PART, UPON DOCUMENTS, WRITINGS, AND INFORMATION OWNED AND POSSESSED BY OUR CLIENT. NEITHER THIS REPORT, NOR ANY OF THE INFORMATION CONTAINED HEREIN, SHALL BE USED OR RELIED UPON FOR ANY PURPOSE BY ANY PERSON OR ENTITY OTHER THAN OUR CLIENT. ALL STANDARD TERMS, CONDITIONS, AND LIMITATIONS BY ***Rivers and Associates, Inc.*** APPLY AT ALL TIMES FOR THIS REPORT AND ALL REPORTS ISSUED BY ***Rivers and Associates, Inc.***

TABLE OF CONTENTS

SECTION 1.0 EXECUTIVE SUMMARY: FINDINGS AND CONCLUSIONS

1.1 FINDINGS
1.2 CONCLUSIONS SUMMARY
1.3 SITE FACTS
1.4 EXCEPTIONS AND/OR DELETIONS TO ASTM E 1527
1.5 NON-SCOPE ISSUES

SECTION 2.0 INTRODUCTION

2.1 PURPOSE OF A PHASE I ESA
2.2 SCOPE OF WORK
2.2.1 Site Description
2.2.2 Site Reconnaissance
2.2.3 Review of Historical Information
2.2.4 Interviews
2.2.5 Conclusions and Recommendations
2.3 INTERPRETATION OF THE REPORT

SECTION 3.0 SITE DESCRIPTION AND RECONNAISSANCE

3.1 SITE PHOTOGRAPHS
3.2 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS
3.3 EXISTING STORAGE TANKS
3.4 PREVIOUSLY EXISTING STORAGE TANKS
3.5 HAZARDOUS SUBSTANCE STORAGE AND HANDLING
3.6 SPECIFIC HAZARDOUS SUBSTANCES RECONNAISSANCE
3.6.1 Summary of Specific Hazardous Substances Reconnaissance (Beyond ASTM Scope)
3.7 CLARIFIERS, SUMPS, TRENCHES, AND INDUSTRIAL DISCHARGE SOURCES
3.8 SURFACE CONDITIONS
3.9 STRESSED VEGETATION
3.10 PRIOR OR CURRENT AGRICULTURAL LAND USE
3.11 OTHER ENVIRONMENTAL CONDITIONS
3.12 VISUAL OBSERVATIONS, ADJOINING SITES

SECTION 4.0 REVIEW OF HISTORICAL INFORMATION AND REGULATORY AGENCY RECORDS

4.1 HISTORICAL AERIAL PHOTOGRAPH AND U.S.G.S. TOPOGRAPHIC MAP REVIEW
4.2 HISTORICAL MAP REVIEW
4.3 HISTORICAL CITY OR STREET DIRECTORY REVIEW
4.4 AGENCY CONTACTS (RECORDS SEARCH)
4.4.1 Fire Department Records
4.5 REVIEW OF ENVIRONMENTAL RECORDS SEARCH

4.6 CHAIN-OF-TITLE ABSTRACT AND/OR REVIEW
4.7 ADDITIONAL ENVIRONMENTAL DOCUMENTS
4.8 HISTORICAL SITE USE

SECTION 5.0 INTERVIEWS

5.1 INTERVIEWS WITH OWNER, PROPERTY MANAGER, USER, AND OTHERS

SECTION 6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 RECOGNIZED ENVIRONMENTAL CONDITIONS
6.2 *DE MINIMIS* CONDITIONS, HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS, AND CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS
6.3 OPINION
6.4 CONCLUSIONS

SECTION 7.0 LIMITATIONS

SECTION 8.0 FIGURES

SECTION 9.0 APPENDICES

Appendix A Site Photographs
Appendix B One-Mile Radius Regulatory Database Report
Appendix C Environmental Acronyms

SECTION 1.0

EXECUTIVE SUMMARY: FINDINGS AND CONCLUSIONS

1.1 FINDINGS

This report presents the results of the Phase I Environmental Site Assessment conducted by ***Rivers and Associates, Inc.*** at the southern-most area (+/- 4.5 acres) of 509 Old Pollocksville Road, River Bend, NC 28562 (see Figure 1, ***Site Overview Map***). The findings and conclusions of this investigation are based upon a review of historic site-use activities, contact with and records from governmental regulatory agencies, regulatory database searches, as well as a site reconnaissance and interviews with the client, site personnel, and possibly others who may have knowledge of various aspects of the subject site.

At the time of this assessment, the site consisted of approximately 4.5 acres of vacant wooded land. Information gathered in the course of this assessment indicates that the subject site is currently owned by Weldon Brown, Jr. and Naqueldon Brown.

The principal findings of ***Rivers and Associates, Inc.***'s Phase I Environmental Site Assessment for this site are as follows:

The subject site is currently affected by

- No recognized environmental condition(s) (REC); and

- No *de minimis* condition(s), historical recognized environmental condition(s) (HREC), or controlled recognized environmental condition(s) (CREC).

- The potential for soil or groundwater contamination of the subject property from either on or off-site sources appears to be low.

- Given the findings and conclusions of ***Rivers and Associates, Inc.***'s Phase I Environmental Site Assessment, further investigation is recommended to delineate and make a jurisdictional determination on the presence and magnitude of wetlands (<0.2 acres) and stream on or near the site.

- Rivers and Associates, Inc. has performed this Phase I Environmental Site Assessment of the subject site in conformance with the scope and limitations of the Environmental Protection Agency, Standards and Practices for All Appropriate Inquiries, 40 CFR Part 312 and the standard practice set forth in the American Society for Testing and Materials (ASTM) Designation: E1527-21, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." Any exceptions to, or deletions from, these practices are described in Section 1.4 of this report.

- This assessment has revealed no evidence of recognized environmental conditions in connection with the property.

1.2 CONCLUSIONS SUMMARY

Based on the findings of this Phase I Environmental Site Assessment, ***Rivers and Associates, Inc.*** has identified the following recognized environmental condition(s):

RECOGNIZED ENVIRONMENTAL CONDITION(S)

Condition #	Location	Description of Condition
None	N/A	No evidence of recognized environmental conditions was found during this investigation.

Note: Descriptions of conditions are given again in further detail in Section 6.0, ***Conclusions and Recommendations***, along with recommendations as to how to address the conditions and the estimated costs of completing any recommended next-step action. ***Rivers and Associates, Inc.*** classifies a recognized environmental condition, per the ASTM Standard E 1527-21 definition, as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property due to any release to the environment; under conditions indicative of a release to the environment; or under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

Based on the findings of this Phase I Environmental Site Assessment, ***Rivers and Associates, Inc.*** has identified the following *de minimis* conditions, historical recognized environmental conditions, and/or controlled recognized environmental conditions:

***DE MINIMIS* CONDITIONS**
HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS, OR
CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS

Condition #	Location	Description of Condition	Condition
None	N/A	The subject site does not appear to be at risk from a *de minimis* condition, historical recognized environmental condition, or controlled recognized environmental condition.	N/A / *De minimis* / HREC / CREC

Note: Descriptions of conditions are given again in further detail in Section 6.0, Conclusions and Recommendations, along with recommendations as to how to address the conditions. *Rivers and Associates, Inc.* classifies an environmental condition as a de minimis (potential or possible) condition when it appears to pose no immediate threat to the subject site and/or requires no immediate action given the current knowledge of site conditions. It is a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. This condition with time, groundwater movement, demolition or other disturbances, or sometimes with the acquisition of further information, may come to pose a long-term, immediate, or chronic environmental risk; and/or this condition may appear to have a negligible monetary/physical impact on the subject property, and therefore, does not require additional investigation at this time. Conditions determined to be de minimis conditions are not recognized environmental conditions nor controlled recognized environmental conditions. *Rivers and Associates, Inc.* classifies a historical recognized environmental condition (HREC) as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls. An HREC is limited to include only past releases that have been addressed to unrestricted residential use. *Rivers and Associates, Inc.* classifies a Controlled Recognized Environmental Condition (CREC) as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable agency, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

1.3 SITE FACTS

Current Owner(s): Weldon Brown, Jr. and Naqueldon Brown
Current Use: Vacant/ Forested Land
Site Contact: Weldon Brown, Jr.
Field Assessor: Greg Churchill and Ben Williams
Report Writer: Greg Churchill and Haleigh Robinson
Parcel ID: 8-200-028
Address(es) Provided by Client: 509 Old Pollocksville Road, River Bend, NC 28562
Additional/Previous Address(es): N/A
Total Acreage of Land: 29.49
Total Acreage of Land Evaluated: 4.54
Date of Site Reconnaissance: January 18, 2024
Total # of Wells (water, oil, gas, other) identified onsite: N/A
Areas/Units that were inaccessible to the ***Rivers and Associates, Inc.*** field assessor: N/A
Were enough (units/offices/buildings/acres) inspected to ensure that the inspection was homogenous? Yes
Did the field assessor notice any unusual odors on or from the subject site or adjoining sites during the site reconnaissance? No

1.4 EXCEPTIONS AND/OR DELETIONS TO ASTM E 1527

There are no exceptions to ASTM E 1527.

1.5 NON-SCOPE ISSUES

According to client request, no other environmental issues that are "non-scope considerations" under ASTM E 1527, such as asbestos-containing materials, radon, lead-based paint, and lead in drinking water, were assessed.

SECTION 2.0

INTRODUCTION

2.1 PURPOSE OF A PHASE I ESA

The purpose of this Phase I Environmental Site Assessment is to assess (1) the likelihood of contamination of the subject site as a result of either past or present land-use practices; and (2) the potential for future environmental contamination which may occur as a result of current conditions or operations and maintenance activities at either the subject site or properties adjoining the subject site, thereby identifying real or potential environmental or economic impact to the subject site. In this way, the client may satisfy a requirement to qualify for the innocent landowner defense to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) liability by completing "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial and customary practice." To meet these objectives, ***Rivers and Associates, Inc.*** attempted to complete the tasks outlined in this section except as noted in Section 1.4.

2.2 SCOPE OF WORK

The Scope of Work that has been followed for this assessment is identified in Section 1.1, Page 1-1.

2.2.1 Site Description

Site photographs were taken during the site reconnaissance. The photographs and their summary descriptions can be found in **Appendix A.**

Rivers and Associates, Inc. reviewed pertinent, reasonably ascertainable information on the soil types and groundwater conditions in the vicinity of the subject site. For the purposes of this assessment, the depth from the ground surface and the direction (or gradient) of the groundwater flow are of particular significance. Such findings are used by ***Rivers and Associates, Inc.*** report writers, in conjunction with additional information about environmental conditions on nearby sites, to assess the risk that is faced by the subject site from off-site sources of contamination.

It should be noted that ***Rivers and Associates, Inc.***'s geological and hydrological research does not include investigation of seismological concerns (i.e., fault lines) that may affect the area of the subject site. Although the existence of faults in an area may be of concern to property owners and residents in that area, it is not considered to be an environmental concern, and so is not usually a component of a Phase I Environmental Site Assessment. (However, in the event that it is required, ***Rivers and Associates, Inc.*** can assist the client in completing a seismological investigation.)

2.2.2 Site Reconnaissance

A ***Rivers and Associates, Inc.*** field assessor conducted a visual reconnaissance of the subject property to identify observable signs of environmental impairments, including on-site operations and maintenance activities which may lead to possible environmental impairment. As a part of the site reconnaissance, ***Rivers and Associates, Inc.*** visually inspected the site for obvious indications of:

- Existing and previously existing storage tanks (aboveground and underground)
- Hazardous substances storage and handling
- Clarifiers, sumps, trenches, and industrial discharge sources
- Equipment which may contain polychlorinated biphenyls (PCB) (fluorescent light ballasts are not inspected)
- Indications of spillage of hazardous substances, and the general condition of concrete, asphalt, soil, and other surfaces
- Indications of stressed vegetation as a result of on-site contamination

During the site reconnaissance, ***Rivers and Associates, Inc.*** field assessors may make note of basic compliance issues which, may be environmental in nature, however are not issues directly associated with the potential for site contamination (i.e., the specific objective of our assessment). However, as a service to our clients, and because these compliance issues may contribute to our overall understanding of site operations, ***Rivers and Associates, Inc.*** may comment on the site's basic compliance status. The review of the site's compliance status is not intended to be complete or comprehensive and may or may not include all items identified during the site reconnaissance.

Again, the compliance review is not intended as a comprehensive compliance audit. Rather, the compliance review is only intended to aid ***Rivers and Associates, Inc.*** in determining the likelihood that the subject site may have been impacted by releases of hazardous substances.

When the storage or use of hazardous substances are encountered on a site, the ***Rivers and Associates, Inc.*** field assessor will look for or inquire about the on-site presence of Material Safety Data Sheets (MSDSs). MSDSs are prepared by the manufacturers of hazardous substances (pursuant to OSHA's Hazard Communication Standard), and they detail the components, dangers, and proper handling procedures for the hazardous substance for which they have been prepared. The presence or absence of MSDSs for on-site hazardous substances will be noted in 3.5, ***Hazardous Substances Storage and Handling***. However, some sites may use or store hundreds of various chemical compounds. In such cases, it is practically impossible for the field assessor to match-up each substance with its corresponding MSDS.

Rivers and Associates, Inc. may have (based on contract) inspected and reviewed information for the subject site regarding the presence of specific hazardous substances which are relatively common sources of environmental concern. The substances in question include:

- Common building materials that may contain or are suspected of containing asbestos
- Radon (at elevated levels)
- Lead-contaminated drinking water
- Lead-based paints

Based on ASTM E1527-21, federal, state, and other regulatory agency guidelines, the following presumptions were in force if and when ***Rivers and Associates, Inc.*** inspected the subject site for specific hazardous substances:

- Structures built after 1980 are considered asbestos-free.
- Structures built after 1979 are considered lead-free (with respect to both water and painted surfaces).
- Fluorescent light ballasts will be considered PCB-free and will not be noted in the report regardless of their date of manufacture, unless ***Rivers and Associates, Inc.*** is instructed to do otherwise in writing by the client.

Rivers and Associates, Inc. also inspected the properties that adjoin the subject site. In general, this inspection included a "drive-by" survey to note the operations which may pose an imminent or potential environmental threat to the subject site.

2.2.3 Review of Historical Information

For this assessment, ***Rivers and Associates, Inc.*** may have reviewed reasonably ascertainable historical aerial photographs and United States Geologic Survey (U.S.G.S.) topographic maps of the subject site and vicinity. This review consisted of examining the reasonably ascertainable available photographs and topographic maps for evidence of activities on or development of the subject site and adjoining sites that may show an environmental condition or concern which may currently affect the subject site. The specific aerial photographs and U.S.G.S. maps that were reviewed for this assessment are identified and their environmentally relevant features are described in Section 4.1.

Rivers and Associates, Inc. may have also reviewed any reasonably ascertainable Historic Maps of the subject site and vicinity. Such maps have been prepared by fire insurance companies in order to determine the potential risk of fire damage to buildings in metropolitan areas. These maps have been produced since the mid-1850s and, for some areas, they are still produced today. For the

purposes of a Phase I Environmental Site Assessment, these maps may contain helpful information on the ages and past uses of buildings, as well as information about on the storage of hazardous and flammable substances. However, because it was only worthwhile for fire insurance companies to map metropolitan areas, the scope of coverage of these maps is somewhat limited. If Historic Maps have provided coverage of the subject site, and if the specific maps were reasonably ascertainable, then the specific maps that were reviewed for this assessment are identified, and their environmentally relevant features described, in Section 4.2.

One of the least known yet most complete and comprehensive historical sources are historical city or street directories. These texts may have been reviewed by ***Rivers and Associates, Inc.*** to the extent that they have provided coverage of the subject site and were reasonably ascertainable. ***Rivers and Associates, Inc.*** reviews historical city or street directories (also known as criss cross or reverse indexed directories) for information on the past occupants of and activities on the subject site and adjoining sites. These directories were prepared by companies that catered to the needs of salespeople by providing the names of the occupants at a given address (that is, unlike a traditional telephone book, the entries of a reverse directory are arranged by address, not by name). However, like Historical Maps, the scope of coverage of these directories is limited to mostly metropolitan areas. If they were reasonably ascertainable, they were reviewed and Section 4.3 contains listings of historical city or street directories.

Rivers and Associates, Inc. has contacted various state, county, and municipal agencies having current or past jurisdiction over the subject site, in an attempt to review reasonably ascertainable records that contain specific information about environmental conditions on the subject site that these agencies may have on file, or to establish that no environmentally relevant records are on file for the subject site. The client should be aware that most regulatory agencies file their records by address or corporate name (as opposed to parcel number or site name). If no specific address has been assigned to a site, then, typically, no environmental records related to the site will be forthcoming from the state, county, or municipal regulatory agencies. In some instances, ***Rivers and Associates, Inc.*** may not yet have received a reply from one or more of the agencies that were contacted. (Some agencies will take six weeks or longer to reply to a verbal or written request.) In the event of such delays in response, rather than delaying the issuance of the report, ***Rivers and Associates, Inc.*** has indicated in the report that a response to the request for records is pending, and a copy of the regulatory request form has been included. Any pertinent information that is subsequently received from the pending agency will be addressed and forwarded to the client in the form of an addendum to this report.

Rivers and Associates, Inc. has also reviewed an ERS RecCheck Report, a computer-generated federal, state, and regional one-mile regulatory database search in an effort to determine whether the subject site is listed on an agency environmental database and to identify possible regulatory-listed sites of concern within a one-mile radius of the subject site. In general, these documents list known or suspected hazardous-waste generators, release sites, landfills, unauthorized disposal sites, sites with registered underground storage tanks, and sites currently under investigation for known or suspected environmental violations or releases. In conjunction with the findings on the geological and hydrological conditions, information obtained from the database search can be used to assess the environmental risk faced by the subject site from past or present off-site sources of contamination. Additionally, the ERS RecCheck Report may provide information about on-site

sources of contamination. The ERS RecCheck Report review can be found in Section 4.5; a copy of the complete ERS RecCheck Report document and a detailed description of the databases that were searched are included in Appendix B.

When requested, ***Rivers and Associates, Inc.*** will compile and review a chain-of-title abstract for the subject property. The chain-of-title abstract can help the client and ***Rivers and Associates, Inc.*** to better understand the history of the use of the subject site. The chain-of-title abstract is typically compiled from documents obtained from the County Recorder's Office or Tax Assessor's Office. The chain-of-title abstract review, if completed for this report, can be found in Section 4.6. The County Assessor also may be contacted to determine whether the subject site has been assigned addresses in the past which are different from its current address. It is the client's responsibility to supply ***Rivers and Associates, Inc.*** with any records of environmental liens or other such documents.

On occasion, the client, the client's representatives, or on-site personnel will make available environmental documents pertaining to the subject site. These documents may be prior Phase I Reports, environmental site remediation reports, foundation soil reports, or occupancy records, among others. If these are made available prior to the issuance of the report, ***Rivers and Associates, Inc.*** will review the conclusions of these documents, which may help to confirm or disprove any tentative findings that ***Rivers and Associates, Inc.*** has developed independently. If the client has supplied environmental documents for review as part of this assessment, the findings are included in Section 4.7.

After the above information from existing historical records, regulatory agencies, interviews, and other additional environmental documents has been reviewed and evaluated, ***Rivers and Associates, Inc.*** presents the site uses for the subject property as well as adjoining site uses in a chronological table. This historic site use summary assists the client, as well as the field assessors and reviewers to have a perspective of the historical uses of the subject site. The ***Historical Site Use*** is presented in Section 4.8.

2.2.4 Interviews

Rivers and Associates, Inc. attempts to interview various individuals who may have knowledge of various aspects of the subject site. Typically, the interviewees might include:

- Current and previous owners
- Site and operations managers
- Tenants
- Local regulatory personnel

The interviews are summarized in Section 5.0.

2.2.5 Conclusions and Recommendations

Section 6.0, ***Conclusions and Recommendations***, provides detailed descriptions of the recognized environmental conditions, the *de minimis* conditions, historical recognized environmental conditions, and controlled recognized environmental conditions that, in the professional opinion of ***Rivers and Associates, Inc.***, currently affect the subject site. Section 6.0 also recommends or suggests the next-step actions that may be required to begin addressing the conditions.

The essential information on a condition at a given location is contained in the "Description of Condition" and the "Action Suggested" boxes of the table for that location. The section numbers refer to those sections in the report that describe the research tasks and findings behind the conclusions. This reporting method allows the reader to quickly go to those sections that are pertinent to the condition.

2.3 INTERPRETATION OF THE REPORT

Following the completion of the tasks outlined above, ***Rivers and Associates, Inc.*** prepared this report to present our findings and conclusions clearly and consistently. In an attempt to aid the reader and bring organization to pieces of seemingly unrelated information, ***Rivers and Associates, Inc.*** has developed a report format that is both innovative and concise. Each piece of information is described in the context of the research or assessment task under which it was found. Typically, an environmental condition will incorporate a number of specific findings. So, in Section 6.0, ***Conclusions and Recommendations***, the various particular findings are grouped together and collectively presented with the description of the environmental condition that is corroborated by those findings.

SECTION 3.0

SITE DESCRIPTION AND RECONNAISSANCE

The subject site is surrounded by an area of predominantly vacant wooded properties, as well as municipal public works/utility facilities, and residential properties. On the date of the site reconnaissance, the subject site consisted of vacant wooded land. The following subsections describe the physical characteristics of the subject site and are a compilation of the observations made during the visual site inspection.

3.1 SITE PHOTOGRAPHS

A ***Rivers and Associates, Inc.*** field assessor completed a reconnaissance of the subject site, at which time a number of photographs were taken to document the current condition and use of the site. The photographs with their descriptions can be found in **Appendix A.**

3.2 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

According to United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database data, the native soil type is defined as:

Map Unit Name: Goldsboro loamy fine sand, 0 to 2 percent slopes
Map Unit Type: Consociation
Drainage Class - Dominant Condition: Moderately well drained
General Information: Fine-loamy, siliceous, subactive, thermic Aquic Paleudults
Top 3 Map Unit Components are below (if available):
Component Name: Muckalee, Rains, Goldsboro
Component Percentage: 1%, 5%, 90%
Hydric: Yes, Yes, No.

The elevation of the subject site appears to average 28 feet above mean sea level with a range of 19 to 30 feet above mean sea level.

Seasonal high groundwater in the site vicinity is estimated by the United States Department of Agriculture (USDA) Craven County Soil Survey to occur at a depth of approximately 18 to 36 inches below ground surface. However, the flow direction is unknown. It should be noted that the flow direction and depth of groundwater may be influenced by rainfall, tidal activity (shore properties), and local groundwater pumping operations. It should also be noted that shallower, unreported, perched groundwater zones may occur in the immediate site vicinity.

During the site reconnaissance and the review of historical maps and photographs, the following was determined to exist or not to exist on the subject site:

- No waterways
- Three (3) potential wetland areas (<0.2 acres)
- No pits
- No lagoons
- No ponds

In-addition, the following was determined to exist or not to exist immediately adjacent to the subject site:

- One (1) waterway (potential non-jurisdictional drainage stream)
- No wetlands
- No pits
- No lagoons
- No ponds

According to FEMA Data, the site is located outside the 100-year flood zone.

Panel: 3720545800J, Effective Date: 7/2/2004

Storm water discharge across the site appears to flow to the south-east corner of the site. The storm water runoff appears to flow through an existing stormwater culvert located beneath a driveway entering an adjacent site. This adjacent site is owned by the Town of River Bend. Rivers' research and site reconnaissance does not suggest the direction and destination of storm water discharge would be a source of environmental concern to the subject site.

The findings of Rivers' site reconnaissance suggested that there are three (3) minor wetland areas present on the site totaling less than 0.2-acres. Through additional research, Rivers' determined that the National Wetlands Inventory does not recognize these wetland areas within their database (see Figure 3). Considering their seemingly negligible size, Rivers' does not find these potential wetland areas to be a source of environmental concern.

To confirm these findings, it is recommended the Town seek additional input from regulatory agencies such as the U.S. Army Corps of Engineer and the NCDEQ Division of Water Resources. Likewise, to confirm the waterway is non-jurisdictional it is recommended that additional input be received from NCDEQ Division of Water Resources.

3.3 EXISTING STORAGE TANKS

No evidence of any existing aboveground or underground storage tanks was observed on the subject site during the site reconnaissance nor noted in the research conducted for this assessment.

3.4 PREVIOUSLY EXISTING STORAGE TANKS

No evidence of previously existing aboveground or underground storage tanks was observed on the subject site during the site reconnaissance nor noted in the research conducted for this assessment.

3.5 HAZARDOUS SUBSTANCE STORAGE AND HANDLING

No storage or handling of hazardous substances was observed in the areas inspected during the site reconnaissance.

3.6 SPECIFIC HAZARDOUS SUBSTANCES RECONNAISSANCE

3.6.1 Summary of Specific Hazardous Substances Reconnaissance (Beyond ASTM Scope)

At the request of the client, non-scope items, as defined in the ASTM Standard, were not addressed. These non-scope items are asbestos, radon, lead water and lead paint. (Note: Delete everything that follows to 3.7)

3.7 CLARIFIERS, SUMPS, TRENCHES, AND INDUSTRIAL DISCHARGE SOURCES

No clarifiers, sumps, trenches, industrial floor drains, or industrial discharge points were noted during the site reconnaissance, historical, and/or regulatory research.

3.8 SURFACE CONDITIONS

No significant areas of staining or other unusual surface conditions were observed during the site reconnaissance.

3.9 STRESSED VEGETATION

No disfigured, discolored, dying, or otherwise stressed vegetation was observed on-site during the site reconnaissance.

3.10 PRIOR OR CURRENT AGRICULTURAL LAND USE

On the basis of a review of aerial photographs, U.S.G.S. topographic maps, site observations, regulatory research, and/or interviews, ***Rivers and Associates, Inc.*** has concluded that the site is currently used for silvicultural purposes. The site has previously been used for agricultural purposes, likely over six decades ago. This information is detailed in the following table.

PRIOR OR CURRENT AGRICULTURAL LAND USE

ID #	Approx. Date Range	Description	Condition
1	Mid-1900s	During the interview process of this report, the property owner stated that in the past the site was farmed by his great-grandfather. He has no knowledge of the specific time period this may have occurred, or the crops which were grown on the land. The Rhems Fire Chief recalled that it was farmed in the mid-1900s. There is no indication that the property has been farmed over the past six decades.	Wooded/Vacant

3.11 OTHER ENVIRONMENTAL CONDITIONS

No evidence of further environmental conditions and/or impairments was observed during the site reconnaissance, beyond that evidence that has already been noted in this section.

3.12 VISUAL OBSERVATIONS, ADJOINING SITES

During the site reconnaissance, the ***Rivers and Associates, Inc.*** field assessor also visually inspected and documented the use of those properties which immediately adjoin the subject property. The observations of the adjoining properties were made by the ***Rivers and Associates, Inc.*** field assessor on the date of the site reconnaissance.

VISUAL OBSERVATIONS, ADJOINING SITES

Description		Condition
Northerly View:		Good
Address:	509 Old Pollocksville Road *(remaining, northern-most portion of site)*	
Owner Name:	Weldon Brown Jr and Naqueldon Brown	
Apparent Current Use of Property:	Vacant/ Wooded/ one (1) single-family home adjoining Old Pollocksville Road	
Visual Concerns:	None	
Easterly View:		Good
Address:	1504 Plantation Drive; 1411 Plantation Drive	
Owner Name:	Town of River Bend	
Apparent Current Use of Property:	Public Works Building; Water EST Site	
Visual Concerns:	None	
Southerly View:		Good
Address:	331 Gatewood Drive; 333 Gatewood Drive	
Owner Name:	Mary McKinney; Sanford and Carolyn Barnes	
Apparent Current Use of Property:	Single Family Residential	
Visual Concerns:	None	

Description		Condition
Westerly View:		Good
Address:	Parcel ID (8-200-027)	
Owner Name:	Ronnie Walker Brown	
Apparent Current Use of Property:	Vacant/ Wooded	
Visual Concerns:	None	

SECTION 4.0

REVIEW OF HISTORICAL INFORMATION AND REGULATORY AGENCY RECORDS

4.1 HISTORICAL AERIAL PHOTOGRAPH AND U.S.G.S. TOPOGRAPHIC MAP REVIEW

Rivers and Associates, Inc. reviewed readily available and reasonably ascertainable aerial photographs and U.S.G.S. topographic maps of the area of the subject site. (A copy of a U.S.G.S. map, if available, has been included as Figure 2.) These aerial photographs and maps may have been obtained from ***Rivers and Associates, Inc.***'s library and/or another. Each aerial photograph was reviewed for the subject property and, where applicable, adjacent property use. In addition, each photograph was reviewed to identify the presence of areas of dumping, staining, buildings, and/or aboveground storage tanks.

Aerial photographs for the years of 1988, 1989 1993, 1998, 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, and 2022 and U.S.G.S. topographic maps for the year(s) of 1901, 1903, 1950 1953, 1954, 1974, 1983, 1985, 1994, 2011, 2013, 2016, 2019, and 2022 were reviewed and no recognized environmental conditions, *de minimis* conditions, historical or controlled recognized environmental conditions were identified.

4.2 HISTORICAL MAP REVIEW

Rivers and Associates, Inc. reviewed readily available historical maps with coverage of the subject site and vicinity. These maps were obtained from ***Rivers and Associates, Inc.***'s in-house library and/or reviewed from other available sources.

Historical maps were reviewed and no recognized environmental conditions, *de minimis* conditions, historical or controlled recognized environmental conditions were identified.

4.3 HISTORICAL CITY OR STREET DIRECTORY REVIEW

Rivers and Associates, Inc. did not review historical city or street directories for one or more of the following reasons:

1. Based on a reasonable amount of research, the information was not readily available, as defined in the ASTM Standard.
2. Sufficient historical information was available from other sources to identify the past property uses.

4.4 AGENCY CONTACTS (RECORDS SEARCH)

4.4.1 Fire Department Records

Rivers and Associates, Inc. submitted a request to the local Fire Department for copies of readily available records this agency may have on file for the subject site pertaining to hazardous substances storage, underground storage tanks, and other related environmental issues. However, ***Rivers and Associates, Inc.*** was informed that no records for the subject site were on file with this agency.

4.5 REVIEW OF ERS RECCHECK REPORT

The ***Rivers and Associates, Inc.*** review of the ERS RecCheck Report, (the ERS RecCheck Report is included in Appendix B) found the subject site is not a regulatory-listed site. The ERS RecCheck Report occurrence summary table below identifies the number of sites listed in each database included in the ERS RecCheck Report. [No sites of environmental concern to the subject site were identified.]

ERS RECCHECK REPORT OCCURRENCE SUMMARY

FEDERAL ASTM/AAI DATABASES							
LIST SEARCHED	**DISTANCE SEARCHED**	**SUBJECT SITE**	**0.125**	**0.25**	**0.5**	**1.0**	**TOTAL**
BF-Tribal-US	0.5	0	0	0	0	-	0
BF-US	0.5	0	0	0	0	-	0
CERCLIS-Archived-US	0.5	0	0	0	0	-	0
CERCLIS-US	0.5	0	0	0	0	-	0
Controls-RCRA-US	0.5	0	0	0	0	-	0
Controls-US	0.5	0	0	0	0	-	0
Debris-US	0.5	0	0	0	0	-	0
Delisted-NPL-US	1	0	0	0	0	0	0
ERNS-US	0.0625	0	0	-	-	-	0
FEMA-UST-US	0.25	0	0	0	-	-	0
FTTS-ENF-US	0.25	0	0	0	-	-	0
Hist-Dumps-US	0.5	0	0	0	0	-	0
Hist-US-EC	0.5	0	0	0	0	-	0
Hist-US-IC	0.5	0	0	0	0	-	0
HMIS-US	0.0625	0	0	-	-	-	0
LIENS-US	0.0625	0	0	-	-	-	0
NPL-US	1	0	0	0	0	0	0
PADS-US	0.0625	0	0	-	-	-	0
PCB-US	0.25	0	0	0	-	-	0
Proposed-NPL-US	1	0	0	0	0	0	0
RCRA-CESQG-US	0.25	0	0	0	-	-	0

FEDERAL ASTM/AAI DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
RCRA-COR-US	1	0	0	0	0	0	0
RCRA-LQG-US	0.25	0	0	0	-	-	0
RCRA-NON-US	0.25	0	0	0	-	-	0
RCRA-SQG-US	0.25	0	0	0	-	-	0
RCRA-TSDF-US	0.5	0	0	0	0	-	0
SAA-Agreements-US	1	0	0	0	0	0	0
SWLF-US	0.5	0	0	0	0	-	0
Tribal-LUST-Closed-Reg4	0.5	0	0	0	0	-	0
Tribal-LUST-Closed-Reg9	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg10	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg4	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg9	0.5	0	0	0	0	-	0
Tribal-LUST-Reg1	0.5	0	0	0	0	-	0
Tribal-LUST-Reg7	0.5	0	0	0	0	-	0
Tribal-ODI-US	0.5	0	0	0	0	-	0
Tribal-UST-Reg1	0.25	0	0	0	-	-	0
Tribal-UST-Reg10	0.25	0	0	0	-	-	0
Tribal-UST-Reg4	0.25	0	0	0	-	-	0
Tribal-UST-Reg7	0.25	0	0	0	-	-	0
Tribal-UST-Reg9	0.25	0	0	0	-	-	0
Tribal-VCP-US	0.5	0	0	0	0	-	0

STATE ASTM/AAI DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
AST-NC	0.25	0	0	0	-	-	0
BF-NC	0.5	0	0	0	0	-	0
E-CS-NC	0.5	0	0	0	0	-	0
FRCERCLA-NC	0.5	0	0	0	0	-	0

STATE ASTM/AAI DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Hist-AST-NC	0.25	0	0	0	-	-	0
Hist-LF-NC	0.5	0	0	0	0	-	0
HWSPL-NC	0.5	0	0	0	0	-	0
IC-NC	0.5	0	0	0	0	-	0
IHS-NC	0.5	0	0	0	0	-	0
Landfills-NC	0.5	0	0	0	0	-	0
LAST-Closed-NC	0.5	0	0	0	0	-	0
LAST-Open-NC	0.5	0	0	0	0	-	0
LUST-Closed-NC	0.5	0	0	0	0	-	0
LUST-Open-NC	0.5	0	0	0	0	-	0
Manifest2-RI	0.0625	0	0	-	-	-	0
Spills-NC	0.0625	0	0	-	-	-	0
SWF-NC	0.5	0	0	0	0	-	0
SWRCY-NC	0.5	0	0	0	0	-	0
UST-NC	0.25	0	0	0	-	-	0
VCP-NC	0.5	0	0	0	0	-	0

SUPPLEMENTAL DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Air-CE-NC	0.25	0	0	0	-	-	0
Air-NC	0.25	0	0	0	-	-	0
BioFuel-US	0.25	0	0	0	-	-	0
CDL-US	0.0625	0	0	-	-	-	0
Coal-Ash-Dams-US	0.5	0	0	0	0	-	0
Coal-Ash-NC	0.5	0	0	0	0	-	0
DCF-NC	0.25	0	0	0	-	-	0
Debris-NC	0.25	0	0	0	-	-	0
DSCA-NC	0.25	0	0	0	-	-	0
EGRID-US	0.5	0	0	0	0	-	0
EPA-Watch-List-US	0.25	0	0	0	-	-	0
FA-HW-NC	0.0625	0	0	-	-	-	0
FA-HW-US	0.0625	0	0	-	-	-	0
FA-SW-NC	0.0625	0	0	-	-	-	0
FA-UST-NC	0.0625	0	0	-	-	-	0
FRS-US	0.0625	0	0	-	-	-	0
FSS-NC	0.25	0	0	0	-	-	0
FTTS-INSP-US	0.0625	0	0	-	-	-	0
FUDS-US	1	0	0	0	0	0	0
FUSRAP-US	0.25	0	0	0	-	-	0
GasSt-NC	0.25	0	0	0	-	-	0

SUPPLEMENTAL DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Hist-AFS2-US	0.25	0	0	0	-	-	0
Hist-AFS-US	0.25	0	0	0	-	-	0
Hist-CERCLIS-NFRAP-US	0.25	0	0	0	-	-	0
Hist-CERCLIS-US	0.25	0	0	0	-	-	0
Hist-ERNS-US	0.0625	0	0	-	-	-	0
Hist-FIFRA-US	0.25	0	0	0	-	-	0
Hist-FINDS-US	0.0625	0	0	-	-	-	0
Hist-HSI-NC	0.25	0	0	0	-	-	0
Hist-LUST-NC	0.25	0	0	0	-	-	0
HIST-MLTS-US	0.25	0	0	0	-	-	0
Hist-NC	0.0625	0	0	-	-	-	0
Hist-NPL-US	0.25	0	0	0	-	-	0
Hist-RCRIS-US	0.25	0	0	0	-	-	0
Hist-State-Trust-Fund-NC	0.25	0	0	0	-	-	0
Hist-SWF-NC	0.25	0	0	0	-	-	0
Hist-TRIS-US	0.25	0	0	0	-	-	0
Hist-US	0.0625	0	0	-	-	-	0
Hist-UST-NC	0.25	0	0	0	-	-	0
Hist-WaterWells-US	0.0625	0	0	-	-	-	0
ICIS-Air-US	0.0625	0	0	-	-	-	0
ICIS-FEC-US	0.0625	0	0	-	-	-	0
ICIS-NPDES-US	0.0625	0	0	-	-	-	0
Lead-Smelter-2-US	0.25	0	0	0	-	-	0
Lead-US	0.25	0	0	0	-	-	0
LMOP-US	0.5	0	0	0	0	-	0
Lust-Trust-NC	0.5	0	0	0	0	-	0
MGP-NC	0.25	0	0	0	-	-	0
Mines-NC	0.0625	0	0	-	-	-	0
MINES-US	0.0625	0	0	-	-	-	0
MLTS-US	0.0625	0	0	-	-	-	0
MRDS-US	0.25	0	0	0	-	-	0
NPDES-NC	0.0625	0	0	-	-	-	0
PCS-US	0.25	0	0	0	-	-	0
PWS-NC	0.0625	0	0	-	-	-	0
RADINFO-US	0.0625	0	0	-	-	-	0
RFG-Lab-US	0.25	0	0	0	-	-	0
RMP-US	0.0625	0	0	-	-	-	0
ROD-US	0.5	0	0	0	0	-	0
SDWIS-US	0.25	0	0	0	-	-	0
SSTS-US	0.0625	0	0	-	-	-	0
STC-NC	0.25	0	0	0	-	-	0
STH-NC	0.25	0	0	0	-	-	0

SUPPLEMENTAL DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Stormwater-NC	0.25	0	0	0	-	-	0
Tribal-Air-US	0.25	0	0	0	-	-	0
TRIS2000-US	0.0625	0	0	-	-	-	0
TRIS2010-US	0.0625	0	0	-	-	-	0
TRIS80-US	0.0625	0	0	-	-	-	0
TRIS90-US	0.0625	0	0	-	-	-	0
TSCA-US	0.0625	0	0	-	-	-	0
UIC-NC	0.0625	0	0	-	-	-	0
UMTRA-US	0.0625	0	0	-	-	-	0
USGS-Waterwells-US	0.0625	0	0	-	-	-	0
Vapor-Intrusions-US	0.5	0	0	0	0	-	0
Water-CE-NC	0.25	0	0	0	-	-	0
Wells-NC	0.0625	0	0	-	-	-	0

PROPRIETARY HISTORIC DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Hist-Agriculture	0.0625	0	0	-	-	-	0
Hist-Auto Dealers	0.0625	0	0	-	-	-	0
Hist-Auto Repair	0.25	0	0	0	-	-	0
Hist-Chemical Manufacturing	0.0625	0	0	-	-	-	0
Hist-Chemical-Storage	0.0625	0	0	-	-	-	0
Hist-Cleaners	0.25	0	0	0	-	-	0
Hist-Convenience	0.0625	0	0	-	-	-	0
Hist-Disposal-Recycle	0.0625	0	0	-	-	-	0
Hist-Food-Processors	0.0625	0	0	-	-	-	0
Hist-Gun-Ranges	0.0625	0	0	-	-	-	0
Hist-Machine Shop	0.0625	0	0	-	-	-	0
Hist-Manufacturing	0.0625	0	0	-	-	-	0
Hist-Metal Plating	0.0625	0	0	-	-	-	0
Hist-Mining	0.0625	0	0	-	-	-	0
Hist-Mortuaries	0.0625	0	0	-	-	-	0
Hist-Oil-Gas	0.0625	0	0	-	-	-	0

PROPRIETARY HISTORIC DATABASES							
LIST SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125	0.25	0.5	1.0	TOTAL
Hist-OilGas-Refiners	0.0625	0	0	-	-	-	0
Hist-Other	0.0625	0	0	-	-	-	0
Hist-Paint-Stores	0.0625	0	0	-	-	-	0
Hist-Petroleum	0.0625	0	0	-	-	-	0
Hist-Post-Offices	0.0625	0	0	-	-	-	0
Hist-Printers	0.0625	0	0	-	-	-	0
Hist-Rental	0.0625	0	0	-	-	-	0
Hist-RV-Dealers	0.0625	0	0	-	-	-	0
Hist-Salvage	0.0625	0	0	-	-	-	0
Hist-Service Stations	0.25	0	0	0	-	-	0
Hist-Steel-Metals	0.0625	0	0	-	-	-	0
Hist-Textile	0.0625	0	0	-	-	-	0
Hist-Transportation	0.0625	0	0	-	-	-	0
Hist-Trucking	0.0625	0	0	-	-	-	0
Hist-Vehicle-Parts	0.0625	0	0	-	-	-	0
Hist-Vehicle-Washing	0.0625	0	0	-	-	-	0

4.6 CHAIN-OF-TITLE ABSTRACT AND/OR REVIEW

At the request of the client, a chain-of-title abstract was not requested or completed for this project.

4.7 ADDITIONAL ENVIRONMENTAL DOCUMENTS

In the course of this assessment, ***Rivers and Associates, Inc.*** was not provided with any additional environmental documents for review regarding the environmental condition of the subject site by the client or the client's representatives.

4.8 HISTORICAL SITE USE

The chronological historical site use summary is based on reviewed aerial photographs, maps, regulatory agency files, interviews, and additional environmental documents. The historical site use summary for the subject site and the adjoining sites is presented in the following table. The rows of this table are organized in chronological order, according to the date range of a specific site use.

HISTORICAL SITE USE

Date Range	Site/ Parcel ID	Use Type
Unknown - Present	(Subject Site/ 8-200-028)	Vacant/ Wooded
Unknown Time Period	(Subject Site/ 8-200-028)	Agricultural
Until 2023	(NE Adjoining Site/ 8-200-27001)	Vacant/ Wooded
2023 - Present	(NE Adjoining Site/ 8-200-27001)	Town of River Bend Public Works Building
1998 - Present	(SE Adjoining Site/ 8-200-3001)	Town of River Bend EST Site
Until 1998	(SE Adjoining Site/ 8-200-3001)	Vacant/ Wooded
Mid 1980s - Present	(S Adjoining Site (1) / 8-200-A-004)	Single Family Residential
Until Mid-1980s	(S Adjoining Site (1) / 8-200-A-004)	Vacant/ Wooded
Mid 1980s - Present	(S Adjoining Site (2) / 8-200-A-002)	Single Family Residential
Until Mid-1980s	(S Adjoining Site (2) / 8-200-A-002)	Vacant/ Wooded
Consistent	(W Adjoining Site/ 8-200-027)	Vacant/ Wooded

SECTION 5.0

INTERVIEWS

5.1 INTERVIEWS WITH OWNER, PROPERTY MANAGER, USER, AND OTHERS

As part of the Phase I Assessment, ***Rivers and Associates, Inc.*** attempts to interview various individuals who may have knowledge of different aspects of the subject site as it pertains to environmental conditions. The following table summarizes the relevant portions of these notes.

SUMMARY OF INTERVIEWS

Property Owner

Rivers and Associates interviewed Mr. Weldon Brown Jr, the property owner of site on January 23, 2024 to gather information regarding prior uses of the site, and more specifically any underground structures of which he may have knowledge. Mr. Brown is not aware of any activity or land use limitations, engineering or institutional controls, environmental liens, or other restrictions that have been placed on the property relating to hazardous materials or petroleum products. He does not have any specialized knowledge of the subject property and surrounding areas material to recognized environmental conditions in connection with the subject property.

Rhems Volunteer Fire Department

Rivers and Associates interviewed Mr. Keith Cherry, the Rhems Volunteer Fire Department Fire Chief on January 24, 2024 concerning surface discharges of hazardous chemical or petroleum products at or adjacent to the subject site. Mr. Cherry did not recall any responses due to such discharges on or adjacent to the subject site and found no incidents or responses in the Fire Department's database. Mr. Cherry is a long-time resident of the Town of River Bend and was able to recall the site being used for farmland in the mid-1900s. He stated that since then, the site has been vacant with no other use throughout the years.

SECTION 6.0

CONCLUSIONS AND RECOMMENDATIONS

6.1 RECOGNIZED ENVIRONMENTAL CONDITIONS

This section contains full descriptions of any recognized environmental conditions (REC) that have been identified as a result of the ***Rivers and Associates, Inc.*** Phase I Environmental Site Assessment for the subject site. ***Rivers and Associates, Inc.*** classifies a condition as a REC (as opposed to a *de minimis* condition) when it is one that involves a condition for which, in the opinion of ***Rivers and Associates, Inc.***, further investigation and/or remediation is recommended. In addition to the descriptions of condition, this section also contains a statement of the recommended next-step actions for any conditions that are described in the following tables.

Each identified condition receives its own table, and that table will collect together the particular findings from the body of the report that have been used to support ***Rivers and Associates, Inc.***'s conclusion as to the presence of a recognized environmental condition. For the benefit of the reader, the tables also contain the section numbers of the findings cited in support of the condition.

CONDITION # N/A	**IDENTIFIED CONDITION APPEARS TO BE A RECOGNIZED ENVIRONMENTAL CONDITION**
LOCATION:N/A	

SECTION #	**COMMENTS**
N/A	No recognized environmental conditions appear to currently affect the subject site.
DESCRIPTION OF CONDITION: N/A	
ACTION SUGGESTED: N/A	
TOTAL ESTIMATED COST TO COMPLETE SUGGESTED NEXT STEP ACTION† N/A	

6.2 *DE MINIMIS* CONDITION, HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS, AND CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS

This section contains descriptions of de minimis conditions, historical RECs, or controlled RECs that have been identified in the ***Rivers and Associates, Inc.*** Phase I Environmental Site Assessment for the subject site. ***Rivers and Associates, Inc.*** classifies an issue as a *de minimis* condition (as opposed to a REC) when (1) it involves issues that appear to pose no immediate or imminent threat to the subject site, but which over time (with the occurrence of groundwater movement, demolition, disturbance, etc.) may come to pose an actual or present REC for the subject site and/or when (2) it involves areas that currently appear to have a negligible impact on the subject property and which do not, therefore, require additional investigation at this time, but of which ***Rivers and Associates, Inc.*** feels the client

should be made aware. ***Rivers and Associates, Inc.*** classifies a historical recognized environmental condition (HREC) as a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls. An HREC is limited to include only past releases that have been addressed to unrestricted residential use. ***Rivers and Associates, Inc.*** classifies a controlled recognized environmental condition (CREC) as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable agency, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

Each identified condition receives its own table, and that table will collect together the particular findings from the body of the report that have been used to support ***Rivers and Associates, Inc.***'s conclusion as to the presence of that condition. For the benefit of the reader, the table also contains the section numbers of the findings cited in support of the condition.

CONDITION # N/A	**IDENTIFIED CONDITION APPEARS TO BE A *DE MINIMIS,* OR HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITION**
LOCATION: N/A	

SECTION #	**COMMENTS**
N/A	The subject site does not appear to be at risk from *de minimis* conditions, or historical and controlled recognized environmental conditions.
DESCRIPTION OF CONDITION: N/A	
ACTION SUGGESTED: N/A	

6.3 OPINION

Based on the review of the subject site's history, there is no reason to believe adversely negative environmental impacts to the immediate area would have resulted from the subject property's historical or current use.

It is our opinion the proposed municipal use of the property will not be negatively impacted.

6.4 CONCLUSIONS

Rivers conducted this Phase 1 Environmental Assessment in general conformance with the scope and limitations of ASTM E1527-13. Rivers did not identify evidence of recognized environmental conditions. Based on review of the subject site's history and reconnaissance of the area, there is no reason to believe adversely negative environmental impacts to the immediate area would have resulted from the subject property's historical uses.

SECTION 7.0

LIMITATIONS

To achieve the study objectives stated in this report, we were required to base ***Rivers and Associates, Inc.***'s conclusions and recommendations on the best information available during the period the investigation was conducted and within the limits prescribed by ***Rivers and Associates, Inc.***'s client in the contract/authorization agreement and standard terms and conditions.

Rivers and Associates, Inc.'s professional services were performed using that degree of care and skill ordinarily exercised by environmental consultants practicing in this or similar fields. The findings were mainly based upon examination of historic records, maps, aerial photographs, and governmental agencies lists. The hazardous waste site lists represented in this report represent only a search of the specific government records as listed above. It should be noted that governmental agencies often do not list all sites with environmental contamination; the lists could be inaccurate and/or incomplete. Recommendations are based on the historic land use of the subject property, as well as features noted during the site walk and examined records. The absence of potential gross contamination sources, historic or present, does not necessarily imply that the subject property is free of any contamination. This report only represents a "due diligence" effort as to the integrity of the subject property. No warranty or guarantee, expressed or implied, is made as to the professional conclusions or recommendations contained in this report. The limitations contained within this report supersede all other contracts or scopes of work, implied or otherwise, except those stated or acknowledged herewith.

This report is not a legal opinion. It does not necessarily comply with requirements defined in any environmental law such as the "innocent landowner defense" or "due diligence inquiry." Only legal counsel retained by the client is competent to determine the legal implications of any information, conclusions, or recommendations in this report. The compliance status, discussed in Section 3.0, is not intended for use as a guide to compliance for the present owner. Its intended use is to identify environmental impairments to the subject property and is not to be used as a guide to the legal compliance to any regulations of any kind.

The findings, conclusions, recommendations, and professional opinions contained in this report have been prepared by the staff of ***Rivers and Associates, Inc.*** , in accordance with generally accepted professional practices.

This report does not address, in any way, septic systems, leach fields, septic tanks, or related health hazards.

All asbestos, lead, or any other sampling is sampled in a good faith effort by ***Rivers and Associates, Inc.*** assessors. Sample results should not be construed as conclusive and binding in any way. All sampling conducted is only for the purposes of general screening and does not imply that all materials, locations, or hazardous materials have been identified nor was the sampling intended to identify every instance of the materials sampled. No interpretation of the sample results is made or implied. ***Rivers and Associates, Inc.*** only relays the information supplied by the laboratory conducting the analysis.

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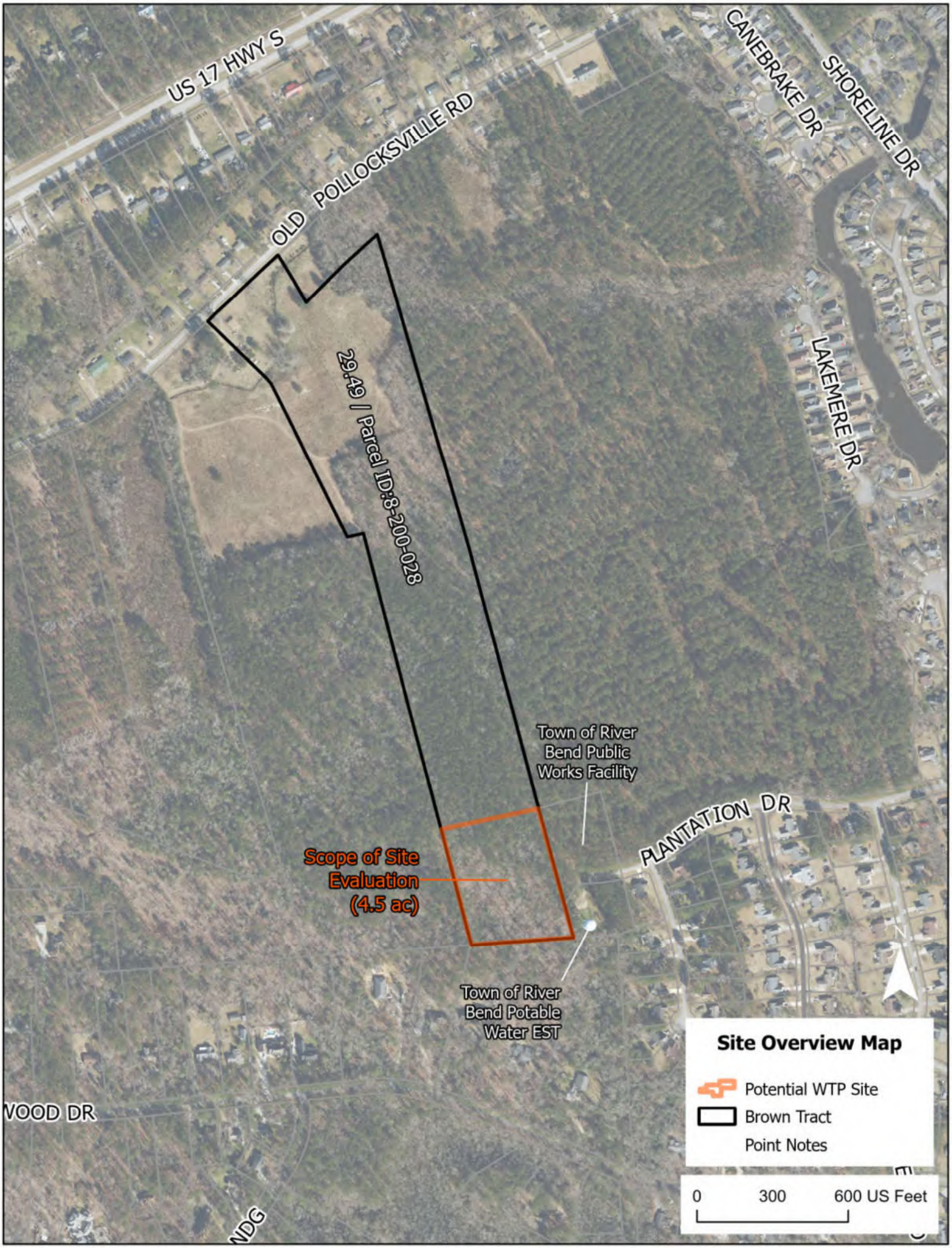
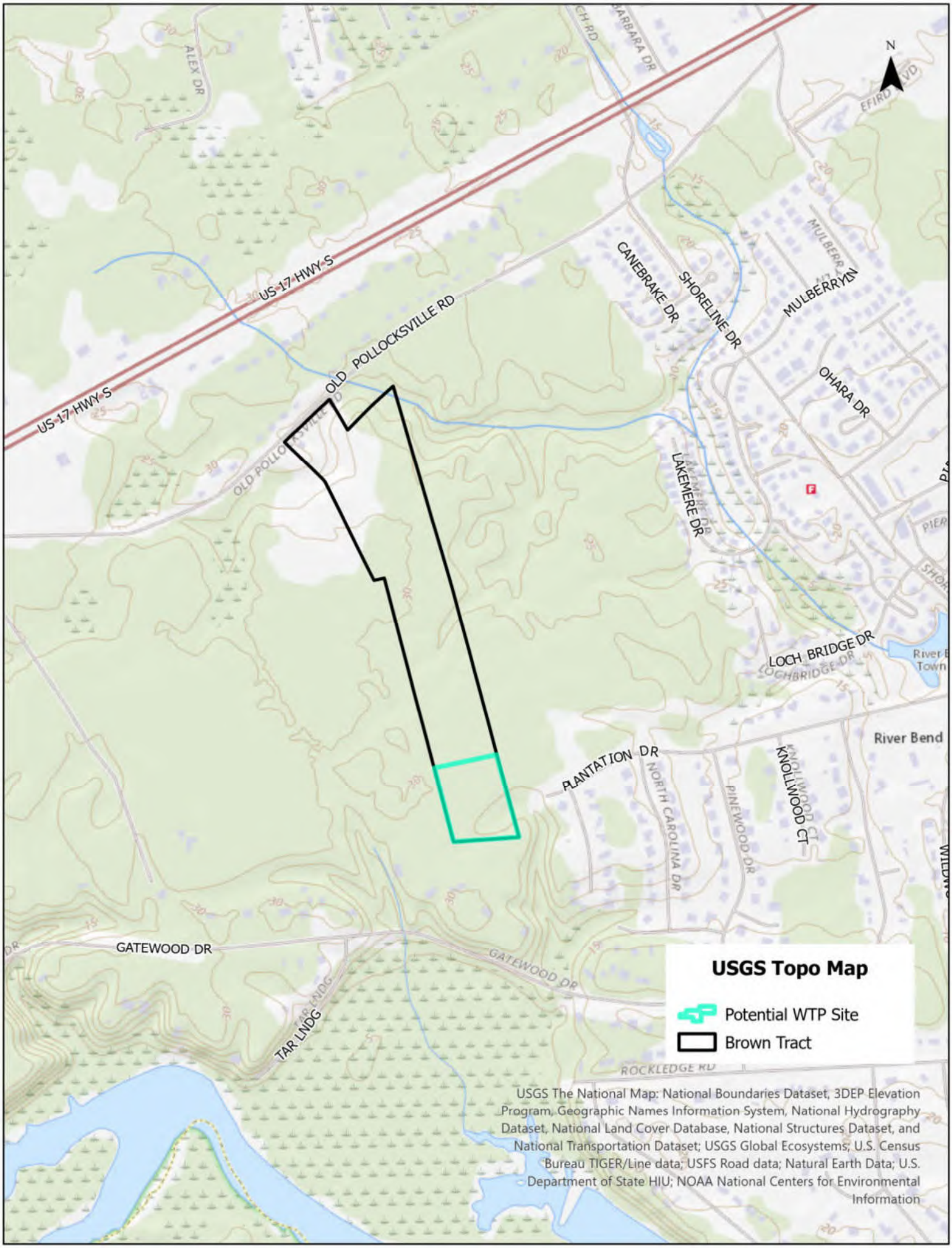
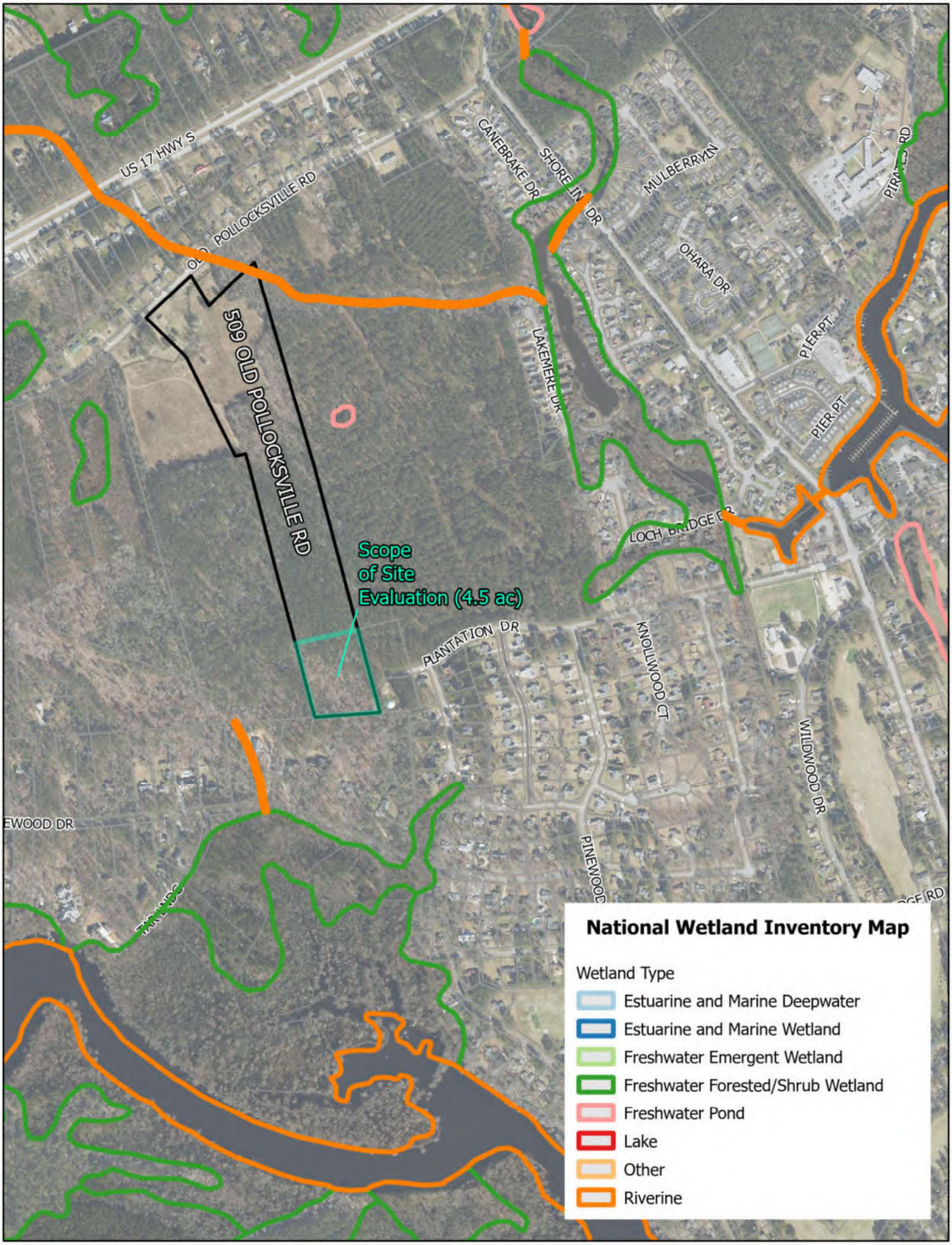
SECTION 8.0

FIGURES


US 17 HWY S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
LAKEMERE DR
29.49 | Parcel ID:8-200-028
Town of River Bend Public Works Facility
PLANTATION DR
Scope of Site Evaluation (4.5 ac)
Town of River Bend Potable Water EST
VOOD DR
NDG
Site Overview Map
Potential WTP Site
Brown Tract
Point Notes
0
300
600 US Feet


N
US-17-HWY-S
US-17-HWY-S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
MULBERRY DR
OHARA DR
LAKEMERE DR
LOCH BRIDGE DR
River Bend
PLANTATION DR
NORTH CAROLINA DR
PINEWOOD DR
KNOLLWOOD CT
GATEWOOD DR
TAR LNDG
ROCKLEDGE RD
USGS Topo Map
Potential WTP Site
Brown Tract
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information


US 17 HWY S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
MULBERRYLN
OHARA DR
PIER PT
PIER PT
LAKEMERE DR
LOCH BRIDGE DR
509 OLD POLLOCKSVILLE RD
Scope
of Site
Evaluation (4.5 ac)
PLANTATION DR
KNOLLWOOD CT
WILDWOOD DR
PINEWOOD
National Wetland Inventory Map
Wetland Type
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine

SECTION 9.0

APPENDICES

APPENDIX A

SITE PHOTOGRAPHS

SITE PHOTOS

Northwest corner (facing North)

Northwest corner (facing West)

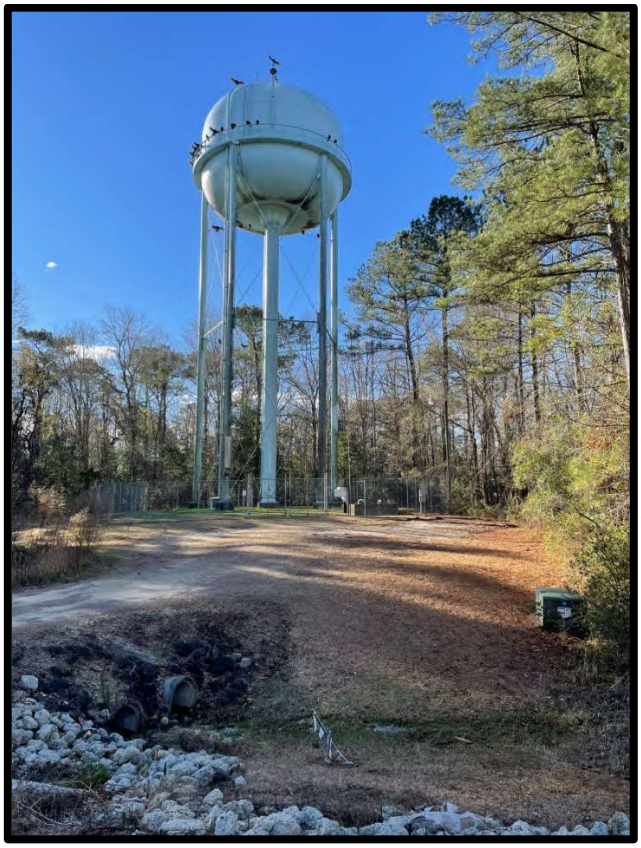
SITE PHOTOS (CONT.)

Southwest corner (facing South)

Southwest corner (facing West)

SITE PHOTOS (CONT.)

Town of River Bend Public Works Facility on Eastern Boundary



Town of River Bend Potable Water Elevated Storage Tank - Adjacent to Southeast Corner

SITE PHOTOS (CONT.)

Wetland Area

Wetland Area

SITE PHOTOS (CONT.)

Wetland Area

APPENDIX B

ENVIRONMENTAL RECORD SEARCH

ONE-MILE RADIUS REGULATORY DATABASE REPORT

ENVIRONMENTAL RECORD SEARCH

"The Intelligent Choice"

RecCheck Report Results

The Standard for ASTM/AAI Radius Searches

(One Mile Environmental Records Search, Exceeds ASTM 1527/1528 and EPA All Appropriate Inquiry)

REPORT RESULTS

Site Location:

509 Old Pollocksville Road
River Bend, NC 28562
(N 35-4-16, W 77-9-31) NAD83

Client:

Rivers and Associates, Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1
SUMMARY OF OCCURRENCES.....3
POTENTIAL AREAS OF CONCERN/CONTAMINATION SUMMARY 4
DATABASE OCCURRENCE SUMMARY.....4
SITE LOCATION TOPOGRAPHIC MAP 10
SITE LOCATION MAP 11
1-MILE RADIUS STREET MAP W/OCCURRENCES (MAP1) 12
0.25-MILE RADIUS STREET MAP W/OCCURRENCES (MAP2) 13
0.0625-MILE RADIUS STREET MAP W/ OCCURRENCES (MAP3) 14
1-MILE TOPOGRAPHIC MAP W/OCCURRENCES (MAP4) 15
AGENCY DIFFERENCES IN MAPPED LOCATIONS (MAP5) 16
SUMMARY OF AGENCY DIFFERENCES.....17
MAPPED AIR PERMITS WITH POTENTIAL DISPERSION (MAP6).....18
FEMA FLOODPLAIN MAPPING.....19
FLOODPLAIN MAP KEY.....20
US FISH & WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY22
WETLANDS ACRONYM MAP KEY 23
US FISH & WILDLIFE SERVICE, CRITICAL HABITATS.....25
FEDERAL LANDS AND TRIBAL AREAS 26
FEDERAL LANDS AND TRIBAL AREAS MAP KEY 27
LISTED OCCURRENCE DETAILS 28
RECORDS SOURCES SEARCHED.....29
UN-MAPPABLE OCCURRENCES.....38
DISCLAIMER, LIMITS AND LIABILITIES.....39

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EXECUTIVE SUMMARY

INFORMATION ON THE REQUESTED LOCATION

Site Address:	509 Old Pollocksville Road River Bend, NC 28562
Client Project Name/Number:	509 OLD POLLOCKSVILLE RD 2104778917
Coordinates:	N 35-4-16, W 77-9-31 (NAD 83) 35.071127, -77.15859
Date of Report	January 25, 2024
ERS Project Number:	2104778917
Subject Site Listed on the following lists:	Not Listed
Subject Site Listed as Map ID#:	N/A
USGS 7.5 Minute Quad Map:	Pollocksville (Date Unavailable)
Subject Site Located within a Potential Area of Concern:	No
Township, Section and Range:	Electronic TRS is unavailable
Site Elevation: **(feet above or below (-) mean sea level)**	28
Flood Zone: **(Digital Flood Insurance Rate Maps - DFIRMs)** **Only available digital data is provided**	Panel: 3720545800J, Effective Date: 7/2/2004 Electronic Flood Zone information Is Not available. Check www.FEMA.gov For map.
Fire Insurance Map Coverage:	There may be coverage of your site.
Radon Information:	EPA Radon Zone: 3 (Predicted avg for county: < 2 pCi/L)
Search Radius Expansion Size: **(In Miles)**	0

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Soil Type: **(USDA Soil Survey Geographic Database) (SSURGO)**	Map Unit Name: Goldsboro loamy fine sand, 0 to 2 percent slopes Map Unit Type: Consociation Drainage Class - Dominant Condition: Moderately well drained General Information: Fine-loamy, siliceous, subactive, thermic Aquic Paleudults Top 3 Map Unit Components are below (if available): Component Name: Muckalee, Rains, Goldsboro Component Percentage: 1%, 5%, 90% Hydric: Yes, Yes, No
Zip Codes Searched for "Un-Mappable" Sites:	Not Researched
Occurrence Count:	0

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SUMMARY OF OCCURRENCES

MAP ID	ID/SITE NAME	ADDRESS	DATABASE	STATUS	DISTANCE (MILES)	ELEV DIFF (FEET)
N/A						

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POTENTIAL AREAS OF CONCERN/CONTAMINATION SUMMARY

DATABASE SEARCHED	SUBJECT SITE WITHIN POTENTIAL AREA OF CONCERN	AREAS FOUND WITHIN 1-MILE RADIUS
Brownfield-NC	No	0
Military-Bases-US	No	0
DCF-GW-NC	No	0
South-East-CoalAsh-SC	No	0
NPL-US	No	0

DATABASE OCCURRENCE SUMMARY

HIGH RISK* OCCURRENCES IDENTIFIED IN REQUESTED SEARCH RADIUS		
DATABASE SEARCHED	DISTANCE SEARCHED (MILES)	HIGH RISK OCCURRENCES FOUND
CERCLIS-US	0.5	0
FRCERCLA-NC	0.5	0
HWSPL-NC	0.5	0
LAST-Open-NC	0.5	0
LUST-Open-NC	0.5	0
NPL-US	1	0
Proposed-NPL-US	1	0
SAA-Agreements-US	1	0
Tribal-LUST-Open-Reg10	0.5	0
Tribal-LUST-Open-Reg4	0.5	0
Tribal-LUST-Open-Reg9	0.5	0
Tribal-LUST-Reg7	0.5	0

* For the purposes of this report, “high risk” occurrences are those that have known contamination and have not received a “case closed” or “no further action” status from the agency that maintains the records.

ASTM/AAI STANDARD RECORD SOURCES SUMMARY				
STANDARD ENVIRONMENTAL RECORD SOURCES	ASTM MIN. SEARCH DIST. / ERS SEARCH DIST. (MILES)	ERS DATABASE NAME	TOTAL LISTINGS	MAP ID #’S
Federal NPL site list	1.0 / 1.0	NPL-US	0	None Listed
		Proposed-NPL-US	0	None Listed
Federal Delisted NPL site list	0.5 / 1.0	Delisted-NPL-US	0	None Listed
Federal CERCLIS list	0.5 / 0.5	CERCLIS-US	0	None Listed
Federal CERCLIS NFRAP site list	0.5 / 0.5	CERCLIS-Archived-US	0	None Listed
Federal RCRA CORRACTS facilities list	1.0 / 1.0	RCRA-COR-US	0	None Listed
Federal RCRA non-CORRACTS TSD facilities list	0.5 / 0.5	RCRA-TSDF-US	0	None Listed
Federal RCRA generators list	Property	RCRA-CESQG-US	0	None Listed

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	and adjoining properties / 0.25			
		RCRA-LQG-US	0	None Listed
		RCRA-NON-US	0	None Listed
		RCRA-SQG-US	0	None Listed
Federal Inst/Eng control registries	Property Only / 0.25	Controls-RCRA-US	0	None Listed
		Controls-US	0	None Listed
		Hist-US-EC	0	None Listed
		Hist-US-IC	0	None Listed
		LIENS-US	0	None Listed
Federal ERNS list	Property Only / 0.0625	ERNS-US	0	None Listed
State and Tribal-Equivalent NPL	1.0 / 1.0	HWSPL-NC	0	None Listed
State and Tribal-Equivalent CERCLIS	0.5 / 0.5	FRCERCLA-NC	0	None Listed
		IHS-NC	0	None Listed
State and Tribal landfill and/or solid waste disposal sites	0.5 / 0.5	Debris-US	0	None Listed
		Hist-Dumps-US	0	None Listed
		Hist-LF-NC	0	None Listed
		SWF-NC	0	None Listed
		SWLF-US	0	None Listed
		Tribal-ODI-US	0	None Listed
State and Tribal Leaking Storage Tank Lists	0.5 / 0.5	LAST-Closed-NC	0	None Listed
		LAST-Open-NC	0	None Listed
		LUST-Closed-NC	0	None Listed
		LUST-Open-NC	0	None Listed
		Tribal-LUST-Closed-Reg4	0	None Listed
		Tribal-LUST-Closed-Reg9	0	None Listed
		Tribal-LUST-Open-Reg10	0	None Listed
		Tribal-LUST-Open-Reg4	0	None Listed
		Tribal-LUST-Open-Reg9	0	None Listed
		Tribal-LUST-Reg1	0	None Listed
		Tribal-LUST-Reg7	0	None Listed
State and Tribal Registered Storage Tank Lists	Property and adjoining properties / 0.25	AST-NC	0	None Listed
		FEMA-UST-US	0	None Listed
		Hist-AST-NC	0	None Listed
		Tribal-UST-Reg1	0	None Listed
		Tribal-UST-Reg10	0	None Listed
		Tribal-UST-Reg4	0	None Listed
		Tribal-UST-Reg7	0	None Listed

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		Tribal-UST-Reg9	0	None Listed
		UST-NC	0	None Listed
State and Tribal Inst/Eng Control Registries	Property Only / 0.5	IC-NC	0	None Listed
State and Tribal Voluntary Cleanup Sites	0.5 / 0.5	Tribal-VCP-US	0	None Listed
		VCP-NC	0	None Listed
State and Tribal Brownfield Sites	0.5 / 0.5	BF-NC	0	None Listed
		BF-Tribal-US	0	None Listed

FEDERAL ASTM/AAI DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
BF-Tribal-US	0.5	0	0	0	0	-	0
BF-US	0.5	0	0	0	0	-	0
CERCLIS-Archived-US	0.5	0	0	0	0	-	0
CERCLIS-US	0.5	0	0	0	0	-	0
Controls-RCRA-US	0.5	0	0	0	0	-	0
Controls-US	0.5	0	0	0	0	-	0
Debris-US	0.5	0	0	0	0	-	0
Delisted-NPL-US	1	0	0	0	0	0	0
ERNS-US	0.0625	0	0	-	-	-	0
FEMA-UST-US	0.25	0	0	0	-	-	0
FTTS-ENF-US	0.25	0	0	0	-	-	0
Hist-Dumps-US	0.5	0	0	0	0	-	0
Hist-US-EC	0.5	0	0	0	0	-	0
Hist-US-IC	0.5	0	0	0	0	-	0
HMIS-US	0.0625	0	0	-	-	-	0
LIENS-US	0.0625	0	0	-	-	-	0
NPL-US	1	0	0	0	0	0	0
PADS-US	0.0625	0	0	-	-	-	0
PCB-US	0.25	0	0	0	-	-	0
Proposed-NPL-US	1	0	0	0	0	0	0
RCRA-CESQG-US	0.25	0	0	0	-	-	0
RCRA-COR-US	1	0	0	0	0	0	0
RCRA-LQG-US	0.25	0	0	0	-	-	0
RCRA-NON-US	0.25	0	0	0	-	-	0
RCRA-SQG-US	0.25	0	0	0	-	-	0
RCRA-TSDF-US	0.5	0	0	0	0	-	0
SAA-Agreements-US	1	0	0	0	0	0	0
SWLF-US	0.5	0	0	0	0	-	0
Tribal-LUST-Closed-Reg4	0.5	0	0	0	0	-	0
Tribal-LUST-Closed-Reg9	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg10	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg4	0.5	0	0	0	0	-	0
Tribal-LUST-Open-Reg9	0.5	0	0	0	0	-	0
Tribal-LUST-Reg1	0.5	0	0	0	0	-	0
Tribal-LUST-Reg7	0.5	0	0	0	0	-	0
Tribal-ODI-US	0.5	0	0	0	0	-	0
Tribal-UST-Reg1	0.25	0	0	0	-	-	0
Tribal-UST-Reg10	0.25	0	0	0	-	-	0
Tribal-UST-Reg4	0.25	0	0	0	-	-	0
Tribal-UST-Reg7	0.25	0	0	0	-	-	0
Tribal-UST-Reg9	0.25	0	0	0	-	-	0
Tribal-VCP-US	0.5	0	0	0	0	-	0

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STATE ASTM/AAI DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
AST-NC	0.25	0	0	0	-	-	0
BF-NC	0.5	0	0	0	0	-	0
E-CS-NC	0.5	0	0	0	0	-	0
FRCERCLA-NC	0.5	0	0	0	0	-	0
Hist-AST-NC	0.25	0	0	0	-	-	0
Hist-LF-NC	0.5	0	0	0	0	-	0
HWSPL-NC	0.5	0	0	0	0	-	0
IC-NC	0.5	0	0	0	0	-	0
IHS-NC	0.5	0	0	0	0	-	0
Landfills-NC	0.5	0	0	0	0	-	0
LAST-Closed-NC	0.5	0	0	0	0	-	0
LAST-Open-NC	0.5	0	0	0	0	-	0
LUST-Closed-NC	0.5	0	0	0	0	-	0
LUST-Open-NC	0.5	0	0	0	0	-	0
Manifest2-RI	0.0625	0	0	-	-	-	0
Spills-NC	0.0625	0	0	-	-	-	0
SWF-NC	0.5	0	0	0	0	-	0
SWRCY-NC	0.5	0	0	0	0	-	0
UST-NC	0.25	0	0	0	-	-	0
VCP-NC	0.5	0	0	0	0	-	0

SUPPLEMENTAL DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
Air-CE-NC	0.25	0	0	0	-	-	0
Air-NC	0.25	0	0	0	-	-	0
BioFuel-US	0.25	0	0	0	-	-	0
CDL-US	0.0625	0	0	-	-	-	0
Coal-Ash-Dams-US	0.5	0	0	0	0	-	0
Coal-Ash-NC	0.5	0	0	0	0	-	0
DCF-NC	0.25	0	0	0	-	-	0
Debris-NC	0.25	0	0	0	-	-	0
DSCA-NC	0.25	0	0	0	-	-	0
EGRID-US	0.5	0	0	0	0	-	0
EPA-Watch-List-US	0.25	0	0	0	-	-	0
FA-HW-NC	0.0625	0	0	-	-	-	0
FA-HW-US	0.0625	0	0	-	-	-	0
FA-SW-NC	0.0625	0	0	-	-	-	0
FA-UST-NC	0.0625	0	0	-	-	-	0
FRS-US	0.0625	0	0	-	-	-	0
FSS-NC	0.25	0	0	0	-	-	0
FTTS-INSP-US	0.0625	0	0	-	-	-	0
FUDS-US	1	0	0	0	0	0	0
FUSRAP-US	0.25	0	0	0	-	-	0
GasSt-NC	0.25	0	0	0	-	-	0
Hist-AFS2-US	0.25	0	0	0	-	-	0
Hist-AFS-US	0.25	0	0	0	-	-	0
Hist-CERCLIS-NFRAP-US	0.25	0	0	0	-	-	0
Hist-CERCLIS-US	0.25	0	0	0	-	-	0
Hist-ERNS-US	0.0625	0	0	-	-	-	0
Hist-FIFRA-US	0.25	0	0	0	-	-	0
Hist-FINDS-US	0.0625	0	0	-	-	-	0

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SUPPLEMENTAL DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
Hist-HSI-NC	0.25	0	0	0	-	-	0
Hist-LUST-NC	0.25	0	0	0	-	-	0
HIST-MLTS-US	0.25	0	0	0	-	-	0
Hist-NC	0.0625	0	0	-	-	-	0
Hist-NPL-US	0.25	0	0	0	-	-	0
Hist-RCRIS-US	0.25	0	0	0	-	-	0
Hist-State-Trust-Fund-NC	0.25	0	0	0	-	-	0
Hist-SWF-NC	0.25	0	0	0	-	-	0
Hist-TRIS-US	0.25	0	0	0	-	-	0
Hist-US	0.0625	0	0	-	-	-	0
Hist-UST-NC	0.25	0	0	0	-	-	0
Hist-WaterWells-US	0.0625	0	0	-	-	-	0
ICIS-Air-US	0.0625	0	0	-	-	-	0
ICIS-FEC-US	0.0625	0	0	-	-	-	0
ICIS-NPDES-US	0.0625	0	0	-	-	-	0
Lead-Smelter-2-US	0.25	0	0	0	-	-	0
Lead-US	0.25	0	0	0	-	-	0
LMOP-US	0.5	0	0	0	0	-	0
Lust-Trust-NC	0.5	0	0	0	0	-	0
MGP-NC	0.25	0	0	0	-	-	0
Mines-NC	0.0625	0	0	-	-	-	0
MINES-US	0.0625	0	0	-	-	-	0
MLTS-US	0.0625	0	0	-	-	-	0
MRDS-US	0.25	0	0	0	-	-	0
NPDES-NC	0.0625	0	0	-	-	-	0
PCS-US	0.25	0	0	0	-	-	0
PWS-NC	0.0625	0	0	-	-	-	0
RADINFO-US	0.0625	0	0	-	-	-	0
RFG-Lab-US	0.25	0	0	0	-	-	0
RMP-US	0.0625	0	0	-	-	-	0
ROD-US	0.5	0	0	0	0	-	0
SDWIS-US	0.25	0	0	0	-	-	0
SSTS-US	0.0625	0	0	-	-	-	0
STC-NC	0.25	0	0	0	-	-	0
STH-NC	0.25	0	0	0	-	-	0
Stormwater-NC	0.25	0	0	0	-	-	0
Tribal-Air-US	0.25	0	0	0	-	-	0
TRIS2000-US	0.0625	0	0	-	-	-	0
TRIS2010-US	0.0625	0	0	-	-	-	0
TRIS80-US	0.0625	0	0	-	-	-	0
TRIS90-US	0.0625	0	0	-	-	-	0
TSCA-US	0.0625	0	0	-	-	-	0
UIC-NC	0.0625	0	0	-	-	-	0
UMTRA-US	0.0625	0	0	-	-	-	0
USGS-Waterwells-US	0.0625	0	0	-	-	-	0
Vapor-Intrusions-US	0.5	0	0	0	0	-	0
Water-CE-NC	0.25	0	0	0	-	-	0
Wells-NC	0.0625	0	0	-	-	-	0

PROPRIETARY HISTORIC DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
Hist-Agriculture	0.0625	0	0	-	-	-	0

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PROPRIETARY HISTORIC DATABASES							
DATABASE SEARCHED	DISTANCE SEARCHED	SUBJECT SITE	0.125 MILES	0.25 MILES	0.5 MILES	1.0 MILES	TOTAL
Hist-Auto Dealers	0.0625	0	0	-	-	-	0
Hist-Auto Repair	0.25	0	0	0	-	-	0
Hist-Chemical Manufacturing	0.0625	0	0	-	-	-	0
Hist-Chemical-Storage	0.0625	0	0	-	-	-	0
Hist-Cleaners	0.25	0	0	0	-	-	0
Hist-Convenience	0.0625	0	0	-	-	-	0
Hist-Disposal-Recycle	0.0625	0	0	-	-	-	0
Hist-Food-Processors	0.0625	0	0	-	-	-	0
Hist-Gun-Ranges	0.0625	0	0	-	-	-	0
Hist-Machine Shop	0.0625	0	0	-	-	-	0
Hist-Manufacturing	0.0625	0	0	-	-	-	0
Hist-Metal Plating	0.0625	0	0	-	-	-	0
Hist-Mining	0.0625	0	0	-	-	-	0
Hist-Mortuaries	0.0625	0	0	-	-	-	0
Hist-Oil-Gas	0.0625	0	0	-	-	-	0
Hist-OilGas-Refiners	0.0625	0	0	-	-	-	0
Hist-Other	0.0625	0	0	-	-	-	0
Hist-Paint-Stores	0.0625	0	0	-	-	-	0
Hist-Petroleum	0.0625	0	0	-	-	-	0
Hist-Post-Offices	0.0625	0	0	-	-	-	0
Hist-Printers	0.0625	0	0	-	-	-	0
Hist-Rental	0.0625	0	0	-	-	-	0
Hist-RV-Dealers	0.0625	0	0	-	-	-	0
Hist-Salvage	0.0625	0	0	-	-	-	0
Hist-Service Stations	0.25	0	0	0	-	-	0
Hist-Steel-Metals	0.0625	0	0	-	-	-	0
Hist-Textile	0.0625	0	0	-	-	-	0
Hist-Transportation	0.0625	0	0	-	-	-	0
Hist-Trucking	0.0625	0	0	-	-	-	0
Hist-Vehicle-Parts	0.0625	0	0	-	-	-	0
Hist-Vehicle-Washing	0.0625	0	0	-	-	-	0

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SITE LOCATION TOPOGRAPHIC MAP

U.S. Geological Survey. Pollocksville (Date Unavailable) Quadrangle, 7.5 Minute Series

Rivers and Associates, Inc.	509 Old Pollocksville Road River Bend, NC 28562	FIGURE: 1 JOB: 2104778917 DATE: 1/25/2024

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SITE LOCATION MAP

Rivers and Associates, Inc.	509 Old Pollocksville Road River Bend, NC 28562	FIGURE: 2 JOB: 2104778917 DATE: 1/25/2024

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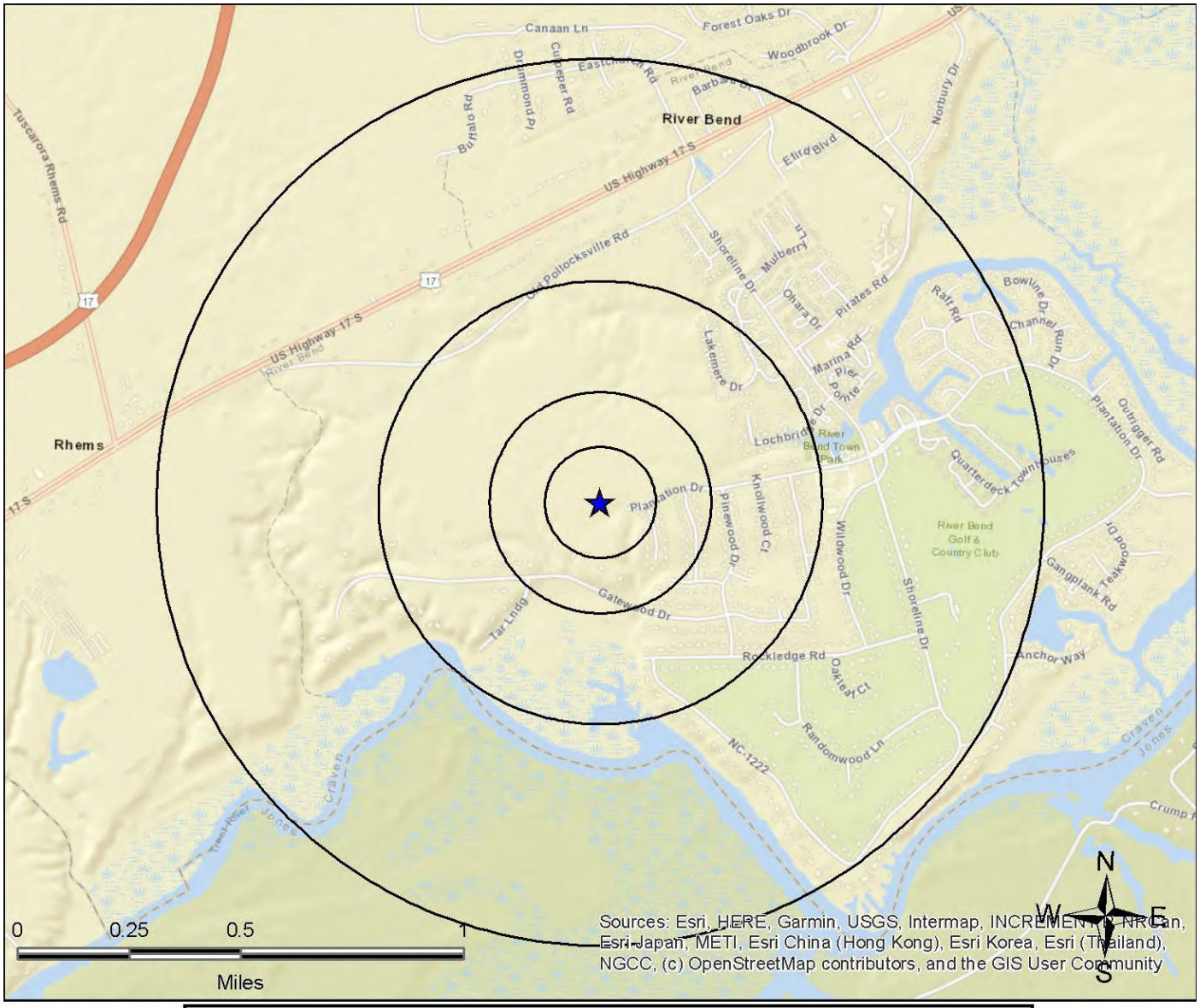
1-MILE RADIUS STREET MAP W/OCCURRENCES (MAP1)



All plotted occurrences represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. **Occurrences are shown in three colors** to give a visual indication of the potential risk of the listed occurrence based on the type of list and the current status of the occurrence. Occurrences shown in **RED** are locations with known contamination that have not received a "case closed" or "no further action" status. Occurrences shown in **YELLOW** have been listed by the respective agency, but do not always represent an environmental risk. The detailed status information and description of the listing should be reviewed for further information. Occurrences shown in **GREEN** are occurrences that have active permits or have had contamination in the past but have received a "case closed" or "no further action" status and therefore, do not likely present an environmental risk.

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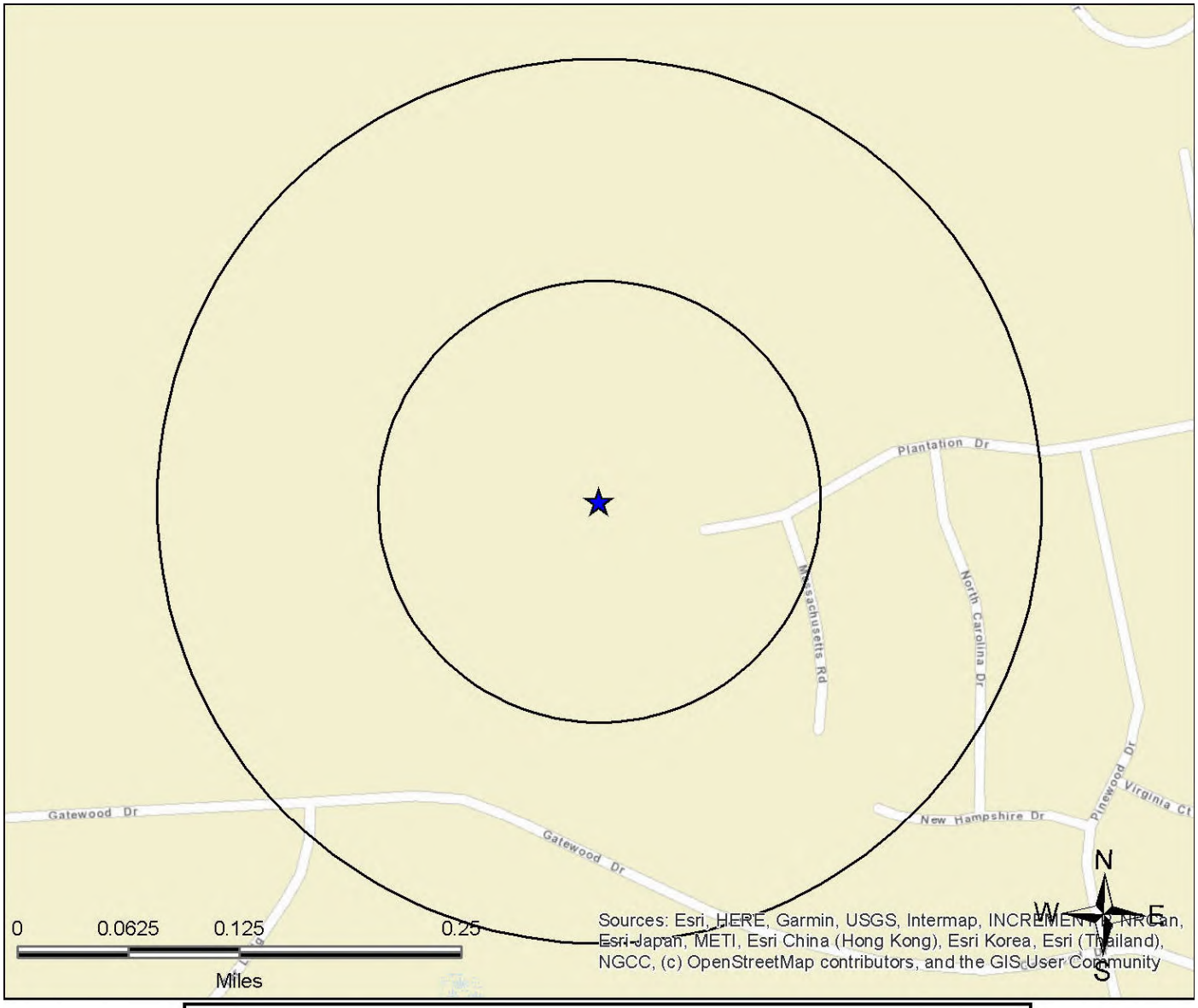
0.25-MILE RADIUS STREET MAP W/OCCURRENCES (MAP2)



Legend

- Federal NPL
- Federal Delisted NPL
- Federal CERCLIS
- Federal CERCLIS NFRAP
- Federal LUST
- Federal RCRA CORR ACTS
- Federal RCRA non-CORRACTS TSD
- Federal RCRA Generators
- Federal UST
- Federal Inst/Eng Controls
- Federal Brownfield
- Federal ERNS
- Federal Emergency Release Reports
- Emergency Release Reports
- State/Tribal NPL
- State/Tribal CERCLIS Equivalent
- State/Tribal LUST
- State/Tribal Voluntary Cleanup Sites
- State/Tribal UST
- State/Tribal Brownfield
- State/Tribal Inst/Eng Controls
- State/Tribal Landfill/Solid Waste
- State/Tribal RCRA Equivalent
- State/Tribal ASTM Other
- ERS Supplemental Govt Sources
- ERS Exclusive Historic Sources

All plotted occurrences represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. **Occurrences are shown in three colors** to give a visual indication of the potential risk of the listed occurrence based on the type of list and the current status of the occurrence. Occurrences shown in **RED** are locations with known contamination that have not received a "case closed" or "no further action" status. Occurrences shown in **YELLOW** have been listed by the respective agency, but do not always represent an environmental risk. The detailed status information and description of the listing should be reviewed for further information. Occurrences shown in **GREEN** are occurrences that have active permits or have had contamination in the past but have received a "case closed" or "no further action" status and therefore, do not likely present an environmental risk.

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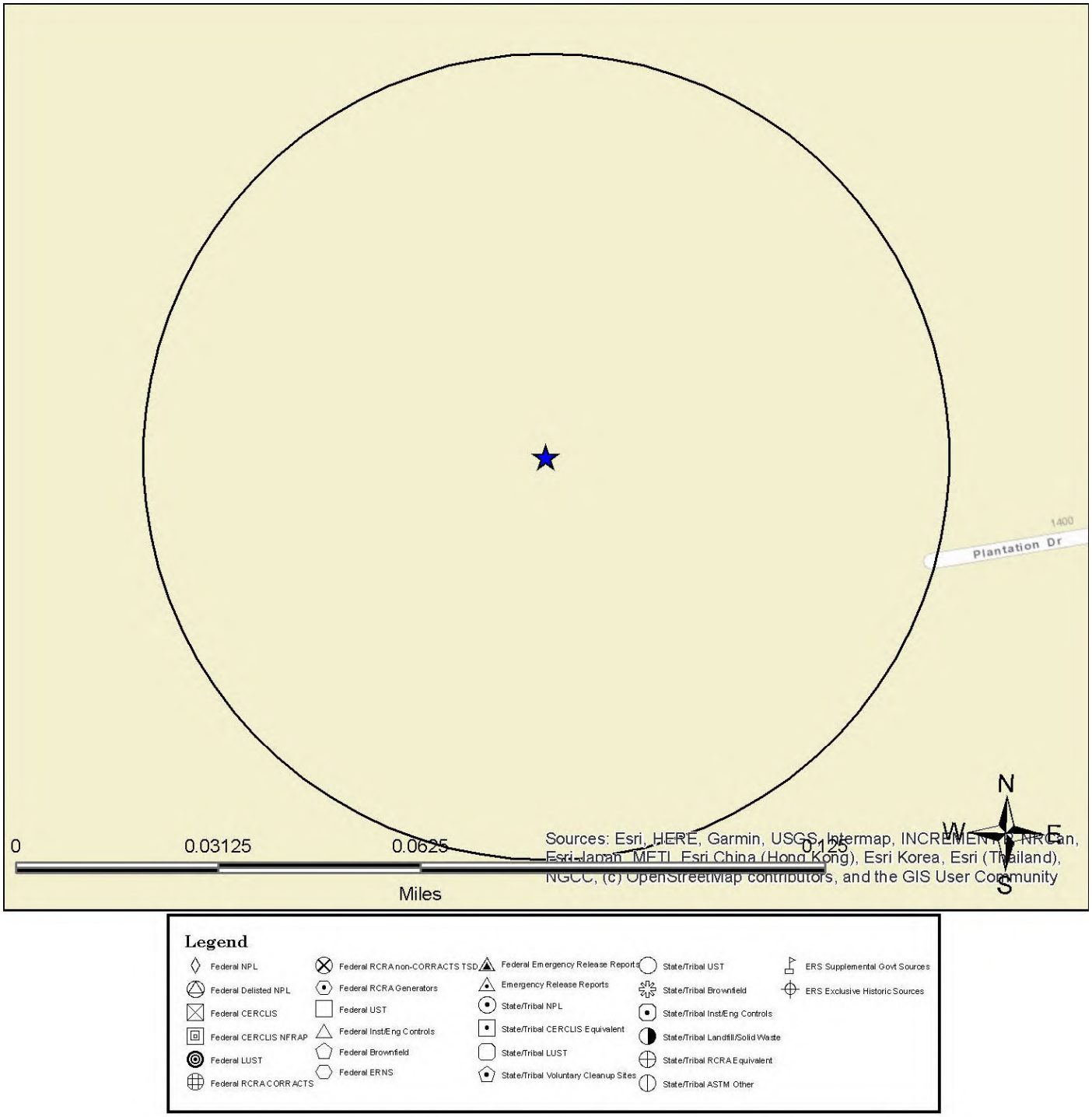
0.0625-MILE RADIUS STREET MAP W/ OCCURRENCES (MAP3)



All plotted occurrences represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. **Occurrences are shown in three colors** to give a visual indication of the potential risk of the listed occurrence based on the type of list and the current status of the occurrence. Occurrences shown in **RED** are locations with known contamination that have not received a "case closed" or "no further action" status. Occurrences shown in **YELLOW** have been listed by the respective agency, but do not always represent an environmental risk. The detailed status information and description of the listing should be reviewed for further information. Occurrences shown in **GREEN** are occurrences that have active permits or have had contamination in the past but have received a "case closed" or "no further action" status and therefore, do not likely present an environmental risk.

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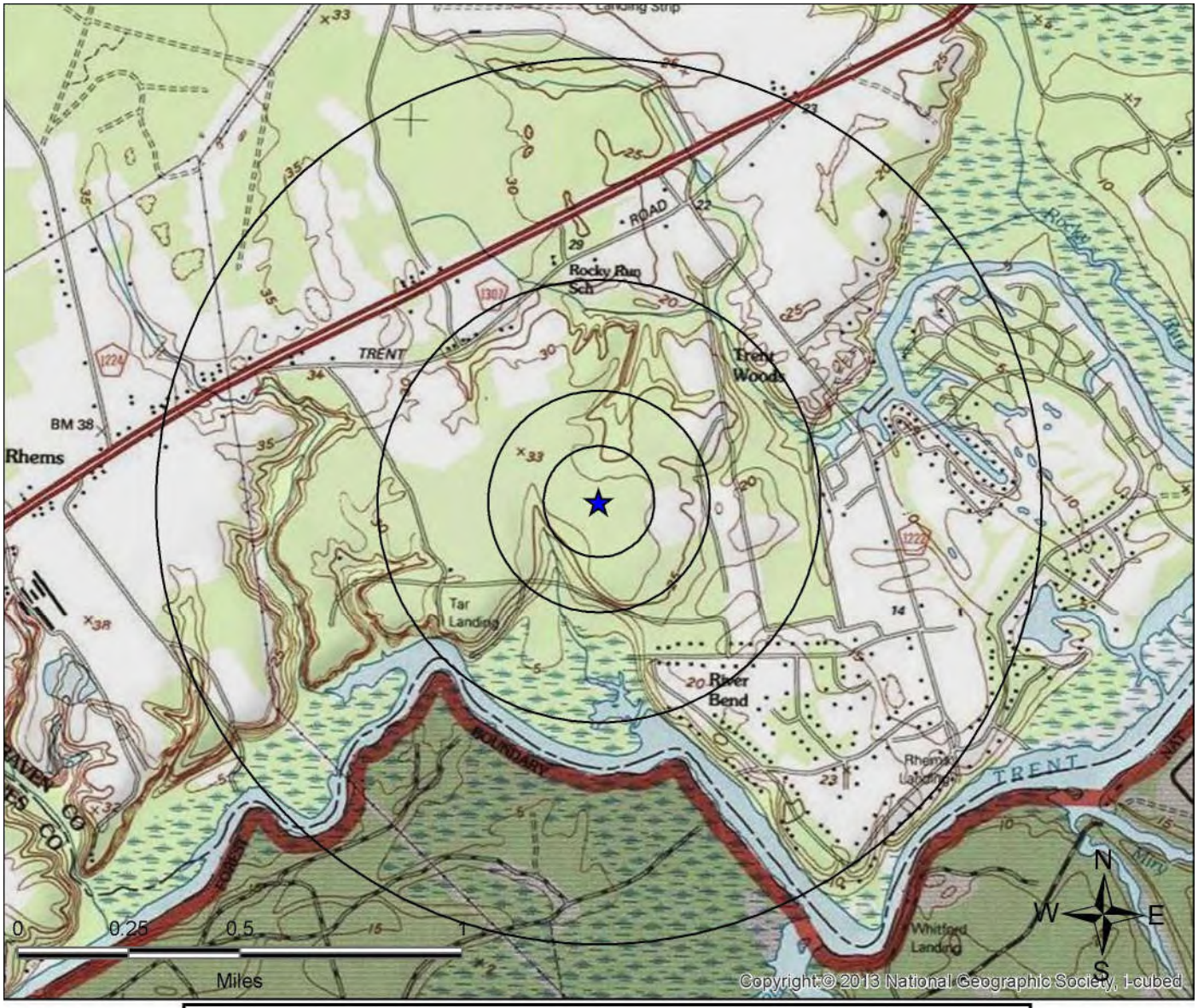
1-MILE TOPOGRAPHIC MAP W/OCCURRENCES (MAP4)



Legend

- Federal NPL
- Federal Delisted NPL
- Federal CERCLIS
- Federal CERCLIS NFRAP
- Federal LUST
- Federal RCRA CORRACTS
- Federal RCRA non-CORRACTS TSD
- Federal RCRA Generators
- Federal UST
- Federal Inst/Eng Controls
- Federal Brownfield
- Federal ERNS
- Federal Emergency Release Reports
- Emergency Release Reports
- State/Tribal NPL
- State/Tribal CERCLIS Equivalent
- State/Tribal LUST
- State/Tribal Voluntary Cleanup Sites
- State/Tribal UST
- State/Tribal Brownfield
- State/Tribal Inst/Eng Controls
- State/Tribal Landfill/Solid Waste
- State/Tribal RCRA Equivalent
- State/Tribal ASTM Other
- ERS Supplemental Govt Sources
- ERS Exclusive Historic Sources

All plotted occurrences represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. **Occurrences are shown in three colors** to give a visual indication of the potential risk of the listed occurrence based on the type of list and the current status of the occurrence. Occurrences shown in **RED** are locations with known contamination that have not received a "case closed" or "no further action" status. Occurrences shown in **YELLOW** have been listed by the respective agency, but do not always represent an environmental risk. The detailed status information and description of the listing should be reviewed for further information. Occurrences shown in **GREEN** are occurrences that have active permits or have had contamination in the past but have received a "case closed" or "no further action" status and therefore, do not likely present an environmental risk.

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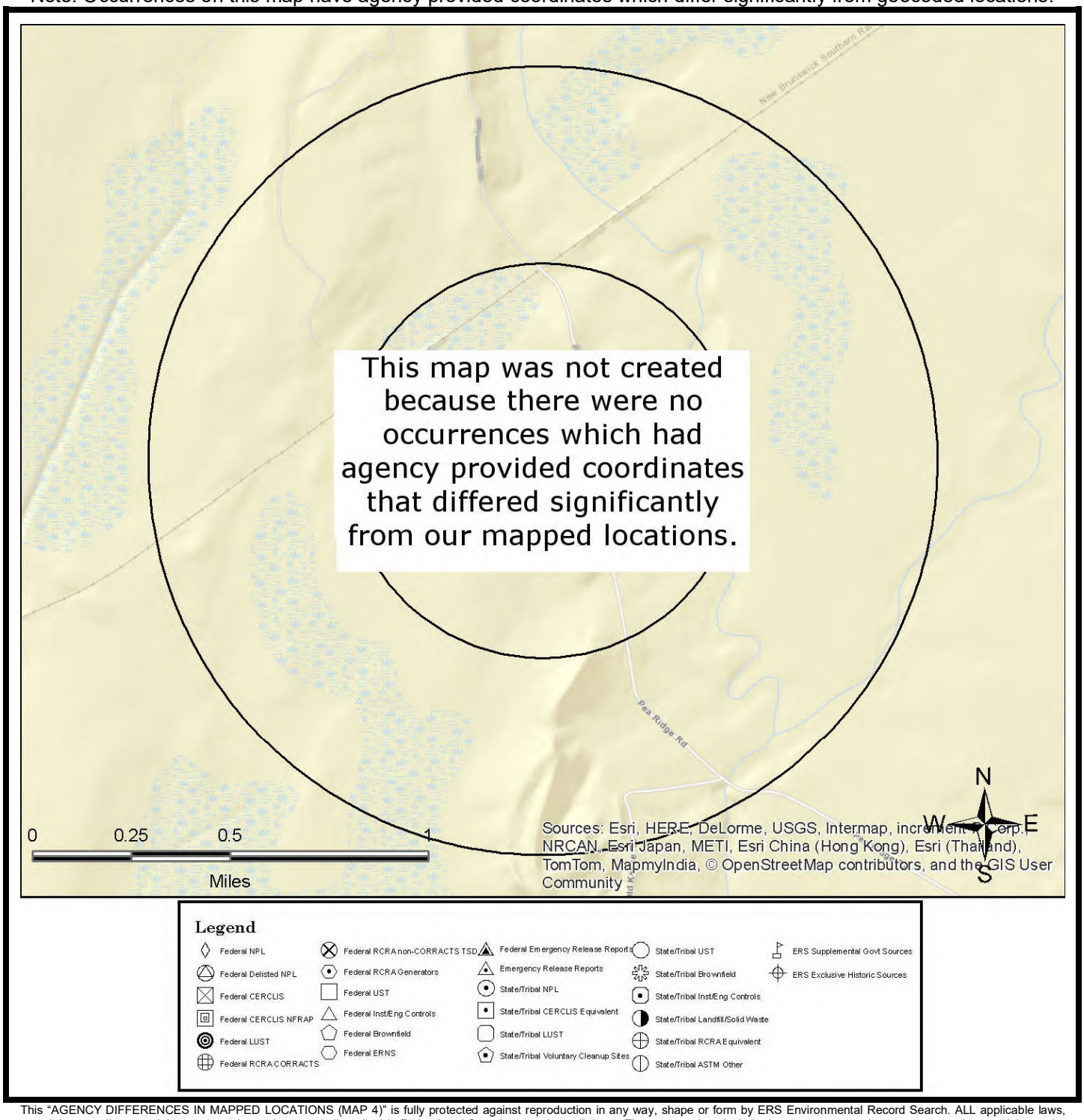
AGENCY DIFFERENCES IN MAPPED LOCATIONS (MAP5)

Note: Occurrences on this map have agency provided coordinates which differ significantly from geocoded locations.



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SUMMARY OF AGENCY DIFFERENCES

MAP ID	ID / SITE NAME	ADDRESS / DATABASE	AGENCY COORDINATES	DISTANCE (MILES)	DIRECTION
N/A	No occurrences were identified where the agency provided coordinates that differed significantly from our mapped locations.				

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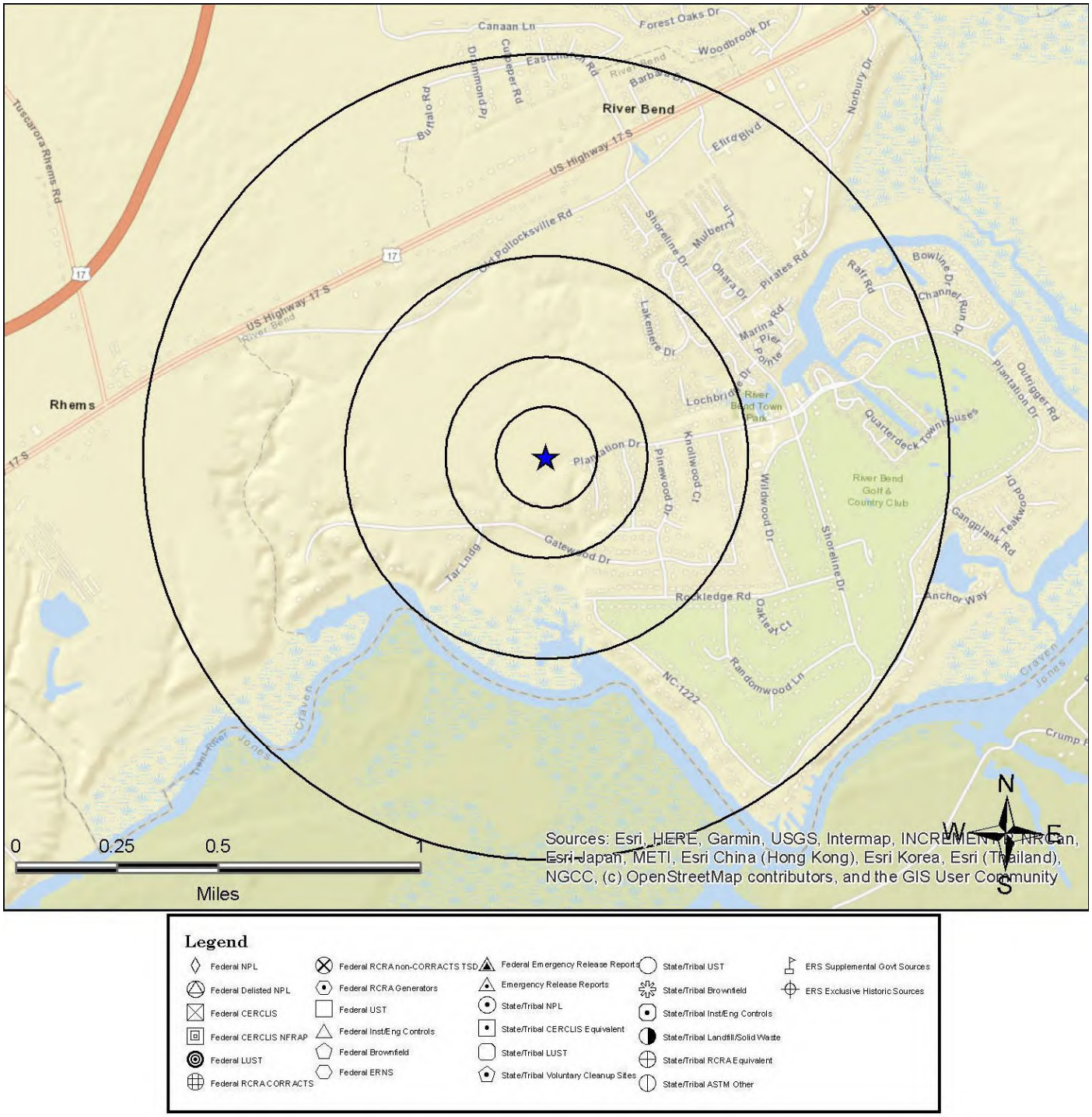
MAPPED AIR PERMITS WITH POTENTIAL DISPERSION (MAP6)

Note: Occurrences on this map are reported in Air Quality databases. Potential air plumes are drawn in the direction of the prevailing wind.
No air quality occurrences were identified in the search radius



Legend

- Federal NPL
- Federal Delisted NPL
- Federal CERCLIS
- Federal CERCLIS NFRAP
- Federal LUST
- Federal RCRA CORRACTS
- Federal RCRA non-CORRACTS TSD
- Federal RCRA Generators
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- State/Tribal Brownfield
- State/Tribal Inst/Eng Controls
- State/Tribal Landfill/Solid Waste
- State/Tribal RCRA Equivalent
- State/Tribal ASTM Other
- ERS Supplemental Govt Sources
- ERS Exclusive Historic Sources

All plotted occurrences represent approximate locations based on geographic information provided by the respective agency/source. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. Potential air dispersion plumes are depicted to graphically show the direction contaminates may travel based on prevailing wind data and provide a visual screening tool only. Actual direction will vary especially by season. Depending on the actual contaminate, amount released, and other variables, the distance from the source the contaminate may travel can and will vary. Interpretation and review of all the actual relevant data by an environmental professional is recommended before making any decisions, conclusions or otherwise based on the map depictions, air data, and potential air dispersion plumes.

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FEMA FLOODPLAIN MAPPING

Flood Zone

0.2 PCT	A99	AO	OPEN WATER	X
1 PCT	AE	ANI	V	X (LEVEE)
A	AH	D	VE	

All plotted polygons represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc.

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FLOODPLAIN MAP KEY

FLOOD ZONE	RISK LEVEL	WITHIN 100-YEAR FLOODPLAIN?	DEFINED AS WITHIN "SPECIAL FLOOD HAZARD AREA"?	DESCRIPTION
0.2 PCT	Low to Moderate	No	No	Areas between limits of the 100-year flood and the 500-year flood; or certain areas subject to 100-year flooding with average depths of less than one (1) foot.
1 PCT	High	Yes	Yes	Areas with a 1% annual chance of flooding. Also, areas where the 100-year flooding is contained within channel banks and the channel is too narrow to show to scale.
A	High	Yes	Yes	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
A99	High	Yes	Yes	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements
AE	High	Yes	Yes	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
AH	High	Yes	Yes	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
ANI (Area Not Included)	Undetermined	Unknown	No	An area that is located within a community or county that is not mapped on any published FIRM.
AO	High	Yes	Yes	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

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FLOOD ZONE	RISK LEVEL	WITHIN 100-YEAR FLOODPLAIN?	DEFINED AS WITHIN "SPECIAL FLOOD HAZARD AREA"?	DESCRIPTION
D	Undetermined	Unknown	No	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.
V	High (Coastal)	Yes	Yes	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones
VE	High (Coastal)	Yes	Yes	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
X	Low to Moderate	No	No	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level.
X Levee	Low to Moderate	No	No	Areas protected by levees from the 1% annual chance (100-year) flood.

FIRM = Flood Insurance Rate Map
SFHA = Special Flood Hazard Area

SFHAs are defined as the areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone X are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, Zone X.

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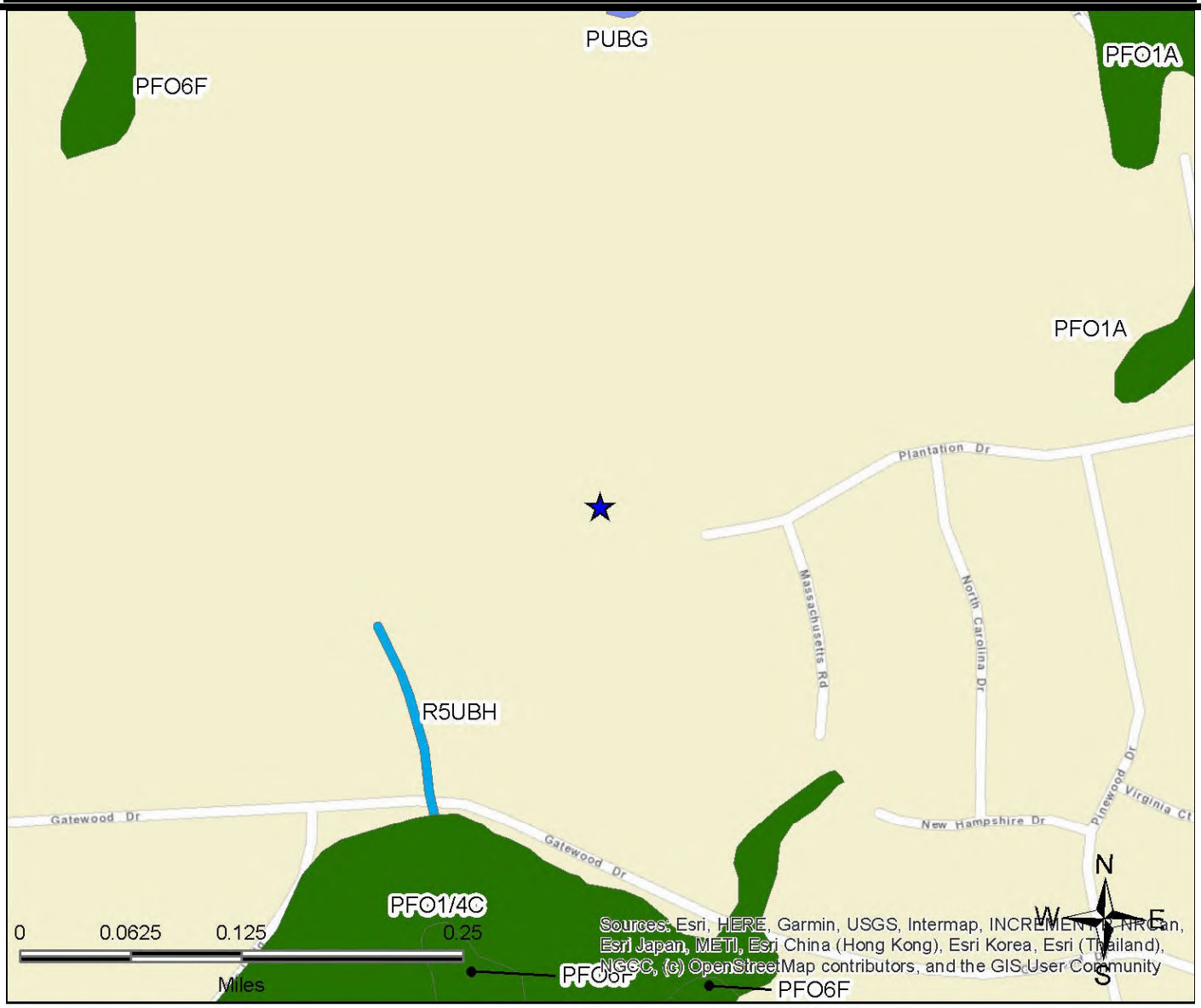
US FISH & WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY



Legend

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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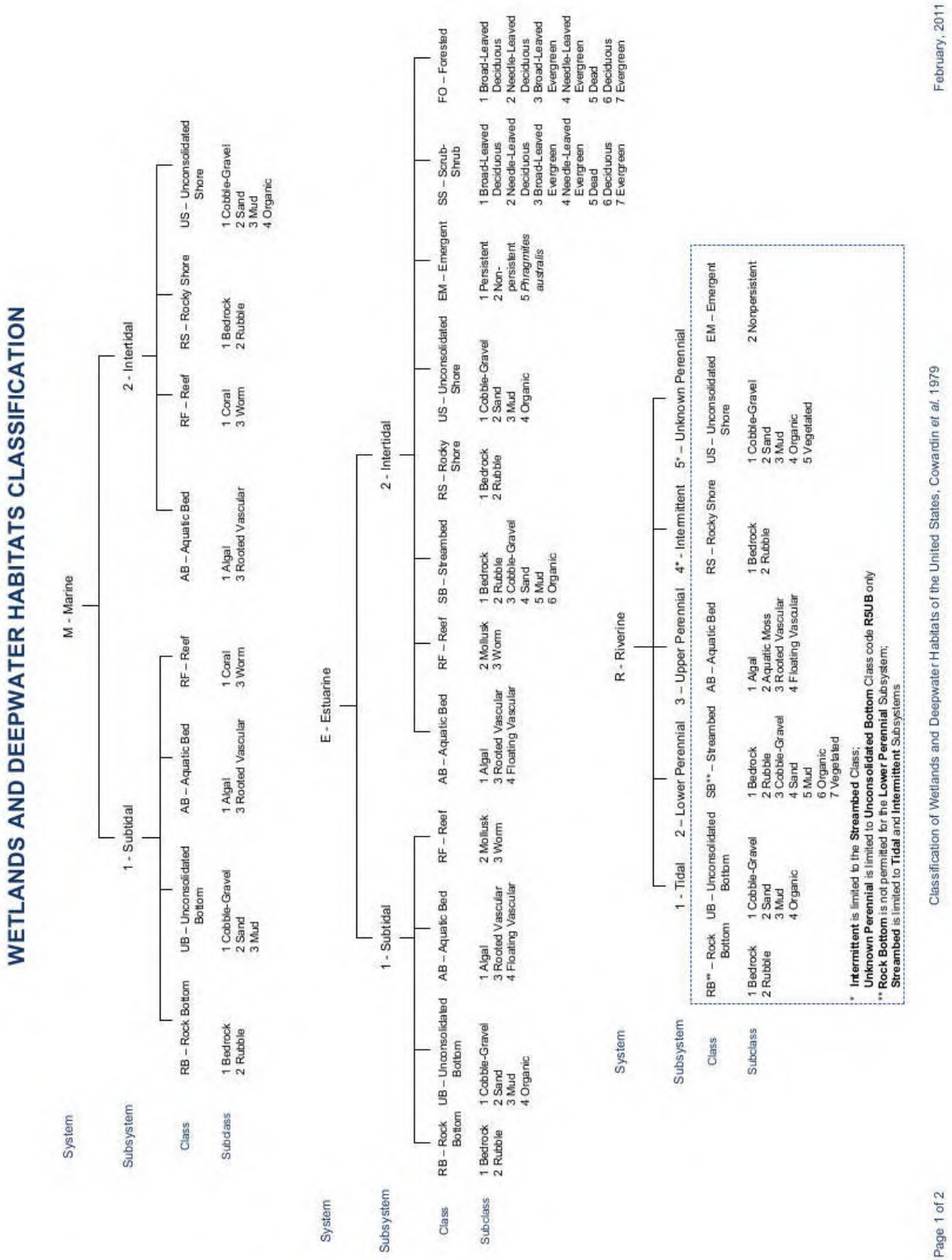
WETLANDS ACRONYM MAP KEY



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WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

System: L - Lacustrine

Subsystem: 1 - Limnetic

Class	Subclass
RB – Rock Bottom	1 Bedrock 2 Rubble
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular

Subsystem: 2 - Littoral

Class	Subclass
RB – Rock Bottom	1 Bedrock 2 Rubble
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular
RS – Rocky Shore	1 Bedrock 2 Rubble
US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
EM – Emergent	2 Nonpersistent

System: P - Palustrine

Class	Subclass
RB – Rock Bottom	1 Bedrock 2 Rubble
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular
US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
ML – Moss-Lichen	1 Moss 2 Lichen
EM – Emergent	1 Persistent 2 Nonpersistent 5 *Phragmites australis*
SS – Scrub-Shrub	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
FO – Forested	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	**Saltwater Tidal**	**Freshwater Tidal**		**Coastal Halinity**	**Inland Salinity**	**pH Modifiers for all Fresh Water**	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

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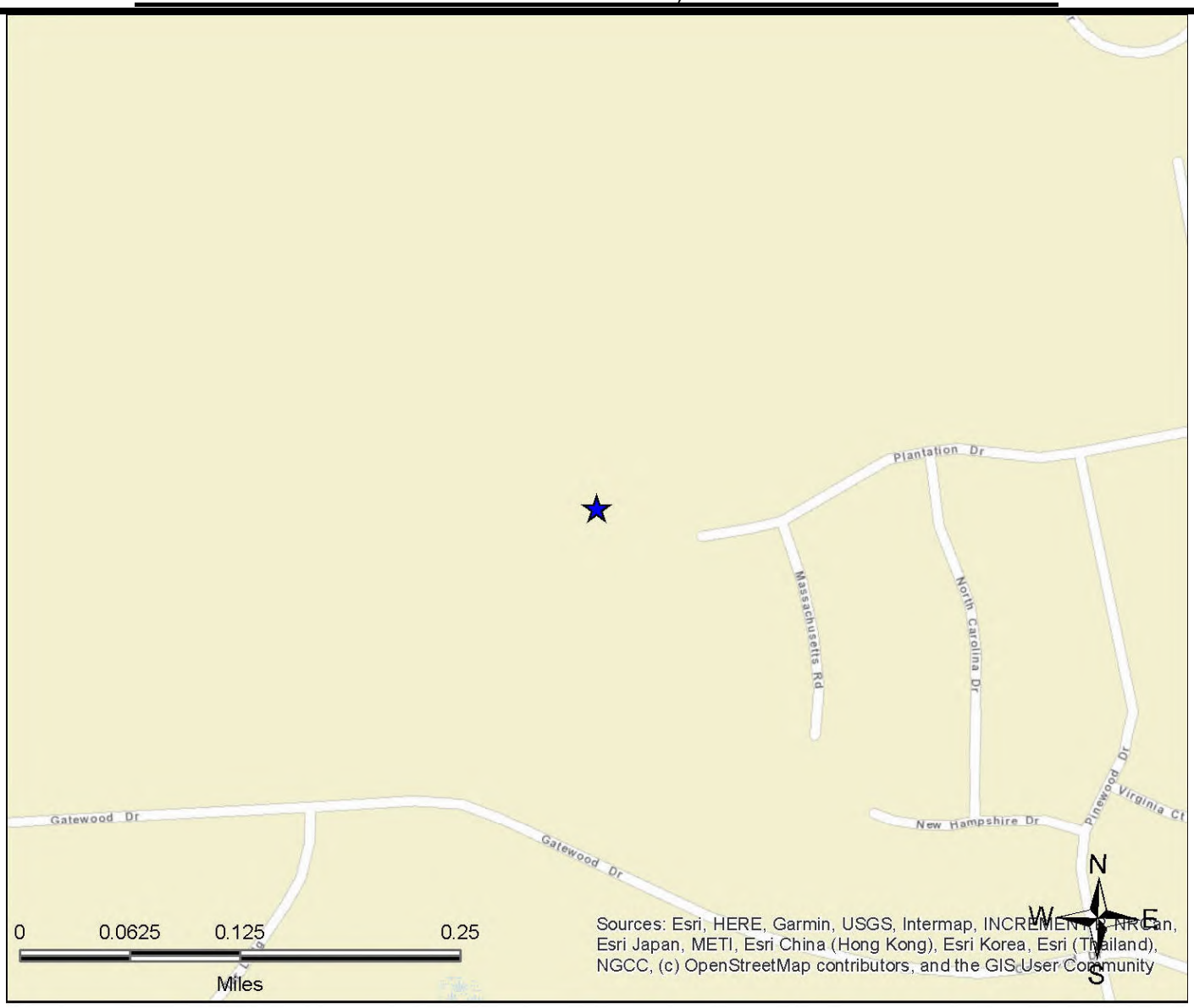
US FISH & WILDLIFE SERVICE, CRITICAL HABITATS



Legend

Endangered | Resolved Taxon | Species of Concern | Threatened

All plotted polygons represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc.

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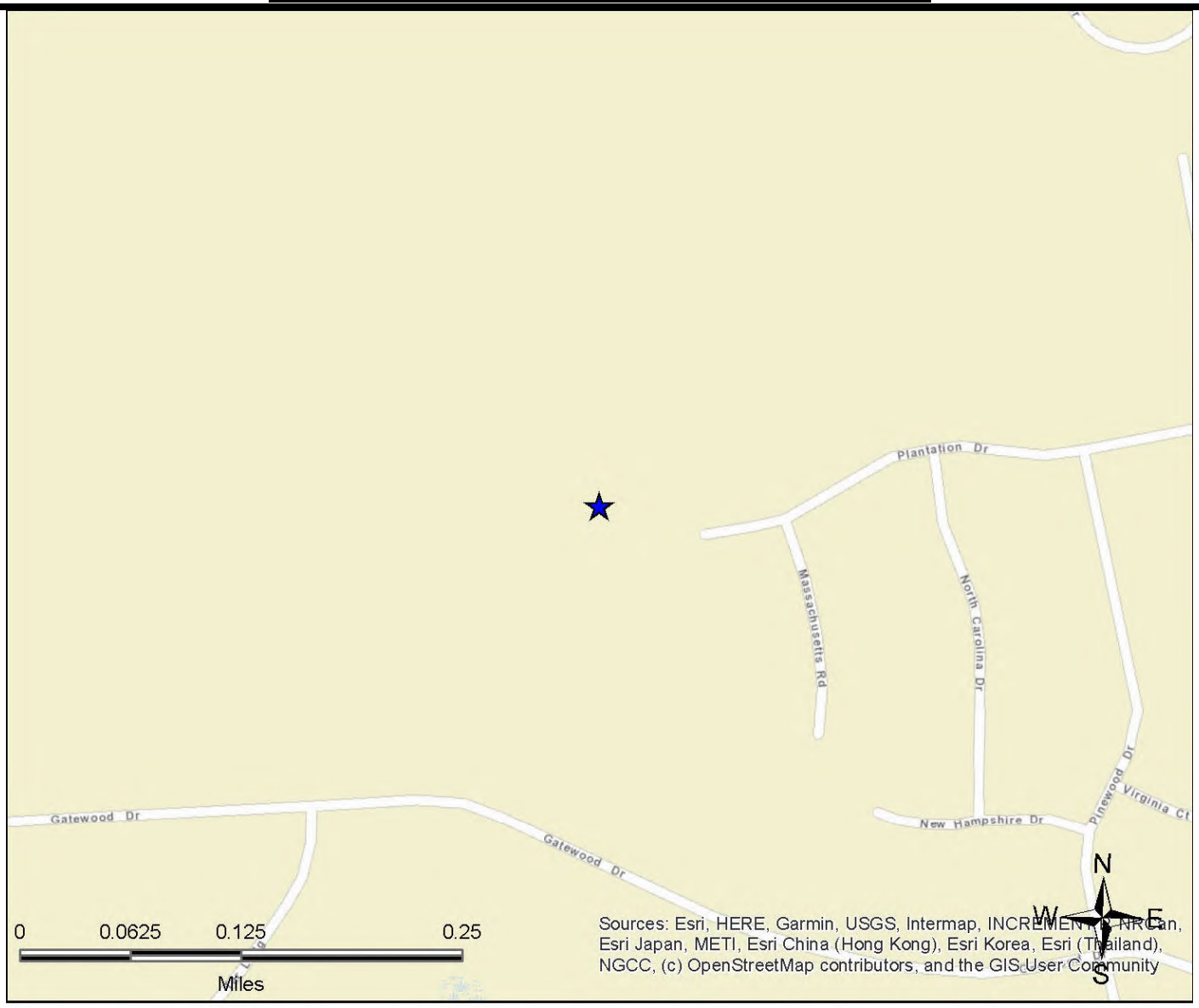
FEDERAL LANDS AND TRIBAL AREAS



Legend

BIA BLM BOR DOD FS FWS NPS OTHER TVA

All plotted polygons represent approximate locations based on geographic information provided by the respective agency. Actual locations may vary due to numerous reasons such as: the size of the property, accuracy of the provided location, accuracy of the software used to determine the location, etc. Note: Only areas of 640 acres or more are included.

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FEDERAL LANDS AND TRIBAL AREAS MAP KEY

ABBREVIATION	ADMINISTERING AGENCY NAME	DESCRIPTION
BIA	Bureau of Indian Affairs	Typically Indian Reservations
BLM	Bureau of Land Management	Typically Petroleum Reserves, Recreation Areas, Conservations Areas, and Wilderness Study Areas
BOR	Bureau of Reclamation	Typically Reservoirs and Lakes
DOD	Department of Defense	Typically Military Bases
FS	Forest Service	Typically National Forests and Wilderness Areas,
FWS	Fish and Wildlife Service	Typically Wilderness and Wildlife Refuges
NPS	National Park Service	Typically National Parks, National Monuments, and National Preserves
TVA	Tennessee Valley Authority	Typically Lakes and Reservoirs
Other	Other	Typically Laboratories, Correctional Facilities, Law Enforcement Training Facilities, Coast Guard Facilities, and Space Centers

This data was originally digitized by the National Mapping Division based on the sectional maps contained in 'The National Atlas of the United States of America' published by the USGS in 1970. The sectional maps were updated during 1978-1981 and digitized in the early 1980's. The data were updated in 1995 using 1:1,000,000-scale and 1:2,000,000-scale BLM state base maps. Only federal and Indian land polygons and attribute information were extracted for inclusion. In 1998, topological errors introduced when the state files were paneled were corrected.

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LISTED OCCURRENCE DETAILS

DATABASE	STATUS	DISTANCE	ELEVATION	MAP ID
N/A				
SITE NAME			**MAPS**	**ID**
ADDRESS			**CITY**	**ZIP**
DETAILS				
No listed sites were found.				

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RECORDS SOURCES SEARCHED

ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
Air-CE-NC	Air Quality Civil Penalties	ERS Supplemental Govt Sources	Click Here	None Found
Air-NC	Air Permitted Facilities	ERS Supplemental Govt Sources	Click Here	None Found
AST-NC	Aboveground Storage Tanks (aka Registration of AST's, Oil Terminal Facilities)	State/Tribal UST	Click Here	None Found
BF-NC	Brownfield Sites (aka Brownfields Project Inventory)	State/Tribal Brownfield	Click Here	None Found
BF-Tribal-US	Historical Tribal Brownfields	Federal Brownfield	Click Here	None Found
BF-US	Brownfields Sites	Federal Brownfields	Click Here	None Found
BioFuel-US	Bio Diesel Fuel	ERS Supplemental Govt Sources	Click Here	None Found
Brownfield-NC	Brownfield Site Boundaries	State/Tribal Brownfield	Click Here	None Found
CDL-US	National Clandestine Drug Lab Register	ERS Supplemental Govt Sources	Click Here	None Found
CERCLIS-Archived-US	CERCLIS sites that have been archived	Federal CERCLIS NFRAP	Click Here	None Found
CERCLIS-US	Comprehensive Environmental Response, Compensation, and Liability Information System	Federal CERCLIS	Click Here	None Found
Coal-Ash-Dams-US	Coal Ash Contaminated Sites and Hazard Dams	ERS Supplemental Govt Sources	Click Here	None Found
Coal-Ash-NC	Coal Ash Disposal Sites	ERS Supplemental Govt Sources	Click Here	None Found
Controls-RCRA-US	RCRA Institutional and Engineering Controls Summary (aka Federal RCRA with Controls)	Federal Institutional/Engineering Controls	Click Here	None Found
Controls-US	US CERCLA Sites with Controls (aka US IC/EC, Institutional/Engineering List Controls, Land Use Controls)	Federal Institutional/Engineering Controls	Click Here	None Found
DCF-GW-NC	Dry Cleaning Contaminant Soil/GW Plumes	ERS Supplemental Govt Sources	Click Here	None Found
DCF-NC	Dry Cleaning Facilities	ERS Supplemental Govt Sources	Click Here	None Found
Debris-NC	Active Debris Sites	ERS Supplemental Govt Sources	Click Here	None Found
Debris-US	Historical Debris Sites	Federal Solid Waste	Click Here	None Found
Delisted-NPL-US	Delisted NPL Sites	Federal Delisted NPL	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
DSCA-NC	Dry-Cleaning Solvent Cleanup Act Program	ERS Supplemental Govt Sources	Click Here	None Found
E-CS-NC	Electronic Collection Sites (aka E-Waste Drop Off)	State/Tribal ASTM Other Med	Click Here	None Found
EGRID-US	Emissions & Generation Resource Facilities	ERS Supplemental Govt Sources	Click Here	None Found
EPA-Watch-List-US	Historical EPA Watch List	ERS Supplemental Govt Sources	Click Here	None Found
ERNS-US	Emergency Response Notification System	Federal ERNS	Click Here	None Found
FA-HW-NC	Financial Assurance, Hazardous Waste	ERS Supplemental Govt Sources	Click Here	None Found
FA-HW-US	Financial Assurance, Hazardous Waste	ERS Supplemental Govt Sources	Click Here	None Found
FA-SW-NC	Financial Assurance, Solid Waste Facilities	ERS Supplemental Govt Sources	Click Here	None Found
FA-UST-NC	Financial Assurance, Underground Storage Tanks	ERS Supplemental Govt Sources	Click Here	None Found
FEMA-UST-US	Historical FEMA Underground Storage Tanks	Federal UST	Click Here	None Found
FRCERCLA-NC	Federal Remediation Sites, FRB Sites	State/Tribal Cerclis Equivalent	Click Here	None Found
FRS-US	Facility Registry Index (FINDS)	ERS Supplemental Govt Sources	Click Here	None Found
FSS-NC	Fuel Service Stations	ERS Supplemental Govt Sources	Click Here	None Found
FTTS-ENF-US	Historical FIFRA/TSCA Tracking System (FTTS) Enforcement Actions	Federal ASTM Other	Click Here	None Found
FTTS-INSP-US	Historical FIFRA/TSCA Tracking System (FTTS) Inspections	ERS Supplemental Govt Sources	Click Here	None Found
FUDS-US	Formerly Used Defense Sites	ERS Supplemental Govt Sources	Click Here	None Found
FUSRAP-US	Formerly Utilized Sites Remedial Action Program Sites	ERS Supplemental Govt Sources	Click Here	None Found
GasSt-NC	Gas Stations	ERS Supplemental Govt Sources	Click Here	None Found
Hist-AFS2-US	Historical Air Facility System for Clean Air Act stationary sources	ERS Supplemental Govt Sources	Click Here	None Found
Hist-AFS-US	Historical Air Facility System for Clean Air Act stationary sources	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Agriculture	Historical Ranches/Farms, Livestock/Agriculture	ERS Exclusive Historic Sources	Click Here	None Found
Hist-AST-NC	Historical Aboveground Storage Tanks	State/Tribal UST	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
Hist-Auto Dealers	Historical Auto and Truck Dealers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Auto Repair	Historical Automotive Repair	ERS Exclusive Historic Sources	Click Here	None Found
Hist-CERCLIS-NFRAP-US	Historical CERCLIS-NFRAP	ERS Supplemental Govt Sources	Click Here	None Found
Hist-CERCLIS-US	Historical CERCLIS Sites	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Chemical Manufacturing	Historical Manufacturing and Distribution of Chemicals, Gases, and/or Solids	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Chemical-Storage	Historical Chemical/Hazardous Use Storage	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Cleaners	Historical Laundry, Cleaners, and Dry Cleaning Services	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Convenience	Historical Convenience Store with Possible Gas	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Disposal-Recycle	Historical Hazardous Disposal/Recycle and Dumps/Waste	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Dumps-US	Historical Dumps Inventory of 1985	Federal Solid Waste	Click Here	None Found
Hist-ERNS-US	Historical Emergency Response Notification System (ERNS)	ERS Supplemental Govt Sources	Click Here	None Found
Hist-FIFRA-US	Historical Case Administration Data from National Compliance Database (Federal Insecticide, Fungicide, and Rodenticide Act)	ERS Supplemental Govt Sources	Click Here	None Found
Hist-FINDS-US	Historical Facility Index System	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Food-Processors	Historical Food Processing Manufacturers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Gun-Ranges	Historical Gun Ranges/Clubs	ERS Exclusive Historic Sources	Click Here	None Found
Hist-HSI-NC	Historical Inactive Hazardous Sites Inventory	ERS Supplemental Govt Sources	Click Here	None Found
Hist-LF-NC	Historical Landfills	State/Tribal Landfill/Solid Waste	Click Here	None Found
Hist-LUST-NC	Historical Incident Report	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Machine Shop	Historical Machine Shops, Welding, Machine Repair	ERS Exclusive Historic Sources	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
Hist-Manufacturing	Historical Sources US: Manufacturing	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Metal Plating	Historical Metal Plating	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Mining	Historical Mining Operations	ERS Exclusive Historic Sources	Click Here	None Found
HIST-MLTS-US	Historical Material Licensing Tracking System	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Mortuaries	Historical Crematories/Mortuaries	ERS Exclusive Historic Sources	Click Here	None Found
Hist-NC	Previously Listed North Carolina Sites	ERS Supplemental Govt Sources	Click Here	None Found
Hist-NPL-US	Historical National Priority List	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Oil-Gas	Historical Oil and Gas Well Related Facilities	ERS Exclusive Historic Sources	Click Here	None Found
Hist-OilGas-Refiners	Historical Oil/Gas Refiners/Manufacturers/Plants	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Other	Historical Environmental Facilities	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Paint-Stores	Historical Paint Stores	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Petroleum	Historical Petroleum Refining/ Manufacturing/ Chemicals	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Post-Offices	Historical Post Offices	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Printers	Historical Printers and Publishers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-RCRIS-US	Historical EPA's Resource Conservation and Recovery Act	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Rental	Historical Rental Equipment & Yards	ERS Exclusive Historic Sources	Click Here	None Found
Hist-RV-Dealers	Historical Trailer and Recreational Vehicle Dealers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Salvage	Historical Vehicle Salvage Yards or Wreckers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Service Stations	Historical Service Stations/Vehicle Fueling	ERS Exclusive Historic Sources	Click Here	None Found
Hist-State-Trust-Fund-NC	Historical State Trust Fund Database	ERS Supplemental Govt Sources	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
Hist-Steel-Metals	Historical Steel Mills/Manufacturers/Foundries/Smelters	ERS Exclusive Historic Sources	Click Here	None Found
Hist-SWF-NC	Historical Inactive and Closed Solid Waste Facilities	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Textile	Historical Textile Mills/Manufacturers	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Transportation	Historical Transportation Facilities	ERS Exclusive Historic Sources	Click Here	None Found
Hist-TRIS-US	Historical Toxic Release Inventory System	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Trucking	Historical Trucking, Shipping, Delivery, and/or Storage	ERS Exclusive Historic Sources	Click Here	None Found
Hist-US	Historical Previously Listed Federal Sites	ERS Supplemental Govt Sources	Click Here	None Found
Hist-US-EC	Historical Engineering Controls Sites (aka US EC, Engineering Controls, Land Use Controls)	Federal Institutional/Engineering Controls	Click Here	None Found
Hist-US-IC	Historical Sites with Institutional Controls (aka US IC, Institutional Controls, Land Use Controls)	Federal Institutional/Engineering Controls	Click Here	None Found
Hist-UST-NC	Historical Petroleum UST Database	ERS Supplemental Govt Sources	Click Here	None Found
Hist-Vehicle-Parts	Historical Vehicle Parts	ERS Exclusive Historic Sources	Click Here	None Found
Hist-Vehicle-Washing	Historical Vehicle/Truck Washing Facilities	ERS Exclusive Historic Sources	Click Here	None Found
Hist-WaterWells-US	Historical Public Community Water Supply/Well Head Protection Database	ERS Supplemental Govt Sources	Click Here	None Found
HMIS-US	Hazardous Materials Information System	Federal Emergency Release Reports	Click Here	None Found
HWSPL-NC	Inactive Hazardous Waste Sites Priority List	State/Tribal NPL	Click Here	None Found
ICIS-Air-US	Integrated Compliance Information System for Air	ERS Supplemental Govt Sources	Click Here	None Found
ICIS-FEC-US	Integrated Compliance Information System for Federal Enforcement Data	ERS Supplemental Govt Sources	Click Here	None Found
ICIS-NPDES-US	National Pollutant Discharge Elimination System (NPDES)	ERS Supplemental Govt Sources	Click Here	None Found
IC-NC	Institutional Controls Sites (aka No Further Action Sites with Restricted Use)	State/Tribal Inst/Eng Controls	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
IHS-NC	Inactive Hazardous Sites	State/Tribal CERCLIS Equivalent	Click Here	None Found
Landfills-NC	Active Permitted Landfills	State/Tribal Solid Waste	Click Here	None Found
LAST-Closed-NC	Leaking Aboveground Storage Tanks, Closed Cases (aka Regional Aboveground Storage Tanks, Aboveground Incident Management Database)	State/Tribal LUST	Click Here	None Found
LAST-Open-NC	Leaking Aboveground Storage Tanks, Open Cases (aka Regional Aboveground Storage Tanks, Aboveground Incident Management Database)	State/Tribal LUST	Click Here	None Found
Lead-Smelter-2-US	Historical Lead Smelter Sites	ERS Supplemental Govt Sources	Click Here	None Found
Lead-US	Lead Smelter Sites	ERS Supplemental Govt Sources	Click Here	None Found
LIENS-US	Superfund Liens	Federal Institutional/Engineering Controls	Click Here	None Found
LMOP-US	Landfill Methane Outreach Program	ERS Supplemental Govt Sources	Click Here	None Found
LUST-Closed-NC	Leaking Underground Storage Tanks, Closed Cases (aka Regional Underground Storage Tanks, Incident Management Database)	State/Tribal LUST	Click Here	None Found
LUST-Open-NC	Leaking Underground Storage Tanks, Open Cases (aka Regional Underground Storage Tanks, Incident Management Database)	State/Tribal LUST	Click Here	None Found
Lust-Trust-NC	Lust Trust Sites (aka State Cleanup Funds Database)	ERS Supplemental Govt Sources	Click Here	None Found
Manifest2-RI	Hazardous Waste Manifest	State/Tribal RCRA Equivalent	Click Here	None Found
MGP-NC	Manufactured Gas Plants	ERS Supplemental Govt Sources	Click Here	None Found
Military-Bases-US	Military Base Boundaries	ERS Supplemental Govt Sources	Click Here	None Found
Mines-NC	Mine Inventory	ERS Supplemental Govt Sources	Click Here	None Found
MINES-US	Mines Master Index File	ERS Supplemental Govt Sources	Click Here	None Found
MLTS-US	Material Licensing Tracking System	ERS Supplemental Govt Sources	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
MRDS-US	Mineral Resources Data System (MRDS)	ERS Supplemental Govt Sources	Click Here	None Found
NPDES-NC	NPDES Active Facilities	ERS Supplemental Govt Sources	Click Here	None Found
NPL-US	National Priorities List	Federal NPL	Click Here	None Found
NPL-US	NPL Boundaries	Federal NPL	Click Here	None Found
PADS-US	PCB Registration Database System	Federal ASTM Other	Click Here	None Found
PCB-US	PCB Transformers	Federal ASTM Other	Click Here	None Found
PCS-US	Historical Permit Compliance System for Clean Water Act	ERS Supplemental Govt Sources	Click Here	None Found
Proposed-NPL-US	Proposed NPL Sites	Federal NPL	Click Here	None Found
PWS-NC	Public Water Supply Water Sources	ERS Supplemental Govt Sources	Click Here	None Found
RADINFO-US	Radiation Information Database	ERS Supplemental Govt Sources	Click Here	None Found
RCRA-CESQG-US	Resource Conservation and Recovery Act, Conditionally Exempt Small Quantity Generators (aka RCRA CESQG)	Federal RCRA Generators	Click Here	None Found
RCRA-COR-US	Resource Conservation and Recovery Act, - Corrective Actions (aka RCRA CORRACTS)	Federal RCRA CORRACTS	Click Here	None Found
RCRA-LQG-US	Resource Conservation and Recovery Act, Large Quantity Generators (aka RCRA LQG)	Federal RCRA Generators	Click Here	None Found
RCRA-NON-US	Resource Conservation and Recovery Act, Non-Hazardous Generators (aka RCRA Non-Haz, RCRA NonGen, RCRA No longer Regulated)	Federal RCRA Generators	Click Here	None Found
RCRA-SQG-US	Resource Conservation and Recovery Act, Small Quantity Generators (aka RCRA SQG)	Federal RCRA Generators	Click Here	None Found
RCRA-TSDF-US	Resource Conservation and Recovery Act -, Treatment, Storage, and Disposal Facilities (aka RCRA TSD, RCRA TSDF)	Federal RCRA non-CORRACTS TSD	Click Here	None Found
RFG-Lab-US	Reformulated Gasoline (RFG)	ERS Supplemental Govt Sources	Click Here	None Found
RMP-US	Risk Management Plans	ERS Supplemental Govt Sources	Click Here	None Found
ROD-US	Records of Decision	ERS Supplemental Govt Sources	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
SAA-Agreements-US	Sites with Superfund Alternative Approach Agreements	Federal ASTM Other	Click Here	None Found
SDWIS-US	Safe Drinking Water Information System	ERS Supplemental Govt Sources	Click Here	None Found
South-East-CoalAsh-SC	Coal Ash Pond Boundaries	ERS Supplemental Govt Sources	Click Here	None Found
Spills-NC	Incident Spill Data (aka Incident Summary List)	Emergency Release Reports	Click Here	None Found
SSTS-US	Section 7 Tracking System	ERS Supplemental Govt Sources	Click Here	None Found
STC-NC	Scrap Tire Collection Centers	ERS Supplemental Govt Sources	Click Here	None Found
STH-NC	Scrap Tire Haulers	ERS Supplemental Govt Sources	Click Here	None Found
Stormwater-NC	Stormwater Permits	ERS Supplemental Govt Sources	Click Here	None Found
SWF-NC	Solid Waste Permitted Facilities	State/Tribal Landfill/Solid Waste	Click Here	None Found
SWLF-US	Solid Waste Facilities	Federal Solid Waste	Click Here	None Found
SWRCY-NC	Recycling Facilities Database (aka Recycling Center Listing)	State/Tribal ASTM Other Med	Click Here	None Found
Tribal-Air-US	Tribal Air Permitted Facilities	ERS Supplemental Govt Sources	Click Here	None Found
Tribal-LUST-Closed-Reg4	Tribal Leaking Underground Storage Tanks, Region 4, Closed Cases (aka Indian LUST)	Federal LUST	Click Here	None Found
Tribal-LUST-Closed-Reg9	Tribal Leaking Underground Storage Tanks, Region 9 (aka Indian Lust)	Federal LUST	Click Here	None Found
Tribal-LUST-Open-Reg10	Tribal Leaking Underground Storage Tanks (aka Indian LUST)	Federal LUST	Click Here	None Found
Tribal-LUST-Open-Reg4	Tribal Leaking Underground Storage Tanks, Region 4, Open Cases (aka Indian LUST)	Federal LUST	Click Here	None Found
Tribal-LUST-Open-Reg9	Tribal Leaking Underground Storage Tanks , Region 9 (aka Indian Lust)	Federal LUST	Click Here	None Found
Tribal-LUST-Reg1	Tribal Leaking Underground Storage Tanks (aka Indian LUST)	Federal LUST	Click Here	None Found
Tribal-LUST-Reg7	Tribal Leaking Underground Storage Tanks, Region 7 (aka Indian LUST)	Federal LUST	Click Here	None Found
Tribal-ODI-US	Tribal Open Dump Sites	Federal Solid Waste	Click Here	None Found

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ABREVIATION	DATABASE FULLNAME	DATABASE CATEGORY	DATABASE DETAILS LINK	TOTAL LISTINGS
Tribal-UST-Reg1	Tribal Underground Storage Tanks (aka INDIAN UST)	Federal UST	Click Here	None Found
Tribal-UST-Reg10	Tribal Underground Storage Tanks (aka Indian UST)	Federal UST	Click Here	None Found
Tribal-UST-Reg4	Tribal Underground Storage Tanks (aka INDIAN UST)	Federal UST	Click Here	None Found
Tribal-UST-Reg7	Tribal Underground Storage Tanks, Region 7 (aka UST)	Federal UST	Click Here	None Found
Tribal-UST-Reg9	Tribal Underground Storage Tanks (aka Tribal UST)	Federal UST	Click Here	None Found
Tribal-VCP-US	Tribal VCP	Federal Tribal VCP	Click Here	None Found
TRIS2000-US	Historical Toxics Release Inventory System	ERS Supplemental Govt Sources	Click Here	None Found
TRIS2010-US	Toxics Release Inventory System	ERS Supplemental Govt Sources	Click Here	None Found
TRIS80-US	Historical Toxics Release Inventory System	ERS Supplemental Govt Sources	Click Here	None Found
TRIS90-US	Historical Toxics Release Inventory System	ERS Supplemental Govt Sources	Click Here	None Found
TSCA-US	Toxics Substance Control Sites	ERS Supplemental Govt Sources	Click Here	None Found
UIC-NC	Underground Injection Control Wells	ERS Supplemental Govt Sources	Click Here	None Found
UMTRA-US	Historical Uranium Mill Tailings Remedial Action Sites	ERS Supplemental Govt Sources	Click Here	None Found
USGS-Waterwells-US	Ground Water Site Inventory	ERS Supplemental Govt Sources	Click Here	None Found
UST-NC	Underground Storage Tanks (aka Registered Tanks Database)	State/Tribal UST	Click Here	None Found
Vapor-Intrusions-US	Vapor Intrusion Database	ERS Supplemental Govt Sources	Click Here	None Found
VCP-NC	Voluntary Cleanup Program Sites (aka Voluntary Remedial Action Sites, Responsible Party Voluntary Action Sites)	State/Tribal Voluntary Cleanup Sites	Click Here	None Found
Water-CE-NC	Water Compliance and Enforcement	ERS Supplemental Govt Sources	Click Here	None Found
Wells-NC	North Carolina Wells	ERS Supplemental Govt Sources	Click Here	None Found

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UN-MAPPABLE OCCURRENCES

The following occurrences were not mapped primarily due to incomplete or inaccurate address information. All of the following occurrences were determined to share the same zip code as the area searched. General status information is given with each occurrence along with any address information entered by the agency responsible for the list.

ID	Facility Name	Address	Database	Status
No "un-mapped" sites requested.				

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APPENDIX C

ENVIRONMENTAL ACRONYMS AND DEFINITION

APPENDIX C

ENVIRONMENTAL ACRONYMS

AA.....Administering Agency
ACM .....Asbestos Containing Materials
AHERA.....Asbestos Hazard Emergency Response Act, 1986
AHM .....Acutely Hazardous Materials
AQMD .....Air Quality Management District
CEG.....Certified Engineering Geologist
CERCLA.....Comprehensive Environmental Response, Comprehensive Liability Act of 1980 (Federal Superfund), 42 USC 9601 et seq.
CERCLIS .....Comprehensive Environmental Response, Compensation,
.....and Liability Information System
CFR .....Code of Federal Regulations
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
EPA .....Environmental Protection Agency (Federal)
EPA #.....Generator # for RCRA manifesting
HMBP .....Hazardous Materials Business Plans, H&S Code 25504
HWIS……..Hazardous Waste Information System
LUFT.....Leaking Underground Fuel Tank
LUST.....Leaking Underground Storage Tank
MSDS.....Material Safety Data Sheet
NEPA .....National Environmental Policy Act
NIOSH .....National Institute for Occupational Safety & Health
NPDES.....National Pollution Discharge Elimination System (CWA)
NPL.....National Priority List (Federal Superfund)
OEA .....Office of Environmental Affairs
OSHA.....Occupational Safety and Health Administration (Federal)
PCB .....Polychlorinated biphenyl
POTW .....Publicly-Owned Treatment Works
ppb.....part per billion
ppm .....part per million
PRP .....Potentially Responsible Party (in Superfund site)
RAP.....Remedial Action Plan
RCRA.....Resource Conservation and Recovery Act
.....(Federal) 42 USC 6902, 40 CFR
R&D.....Research and Development
REA.....Registered Environmental Assessor
RG .....Registered Geologist
RI/FS .....Remedial Investigation/Feasibility Study
ROD .....Record of Decision (CERCLA)
RP.....Responsible Party (CERCLA) 42 UCF 9607(a)
RQ .....Reportable Quantity
.....(under DOT CERCLA and SARA Title III)

RWQCB.....Regional Water Quality Control Board
SARA.....Superfund amendments and Reauthorization Act of 1986
.....SARA Title III Emergency Preparedness and Community
.....Right-to-Know section
SB.....Senate Bill
SIC .....Standard Industrial Classification
.....(company description)
SOP .....Standard Operating Procedures
SWA.....Solid Waste Act (a/k/a RCRA)
SWMU .....Solid Waste Management Unit
TPCA .....Toxic Pits Cleanup Act H&S Code 25208 et seq.
TSCA .....Toxic Substance Control Act (Federal)
.....15 USC 2601 et seq.
TSD.....Treatment, Storage, and Disposal Facilities (permitted by RCRA) H&S Code
.....25123.3
TSDF.....Treatment, Storage, Disposal Facility (hazardous waste)
UBC .....Uniform Building Code
UFC.....Uniform Fire Code
UST.....Underground Storage Tank
UM .....Uniform Manifest
UST.....Underground Storage Tanks
VOC .....Volatile Organic Compound H&S 25123.6
WDR .....Waste Discharge Requirements
WWTP .....Wastewater Treatment Plant

REPORT SIGNATURE SHEET AND CERTIFICATION

The undersigned hereby certifies that:

The following people have prepared, written, and/or reviewed the Phase I Environmental Assessment Report. All the below parties have, in good faith, conducted their respective project responsibilities using that degree of care and skill ordinarily exercised by environmental consultants practicing in this or similar fields.

All parties have acted in good faith and have no known relationship with the subject site, owners, buyers, or any other entity associated with the subject site. All respective project responsibilities have been conducted independently, and with no conflict of interest.

The statements of fact contained in this report are true and correct based on materials reviewed.

The reported analyses, opinions, and conclusions are personal, unbiased, professional, and limited only by the assumptions and qualifications stated herein. Compensation is not contingent upon an action or an event resulting from the analyses, opinions, or conclusions included in this report. Nor is it contingent upon the use of this report.

The investigation has been performed in accordance with all applicable legal requirements and in accordance with accepted practices prevailing in the environmental assessment and asbestos consulting industries. The personnel who performed the investigation are properly licensed and certified in accordance with the requirements of all federal, state, and local laws, rules, and regulations.

I/We declare that, to the best of our professional knowledge and belief, I/we meet the definition of Environmental Professional as defined in §312.10 of this part.

I/We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I/We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

We have no present or prospective interest in the subject property or the parties involved.

If necessary, expert testimony and other legal appearances will be provided for a reasonable fee to be arranged.

Gregory J. Churchill, P.E.
President

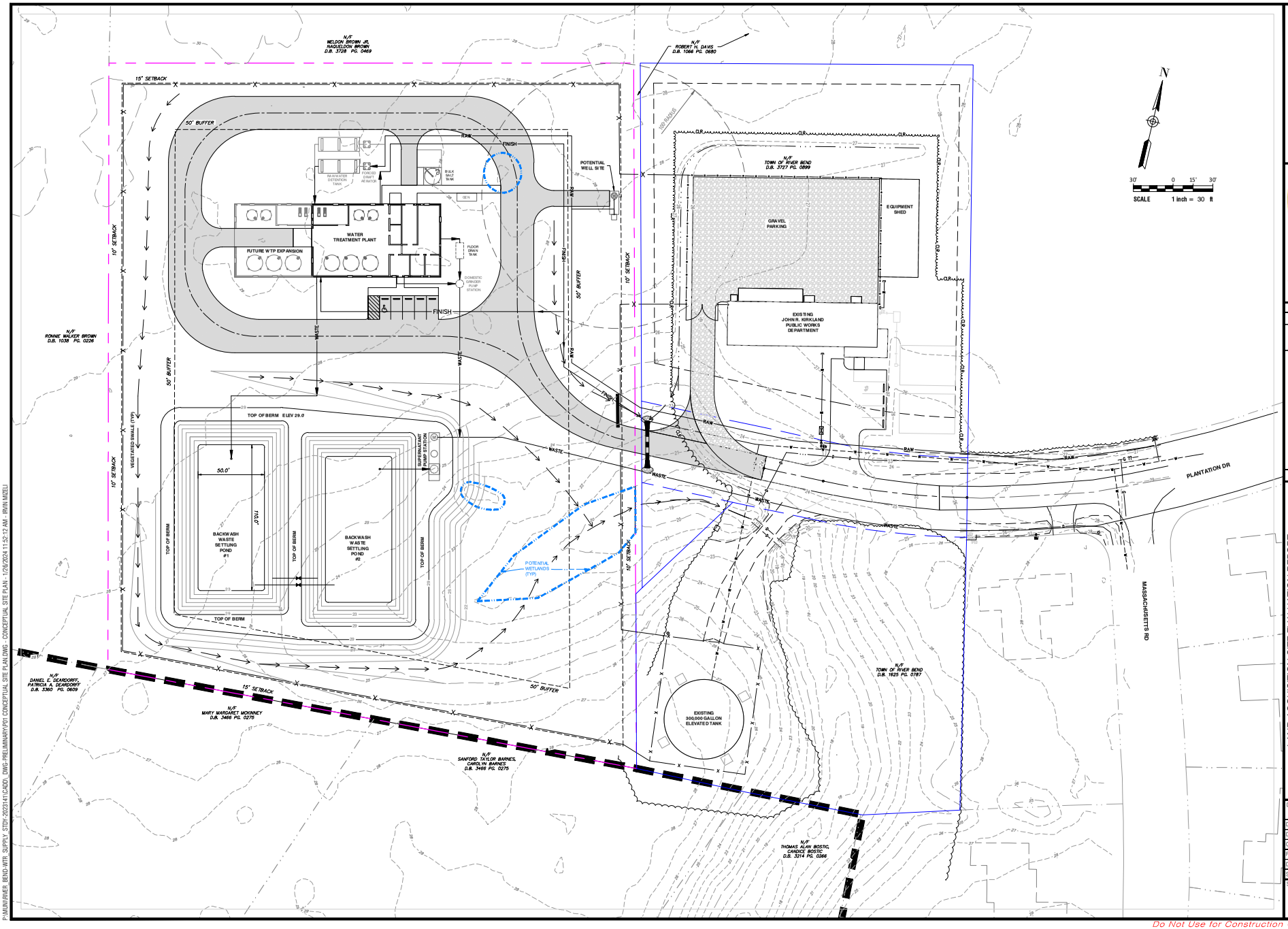
Haleigh Robinson
Planner

NORTH CAROLINA PROFESSIONAL SEAL 16744 ENGINEER GREGORY J. CHURCHILL

1-26-24

APPENDIX D

Conceptual Site Plan



Do Not Use for Construction - PRELIMINARY

P:\MUN\RIVER BEND\WTR SUPPLY STDY-2023141\CADD\DWG-PRELIMINARY\P01 CONCEPTUAL SITE PLAN.DWG - CONCEPTUAL SITE PLAN - 1/26/2024 11:52:12 AM - IRWIN MIZELL

NC License #2804
Rivers & Associates, Inc.
Engineers
Surveyors
Landscape Architects
Since 1916
107 East Second Street
Greenville, NC 27858
(252) 752-4135

TOWN OF RIVER BEND
NORTH CAROLINA
1981

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
GREGORY J. CHURCHILL
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS:

NO.	DESCRIPTION	DATE	BY

LAND ACQUISITION SITE EVALUATION REPORT
TOWN OF RIVER BEND
CITY COUNTY STATE

CONCEPTUAL SITE PLAN

DATE:	JANUARY 26, 2024
DESIGNED BY:	GJC
DRAWN BY:	JIM
CHECKED BY:	GJC
PROJECT No.	2023141
DRAWING No.	W-4153
SCALE:	AS NOTED
SHEET No.	P01

APPENDIX E

Site Photographs

SITE PHOTOS

Northwest corner (facing North)

Northwest corner (facing West)

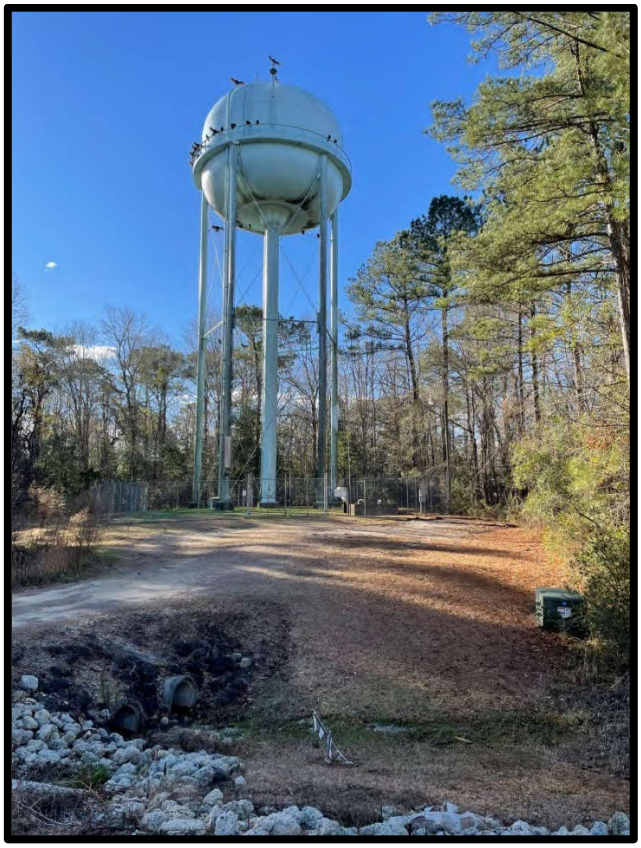
SITE PHOTOS (CONT.)

Southwest corner (facing South)

Southwest corner (facing West)

SITE PHOTOS (CONT.)

Town of River Bend Public Works Facility on Eastern Boundary



Town of River Bend Potable Water Elevated Storage Tank - Adjacent to Southeast Corner

SITE PHOTOS (CONT.)

Wetland Area

Wetland Area

SITE PHOTOS (CONT.)

Wetland Area

Soil Sampling Process for Wetland Area

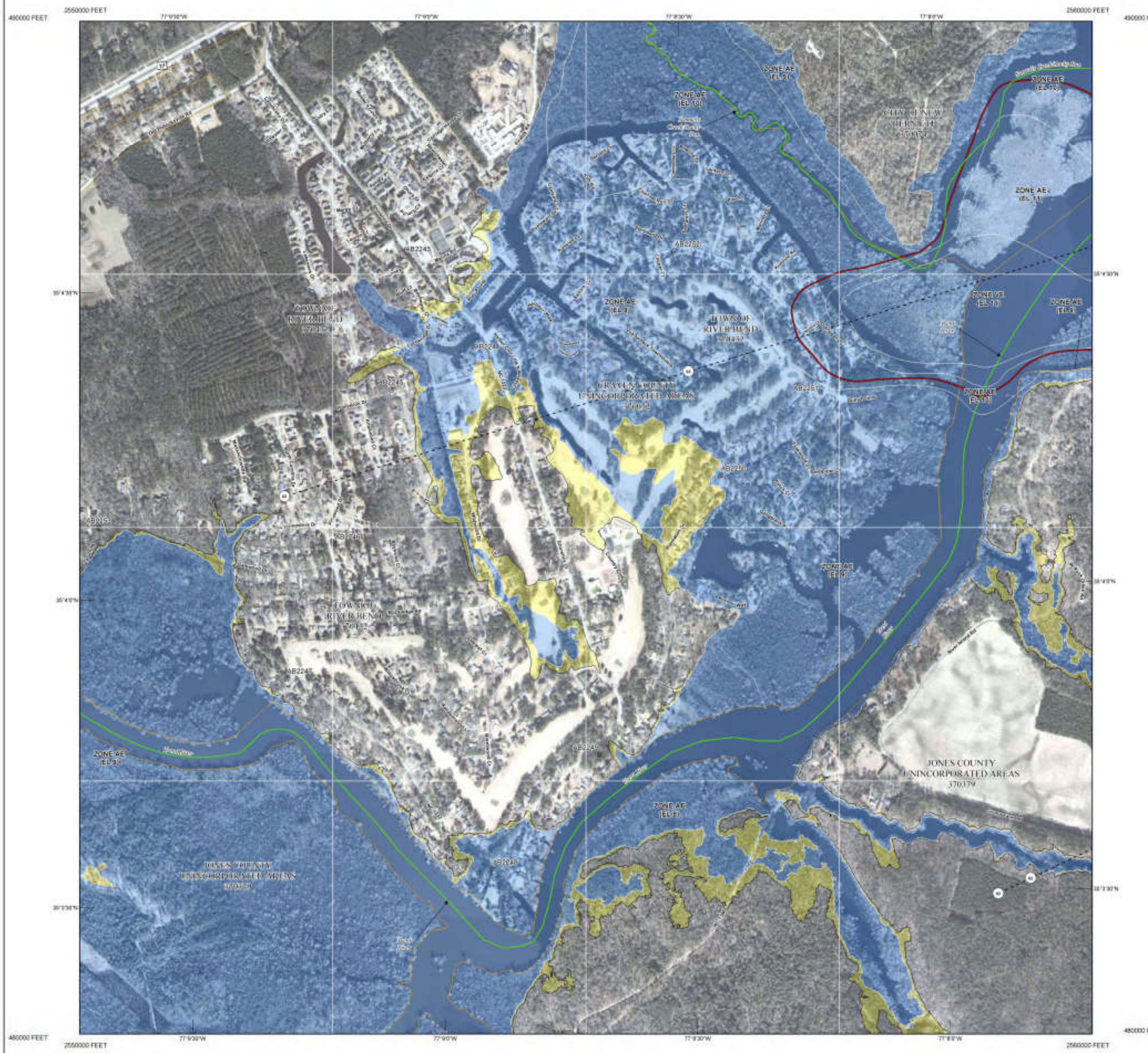
SITE PHOTOS (CONT.)

Soil Sampling Process

Internal Site View (Typical)

APPENDIX F

FEMA Effective Flood Insurance Rate Map



Cooperating Technical State

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map flood hazard areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://FRIS.NC.GOV/FRIS

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A,V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% Annual Chance Flood with Average Depth Less Than One Foot or With Drainage Areas of Less Than One Square Mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
OTHER AREAS	Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
	BM5510 North Carolina Geodetic Survey bench mark
	BM5510 National Geodetic Survey bench mark
	BM5510 Contractor Est. NCFMP Survey bench mark
	(012) 18.2 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	(8) Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at http://www.ncfloodmaps.com or contact the FEMA Map Service Center.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the North Carolina Floodplain Mapping Program (NCFMP). The source of this information can be determined from the metadata available in the digital FLOOD database and in the Technical Support Data Notebook (TSDN).

ACCREDITED LEVEE NOTES TO USERS: If an accredited levee note appears on this panel check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

PROVISIONALLY ACCREDITED LEVEE NOTES TO USERS: If a Provisionally Accredited Levee (PAL) note appears on this panel, check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection. To maintain accreditation, the levee owner or community is required to submit the data and documentation necessary to comply with Section 65.10 of the NFIP regulations. If the community or owner does not provide the necessary data and documentation or if the data and documentation provided indicates the levee system does not comply with Section 65.10 requirements, FEMA will revise the flood hazard and risk information for this area to reflect de-accreditation of the levee system. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

LIMIT OF MODERATE WAVE ACTION NOTES TO USERS: For some coastal flooding zones the AE Zone category has been divided by a Limit of Moderate Wave Action (LiMWA). The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The effects of wave hazards between the VE Zone and the LiMWA (or between the shoreline and the LiMWA for areas where VE Zones are not identified) will be similar to, but less severe than those in the VE Zone.

Limit of Moderate Wave Action (LiMWA)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE

This map may include approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see http://www.fws.gov/cbra, the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

CBRS Area

Otherwise Protected Area

SCALE

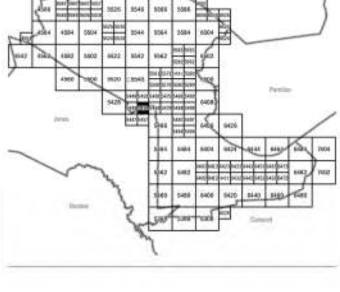
Map Projection:
North Carolina State Plane Projection Feet (Zone 3200)
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

PANEL LOCATOR



National Flood Insurance Program

FEMA

NORTH CAROLINA FLOODPLAIN MAPPING PROGRAM
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 5458

FEMA

Panel Contains:

COMMUNITY	CID	PANEL	SUFFIX
CRAVEN COUNTY	370072	5458	K
JONES COUNTY	370379	5458	K
NEW BERN, CITY OF	370074	5458	K
RIVER BEND, TOWN OF	370432	5458	K

VERSION NUMBER
2.3.3.2

MAP NUMBER
3720545800K

MAP REVISED
June 15, 2022

APPENDIX G

USGS Topographic Map

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

POLLOCKSVILLE QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 18S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, October 2020 - October 2020
Roads.....U.S. Census Bureau, 2016
Roads within US Forest Service Lands.....FSTopo Data with limited Forest Service updates, 2012
Names.....GNIS, 1980 - 2022
Hydrography.....National Hydrography Dataset, 2004 - 2018
Contours.....National Elevation Dataset, 2015 - 2015
Boundaries.....Multiple sources; see metadata file 2017 - 2021
Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
9°55'
177 MILS
1°15'
22 MILS

UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
TD UD
Grid Zone Designation 18S

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

NORTH CAROLINA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Cove City
2 Jasper
3 Askin
4 Trenton
5 New Bern
6 Jacksonville NE
7 Maysville
8 Catfish Lake

ADJOINING QUADRANGLES

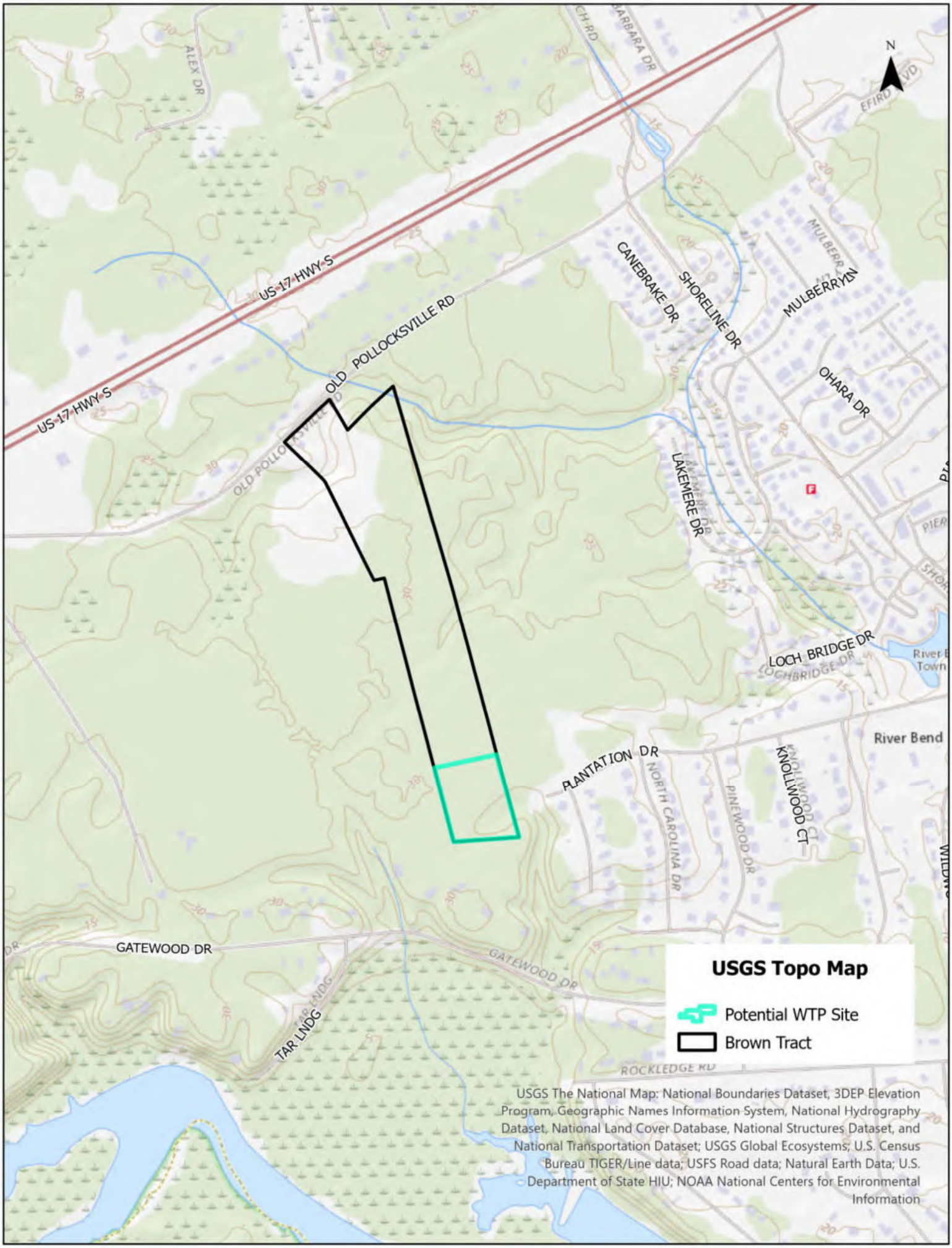
ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route
FS Primary Route
FS Passenger Route
FS High Clearance Route

Check with local Forest Service unit for current travel conditions and restrictions.

POLLOCKSVILLE, NC
2022

NSN 7643016347923
NOAREF NO.USGS2K34K35898


N
US-17-HWY-S
US-17-HWY-S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
MULBERRY DR
OHARA DR
LAKEMERE DR
LOCH BRIDGE DR
River Bend
PLANTATION DR
NORTH CAROLINA DR
PINEWOOD DR
KNOLLWOOD CT
GATEWOOD DR
TAR LNDG
ROCKLEDGE RD
USGS Topo Map
Potential WTP Site
Brown Tract
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information

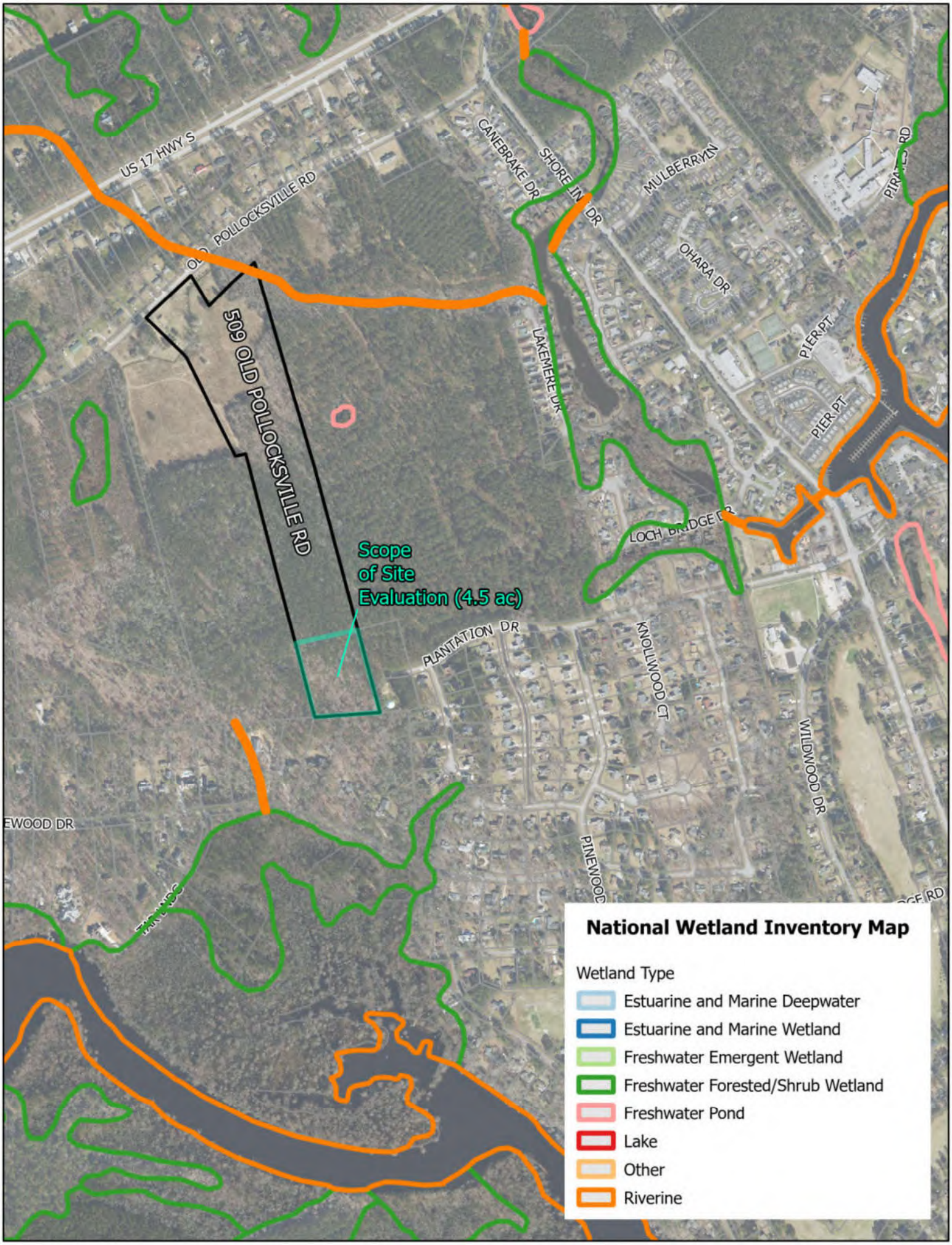
APPENDIX H

Craven County Soils Map

(Joins sheet 8)
(Joins sheet 1)
Hayward Creek
Rocky Run
Rhems
TRENT
RIVER
Potential WTP Site
(Approximate Location)

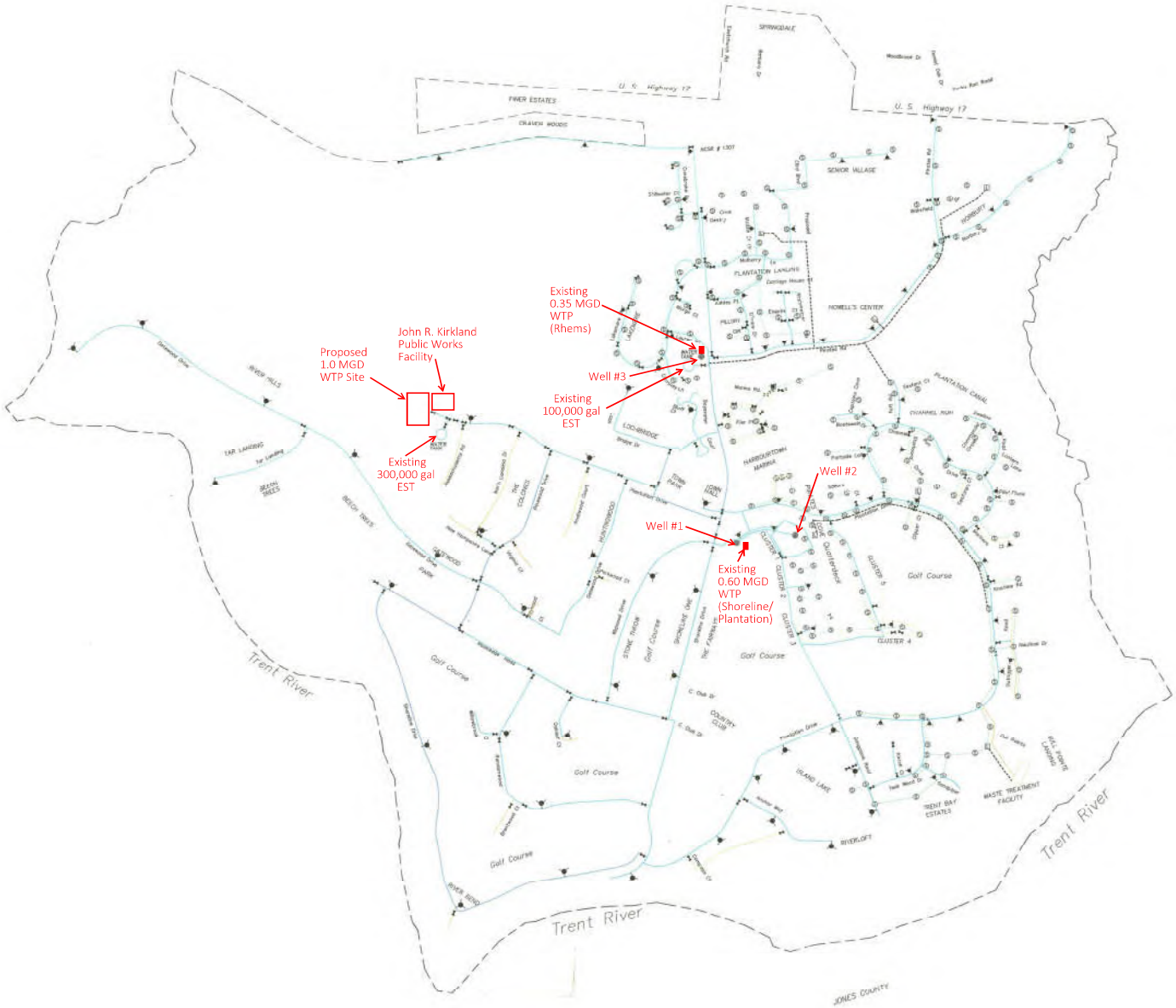
APPENDIX I

National Wetlands Inventory Map


US 17 HWY S
OLD POLLOCKSVILLE RD
CANEBRAKE DR
SHORELINE DR
MULBERRYLN
OHARA DR
PIER PT
PIER PT
LAKEMERE DR
LOCH BRIDGE DR
509 OLD POLLOCKSVILLE RD
Scope
of Site
Evaluation (4.5 ac)
PLANTATION DR
KNOLLWOOD CT
WILDWOOD DR
PINEWOOD
National Wetland Inventory Map
Wetland Type
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine

APPENDIXJ

Existing Water System Map



6" WATER MAIN
6" WATER MAIN
8" WATER MAIN
8" GRAVITY SEWER
SEWER FORCE MAIN
VALVE
HYDRANT
SEWER MANHOLE
LIFT STATION
WATER TOWER
WELL
Water Treatment Plant

NO.	DESCRIPTION	DATE

Revisions

Town of River Bend Water System

Preliminary
NOT FOR RECORDATION, SALE OR CONVEYANCE

GRAPHIC SCALE
(IN FEET)
1 inch = 500 ft.

PROJECT NO. 05017
SCALE: AS NOTED
DRAWN BY: TDM
CHECKED BY: JKA
DATE:

AVOLIS ENGINEERING, P.A.
Civil and Environmental Engineers
PO BOX 15564, NEW BERN, NC 28561
(252)633-0068, FAX (252)633-6507

AS-BUILT WATER AND SEWER SYSTEM
TOWN OF RIVER BEND
CRAVEN COUNTY, NORTH CAROLINA
OVERALL EXISTING CONDITIONS

C1

05017C1.DWG

APPENDIX K

2022 Local Water Supply Plan

River Bend

2022

The Division of Water Resources (DWR) provides the data contained within this Local Water Supply Plan (LWSP) as a courtesy and service to our customers. DWR staff does not field verify data. Neither DWR, nor any other party involved in the preparation of this LWSP attests that the data is completely free of errors and omissions. Furthermore, data users are cautioned that LWSPs labeled **PROVISIONAL** have yet to be reviewed by DWR staff. Subsequent review may result in significant revision. Questions regarding the accuracy or limitations of usage of this data should be directed to the water system and/or DWR.

1. System Information

Complete

Contact Information

Water System Name:	River Bend	PWSID:	04-25-113
Mailing Address:	45 Shoreline Drive River Bend, NC 28562	Ownership:	Municipality
Contact Person:	Brandon Mills	Title:	Public Works Director
Phone:	252-638-3540	Cell/Mobile:	252-617-2893

Distribution System

Line Type	Size Range (Inches)	Estimated % of lines
Ductile Iron	6-8	2.00 %
Polyvinyl Chloride	2-8	98.00 %

What are the estimated total miles of distribution system lines? 19 Miles

How many feet of distribution lines were replaced during 2022? 0 Feet

How many feet of new water mains were added during 2022? 0 Feet

How many meters were replaced in 2022? 673

How old are the oldest meters in this system? 22 Year(s)

How many meters for outdoor water use, such as irrigation, are not billed for sewer services? 6

What is this system's finished water storage capacity? 0.4000 Million Gallons

Has water pressure been inadequate in any part of the system since last update? *Line breaks that were repaired quickly should not be included.* No

Programs

Does this system have a program to work or flush hydrants? Yes, Annually

Does this system have a valve exercise program? Yes, Annually

Does this system have a cross-connection program? Yes

Does this system have a program to replace meters? Yes

Does this system have a plumbing retrofit program? No

Does this system have an active water conservation public education program? Yes

Does this system have a leak detection program? No

Water Conservation

What type of rate structure is used? Uniform

How much reclaimed water does this system use? 0.0000 MGD For how many connections? 0

Does this system have an interconnection with another system capable of providing water in an emergency? No

2. Water Use Information

Service Area

Sub-Basin(s)	% of Service Population	County(s)	% of Service Population
Trent River (10-3)	100 %	Craven	100 %

What was the year-round population served in 2022? 2,703

Has this system acquired another system since last report? No

Water Use by Type

Type of Use	Metered Connections	Metered Average Use (MGD)	Non-Metered Connections	Non-Metered Estimated Use (MGD)
Residential	1,477	0.1420	0	0.0000
Commercial	14	0.0180	0	0.0000
Industrial	0	0.0000	0	0.0000
Institutional	1	0.0100	0	0.0000

How much water was used for system processes (backwash, line cleaning, flushing, etc.)? 0.0700 MGD

3. Water Supply Sources

Monthly Withdrawals & Purchases

	Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)		Average Daily Use (MGD)	Max Day Use (MGD)
Jan	0.2801	0.4650	May	0.2979	0.6850	Sep	0.2835	0.4450
Feb	0.2648	0.4070	Jun	0.3238	0.6160	Oct	0.2923	0.4860
Mar	0.2721	0.4270	Jul	0.2739	0.3710	Nov	0.2519	0.3870
Apr	0.3021	0.7030	Aug	0.2762	0.3930	Dec	0.2812	0.4840

Ground Water Sources

Name or Number	Average Daily Withdrawal (MGD)		Max Day Withdrawal (MGD)	12-Hour Supply (MGD)	CUA Reduction	Year Offline	Use Type
	MGD	Days Used					
1	0.1491	356	0.3870	0.3675	CUA0		Regular
2	0.0518	360	0.1200	0.2625	CUA0		Regular
3	0.0871	364	0.2620	0.3675	CUA0		Regular

Ground Water Sources (continued)

Name or Number	Well Depth (Feet)	Casing Depth (Feet)	Screen Depth (Feet)		Well Diameter (Inches)	Pump Intake Depth (Feet)	Metered?
			Top	Bottom			
1	105		77	105	8	85	Yes
2	110		81	110	6	65	Yes
3	103		90	103	8	85	Yes

Are ground water levels monitored? Yes, Monthly

Does this system have a wellhead protection program? Yes

Water Treatment Plants

Plant Name	Permitted Capacity (MGD)	Is Raw Water Metered?	Is Finished Water Ouput Metered?	Source
River Bend WTP	0.3500	Yes	No	Well #3
River Bend WTP	0.6000	Yes	No	Wells 1 and 2

Did average daily water production exceed 80% of approved plant capacity for five consecutive days during 2022? No

If yes, was any water conservation implemented?

Did average daily water production exceed 90% of approved plant capacity for five consecutive days during 2022? No

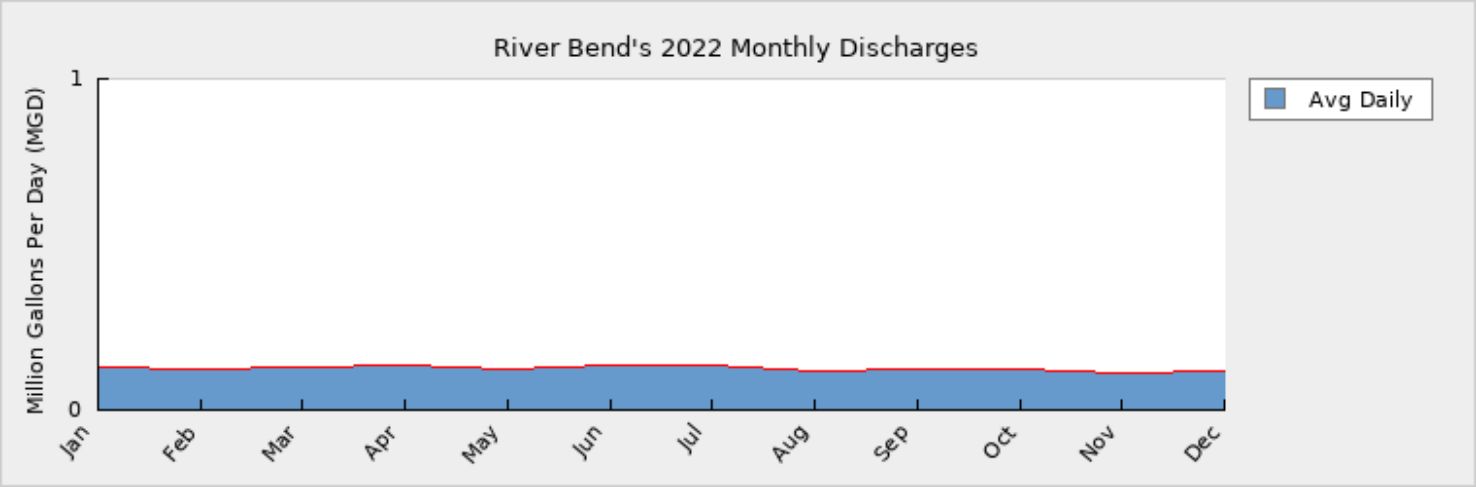
If yes, was any water conservation implemented?

Are peak day demands expected to exceed the water treatment plant capacity in the next 10 years? No

4. Wastewater Information

Monthly Discharges

	Average Daily Discharge (MGD)		Average Daily Discharge (MGD)		Average Daily Discharge (MGD)
Jan	0.1300	May	0.1230	Sep	0.1230
Feb	0.1210	Jun	0.1350	Oct	0.1260
Mar	0.1270	Jul	0.1360	Nov	0.1110
Apr	0.1370	Aug	0.1180	Dec	0.1170



How many sewer connections does this system have? 930

How many water service connections with septic systems does this system have? 497

Are there plans to build or expand wastewater treatment facilities in the next 10 years? No

Wastewater Permits

Permit Number	Type	Permitted Capacity (MGD)	Design Capacity (MGD)	Average Annual Daily Discharge (MGD)	Maximum Day Discharge (MGD)	Receiving Stream	Receiving Basin
NC0030406	WWTP	0.3300	0.3300	0.1090	0.3160	Trent River	Trent River (10-3)
NC0086797	WTP	0.0270	0.0270	0.0170	0.0260	Plantation Canal	Trent River (10-3)

5. Planning

Projections

	2022	2030	2040	2050	2060	2070
Year-Round Population	2,703	2,709	2,736	2,796	2,883	2,994
Seasonal Population	0	0	0	0	0	0
Residential	0.1420	0.1421	0.1435	0.1466	0.1512	0.1570
Commercial	0.0180	0.0200	0.0200	0.0200	0.0200	0.0200
Industrial	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Institutional	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100
System Process	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700
Unaccounted-for	0.0434	0.0420	0.0422	0.0428	0.0436	0.0447

Demand v/s Percent of Supply

	2022	2030	2040	2050	2060	2070
Surface Water Supply	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ground Water Supply	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Purchases	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Future Supplies		0.0000	0.0000	0.0000	0.0000	0.0000
Total Available Supply (MGD)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Service Area Demand	0.2834	0.2841	0.2857	0.2894	0.2948	0.3017
Sales	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Future Sales		0.0000	0.0000	0.0000	0.0000	0.0000
Total Demand (MGD)	0.2834	0.2841	0.2857	0.2894	0.2948	0.3017
Demand as Percent of Supply	0%	0%	0%	0%	0%	0%

The purpose of the above chart is to show a general indication of how the long-term per capita water demand changes over time. The per capita water demand may actually be different than indicated due to seasonal populations and the accuracy of data submitted. Water systems that have calculated long-term per capita water demand based on a methodology that produces different results may submit their information in the notes field.

Your long-term water demand is 53 gallons per capita per day. What demand management practices do you plan to implement to reduce the per capita water demand (i.e. conduct regular water audits, implement a plumbing retrofit program, employ practices such as rainwater harvesting or reclaimed water)? If these practices are covered elsewhere in your plan, indicate where the practices are discussed here.

Are there other demand management practices you will implement to reduce your future supply needs?

What supplies other than the ones listed in future supplies are being considered to meet your future supply needs?

How does the water system intend to implement the demand management and supply planning components above?

Additional Information

Has this system participated in regional water supply or water use planning? No

What major water supply reports or studies were used for planning?

Please describe any other needs or issues regarding your water supply sources, any water system deficiencies or needed improvements (storage, treatment, etc.) or your ability to meet present and future water needs. Include both quantity and quality considerations, as well as financial, technical, managerial, permitting, and compliance issues:

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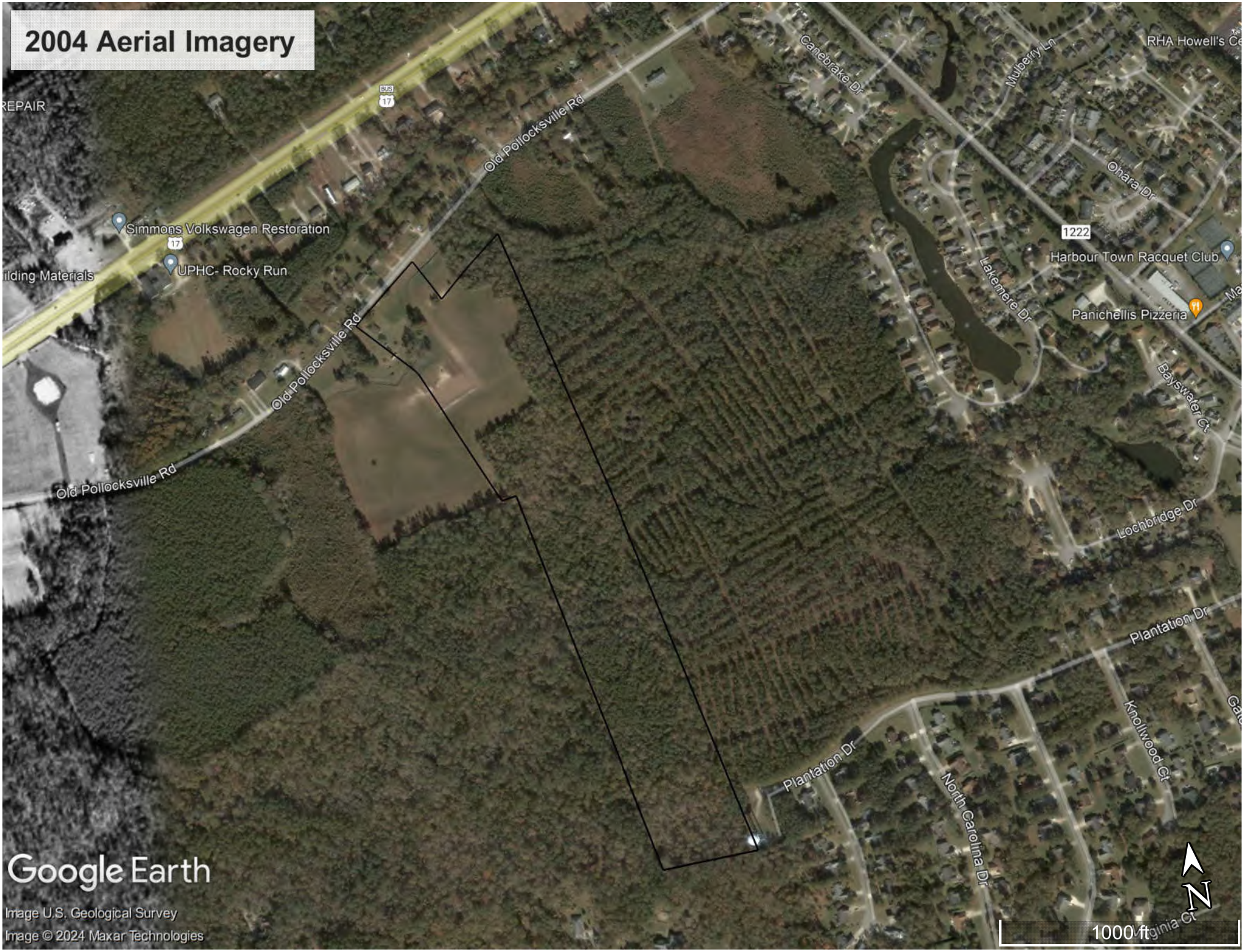
APPENDIX L

Historical Aerial Photographs

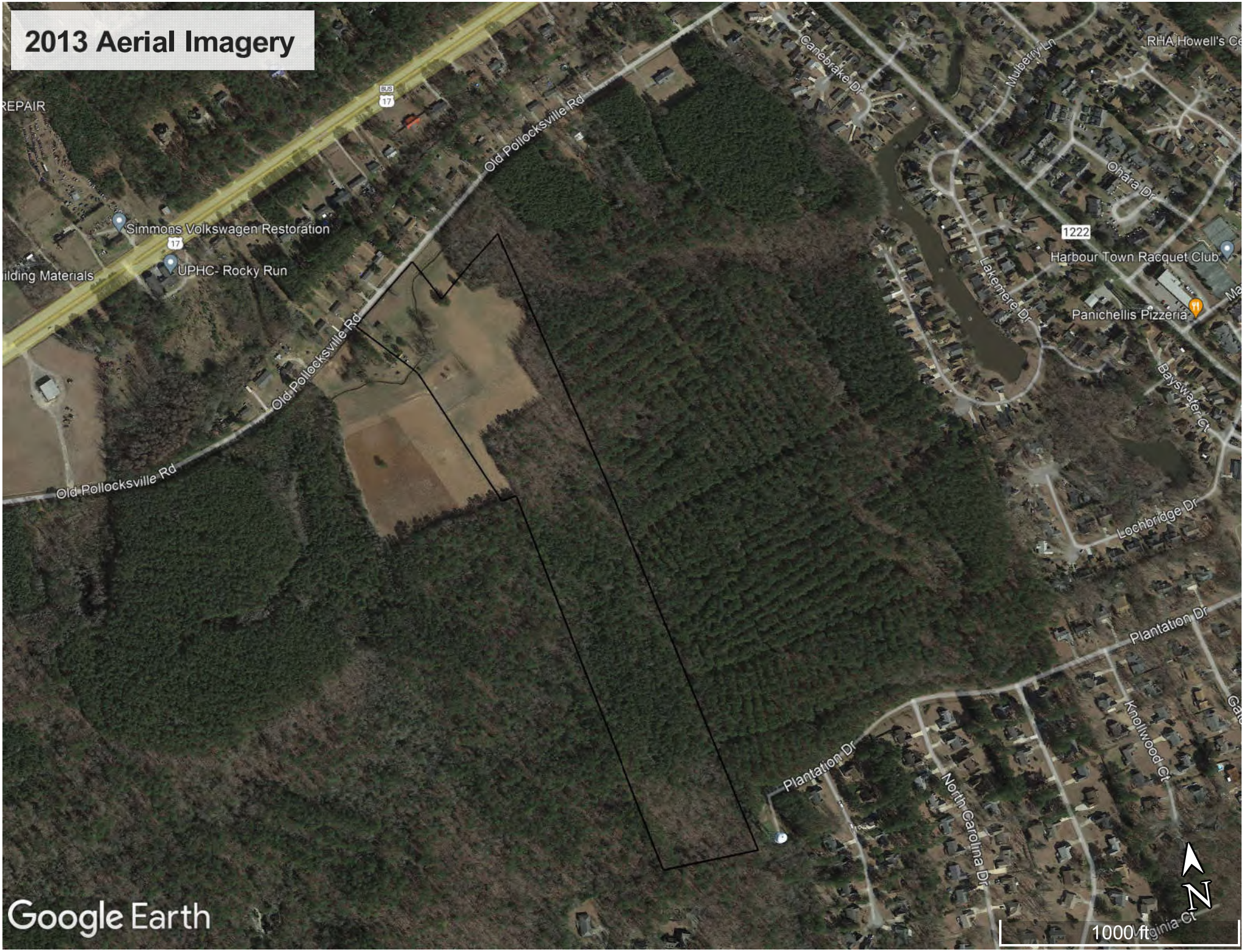
1993 Aerial Imagery
REPAIR
BUS 17
17
Old Pollocksville Rd
Simmons Volkswagen Restoration
UPHC- Rocky Run
ilding Materials
Old Pollocksville Rd
Old Pollocksville Rd
Canebrake Dr
Mulberry Ln
RHA Howell's Ce
Ohara Dr
1222
Harbour Town Racquet Club
Lakemere Dr
Panichellis Pizzeria
Baywater Ct
Lochbridge Dr
Plantation Dr
Plantation Dr
Knollwood Ct
North Carolina Dr
Google Earth
Image U.S. Geological Survey
N
1000 ft

1998 Aerial Imagery

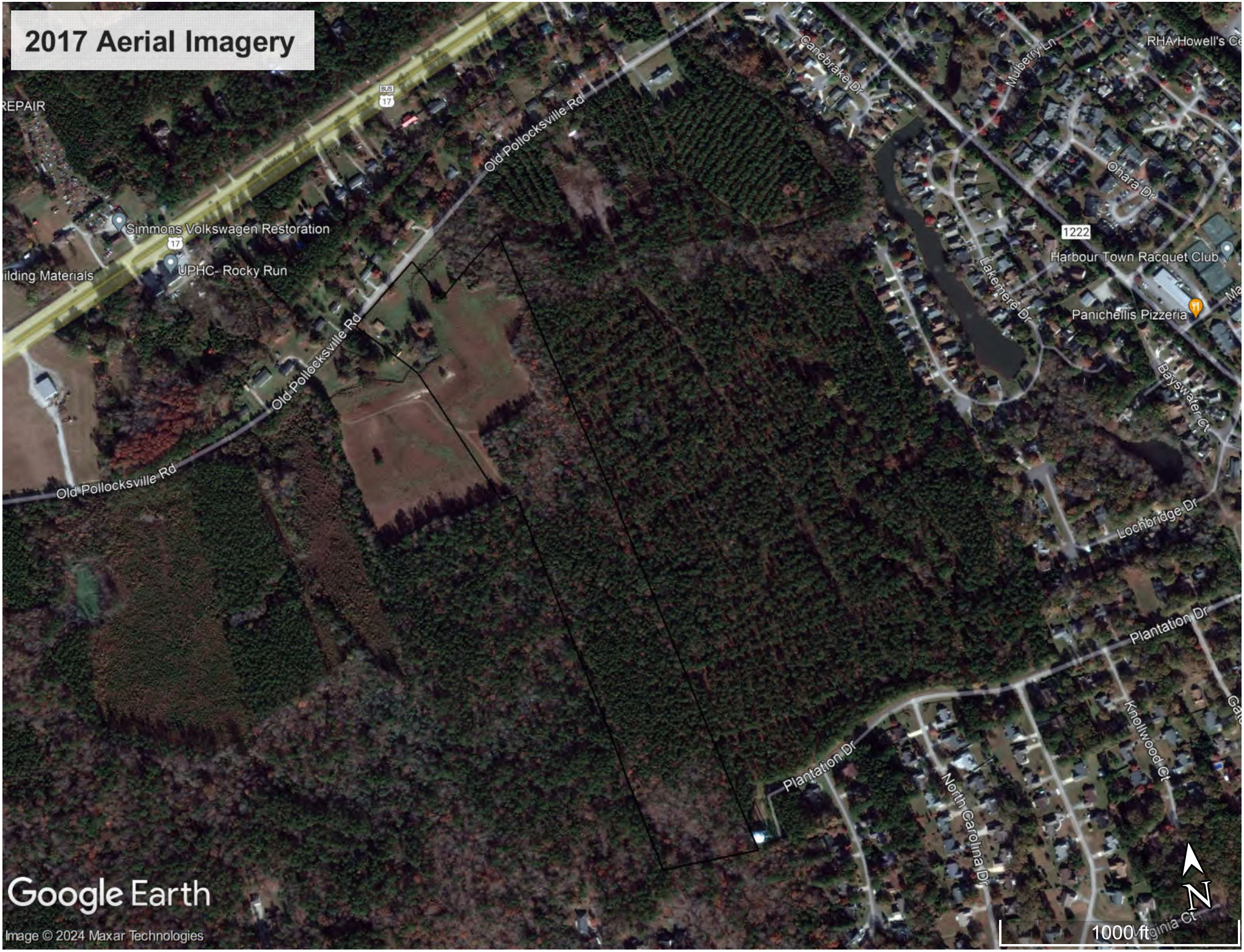
2004 Aerial Imagery



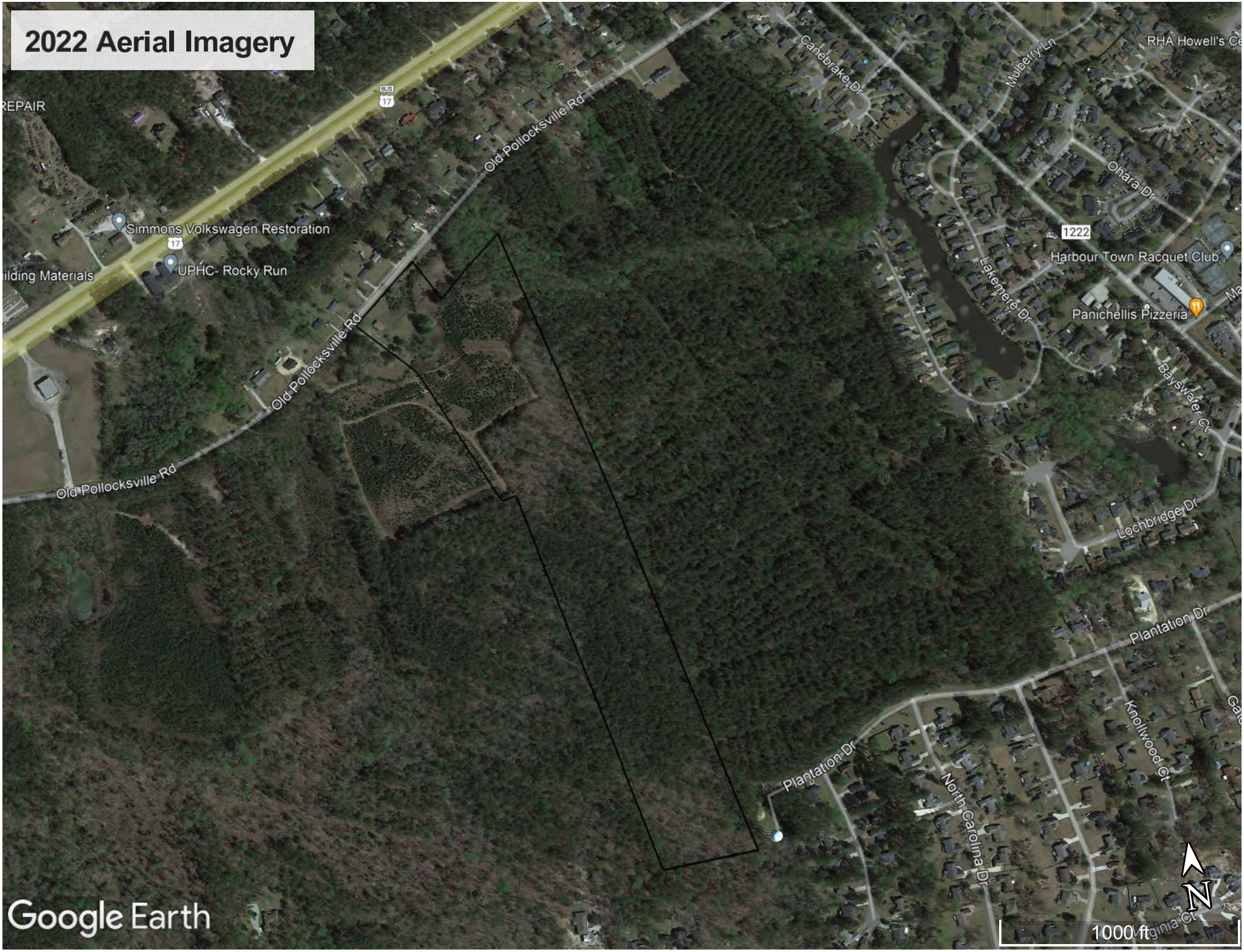
2009 Aerial Imagery
REPAIR
Simmons Volkswagen Restoration
UPHC- Rocky Run
ilding Materials
Old Pollocksville Rd
Old Pollocksville Rd
Old Pollocksville Rd
Canebrake Dr
Mulberry Ln
RHA Howell's Ce
Ohara Dr
1222
Harbour Town Racquet Club
Lakemere Dr
Panichellis Pizzeria
Bayswater Ct
Lochbridge Dr
Plantation Dr
Plantation Dr
Knollwood Ct
North Carolina Dr
Google Earth
Image USDA/FPAC/GEO
N
1000 ft


2013 Aerial Imagery
REPAIR
Simmons Volkswagen Restoration
UPHC- Rocky Run
ilding Materials
Old Pollocksville Rd
Old Pollocksville Rd
Old Pollocksville Rd
Canebrake Dr
Mulberry Ln
RHA Howell's Ce
Ohara Dr
1222
Harbour Town Racquet Club
Lakemere Dr
Panichellis Pizzeria
Bayswater Ct
Lochbridge Dr
Plantation Dr
Plantation Dr
Knollwood Ct
North Carolina Dr
Google Earth
N
1000 ft

2017 Aerial Imagery



2022 Aerial Imagery



APPENDIX M

Soil Resource Report

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Craven County, North Carolina

Potential River Bend WTP Site

January 12, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface..... 2
How Soil Surveys Are Made.....5
Soil Map..... 8
Soil Map.....9
Legend.....10
Map Unit Legend..... 11
Map Unit Descriptions.....11
Craven County, North Carolina..... 13
GoA—Goldsboro loamy fine sand, 0 to 2 percent slopes..... 13
On—Onslow loamy sand.....14
References.....16

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Craven County, North Carolina
Survey Area Data: Version 27, Sep 13, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 9, 2022—Jun 5, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GoA	Goldsboro loamy fine sand, 0 to 2 percent slopes	3.9	86.5%
On	Onslow loamy sand	0.6	13.5%
Totals for Area of Interest		**4.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Craven County, North Carolina

GoA—Goldsboro loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 3wfs
Elevation: 20 to 330 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 200 to 280 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Goldsboro and similar soils: 90 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goldsboro

Setting

Landform: Broad interstream divides on marine terraces, flats on marine terraces
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy marine deposits

Typical profile

Ap - 0 to 10 inches: loamy fine sand
BE - 10 to 13 inches: fine sandy loam
Bt - 13 to 72 inches: sandy clay loam
Cg - 72 to 80 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F153BY040NC - Moist Loamy Rises and Flats, F153AY040NC - Moist Loamy Rises and Flats
Hydric soil rating: No

Minor Components

Rains, undrained

Percent of map unit: 5 percent

Landform: Broad interstream divides on marine terraces, carolina bays on marine terraces, flats on marine terraces
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions, F153BY060NC - Wet Loamy Flats and Depressions
Hydric soil rating: Yes

Muckalee, undrained
Percent of map unit: 1 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F153BY090NC - Flooded Mineral Soil Floodplains and Terraces, F153AY090NC - Flooded Mineral Soil Floodplains and Terraces
Hydric soil rating: Yes

On—Onslow loamy sand

Map Unit Setting
National map unit symbol: 3wgg
Elevation: 20 to 330 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 200 to 280 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Onslow and similar soils: 90 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Onslow

Setting
Landform: Flats on marine terraces, broad interstream divides on marine terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy and sandy marine deposits

Typical profile
A - 0 to 4 inches: loamy fine sand
E/Bh - 4 to 20 inches: loamy fine sand
Bt - 20 to 68 inches: sandy clay loam
Cg - 68 to 80 inches: sandy loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F153AY040NC - Moist Loamy Rises and Flats, F153BY040NC - Moist Loamy Rises and Flats
Hydric soil rating: No

Minor Components

Rains, undrained

Percent of map unit: 5 percent
Landform: Broad interstream divides on marine terraces, carolina bays on marine terraces, flats on marine terraces
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F153AY060NC - Wet Loamy Flats and Depressions, F153BY060NC - Wet Loamy Flats and Depressions
Hydric soil rating: Yes

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APPENDIX N

U.S. Fish & Wildlife Service
Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To: January 17, 2024
Project Code: 2024-0037220
Project Name: Town of River Bend WTP

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

- Marine Mammals

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
(919) 856-4520

PROJECT SUMMARY

Project Code: 2024-0037220
Project Name: Town of River Bend WTP
Project Type: Water Supply Facility - New Constr
Project Description: The project site is approximately 4.5 acres located near the western terminus of Plantation Drive to construct a new 1.0 MGD municipal Water Treatment Plant to serve customers of the Town of River Bend. Preliminary evaluation, final design, permitting and construction is expected to be accomplished over the next several years.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.0710004,-77.15838431805776,14z

Counties: Craven County, North Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

BIRDS

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Red-cockaded Woodpecker *Picoides borealis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

NAME	STATUS
American Alligator *Alligator mississippiensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered

AMPHIBIANS

NAME	STATUS
Neuse River Waterdog *Necturus lewisi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6772	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Rough-leaved Loosestrife *Lysimachia asperulaefolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2747	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

MARINE MAMMALS

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

---

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME
West Indian Manatee *Trichechus manatus* Species profile: https://ecos.fws.gov/ecp/species/4469

IPAC USER CONTACT INFORMATION

Agency: River Bend town
Name: Greg Churchill
Address: 107 E. Second Street
City: Greenville
State: NC
Zip: 27834
Email gchurchill@riversandassociates.com
Phone: 2527524135

LEAD AGENCY CONTACT INFORMATION

Lead Agency: North Carolina Department of Environmental Quality

APPENDIX

L

Craven County Tax Parcel Map

Craven County GIS Town of River Bend Proposed WTP Site

1 inch = 247 feet

N

Craven County does NOT warrant the information shown on this map and should be used ONLY for tax assessment purposes. Printed on September 15, 2024 at 7:44:29 PM

Craven County Geographic Information System

Craven County does NOT warrant the information shown on this page and should be used ONLY for tax assessments purposes. Page generated on 9/15/2024 at 7:44:48 PM

PARCEL ID : 8-200 -29000

Owner :	RIVER BEND-TOWN OF		
Mailing Address :	45 SHORELINE DR NEW BERN, NC 28562		
Address of Property :	PLANTATION DR		
Subdivision :			
Property Description :	TRACT 2 SURVEY FOR TOWN OF RIVER BEND WATER TREATMENT PLANT		
Assessed Acreage :	4.24		
Deed Book Page :	3801 0554	**Deed Recording Date :**	6 7 2024
Land Value :	$43,920	**Recorded Survey :**	J - 85 - A
Total Improvement(s) Value :	$0	**Life Estate Deed :**	
Total Assessed Value :	$43,920	**Estate File Year-E-Folder :**	
Number of Improvements:	0	**Tax Exempt :**	Yes
City Name :	RIVER BEND	**Fire Tax District :**	
Drainage District :		**Lot Dimension :**	
Special District :		**Land Use :**	VACANT - TRACT SUITABLE FOR RESIDENTIAL DEVELOPMENT

Recent Sales Information

Sale Date Deed	Seller Name	Buyer Name	Type of Sale	Sale Price
6/7/2024 3801-0554	BROWN, WELDON JR & BROWN, NAQUELDON	RIVER BEND-TOWN OF	MULTI-PARCEL SALE-2 OR MORE PA	$170,000

Buildings or improvements where not found on this parcel.

APPENDIX

M

Town of River Bend
NCDEQ DWI Revised Letter of Intent to Fund (LOIF)

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
SHADI ESKAF
Director

NORTH CAROLINA
Environmental Quality

July 1, 2024

Mr. Delane Jackson, Town Manager
Town of River Bend
45 Shoreline Drive
River Bend, NC 28562

Subject: REVISED Letter of Intent to Fund
S.L. 2023-134 Appropriations Act Directed Project
Water Treatment Improvements
DWI Project No.: SRP-D-134-0033

Dear Mr. Jackson:

The Division of Water Infrastructure (Division) has received your *Request for Funding* for the aforementioned project for up to $9,252,105 from the Drinking Water/Wastewater State Reserve as established in Session Law (S.L.) 2023-134 and amended in S.L. 2024-1 (hereinafter referred to simply as S.L. 2023-134). Projects funded from the State Reserve must meet applicable State laws and guidance for expenditure of these funds. The following table shows total S.L. 2023-134 appropriations for your local government excluding the Department's administrative fee as amended in S.L. 2024-1, awarded projects and their funding amounts identified to date, and any remaining unobligated appropriations at the time of this letter.

S.L. 2023-134 Appropriations Act Approved Projects

S.L. 2023-134 Approved Projects for S.L. 2023-134 Section 12.2.(e) Line # 151 Appropriation		
Appropriated Funds Available for Projects (excluding administrative costs)		$9,252,105
Project Name	Project Number	Maximum Funding Amount
Water Treatment Improvements	SRP-D-134-0033	$9,252,105
Total Appropriations requested		$9,252,105
Total Appropriations remaining		$0

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The first milestone for this project is the submittal of a bid-and-design package by **April 1, 2025**. Please note that this intent to fund is contingent on meeting all the following milestones:

Milestone	Milestone Date*
Apply for all Necessary Permits**	ASAP
Bid-and-Design/Permit Package Submittal	April 1, 2025
Bid-and-Design Package Approval	August 1, 2025
Advertise Project, Receive Bids, Submit Bid Information, and Receive Authority to Award	December 1, 2025
Execute Construction Contract(s)	January 31, 2026

* Milestone dates only apply to the S.L. 2023-134 portion of funding.
**An engineering alternatives analysis (EAA) may be required on certain projects. See: https://deq.nc.gov/about/divisions/water-resources/water-quality-permitting/npdes-wastewater/permitting-process

The Division will consider milestone timeline modification including extensions provided that appropriate justification for granting extension is provided.

Environmental Review Requirements
The State Environmental Policy Act exempts projects funded by the State Reserve (such as this project) from state-mandated environmental review. Federal requirements may still apply. [North Carolina General Statute (NC G.S.) 113A-12.(2).(h)]

Drought Bill Requirements
In accordance with NC G.S. 143-355.4, a project "for the purpose of extending waterlines or expanding water treatment capacity" must document numerous requirements during the review process. You can find additional information at the following link:
ncleg.net/enactedlegislation/statutes/html/bysection/chapter_143/gs_143-355.4.html

Permitting
The NC Department of Environmental Quality (DEQ) is committed to providing efficient permit processing for your S.L. 2023-134 project(s). To better serve you, we would appreciate your assistance in telling us the type of DEQ permit(s) you will need and the timeframe of permit application(s) submittal. Please complete the online form at the following link:
https://app.smartsheet.com/b/form/bb0d7d19b4024a548b8d1c97cdad0cd8.

When applying for a permit(s), attach a copy of this letter to your permit application(s) and denote your DWI assigned project number on the permit application if asked. If you do not know the type of permit(s) your project may require, we offer a free permit assistance service to address any questions you may have about potential permitting requirements, pitfalls, fees, and timelines. If interested, please complete our online form at https://deq.nc.gov/permits-rules/permit-assistance-and-guidance/permit-assistance-request-form.

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Disbursement of Funds:
These funds will be disbursed to the local government unit after relevant costs are incurred by the local government and invoices are submitted to the Division. Up to 15% of the funds available for the project may be disbursed after costs are incurred during the pre-construction stage to cover design and planning costs. The remainder will be disbursed as invoices for incurred pre-construction and construction costs are submitted by the local government during construction, which may be submitted prior to or after paying the contractors for the incurred costs. Only costs eligible under NC G.S. 159G may be covered by these funds. Projects must be administered in accordance with all applicable federal law and guidance, as well as North Carolina statutes.

Electronic Document Submittal:
Recipients should submit all project documents via the supporting documentation submittal form located at https://edocs.deq.nc.gov/Forms/DW-Document-Upload-Form. The use of this form provides more seamless document tracking, processing, filing, accessibility, and security via our electronic document repository, Laserfiche. The link and a list of frequently asked questions can also be accessed from the Division's I Have Funding page, https://www.deq.nc.gov/about/divisions/water-infrastructure/i-have-funding.

Upon detailed review of the project during the funding process, it may be determined that portions of your project are not eligible for funding. If you have any questions concerning this matter or require general assistance, please contact the Division's project manager assigned to your project: Dustin Rhodes, P.E., either by telephone at 919.707.3888 or by e-mail at dustin.rhodes@deq.nc.gov.

Sincerely,

DocuSigned by:
Shadi Eskaf
6385A872077B4C5...
Shadi Eskaf, Director
Division of Water Infrastructure

cc: Delane Jackson, Town Manager, Town of River Bend (manager@riverbendnc.org)
Karen Tybush, Rivers & Associates, Inc. (ktybush@riversandassociates.com)
Gregory J. Churchill, P.E., Rivers & Associates, Inc. (gchurchill@riversandassociates.com)
Dustin Rhodes, P.E. (DWI, via DocuSign)
Mark Hubbard, P.E. (DWI, via DocuSign)
Administrative Unit (DWI, via DocuSign)
LF Project File (COM – LOIF)
DWI Agreement ID: 2000073755

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
SHADI ESKAF
Director

NORTH CAROLINA
Environmental Quality

July 1, 2024

Mr. Delane Jackson, Town Manager
Town of River Bend
45 Shoreline Drive
River Bend, NC 28562

SUBJECT: Funding Offer
Project No. SRP-D-134-0033
Water Treatment Improvements

Dear Mr. Jackson:

The Town of River Bend has been approved for funding assistance according to the subject funding offer. This offer is made subject to the Assurances and Conditions attached to this document.

Upon your acceptance, please submit the following items to the Division, via email at DEQ.DWI.FundingOffer@deq.nc.gov:

1. One (1) copy of the original Offer and Acceptance Document executed by the Authorized Representative for the project, along with the Conditions and Assurances. **Retain the other copy for your files.**

2. A resolution adopted by the governing body accepting the funding offer and making the applicable Conditions and Assurances contained therein. (Sample copy attached)

3. Federal Identification Number and Unique Entity ID Number of the Recipient (UEID required for federally funded projects)

4. Sales-Tax Certification (attached)

The Site Certification, a Capital Project Ordinance (or budget ordinance covering the project) are due before disbursements begin.

Disbursement requests are to be submitted via Laserfiche at the following link: https://edocs.deq.nc.gov/Forms/DW-Document-Upload-Form. A reference copy of the Disbursement Request Form (also found on the DWI website) has been enclosed for your convenience.

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

On behalf of the Department of Environmental Quality, I am pleased to make this funding offer. Should you have any questions concerning this offer of funding, or any of the stipulations outlined in this offer package, please contact David Smith at david.smith@deq.nc.gov or (919) 707-3885.

Sincerely,

DocuSigned by:

Shadi Eskaf, Director
Division of Water Infrastructure, NCDEQ

Enclosures: Offer and Acceptance Document
Assurances & Conditions
Federal ID and UEID Number Request Memo
Resolution to Accept Funding Offer (suggested format)
Sales-Tax Certification Form
Disbursement Request Form
Guidance Document (North Carolina Wastewater Funding Programs Overview)
Site Certification
Capital Project Ordinance (Sample)

cc: Delane Jackson, Town Manager, Town of River Bend (manager@riverbendnc.org)
Karen Tybush, Rivers & Associates, Inc. (ktybush@riversandassociates.com)
Gregory J. Churchill, P.E., Rivers & Associates, Inc. (gchurchill@riversandassociates.com)
Mark Hubbard (Via DocuSign)
David Smith (Via DocuSign)
DWI Administrative Unit (Via DocuSign)
Carrie Short (Via DocuSign)
Teresa Tripp (Via DocuSign)
DEQ.DWI.FundingOffer@deq.nc.gov
FILE: SRP-134 Project File **(COM_LOX)**
Agreement ID#: 2000073755

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER INFRASTRUCTURE

Funding Offer and Acceptance

Legal Name and Address of Award Recipient

Town of River Bend
45 Shoreline Drive
River Bend, NC 28562

Project Number(s): SRP-D-134-0033

Assistance Listing Number: N/A
Unique Entity ID Number: QMRLTKVN7275

Funding Program

		Additional Amount for Funding Increases	Previous Total	Total Offered
Drinking Water	☒			
Stormwater	☐			
Wastewater	☐			
State Revolving Fund-Repayable Loan	☐			
State Revolving Fund-Principal Forgiveness	☐			
State Reserve Loan	☐			
State Reserve Grant	☐			
State Reserve Earmark (S.L. 2023-134)*	☒			$9,252,105
American Rescue Plan Act - Choose an item.	☐			

Project Description:

Water Treatment Improvements

Total Financial Assistance Offer:	**$9,252,105**
Total Project Cost:	$9,393,000
Estimated Closing Fee:**	$ 0
For Loans	
Interest Rate:	-- Per Annum
Maximum Loan Term:	-- Years

** Federal conditions and requirements will also apply to S.L 2023-134 projects co-funded with federal funds.*
*** Estimated closing fee calculated based on grant and loan amount.*

Pursuant to North Carolina General Statute 159G:

- The applicant is eligible under Federal and State law,
- The project is eligible under Federal and State law, and
- The project has been approved by the Department of Environmental Quality as having sufficient priority to receive financial assistance.

The Department of Environmental Quality, acting on behalf of the State of North Carolina, hereby offers the financial assistance described in this document.

For The State of North Carolina: **Shadi Eskaf, Director, Division of Water Infrastructure**
North Carolina Department of Environmental Quality

DocuSigned by:
Shadi Eskaf
6300A872077B4C5...
Signature

7/5/2024
Date

On Behalf of: Town of River Bend
Name of Representative in Resolution: _____
Title (Type or Print): _____

I, the undersigned, being duly authorized to take such action, as evidenced by the attached CERTIFIED COPY OF AUTHORIZATION BY THE APPLICANT'S GOVERNING BODY, do hereby accept this Financial Award Offer and will comply with the attached Assurances and the Standard Conditions.

Signature

Date

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

STANDARD CONDITIONS & ASSURANCES FOR STATE RESERVE PROJECTS
Project Applicant: Town of River Bend **Project Number: SRP-D-134-0033**

1. The Applicant intends to construct the project or cause it to be constructed to final completion in accordance with the Application approved for financial assistance by the Division.
   The recipient acknowledges that in the event a milestone contained in the most recent Clean Water State Revolving Fund Intended Use Plan and/or the Letter of Intent to Fund is missed, the Department of Environmental Quality will rescind this Funding Offer.

2. The Applicant is responsible for paying for the costs ineligible for DWI funding.

3. The construction of the project, including the letting of contracts in connection therewith, conforms to the applicable requirements of State and local laws and ordinances.

4. As of the acceptance of this Funding Award Offer, steps A-D in the SRP Guidance will be complete. These Assurances, likewise, incorporate the most recent version of the SRP Guidance, and the Applicant hereby certifies by accepting this Funding Award Offer that it will adhere to the subsequent steps in the SRP Guidance document. The remaining steps generally govern project design, bidding, contracting, inspection, disbursements, closeout and repayment.

5. The Applicant will provide and maintain adequate engineering supervision and inspection.

6. The recipient agrees to establish and maintain a financial management system that adequately accounts for revenues and expenditures. Adequate accounting and fiscal records will be maintained during the construction of the project and these records will be retained and made available for a period of at least three years following completion of the project.

7. All SRP funds must be expended solely for carrying out the approved project, and an audit shall be performed in accordance with G.S. 159-34. Partial disbursements on this loan will be made promptly upon request, subject to adequate documentation of incurred eligible costs, and subject to the recipient's compliance with the Standard Conditions of this Award. The Applicant agrees to make prompt payment to its contractor, and to retain only such amount as allowed by North Carolina General Statute.

8. The applicant will expend all of the requisitioned funds for the purpose of paying the costs of the project within three (3) banking days following the receipt of the funds from the State. Please note that the State is not a party to the construction contract(s) and the Applicant is expected to uphold its contract obligations regarding timely payment.

9. The applicant acknowledges that any loan funds contained in this Funding Offer <u>requires approval from the North Carolina Local Government Commission</u> before they can be disbursed.

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FEDERAL ID & Unique Entity ID # REQUEST MEMO

TO: All Loan and Grant Recipients

SUBJECT: Federal Identification Number

Please be advised that all local government units receiving grant or loan funds from the State of North Carolina must supply their Federal Identification Number to this office upon acceptance of your loan/grant offer. Therefore, please provide the information below and return to the Division via email at DEQ.DWI.FundingOffer@deq.nc.gov.

RECIPIENT:

PROJECT NUMBER:

FEDERAL IDENTIFICATION NUMBER:

UNIQUE ENTITY ID:

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

(Suggested Format)

RESOLUTION BY GOVERNING BODY OF RECIPIENT

WHEREAS, the (unit of Government) has received a Directed Projects grant from the 2023 Appropriations Act, Session Law 2023-134, administered through the Drinking Water Reserve and Wastewater Reserve to assist eligible units of government with meeting their water/wastewater infrastructure needs, and

WHEREAS, the North Carolina Department of Environmental Quality has offered 2023 Appropriations Act funding in the amount of $_____ to perform work detailed in the submitted application, and

WHEREAS, the (unit of government) intends to perform said project in accordance with the agreed scope of work,

NOW, THEREFORE, BE IT RESOLVED BY THE (GOVERNING BODY) OF THE (UNIT OF GOVERNMENT):

That (unit of government) does hereby accept the 2023 Appropriations Act Directed Projects Grant offer of $_____.

That the (unit of government) does hereby give assurance to the North Carolina Department of Environmental Quality that any Conditions or Assurances contained in the Award Offer will be adhered to.

That (name and title of authorized representative), and successors so titled, is hereby authorized and directed to furnish such information as the appropriate State agency may request in connection with this project; to make the assurances as contained above; and to execute such other documents as may be required by the Division of Water Infrastructure.

Adopted this the (date adopted) at (place), North Carolina.

(Signature of Chief Executive Officer)

Date

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

SALES-TAX REIMBURSEMENT CERTIFICATION FORM

(FOR FUNDING PROGRAMS IN THE DIVISION OF WATER INFRASTRUCTURE)

Applicant:_____

Project Number:_____

☐ Check If Applicant is not a unit of government under North Carolina law

If Applicant noted above is a Unit of Government in North Carolina, check the applicable box below.

Sales Tax **IS** deducted in this scenario. Please show this on the disbursement requests.

☐ The construction contract was bid with sales taxes and the unit of government will request reimbursement from the DOR.

Sales Tax **IS NOT** deducted in either of these scenarios.

☐ The construction contract was bid with sales taxes and the unit of government will not request reimbursement from the DOR.

☐ The construction contract was bid without sales taxes

_____

(Printed Name and Title of Authorized Representative)

_____

(Signature of Authorized Representative)

_____

(Date)

DocuSign Envelope ID: 7DDE837C-FE46-4D9D-A744-C51D978CB534

DISBURSEMENT REQUEST FORM

NC Division of Water Infrastructure

Funding Recipient:_____ **Payment No.**_____ **Page No.** _____
DWI Project No._____ **Period Covered From:**_____ **To:** _____

CONSTRUCTION (Rename as appropriate)	*Cumulative Cost to Date*	*Minus Ineligibles*	*Minus Overruns Not App'd By Change Order*	**Subtotal of Payable Cost**	*Minus Retainage on Payable Cost*	*Minus Cumulative Sales Tax*	*Other Adjustments (Other Funds e.g.)*	*Minus Previously Paid to Date*	**Requested For This Pay Request**
Contract 1	**$1,200,000**	**($100,000)**	**($100,000)**	**$1,000,000**	**($50,000)**	**($50,000)**	**($500,000)**	**($300,000)**	**$100,000**
Contract 2	**$505,000**		**($5,000)**	**$500,000**	**($25,000)**	**($10,000)**		**($400,000)**	**$65,000**
Contract 3									
Contract 4									
Contract 5									
ENGINEERING (Rename as appropriate)	*Cumulative Cost to Date*						*Other Adjustments (Other Funds e.g.)*	*Minus Previoulsy Paid to Date*	**Requested For This Pay Request**
Item 1	**$250,000**							**($250,000)**	**$0**
Item 2									
Item 3									
Item 4									
OTHER COSTS (Rename as Appropriate)	*Cumulative Cost to Date*						*Other Adjustments (Other Funds e.g.)*	*Minus Previously Paid to Date*	**Requested For This Pay Request**
Item 1									
Item 2									
Item 3									
PAY REQUEST TOTALS	*Cumulative Cost to Date*	*Minus Ineligibles*	*Minus Overruns Not App'd By Change Order*		*Minus Retainage on Payable Cost*	*Minus Cumulative Sales Tax*	*Other Adjustments (Other Funds e.g.)*	*Minus Previously Paid to Date*	**Total Requested For This Pay Request**
	$1,955,000	**($100,000)**	**($105,000)**		**($75,000)**	**($60,000)**	**($500,000)**	**($950,000)**	**$165,000**

Certification

Grant Percentage for SRP Projects: %

- I certify that to the best of my knowledge and belief the incurred costs being requested for disbursement are in accordance with terms of the project and that this request represents the monies due which have not been previously received and that an inspection has been performed and all work is in accordance with the terms and conditions of the award.
- For applicable SRF projects, the project remains in compliance with Davis-Bacon and American Iron and Steel conditions or is the process of remediating noncompliance.

You must check ONE of the boxes below or your payment will not be processed:

The funds requested above have already been paid to the respective vendors, consultants & contractors by the funding recipient ☐

OR

The funds requested above have not been paid to the respective vendors, consultants & contractors.
Funds received from the State will be disbursed to these entities within three (3) banking days. ☐

Type or Print Name and Title **Signature of Authorized Representative** **Date**

DWI comments

Instructions and notes on how to use this form

- Complete guidance for preparing disbursement requests can be found in section G.2. of the North Carolina SRF Program Overiew and Guidance that was included with your Funding offer (applicable to State grants and loans too) .
- **The form, as downloaded, is filled out with sample numbers. It is suggested that the sample be used as a reference (saved or printed).**
- Please submit ONE COPY of this form and backup documents when requesting funds.
- Only the Authorized Representive can sign this form, unless declared otherwise in a resolution.
- Construction contract line item overruns and engineering contract overruns must have approved change orders or engineering amendments before those costs will be paid.

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Water Infrastructure
ENVIRONMENTAL QUALITY

CERTIFICATION REGARDING UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES (URLAP) ACT OF 1970

Applicant:_____
Project No.:_____
Project Name:_____

Please check appropriate boxes:

- ☐ I certify that all real property (including easements) has been acquired or condemnation proceedings have been entered into for property thereby providing legal access for this project.

AND

- ☐ I certify to the best of my knowledge and belief that the acquisition of property specifically for the above referenced project is in compliance with the URLAP Act of 1970 (the Uniform Act). The acquisition either:
  - ☐ Acquisition of real property did not result in the displacement of any person, business or farm operation.
  - ☐ or relocation was involved in the land acquisition, the Federal Highway Administration (FHA) was contacted for technical assistance.

OR

- ☐ Compliance with the Uniform Act does not apply because the land and/or easements associated with the above referenced project were acquired prior to the inception of the project. Date land acquired:_____

I understand that a false statement on this certification may be grounds for rejection or termination of this loan.

_____
Signature of Applicant's Authorized Representative or Attorney Date

_____
Typed Name and Title

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Capital Project Ordinance

Be it ORDAINED by the Governing Board of the (Town of Anywhere), North Carolina, that pursuant to section 13.2 of Chapter 159 of the General Statutes of North Carolina, the following capital Project Ordinance is herby adopted.

Section 1: The Project authorized is the (construction/rehabilitation of a wastewater treatment/collection System) to be financed by (the sale of general obligation bonds/ARRA loan /federal loan/state loan / state grants and reserves).

Section 2: The officers of this unit are hereby directed to proceed with the capital project within the terms of the board resolution, loan documents and the budget contained herein.

Section 3: The following amounts are appropriated for the project:

Engineering	$ 120,000
Land	90,000
Construction	1,440,000
	$ 1,650,000

Section 4: The following revenues are anticipated to be available to complete this project:

Federal/ARRA Loan	$ 1,100,000
Proceeds from general Obligation Bonds	$ 500,000
Transfer from Wastewater treatment capital Reserve	$ 20,000
	$ 1,650,000

Section 5: The finance officer is hereby directed to maintain within the capital project fund sufficient specific detailed accounting records to satisfy the requirements of the grantor agency, the grant agreements, and federal regulations. The terms of the bond resolution also shall be met.

Section 5: Funds may be advanced from the General Fund for the purpose of making payments as due. Disbursement requests should be made to the grantor agency in an orderly and timely manner. Section 7: The finance officer is directed to report, on a quarterly basis, on the financial status of each project element in section 3 and on the total grant/loan revenues received or claimed.

Section 8: The Budget Officer is directed to include a detailed analysis of past and future costs and revenues on this capital project in every budget submission made to this board.

Section 9: Copies of this capital project ordinance shall be furnished to the clerk to the Governing Board, and to the Budget Officer and the Finance officer for direction in carrying out this project.

Duly adopted this __ day of _____ 201_.

_____

Signature, (Authorized Rep)

(Seal)

Attest: _____

Signature (Town Clerk)

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North Carolina Wastewater Funding Programs Overview

Division of Water Infrastructure Website: https://www.deq.nc.gov/about/divisions/water-infrastructure

A) Application Filing

1. Application deadlines are twice a year. The deadlines are typically March and September.
2. If SRF and State Reserve funding are both available, an applicant will simply apply for funding and DWI will slot successful applications into the funding program that best suits the situation (most grant or principal forgiveness, most total dollars etc.)
3. Letter of Intend to Fund (LOIF) letters are mailed after DWI evaluation and State Water Infrastructure Authority approval. Recipients of LOIF letters are placed on a schedule for completing the rest of the steps to start construction.
4. Consult the website for the current application forms.

B) Engineering Report Submission and Approval (See website for guidance and details)

1. From the Date of the LOIF, an Engineering Report (ER) must be submitted within **4 months.**
2. From the Date of the LOIF, the ER must be approved within **9 months.**
3. Consult the website for submittal checklists and instructions.

C) Application Approval by the Local Government Commission

1. For projects with a loan component, the Local Government Commission must approve the ability to take on the requested debt. This is done after the Engineering Report is approved. DWI staff will transmit the required information to the LGC on behalf of the project applicant. **Note that LGC 108A & 108C forms are now not requested by DWI until the ER is approved. The ER approval letter asks the applicant to obtain the forms from the website and return them to DWI. Please do this as soon as possible.**
2. Terms:
   a) Projects with interest bearing loans will receive the lower of two interest rates. The two rates are the current rate when applications are due and the rate when the LGC approves the loan. The Loan Offer (discussed in D, below) will reflect the lower rate. The rates are ½ the 20-year municipal bond buyers index. Certain, qualifying applications receive 0% interest loans.
   b) The LGC sets the loan term with a maximum term of 20 years. Applicants may want to contact the LGC earlier than this to ensure they are able to meet LGC approval requirements. Currently the LGC is not allowed to review applications for $1,000,000 or more unless a letter to the Joint Legislative Committee on Local Government and the Fiscal Research Division has been provided.
   c) Loan Offers can be written for as much as 110% of the LGC approved amount. The applicant must justify this, and request it in writing from the DWI.
   d) In some rare cases a 30 year term may be available. Please consult DWI management to discuss if this is potentially available for your situation.

D) Loan Offer

1. After approval of the Engineering Report and debt capacity by the LGC (for loans), a formal Award Offer is prepared which includes the Award's details and applicable assurances and conditions.

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a) Two copies of the Award Offer are sent to recipients. Return the following to DWI:
b) One signed copy (keep the other copy) of the Loan Offer.
c) Resolution accepting the Award Offer.
d) Federal ID and DUNS # form.
e) Sales Tax Certification.
f) A Fiscal Sustainability Plan (FSP) Certification for certain new SRF projects. This must be returned before a project's final reimbursement will be made.

2. In the event of bids that exceed the project budget, a loan increase for up to 10% can be authorized without additional approval of the LGC. Amounts above 10% require a modified application to be approved by the LGC.
3. Closing Fees are invoiced with the Authority to Award letter. (paragraph F below). The Award Offer contained an estimated closing fee but actual closing costs are based on the total costs after bids are received. Loan Fees are 2% and Grant Fees 1.5%.

E) Plans and Specifications Approval (see website for guidance and details)

1. Plans & Specifications must be submitted within **15 months** of the LOIF.
2. Plans and Specifications must be approved within **19 months** of the LOIF letter. This includes issuance of all permits.
3. The project's plans and specifications must be approved by the Division prior to advertising for bids. Changes by addendum must be submitted to the Division for approval. Changes by change order must also be submitted for approval.

F) Bidding and Issuance of Authority to Award (ATA) the Construction Contract

1. Issuance of the ATA letter must be within **23 months** of the LOIF letter. Awarding contracts before issuance of the ATA letter is at the risk of the owner.
2. The contracts may be advertised as soon as plans & specifications are approved and permits are issued. NC General Statutes require the project to be advertised for 7 days, however DWI prefers projects to be advertised for 30 days. For the initial advertisement period, three bids must be received in order for an award to be made. The Plans & Specifications approval letter has the Project Bid Information form attached. It, and the other information described in it, must be submitted to and approved by this office **before contracts can be awarded**. This information is:
   a. Project Bid Information Form, signed by authorized representative
   b. Bid tabulation, sealed by the consulting engineer
   c. Proposals of the successful bidders
   d. Tentative award resolution from loan recipient subject to DWI approval
   e. Engineer's recommendation
   f. Proof of Advertisement
   g. American Iron and Steel Certification (SRF only)
   h. MBE/WBE requirements. (Detailed guidance on the website).
3. In an environment where program funding is limited, costs not demonstrated to be needed by the applicant, will immediately be made available in future funding rounds (deobligated).

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G) Construction Phase of Project

1. Inspections

a) Site Inspections will be conducted for all funded projects. Coordinate the Preconstruction Conference with the Inspector assigned to project. The number of inspections performed will be determined based on the length of the project, type of project, amount of funding involved and other factors. Any duly authorized representative of the State will have access to the work site and the contractor will provide proper facilities for such access and inspection. Further, any authorized representative of the State shall have access, for the purpose of audit and examination, to any records pertinent to the funds.

b) A primary duty of the administering State agency is to guard against fraud, waste and abuse of Federal funds. To ensure proper use of Federal funds, State personnel may review submittals, daily logs, testing reports, as-builts and other appropriate construction documentation to verify that project elements meet approved specifications. Generally, any changes to unit quantities or changes in specifications that result in substantial monetary savings for the owner, will need to be documented by change order.

c) Conformance with SRF standard conditions is a primary program responsibility. These include Davis-Bacon and American Iron and Steel currently.

d) Additionally, inspections may uncover unsafe construction practices and environmental compliance violations. While not necessarily in SRF staff jurisdiction, deficiencies may be referred to appropriate enforcement agencies. Expeditious and timely use of SRF funds is a program goal and avoidance of any delay in construction is a concern, particularly delays associated with public health or worker safety which are of concern in their own right.

2. Disbursements ($$$)

a) First Reimbursement

i) Approval of Construction Contracts must happen with **24 months** of the LOIF letter. The following items are required for approval:

- Contract must be fully executed
- Notice to Proceed must be executed by owner and contractor
- The project specifications must include 100% performance and payment bonds. Bonds must be dated on or after contract date
- Original power of attorney must be dated on or after bonds
- The contractor must provide current Insurance
- All documents must be bound with the specifications
- Davis-Bacon Documents must be present in the specifications

ii) Capital Project Ordinance submitted as required by G.S. 159-13.2. Alternately a budget ordinance that clearly identifies the project being funded by the SRF can be submitted.

iii) All items under Item D,1.

iv) Site Certificate

v) Engineering Contracts and Engineering Procurement Certification (2 items)

vi) Closing Fee must have been received

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vii) For Loans, promissory note executed and returned to the Local Government Commission (this is requested from the LGC upon receipt of the executed construction contract and is for the amount noted in the ATA letter)

b) Disbursements - General Information

i) Forms can be found online. A sample was included with the Loan Offer

ii) Disbursement requests should be sent to Jackie Moore; 1633 Mail Service Center; Raleigh NC 27699-1633.

iii) All items must be approved in advance before being reimbursed.

iv) One copy of the following information is required for reimbursements:

- Reimbursement request form with original signature.
- Contractor monthly estimates
- Engineering invoices
- Invoices for any other approved costs
- Eligible land costs will be reimbursed when the land has either been acquired or is under condemnation. In both cases and a copy of an offer to purchase the land must be submitted with the appraisal.

v) Indicate cumulative totals on the reimbursement form

vi) Check the appropriate box regarding whether or not contractors have already been paid. Note, that if the DWI funds are needed to pay the contracts, the funds must be disbursed within 3 banking days of receipt.

vii) As noted in the Award Offer Assurances, sales taxes will be deducted from disbursements if an applicant indicates they intend to seek reimbursement for them from the Department of Revenue. A certification form is provided on our website to indicate what the owner intends to do regarding sales tax.

viii) Note that Davis-Bacon certified payrolls and materials invoices that support the contract summary invoice **do not** need to be submitted with reimbursement requests.

c) Project Closeout and Final Disbursement

i) Funds are held at 95% until the final payment is authorized.

ii) Required items for final payment include:

- The inspector must issue final inspection report signifying that project is complete and all concerns have been satisfied and all change orders must have been submitted and approved.
- Final invoices must show zero retainage.
- Submit to Pam Whitley:
  - ✓ Engineer's certifications.
  - ✓ Owner's Certification of Completion
  - ✓ Signed Closeout Checklist.
  - ✓ Fiscal Sustainability Plan (CWSRF Only).

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H) REPAYMENT (Loans Only)

1. Repayments will be reflected in the final promissory note and will be for the actual funds borrowed.
2. Repayments by the recipient begin on the May 1st or the November 1st that is between 6 months and 12 months after original project completion in the notice to proceed.
3. The May 1st payment includes principal and interest and the November 1st payment is only interest.
4. **Interest begins to accrue from the date of completion on the Notice to Proceed.** For multi-prime contracts the General contract will be used to set this date.
5. Construction Manager at Risk and Design Build Contracts, should set a date of completion in that contract.

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I) Eligibility

1. Regulatory Authority - CWSRF

a) The types of projects that can be funded are loosely defined under Sections 212, 319 and 320 of the Clean Water Act. These can be described as publically owned wastewater treatment and transport systems and stormwater pollution treatment and control projects.

2. Construction - Items Not Eligible

a) Project elements not related to the scope of the approved project.
b) The SRF will pay to restore project related items such as road patching, sidewalks Fences, seeding, etc. Complete paving of streets unless warranted by disturbance of construction activities, even if required by NCDOT
c) Note that items or rework that should be covered by bonds, insurance or liquidated damages will not be covered by the SRF funds.
d) Any installation of service lines or service laterals outside the right-of-way.
e) Operation and maintenance type work (e.g. sludge removal not necessary for construction of the project), or items such as spare parts.
f) Extended warranties or maintenance contracts.
g) Drinking water facilities are not eligible for CWSRF projects unless changes are necessary to complete the sewer project (e.g. moving a water line, providing potable water to wastewater facility).

3. Engineering and Technical Services - Eligibility Considerations

a) Planning and Design Contracts
   i. Must include task descriptions and these tasks must be associated with the project being built
b) Construction Administration and Inspection
   i) Task Description must be included and tasks must be associated with eligible construction work
   ii) Typical tasks include but are not limited to: attending meetings, provide plan copies, review testing, review shop drawings, review payment applications, prepare change orders, coordinate with DWI, as-builts
   iii) Price should be cost plus fixed fee or per diem with a ceiling. This fee schedule should be in the contract.
   iv) Invoices must include hours, rate and task
   v) Contract must be amended to pay beyond the ceiling. Must be accompanied by justification such as a corresponding change order.
c) Other eligible engineering activities include bidding, O&M manuals, soils reports, hydro-geologic reports, TVing and cleaning of lines etc.

4. Other Eligibility Notes

a) Legal - Legal fees for contract review and for advertisements etc.
b) Real Property and easements associated with the approved project scope are eligible expenses. All cost items associated with acquiring the property may be paid for if properly documented.
c) Preparation of permits required by Federal, or State regulations or procedures.
d) Permits imposed by the applicant such as building permits are not eligible.

APPENDIX

N

Town of River Bend WTP
NPDES Fact Sheet
2023 Renewal NPDES Permit NC0086797

DENR/DWR
EXPEDITED FACT SHEET - NPDES PERMIT DEVELOPMENT
NPDES Permit: NC0086797
2023 Renewal

This form must be completed by Permit Writers for all **expedited** permits which do not require full Fact Sheets. Expedited permits are generally simple 100% domestics (e.g., schools, mobile home parks, etc.) that can be administratively renewed with minor changes but can include facilities with more complex issues (Special Conditions, 303(d) listed water, toxicity testing, instream monitoring, compliance concerns).

Facility and Stream Information			
Applicant/Facility Name:	Town of River Bend / River Bend WTPs 1 & 2		
Applicant Address:	45 Shoreline Drive; River Bend, NC 28562		
Facility Address:	Gull Point Road, River Bend, NC 28562		
Facility Class/Permit Status:	Grade I Physical/Chemical WPCS / Renewal		
Permitted Flow [as built]	Not Limited	Type of Waste	Filter Backwash
Receiving Stream	Trent River	Stream Class / ID	SB; Sw; NSW / 27-101-(31)
River Basin	Neuse	Subbasin	03-04-11
HUC	030202040302	USGS Topo	G30SW/ Pollocksville
7Q10 Sum/Win (cfs)	/ Tidal	30Q2 (cfs)	
Avg. Stream Flow (cfs)		IWC (%) S/W [as-built]	/
County	Craven	Regional Office	WaRO

Basic Information for Expedited Permit Renewal	
Permit Writer / Date	Bradley Bennett / October 25, 2023 (updated Jan 2, 2024)
Does permit need daily max NH_3 limits?	N0
Does permit need TRC limits/language?	Yes – Already in permit
Does permit have toxicity testing?	Yes
Does permit have Special Conditions?	Yes –WET; and Neuse Re-opener(added)
Does permit have instream monitoring?	No
Stream on 303(d) List? For w/parameter?	No, except statewide mercury
Any compliance concerns?	No Compliance Issues
Any modifications since last permit?	None noted in the application
New expiration date:	May 31, 2028

FACILITY OVERVIEW:

The facilities are public water treatment plants that are 100% industrial waste and treat well water to produce finished potable water for portions of Craven County.

Water Treatment Plant 1 (WTP#1) has a discharge of treated backwash/rinse wastewater from Sand Filtration units through Outfall 001. This water treatment plant currently has a design potable flow rate of 0.6 MGD and a maximum, monthly average wastewater discharge of 0.014 MGD. This facility is located at 52 Shoreline Dr. and water and wastewater treatment consist of:

- Raw well water caustic addition systems
- Raw well air injection systems
- One (1) 8 ft. diameter sand filter tank
- One (1) 10 ft. diameter sand filter tank
- Potable water ortho phosphate addition system
- Potable water chlorination system
- Wastewater dechlorination system
- 5,000-gallon backwash/rinse wastewater settling basin with pump
- Effluent meter

Water Treatment Plant 2 (WTP#2) has a discharge of treated backwash/rinse wastewater from Sand Filtration units through Outfall 002. This water treatment plant currently has a design potable flow rate of 0.35 MGD and a maximum, monthly average wastewater discharge of 0.011 MGD. This facility is located at 27 Shoreline Dr. and water and wastewater treatment consist of:

- Raw well water caustic addition system
- Raw well air injection system
- Two (2) 4.5 ft. diameter sand filter tanks
- Two (2) 6 ft. diameter sand filter tanks
- Potable water ortho phosphate addition system
- Potable water chlorination system
- Wastewater dechlorination system
- 5,000-gallon backwash/rinse wastewater settling basin with pump
- Effluent meter

chemical additives:

- Sodium hydroxide [pH adjustment]
- polyphosphate [scale inhibitor]
- chlorine gas [disinfection]
- Sodium bisulfite [dichlorination]

Raw Water Treatment Process: (from application, historical documents and 2020 System Evaluation on Town website)
Two (2) groundwater wells supply WTP#1 and a third well supplies WTP#2. WTP#1 has two (2) sand filter units and WT#2 has four (4) sand filter units. Sand filters are anthracite over Birm sand filter media. Raw water is injected with Caustic Soda (sodium hydroxide) for pH adjustment and compressed air (oxygen) to oxidize soluble iron and manganese. Water then flows through the sand filters, is chlorinated, treated with phosphate corrosion inhibitor and then goes to the distribution system.

Wastewater and Treatment Process: (from application, historical documents and 2020 System Evaluation on Town website)
Wastewater generated from the system comes from backwash water and rinse water. Finished water is used for backwash and rinse water for each WTP. Each WTP has its own treatment system that includes liquid dichlorination with sodium bisulfate, followed by a settling basin and then wastewater is pumped through effluent meters to outfalls 001 and 002. Sludge is removed from settling basins as needed.

APPLICATION

The application (December 6, 2022) does not indicate any changes in the facility or treatment since the last renewal of the permit in 2018. The water and wastewater treatment systems are owned and operated by the Town of River Bend. The application describes the system as water treatment plants using Birm sand filtration for iron and manganese removal and using finished water for filter backwash which is dechlorinated prior to sedimentation tanks and discharge. The Town submitted EPA Forms 1 and 2E rather than 2C. They did supply Tables A, B and C from Form C. Given the application submittal being almost a year old and the limited additional data to be gained, the Town was not asked to submit Form 2C.

INSPECTION

The most recent inspection occurred on March 17, 2021. Regional staff found the facilities to be in compliance with no significant issues noted.

MONITORING DATA REVIEW:

Parameter (Units)	Min	Max	Avg	Permit Limit	Comments
OUTFALL 001					
pH (su)	6.90	8.30	7.44	6.8 to 8.5	
Flow (MGD)	0.002	0.054	0.010	-	
TRC (µg/L)	< 10	49.00	9.58	13 DM	**88 values > 13 none above 50**
TSS (mg/L	1.20	21.70	2.60	30 MA / 45 DM	
TN (mg/L)	< 0.50	3.1	1.0	-	
TP (mg/L)	0.11	0.61	0.40	-	
Turbidity (NTU)	0.20	33.70	3.01	-	
Manganese (µg/L)	< 0.01	0.174	0.039	-	
OUTFALL 002					
pH (su)	7.00	8.10	7.46	6.8 to 8.5	
Flow (MGD)	0.001	0.023	0.008	-	
TRC (µg/L)	< 10	50.00	10.72	13 DM	**179 values > 13 none above 50**
TSS (mg/L	1.20	15.10	2.96	30 MA / 45 DM	
TN (mg/L)	< 0.50	1.0	0.4	-	
TP (mg/L)	0.20	4.06	0.83	-	
Turbidity (NTU)	0.30	27.90	2.91	-	
Manganese (µg/L)	< 0.01	0.086	0.025	-	

MA – Monthly Average DM – Daily Max QA – Quarterly Average DA - Daily Average Summer - April through Oct Winter – Nov through March

The data reviewed for the renewal is from August 2018 through July 2023.

REVIEW OF PERMIT LIMITS:

Flow – Treatment plants do not have a flow limit included but flow is monitored for use in any RPA evaluations. In these evaluations the maximum monthly flow is used. This flow is also included in the description of the systems on the permit supplement page. For WTP#1 the maximum monthly flow was 0.014MGD and for WTP#2 it was 0.011 MGD.

TSS- TSS values do not appear to be an issue with these facilities.

Total Residual Chlorine (TRC) – Combined the two WTP discharges have exceeded the TRC limit around 20% of the time but have had no values above the 50 µg/L compliance level.

Turbidity – Turbidity levels do not appear to be high for the facilities.

Nutrients -Nutrient levels do not appear to be a major concern for these systems. Monitoring will continue to be included in the permit due to the facilities location in the Neuse River Basin, an NSW watershed.

Manganese – There is no water quality standard for manganese so no limits are set under the WTP guidance. However, monitoring is included for facilities that have systems for manganese removal. These WTPs will continue to have manganese monitoring.

Whole Effluent Toxicity – The two WTPs have performed WET testing quarterly and have passed all the WET tests over the permit cycle.

Reasonable Potential Analysis – there was no data for parameters that require the RPA analysis for these two WTPs.

COMPLIANCE:

The facility has not had a documented enforcement action with penalties since 2001. Over the permit cycle there have been three NODs for monitoring frequency violations. The facilities had regular TRC values over their limit, but none of the values was above the 50 µg/L compliance level.

FILE HISTORY REVIEW SUMMARY

- BIMS indicates permit was originally issued March 31, 2000.
- March 31, 2000 – Permit Issuance. The town requested discharge permit coverage in order to remove the WTP discharge from their wastewater treatment plant. The town wanted to pursue connection of some areas served by septic systems and allow for some additional new connections as well. The initial permit was for discharge of filter backwash with no treatment prior to discharge. The Division determined that the close proximity of the two treatment plant discharges allowed for the issuance of one single permit for the two plants. The effluent limits and monitoring for the two outfalls included:

Flow (MGD)	TSS (mg/L) MA / DM	SS (mg/L) MA / DM	TRC (µg/L) DM	Turbidity (NTU)	Iron (mg/L)	TN (mg/L)	TP (mg/L)
N/A	30 / 45	0.1 / 0.2	28	U/D to meet instream standard	Monitor	Monitor – Concentration and Load	Monitor

  The permit included the condition for calculation of TN load etc.
- October 3, 2003 – Permit Renewal – The only changes in the permit where to add reporting for the components in determining TN values (TKN and NO_2+NO_3).
- July 25, 2008 – Permit Renewal – This permit renewal added a flow limit of 0.027 MGD (sum of the monthly discharge from the two WTPs) to determine TN load; removed the suspended solids monitoring and limit; changed the TRC limit to 13 µg/L and added pH with a limit range of 6.8 to 8.5 SU. Turbidity monitoring was not included in the permit. The renewal Fact Sheet noted the application of green sand filter permitting guidance. The package includes schematics for both treatment facilities and notes settling in collection tanks and dichlorination of backwash/rinse waters prior to discharge. Outfall locations were corrected in this permit issuance. The facilities are noted as Class II treatment facilities.
- February 24, 2009 – Technical Correction to note requirements for Total Suspended Solids rather than Total Dissolved Solids.
- December 30, 2013 – Permit Renewal -The permit removed the flow limit; removed iron monitoring; added total manganese and turbidity effluent monitoring; changed TN and TP monitoring to concentration monitoring only and adjusted some monitoring frequencies. The permit included more detailed narrative on the supplement page to describe the treatment components. This permit also added requirements for electronic reporting. The facilities are noted as Class I treatment systems.
- June 18, 2018 – Permit Renewal – This renewal considered the facility's use of Birm media (rather than greensand) and settling in determining that the facilities were hybrid Greensand/Conventional systems. This, along with gathering information for possible general permit coverage, resulted in the major change of adding Whole Effluent Toxicity Testing (WET) to the permit requirements. This was established as a quarterly pass/fall monitoring only requirement. The permit also added regulatory citations as needed.

PROPOSED PERMIT CHANGES:

- Updated eDMR requirements to be consistent with final EPA rule.
- Added or updated regulatory citations throughout permit as needed.
- Updated average flow on supplement page of permit.
- Added Flow Duration for reporting in the Effluent Table.
- Updated WET conditions language.
- Added Special Condition for Nutrient Re-opener in section A.(3.).
- Permit map information updated including outfall location coordinates for Outfall 001.

PROPOSED SCHEDULE FOR PERMIT ISSUANCE:

Draft Permit to Public Notice:	November 14, 2023
Permit Scheduled Effective Date:	February 1, 2024

STATE CONTACT:

If you have questions concerning the above or the attached documents, please contact Bradley Bennett at bradley.bennett@deq.nc.gov .

UPDATE TO FACT SHEET:

In the draft permit the Division had proposed to include WET testing requirements as a limited requirement consistent with draft 2020 WTP Guidance. Further review and internal discussion determined that, given the nature of the discharge and the facility consistently passing the WET tests, it was appropriate to return the permit requirements to monitoring status for their WET requirements. The language has been updated in the final permit.

AFFP
Public Notice

Affidavit of Publication

STATE OF NC }
COUNTY OF CRAVEN } SS

Christy Williamson , being duly sworn, says:

That she is Christy Williamson, Advertising Director of the New Bern Sun Journal, a daily newspaper of general circulation, printed and published in New Bern, Craven County, NC; that the publication, a copy of which is attached hereto, was published in the said newspaper on

November 16, 2023

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

Christy Williamson, Advertising Director

Subscribed to and sworn to me this 16th day of November 2023.

Elizabeth Goodwin Howell, , Craven County, NC

My commission expires: July 13, 2027

ELIZABETH GOODWIN HOWELL
My Commission Expires
NOTARY PUBLIC
July 13, 2027
BRUNSWICK COUNTY, NC

70085808 70824817

Wren Thedford -(New Bern)
DEQ-Division of Water Resources-(New Bern)
1617 Mail Service Center
Raleigh, NC 27699-1617

Public Notice
North Carolina Environmental Management Commission/NPDES Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

Notice of Intent to Issue NPDES Wastewater Permit NC0086797 – Town of River Bend WTP 1 & 2. The North Carolina Environmental Management Commission proposes to issue a NPDES wastewater discharge permit to the person(s) listed below. Written comments regarding the proposed permit will be accepted until 30 days after the publish date of this notice. The Director of the NC Division of Water Resources (DWR) may hold a public hearing should there be a significant degree of public interest. Please mail comments and/or information requests to DWR at the above address. Interested persons may visit the DWR at 512 N. Salisbury Street, Raleigh, NC 27604 to review the information on file. Additional information on NPDES permits and this notice may be found on our website: https://deq.nc.gov/public-notices-hearings,or by calling (919) 707-3601. The Town of River Bend [45 Shoreline Drive, New Bern NC 28562] has requested renewal of NPDES permit NC0086797 for the Town of River Bend WTP 1 & 2, located in Craven County. These permitted facilities discharge treated wastewater to Plantation Canal, a class SB; Sw; NSW water in the Neuse River Basin. Some of the parameters in the permit are water quality limited. This discharge may affect future allocations in this portion of the Neuse River Basin

November 16, 2023

Bennett, Bradley

From: Bennett, Bradley
Sent: Thursday, January 4, 2024 3:35 PM
To: Brandon Mills
Cc: Delane Jackson
Subject: Final Permit for the Town of River Bend WTP 1 & 2
Attachments: NC0086797_Final_Permit_and_Cover_Ltr Signed_20240104.pdf

Hi Brandon,

Attached is the final signed permit for your two water treatment plants (1 & 2) – NC0086797. This permit will become effective March 1, 2024. Until that time, please continue to abide by your existing NPDES permit.

Please respond to this email to verify that you received the attached permit and that you can open, read, download, and print the document for your use.

Thanks for your help in the renewal process. If you have any questions please feel free to contact me or staff in our Washington Regional Office.

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617
Phone: (919) 707-3629
Email: bradley.bennett@deq.nc.gov

Email correspondence to and from this address may be subject to public records laws

DEQ is updating its email addresses to @deq.nc.gov in phases from May 1st to June 9th 2023.
Employee email addresses may look different, but email performance will not be impacted.

Bennett, Bradley

From: Bennett, Bradley
Sent: Thursday, January 4, 2024 3:39 PM
To: Tankard, Robert; Bullock, Robert
Subject: Final Issued Permit for Town of River Bend WTP 1 & 2 - NC0086797

Hey Guys,

This permit was signed today and has been forwarded through email to the Town (Brandon Mills and Delane Jackson). The permit will be effective March 1, 2024. Thanks for your help on this renewal. The permit and Fact Sheet will be available in Laserfiche.

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617

Phone: (919) 707-3629

Email: bradley.bennett@deq.nc.gov

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Bennett, Bradley

From: Bennett, Bradley
Sent: Thursday, January 4, 2024 3:40 PM
To: ATForms.ATB
Cc: Moore, Cindy; Nicholson, Molly
Subject: Final Issued Permit for Town of River Bend WTP 1 & 2 - NC0086797

Hey Guys,

This permit was issued today. Just wanted to let you know that you can access the final permit and the Fact Sheet in Laserfiche.

Thanks

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
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Raleigh, NC 27699-1617
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Bennett, Bradley

From: Bennett, Bradley
Sent: Tuesday, November 14, 2023 8:23 AM
To: Brandon Mills
Cc: manager@riverbendnc.org
Subject: Draft Permit for River Bend Water Treatment Plant - NC0086797
Attachments: NC0086797_Draft Permit and Cover Ltr_20231113.pdf

Brandon,

As I mentioned yesterday here is the draft permit for the town's water treatment plant – NC0086797. This draft will be publicly noticed in a local paper within the next week. Please let us know if you have any comments or questions about the draft permit.

Please respond to this email to verify that you received the draft permit and were able to open, view, print and download the file for your records.

Thanks for your assistance in the renewal process.

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617
Phone: (919) 707-3629
Email: bradley.bennett@deq.nc.gov

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Bennett, Bradley

From: Bennett, Bradley
Sent: Tuesday, November 14, 2023 8:26 AM
To: Tankard, Robert; Bullock, Robert
Subject: Draft to Notice - River Bend WTP - NC0086797
Attachments: NC0086797_Draft Permit and Cover Ltr_20231113.pdf

Hey Guys,

You previously reviewed the draft for this permit. It is now headed to public notice this week. Just wanted to give you a heads up.

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617
Phone: (919) 707-3629
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Bennett, Bradley

From: Bennett, Bradley
Sent: Tuesday, November 14, 2023 8:52 AM
To: ATForms.ATB; Moore, Cindy; Nicholson, Molly
Subject: Draft NPDES Permit for Town of River Bend WTP - NC0086797
Attachments: NC0086797_Fact Sheet Binder_20231113.pdf; NC0086797_Draft Permit and Cover Ltr_20231113.pdf

Hey Guys,

Here is a draft permit and fact sheet for River Bend WTP – NC0086797. This is a hybrid greensand/conventional WTP. It previously had monitoring only for WET but based on some discussion with AT we had been moving to WET Limit requirements for these I believe. I have included the Limit WET language in the draft. Please let me know if this is correct. They have passed all of their tests since WET requirements started in 2018. If you think monitoring alone is sufficient for this one we can go back to that requirement.

Thanks

BB

Bradley Bennett
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Bennett, Bradley

From: Deuterman, Sydney
Sent: Wednesday, November 15, 2023 3:23 PM
To: Bennett, Bradley
Subject: RE: Second WTP for Review - River Bend WTP - NC0086797

Hey Bradley,

I brought this up during our staff meeting today. John said it will likely require some further discussion with ATB on if we want to establish a set criteria and add it to the guidance for future permitting. He agreed that 100% passing rate of TOX tests over 4-5 years should be sufficient to justify changing a facility back from Limit to Monitoring only. I mentioned the River Bend permit and he said based on the facility details (hybrid system, 100% passing), you could continue to keep the TOX testing as Monitoring instead of changing them to Limit for this renewal.

See you at 4!

Sydney Deuterman *(she/her)*
Environmental Specialist II
Compliance and Expedited Permitting Unit
Division of Water Resources
N.C. Department of Environmental Quality

Office: 919-707-3712
sydney.deuterman@deq.nc.gov

1617 Mail Service Center
Raleigh, NC 27699-1617

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Monday, November 13, 2023 2:48 PM
To: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Subject: RE: Second WTP for Review - River Bend WTP - NC0086797

That sounds reasonable. Maybe we can talk with Mike and John about this in our Wed afternoon meeting on Radiological Parameters. Or, you could mention at our Staff meeting (I won't be there for the morning staff meeting, I have a commitment outside of work).

For now, I'm going to add the Limit language on the permit I have going to notice. If we make any determinations over the next couple of months, I can change it back in the final permit.

Thanks!

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
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Raleigh, NC 27699-1617
Phone: (919) 707-3629
Email: bradley.bennett@deq.nc.gov

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From: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Sent: Monday, November 13, 2023 2:42 PM
To: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Subject: Re: Second WTP for Review - River Bend WTP - NC0086797

I'm not sure, that would probably need to be decided with our group and ATB. I would think consistent Passing of the tests, maybe like no failures over the last 12 quarters?

Sydney Deuterman *(she/her)*
Environmental Specialist II
Compliance and Expedited Permitting Unit
Division of Water Resources
N.C. Department of Environmental Quality

Office: 919-707-3712

NEW EMAIL ADDRESS: *sydney.deuterman@deq.nc.gov*

1617 Mail Service Center
Raleigh, NC 27699-1617

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Monday, November 13, 2023 2:26:55 PM
To: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Subject: RE: Second WTP for Review - River Bend WTP - NC0086797

Sydney,

What do you think the criteria would be for dropping something back to Monitoring? There isn't anything in the guidance about that as far as I can see.

BB

Bradley Bennett
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From: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Sent: Monday, November 13, 2023 2:22 PM
To: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Subject: Re: Second WTP for Review - River Bend WTP - NC0086797

Yeah, I believe it's in the 2020 Strategy, but I did separately confirm it with Cindy Moore when I was doing the WTP training. So there should be no problem with switching it to a limit unless we feel this facility can stay monitoring only.

Sydney Deuterman *(she/her)*
Environmental Specialist II
Compliance and Expedited Permitting Unit
Division of Water Resources
N.C. Department of Environmental Quality

Office: 919-707-3712

NEW EMAIL ADDRESS: *sydney.deuterman@deq.nc.gov*

1617 Mail Service Center
Raleigh, NC 27699-1617

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From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Monday, November 13, 2023 12:52:55 PM
To: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Subject: RE: Second WTP for Review - River Bend WTP - NC0086797

Hey Sydney,

I'm a bit unsure on the WET question you have. I meant to run some thoughts on this one by you. It is strange because it appears one of the main reasons the WET testing was added last time was to gain information about whether this one would qualify for General Permit Coverage under NCG59. The region indicated they wanted to leave it under the individual permit and since it is strange since it has two separate plants and outfalls, I left it as an individual. They have passed all their WET tests to this point. So, I wasn't really sure if moving them to WET with a limit was necessary. The discussion about adding the limit is from the draft 2020 document right? Should we be adding that without finalization of the draft?

BB

Bradley Bennett
Compliance and Expedited Permitting
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From: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Sent: Monday, November 13, 2023 11:58 AM
To: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Subject: RE: Second WTP for Review - River Bend WTP - NC0086797

Hey Bradley,

Sorry again for the delay in getting this back to you! Here are my comments:

Permit:

- Make sure to add ATB under CC: on the cover letter
- eDMR code for Turbidity needs to be updated to 00070
- For the WET testing condition, I would make the effluent concentration and testing months **bold**, and I would add the citation 15A NCAC 02B .0200 as well.
- Map shows two Outfall 001s

Factsheet:

- Under review of permit limits, the flow for WTP #1 says 0.14 MGD instead of 0.014 MGD

My only other thought was regarding WET testing. Conventional WTPs should receive a WET limit instead of just monitoring once they're up for renewal. Greensand facilities do not need WET testing per the guidance. As these facilities are Conventional/Greensand hybrid and WET testing was added in the last renewal, should the WET test be changed from monitoring to limit to be consistent with the way we are permitting Conventionals now, or have we gotten ATB's thoughts on this?

Great job!

Sydney Deuterman *(she/her)*
Environmental Specialist II
Compliance and Expedited Permitting Unit
Division of Water Resources
N.C. Department of Environmental Quality

Office: 919-707-3712

sydney.deuterman@deq.nc.gov

1617 Mail Service Center
Raleigh, NC 27699-1617

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From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Monday, October 30, 2023 2:09 PM

To: Deuterman, Sydney <sydney.deuterman@deq.nc.gov>
Subject: Second WTP for Review - River Bend WTP - NC0086797

Hey Sydney,

Here is another WTP review to add to the one I sent earlier. This one is for River Bend WTP – NC0086797 in Craven County. The link is below. I have also linked the previous one again, so you have both in this email.

River Bend WTP – NC0086797
NC0086797 - River Bend WTP

West Carteret WTP – NC0077143
NC0077143 - West Carteret Water Corp - W. Carteret WTP

Thanks again for all the work on the WTP Training! You did a great job!

BB

Bradley Bennett
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Bennett, Bradley

From: Bullock, Robert
Sent: Monday, October 30, 2023 3:38 PM
To: Bennett, Bradley; Tankard, Robert
Subject: RE: Draft Permit for River Bend WTP - NC0086797

The location map has both locations listed as Outfall 001. There should be an Outfall 001 and Outfall 002.

Thanks,
Robbie

Robbie Bullock
Environmental Program Consultant
Division of Water Resources
Water Quality Regional Operations

252-948-3843 Office
252-402-5832 Cell
Robert.e.bullock@deq.nc.gov Email

943 Washington Square Mall
Washington NC 27889

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Monday, October 30, 2023 2:39 PM
To: Tankard, Robert <robert.tankard@deq.nc.gov>; Bullock, Robert <robert.e.bullock@deq.nc.gov>
Subject: Draft Permit for River Bend WTP - NC0086797

Hey Guys,

Here is the draft permit for the River Bend WTP 1 & 2 – NC0086797. Take a look and let me know if you have any comments on the draft. I have attached the draft permit and the Fact Sheet. The Renewal application is in Laserfiche if you need that.

Thanks

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
1617 Mail Service Center
Raleigh, NC 27699-1617

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Email: bradley.bennett@deq.nc.gov

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Bennett, Bradley

From: Orlando, Anjali
Sent: Wednesday, October 4, 2023 1:44 PM
To: Bennett, Bradley
Cc: Hennessy, John
Subject: RE: River Bend WTP - NC0086797
Attachments: add'l info ltr to WTP Permittee to req. GP and Ind. permit rescind.doc

That is different, and it makes sense they should have an individual permit if they have like 2 WTPs in one! There was a letter I believe we were sending out to WTPs to ask them to request the NCG59. This is what both Brianna and Derek told me when I was training in John's unit, for WTPs. I attached an example of that Add Info letter. I don't know what the policy was in terms of identifying which facilities got this letter and which ones did not, or if it was sent to all WTPs.

Thanks
Anjali

From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Wednesday, October 4, 2023 1:40 PM
To: Orlando, Anjali <anjali.orlando@deq.nc.gov>
Cc: Hennessy, John <john.hennessy@deq.nc.gov>
Subject: RE: River Bend WTP - NC0086797

Thanks Anjali. I did touch base with the regional office and they recommended maintaining the individual permit unless the facility asked for GP coverage. It is a little strange because they actually have two WTPs adjacent to each other that are covered under the one permit.

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
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Employee email addresses may look different, but email performance will not be impacted.

From: Orlando, Anjali <anjali.orlando@deq.nc.gov>
Sent: Wednesday, October 4, 2023 1:36 PM
To: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Cc: Hennessy, John <john.hennessy@deq.nc.gov>
Subject: RE: River Bend WTP - NC0086797

Hi Bradley, I found a couple files in the WTP Expedited Manual folder> General Permit NCG9 WTP folder, that might be relevant to the question you had asked me about River Bend WTP. I believe we were adding WET testing to be able to evaluate WTPs for coverage under the NCG59, as an analysis of the WET test results are required.

In the NCG59 permit writers instructions, dated July 10, 2014:

"It is our goal to get all existing and new Greensand WTPs covered under this general permit and all existing (and expanding) Conventional WTPs covered as long as they are not failing* toxicity tests. Due to staffing levels, it is anticipated that the transfer of existing facilities from an individual permit to a general permit will occur upon permit renewal, not sooner. Please note, that this permit does not cover discharges to HQW or ORW waters and to receiving streams with endangered species that can be impacted by this discharge, etc. Also, for Conventional WTPs, upon permit renewal a RPA should be performed on metal(s) and Fluoride (freshwater) effluent data. If a limitation or monitoring is needed for a parameter not limited or monitored in this general permit then the permittee shall maintain an individual permit.

New Conventional WTPs are required to obtain an individual permit for one permit cycle. Upon renewal, the Division will evaluate the data and determine if the current individual permit limitations or requirements are sufficient, need to be enhanced, and/or if the standard WTP limitations and requirements set forth in the general permit are adequate to protect the receiving waters for that particular permittee's discharge. If the standard conditions in the general permit are adequate, the permittee will be considered for coverage under the general permit."

Hope that is helpful or if there's any other questions.
Thanks,
Anjali

Anjali Orlando
Environmental Specialist II
Water Quality Permitting Section
Division of Water Resources
Department of Environmental Quality
Anjali.orlando@deq.nc.gov
919-707-3622 (office)
336-459-2592 (cell)

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From: Bennett, Bradley <bradley.bennett@deq.nc.gov>
Sent: Thursday, September 21, 2023 1:02 PM
To: Orlando, Anjali <anjali.orlando@deq.nc.gov>
Subject: River Bend WTP - NC0086797

Hey Anjali,

I am working on the permit renewal for this WTP. Looks like you did the last renewal. I noticed in the Fact Sheet that you mentioned adding WET requirements and that these results could be reviewed at renewal to consider coverage

under NCG59. I didn't see any other discussion about this and the Town did not request review of potential NCG59 coverage in their renewal application. Do remember anything about this? Was there discussion before or did you just look at the possibility of GP coverage?

Thanks

BB

Bradley Bennett
Compliance and Expedited Permitting
NC Division of Water Resources
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Whole Effluent Toxicity Testing and Self Monitoring Summary

Reidsville WWTP NC0024881/001 County: Rockingham Region: WSRO Basin: CPF01 Jan Apr Jul Oct SOC_JOC:
Ceri7dPF Begin: 6/1/2013 chr lim: 61% NonComp: Single 7Q10: 7.4 PF: 7.5 IWC: 61 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2020	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2021	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2022	Pass	-	-	Fail	21.6 (NC)	>100	Pass	-	-	Pass	-	-
2023	Pass	-	-	Pass	-	-	Pass	-	-	-	-	-

REXAM, Inc. NC0087874/001 County: Guilford Region: WSRO Basin: CPF02 Feb May Aug Nov SOC_JOC:
Ceri7dPF Begin: 12/1/2004 chr lim 90% NonComp: 7Q10: 0 PF: 0.001 IWC: 100 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	H	-	-	H	-	-	H	-	-	H	-
2020	-	H	-	-	H	-	-	-	-	-	-	-

Richland Township WTP NC0084808/001 County: Beaufort Region: WARO Basin: TAR07 Jan Apr Jul Oct SOC_JOC:
Mysd24PF Begin: 1/1/2015 Ac P/F Monit: 90% M NonComp: 7Q10: PF: IWC: Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	Fail	-	-	Fail	-	-	Fail	-	-	Fail	-	-
2020	Pass	-	-	Fail	-	-	-	-	-	Pass	-	-
2021	Fail	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2022	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2023	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-

Richmond County WTP NC0081281/001 County: Richmond Region: FRO Basin: YAD16 Jan Apr Jul Oct SOC_JOC:
Ceri7dPF Begin: 6/1/2014 Chr Monit: 90% NonComp: 7Q10: PF: 0.50 IWC: Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	H	-	-	H	-	-	H	-	-	H	-	-
2020	H	-	-	H	-	-	H	-	-	H	-	-
2021	H	-	-	-	-	-	-	-	-	-	-	-

Ridgeview Acres Mobile Home Park NC0060283/001 County: Buncombe Region: ARO Basin: FRB02 Feb May Aug Nov SOC_JOC:
Ceri7dPF Begin: 10/1/2021 chr lim: 90% NonComp: Single 7Q10: 0.0 PF: 0.007 IWC: 100 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2020	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2021	-	Pass	-	-	Pass	-	-	Fail	<45 (NC)	<45 (NC)	Fail	<45 (NC)
2022	<45 (NC)	Fail	<2.75 (NC)	>90	Pass	-	-	Pass	-	-	NR H	NR
2023	-	Fail	55.1	<45	Fail	>100	>100	Pass	-	-	-	-

River Bend WTP 001 NC0086797/001 County: Craven Region: WARO Basin: NEU11 Mar Jun Sep Dec SOC_JOC:
Mysd24PF Begin: 8/1/2018 Mysid 24hr PF Monit: NonComp: 7Q10: PF: IWC: Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2020	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2021	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2022	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2023	-	-	Pass	-	-	Pass	-	-	Pass	-	-	-

Legend: P= Fathead minnow (Pimphales promelas), H=No Flow (facility is active), s = Split test between Certified Labs

Whole Effluent Toxicity Testing and Self Monitoring Summary

River Bend WTP 002 NC0086797/002 County: Craven Region: WARO Basin: NEU11 Mar Jun Sep Dec SOC_JOC:
Mysd24PF Begin: 8/1/2018 Mysid 24hr PF Monit: NonComp: 7Q10: PF: IWC: Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2020	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2021	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2022	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2023	-	-	Pass	-	-	Pass	-	-	Pass	-	-	-

Roanoke Rapids Mill WWTP (WestRock/ NC0000752/001 County: Halifax Region: RRO Basin: ROA08 Mar Jun Sep Dec SOC_JOC:
Ceri7dPF Begin: 6/1/2012 chr lim: 3.7% NonComp: Single 7Q10: 1120 PF: 28.0 IWC: 3.7 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2020	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2021	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2022	-	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass
2023	-	-	Pass	-	-	INVALID	Pass	-	-	-	-	-

Roanoke Rapids Sanitary District WWTP NC0024201/001 County: Halifax Region: RRO Basin: ROA08 Jan Apr Jul Oct SOC_JOC:
Ceri7dPF Begin: 7/1/2007 chr lim: 1.1% NonComp: Single 7Q10: 1172 PF: 8.34 IWC: 1.3 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	Pass	-	-	Pass	-	-	Pass	-	-	>4.4(P) Pass	-	-
2020	Pass	-	-	>4.4(P) Pass	-	-	Pass	-	-	Pass	-	-
2021	Pass	-	-	Pass >4.4(P)	-	-	Pass	-	-	Pass	-	-
2022	Pass	-	-	Pass	-	-	Pass	-	-	Pass >4.4	-	-
2023	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-

Robbins WWTP NC0062855/001 County: Moore Region: FRO Basin: CPF10 Jan Apr Jul Oct SOC_JOC:
Ceri7dPF Begin: 1/1/2022 Chr Lim: 10% @ 1.3 NonComp: Single 7Q10: 18.7 PF: 1.3 IWC: 4 Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	Pass	-	-	Pass	-	-	NR	-	-	Pass	-	-
2020	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2021	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2022	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-	-
2023	Pass	-	-	Pass	-	-	Pass	-	-	-	-	-

Robbinsville WTP NC0083071/001 County: Graham Region: ARO Basin: Feb May Aug Nov SOC_JOC:
Ceri7dPF Begin: 2/1/2018 Chr Monit: 10% NonComp: 7Q10: PF: IWC: Freq: Q

	J	F	M	A	M	J	J	A	S	O	N	D
2019	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2020	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2021	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2022	-	Pass	-	-	Pass	-	-	Pass	-	-	Pass	-
2023	-	Pass	-	-	Pass	-	-	Pass	-	-	-	-

Legend: P= Fathead minnow (Pimphales promelas), H=No Flow (facility is active), s = Split test between Certified Labs

APPENDIX

O

Town of River Bend WWTP
2023 NPDES Permit NC0030406

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ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

12/15/2023

Delane Jackson, Town Manager
Town of River Bend
45 Shoreline Drive
New Bern, NC 28562

Subject: Final NPDES Permit NC0030406
Town of River Bend WWTP
Grade II Biological WPCS
Craven County

Mr. Jackson:

Division personnel have reviewed and approved your application for renewal of the subject permit. Accordingly, we are forwarding the attached final NPDES discharge permit. This permit is issued pursuant to the requirements of North Carolina General Statute 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated October 15, 2007 (or as subsequently amended).

The final permit has no changes from the draft permit that was previously sent to you dated September 26, 2023. Please refer to the cover letter for the September draft for a specific discussion of permit changes.

If any parts, measurement frequencies or sampling requirements contained in this permit are unacceptable to you, you have the right to an adjudicatory hearing upon written request within thirty (30) days following receipt of this letter. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings (6714 Mail Service Center, Raleigh, North Carolina 27699-6714). Unless such demand is made, this permit shall be final and binding.

Please note that this permit is not transferable except after notice to the Division. The Division may require modification or revocation and reissuance of the permit. This permit does not affect the legal requirements to obtain any other Federal, State, or Local governmental permit that may be required.

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If you have any questions or need additional information, please do not hesitate to contact Bradley Bennett of my staff at (919) 707-3629 or bradley.bennett@deq.nc.gov.

Sincerely,

DocuSigned by:

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Richard E. Rogers, Jr.
Director, Division of Water Resources

cc: Brandon Mills – Town of River Bend - electronic
NPDES Files - electronic
Washington Regional Office / Water Quality – electronic

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STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES

PERMIT

TO DISCHARGE WASTEWATER UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended, the

Town of River Bend

is hereby authorized to discharge wastewater from a facility located at the

River Bend WWTP
Gull Point Road
River Bend
Craven County

to receiving waters designated as the Trent River in the Neuse River Basin in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, and IV hereof.

The permit shall become effective February 1, 2024

This permit and the authorization to discharge shall expire at midnight on May 31, 2028.

If the permittee intends to continue discharging at the facility beyond the term of this permit, a renewal application must be submitted no later than December 3, 2027 (180 days before the expiration of this permit)

Signed this day December 15, 2023

DocuSigned by:

8328B44CE9EB4A1...

Richard E. Rogers, Jr.
Director, Division of Water Resources
By Authority of the Environmental Management Commission

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SUPPLEMENT TO PERMIT COVER SHEET

All previous NPDES Permits issued to this facility, whether for operation or discharge are hereby revoked. As of this permit issuance, any previously issued permit bearing this number is no longer effective. Therefore, the exclusive authority to operate and discharge from this facility arises under the permit conditions, requirements, terms, and provisions included herein.

The **Town of River Bend** is hereby authorized to:

1. Continue to operate an existing 0.33 MGD wastewater treatment facility that includes the following components:

    - Static screen
    - Surge basin
    - Influent flow splitter box
    - Two extended aeration treatment plants in parallel
    - Sodium hypochlorite disinfection with contact chamber
    - Dechlorination (sodium bisulfate)
    - Effluent flow meter
    - Three aerated sludge digesters
    - Standby power

    This facility is located at the River Bend WWTP (Gull Point Road, River Bend) Craven County.

2. Discharge from said treatment works via outfall 001 at the location specified on the attached map into the Trent River [Stream Index: 27-101-(31)], a waterbody currently classified SB Swamp, NSW waters in sub-basin 03-04-11 [HUC: 030202040302] of the Neuse River Basin.

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PART I

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

[15A NCAC 02B.0400 et seq., 02B.0500 et seq.]
Grade II Biological WPCS [15A NCAC 02B .0508]

Beginning **on the effective date of this permit and lasting until expiration**, the Permittee is authorized to discharge treated wastewater from Outfall 001. Such discharges shall be limited and monitored [6] by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	*eDMR Code*	EFFLUENT LIMITATIONS		MONITORING REQUIREMENTS		
		Monthly Average	**Weekly Average**	**Measurement Frequency**	**Sample Type**	**Sample Location**
Flow	50050	0.33 MGD		Continuous	Recording	Influent or Effluent
BOD, 5-day, 20°C [1]	CO310	30.0 mg/l	45.0 mg/l	Weekly	Composite	Effluent, Influent
Total Suspended Solids [1]	CO530	30.0 mg/l	45.0 mg/l	Weekly	Composite	Effluent, Influent
NH3 as N	CO610	6.7 mg/l	20.1 mg/l	Weekly	Composite	Effluent
Total Residual Chlorine [2]	50060	13 µg/L Daily Maximum		2/Week	Grab	Effluent
Enterococci (*geometric mean*)	61211	35/100 ml	276/100 ml	Weekly	Grab	Effluent
Dissolved Oxygen	00300	Daily Average ≥ 5.0 mg/L		Weekly	Grab	Effluent
Temperature	00010	Monitor & Report		Weekly	Grab	Effluent
pH	00400	≥6.8 and ≤ 8.5 Standard Units		Weekly	Grab	Effluent
TKN [3]	00625	Monitor & Report (mg/L)		2/Month	Composite	Effluent
NO_2+NO_3 [3]	00630	Monitor & Report (mg/L)		2/Month	Composite	Effluent
TN [3]	CO600	Monitor & Report (mg/L)		2/Month	Composite	Effluent
TN Load [4] (NO_2+NO_3+TKN)	QM600	Monitor & Report (lb/month)		Monthly	Calculated	Effluent
	QY600	Monitor & Report (lb/yr)		Annually	Calculated	Effluent
Total Phosphorus	CO665	Monitor & Report		2/Month	Composite	Effluent
Total Mercury [5]	COMER	Monitor & Report		1/Permit Cycle	Grab	Effluent

Footnotes:

1. The monthly average effluent BOD5 and TSS concentrations shall not exceed 15% of the respective influent value (85% removal).
2. The Division shall consider all effluent TRC values reported below 50 µg/l to be in compliance with the permit. However, the Permittee shall continue to record and submit all values reported by a North Carolina certified laboratory (including field certified), even if these values fall below 50 µg/l.
3. For a given wastewater sample, TN=TKN + NO_3-N + NO_2-N, where TN is Total Nitrogen, TKN is Total Kjeldahl Nitrogen, and NO_3-N and NO_2-N are Nitrate and Nitrite Nitrogen, respectively.
4. TN Load is the mass load of Total Nitrogen discharged in a given period of time. See Special Condition A.(2), Calculations of TN Loads.
5. Mercury must be monitored once during the permit cycle. See *Special Condition A. (4.) Effluent Mercury Analysis*.
6. The permittee shall submit discharge monitoring reports electronically using NC DWR's eDMR application system. See Special Condition A (6.).

THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

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A. (2.) CALCULATION OF TOTAL NITROGEN LOADS
[G.S. 143-215.1(b)]

a. The Permittee shall calculate monthly and annual TN Loads as follows:

i. **Monthly TN Load (lb/mo) = TN x TMF x 8.34**

where:

TN = the average Total Nitrogen concentration (mg/L) of the composite samples collected during the month

TMF = the Total Monthly Flow of wastewater discharged during the month (MG/mo)

8.34 = conversion factor, from (mg/L x MG) to pounds

ii. **Annual TN Load (lb/yr) = Sum of the 12 Monthly TN Loads for the calendar year**

b. The Permittee shall report monthly Total Nitrogen results (mg/L and lb/mo) in the appropriate discharge monitoring report for each month and shall report each year's results (lb/yr) with the December report for that year.

A. (3.) TOTAL NITROGEN ALLOCATIONS
[G.S. 143-215.1(b)]

a. The following table lists the Total Nitrogen (TN) allocation(s) assigned to, acquired by, or transferred to the Permittee in accordance with the Neuse River nutrient management rule (15A NCAC 02B .0713) and the status of each as of permit issuance. For compliance purposes, this table does not supersede any TN limit(s) established elsewhere in this permit or in the NPDES permit of a compliance association of which the Permittee is a Co-Permittee Member.

ALLOCATION TYPE	SOURCE	DATE	ALLOCATION AMOUNT (1)		STATUS
			Estuary (lb/yr)	Discharge (lb/yr)	
Base	Assigned by Rule (15A NCAC 02B .0713)	12/7/97; 4/1/03	7,482	7,482	Active

Footnote:

(1) Transport Factor = 100%

b. Any addition, deletion, or modification of the listed allocation(s) (other than to correct typographical errors) or any change to active status of any of the listed allocations shall be considered a major modification of this permit and shall be subject to the public review process afforded such modifications under state and federal rules.

A. (4.) EFFLUENT MERCURY ANALYSIS
[15A NCAC 02B .0400 et seq., 02B .0500 et seq.]

The Permittee shall provide one effluent mercury analysis, using EPA Method 1631E, in conjunction with the next permit renewal application. The analysis shall be taken within 12 months prior to the renewal application due date. Any additional effluent mercury measurements conducted from the effective date of this permit and up to the application date shall also be submitted with the renewal application.

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If the result of the mercury analysis is not provided with the application, the application may be returned as incomplete and the Permittee considered non-compliant.

A. (5.) PERMIT RE-OPENER: NUTRIENT MANAGEMENT
[NCGS 143-215.1 (b)]

a) Pursuant to N.C. General Statues Section 143-215.1 and implementing rules found in Title 15A of North Carolina Administrative Code, Subchapter 02H, specifically, 15A NCAC 02H.0112(b)(1) and 02H.0114(a), and Part II, Sections B.12 and B.13. of this Permit, the Director of DWR may reopen this permit to require nutrient management measures for the discharge. The results of water quality monitoring, modelling or other evaluations may require that conditions for total nitrogen and total phosphorus control be imposed on this permit.
b) The Division may, upon written notification to the permittee, re-open this permit in order to incorporate or modify effluent limits, monitoring and reporting requirements, and other permit conditions when it deems such action is necessary to implement TMDL(s) approved by the USEPA.

A. (6.) ELECTRONIC REPORTING OF DISCHARGE MONITORING REPORTS
[G.S. 143-215.1(b)]

Federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and program reports. The final NPDES Electronic Reporting Rule was adopted and became effective on December 21, 2015.

NOTE: This special condition supplements or supersedes the following sections within Part II of this permit (*Standard Conditions for NPDES Permits*):

- Section B. (11.) Signatory Requirements
- Section D. (2.) Reporting
- Section D. (6.) Records Retention
- Section E. (5.) Monitoring Reports

1. **<u>Reporting Requirements [Supersedes Section D. (2.) and Section E. (5.) (a)]</u>**
The permittee shall report discharge monitoring data electronically using the NC DWR's Electronic Discharge Monitoring Report (eDMR) internet application.

Monitoring results obtained during the previous month(s) shall be summarized for each month and submitted electronically using eDMR. The eDMR system allows permitted facilities to enter monitoring data and submit DMRs electronically using the internet. The eDMR system may be accessed at: https://deq.nc.gov/about/divisions/water-resources/edmr.

If a permittee is unable to use the eDMR system due to a demonstrated hardship or due to the facility being physically located in an area where less than 10 percent of the households have broadband access, then a temporary waiver from the NPDES electronic reporting requirements may be granted and discharge monitoring data may be submitted on paper DMR forms (MR 1, 1.1, 2, 3) or alternative forms approved by the Director. Duplicate signed copies shall be submitted to the following address:

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NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

See "How to Request a Waiver from Electronic Reporting" section below.

Monitoring results obtained during the previous month(s) shall be summarized for each month and reported via the eDMR system no later than the last calendar day of the month following the completed reporting period. Regardless of the submission method, the first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge.

Starting on **December 21, 2025**, the permittee must electronically report the following compliance monitoring data and reports, when applicable:

- Sewer Overflow/Bypass Event Reports;
- Pretreatment Program Annual Reports; and
- Clean Water Act (CWA) Section 316(b) Annual Reports.

The permittee may seek an electronic reporting waiver from the Division (see "How to Request a Waiver from Electronic Reporting" section below).

2. Electronic Submissions

In accordance with 40 CFR 122.41(l)(9), the permittee must identify the initial recipient at the time of each electronic submission. The permittee should use the EPA's website resources to identify the initial recipient for the electronic submission.
Initial recipient of electronic NPDES information from NPDES-regulated facilities means the entity (EPA or the state authorized by EPA to implement the NPDES program) that is the designated entity for receiving electronic NPDES data [see 40 CFR 127.2(b)].
EPA plans to establish a website that will also link to the appropriate electronic reporting tool for each type of electronic submission and for each state. Instructions on how to access and use the appropriate electronic reporting tool will be available as well. Information on EPA's NPDES Electronic Reporting Rule is found at:

https://www.federalregister.gov/documents/2015/10/22/2015-24954/national-pollutant-discharge-elimination-system-npdes-electronic-reporting-rule

Electronic submissions must start by the dates listed in the "Reporting Requirements" section above.

3. How to Request a Waiver from Electronic Reporting

The permittee may seek a temporary electronic reporting waiver from the Division. To obtain an electronic reporting waiver, a permittee must first submit an electronic reporting waiver request to the Division. Requests for temporary electronic reporting waivers must be submitted in writing to the Division for written approval at least sixty (60) days prior to the date the facility would be required under this permit to begin submitting monitoring data and reports. The duration of a temporary waiver shall not exceed 5 years and shall thereupon expire. At such time, monitoring data and reports

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shall be submitted electronically to the Division unless the permittee re-applies for and is granted a new temporary electronic reporting waiver by the Division. Approved electronic reporting waivers are not transferrable. Only permittees with an approved reporting waiver request may submit monitoring data and reports on paper to the Division for the period that the approved reporting waiver request is effective.

Information on eDMR and the application for a temporary electronic reporting waiver are found on the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

4. **Signatory Requirements [Supplements Section B. (11.) (b) and Supersedes Section B. (11.) (d)]**
All eDMRs submitted to the permit issuing authority shall be signed by a person described in Part II, Section B. (11.)(a) or by a duly authorized representative of that person as described in Part II, Section B. (11.)(b). A person, and not a position, must be delegated signatory authority for eDMR reporting purposes.

For eDMR submissions, the person signing and submitting the DMR must obtain an eDMR user account and login credentials to access the eDMR system. For more information on North Carolina's eDMR system, registering for eDMR and obtaining an eDMR user account, please visit the following web page:

http://deq.nc.gov/about/divisions/water-resources/edmr

Certification. Any person submitting an electronic DMR using the state's eDMR system shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

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

5. **Records Retention [Supplements Section D. (6.)]**
The permittee shall retain records of all Discharge Monitoring Reports, including eDMR submissions. These records or copies shall be maintained for a period of at least 3 years from the date of the report. This period may be extended by request of the Director at any time [40 CFR 122.41].

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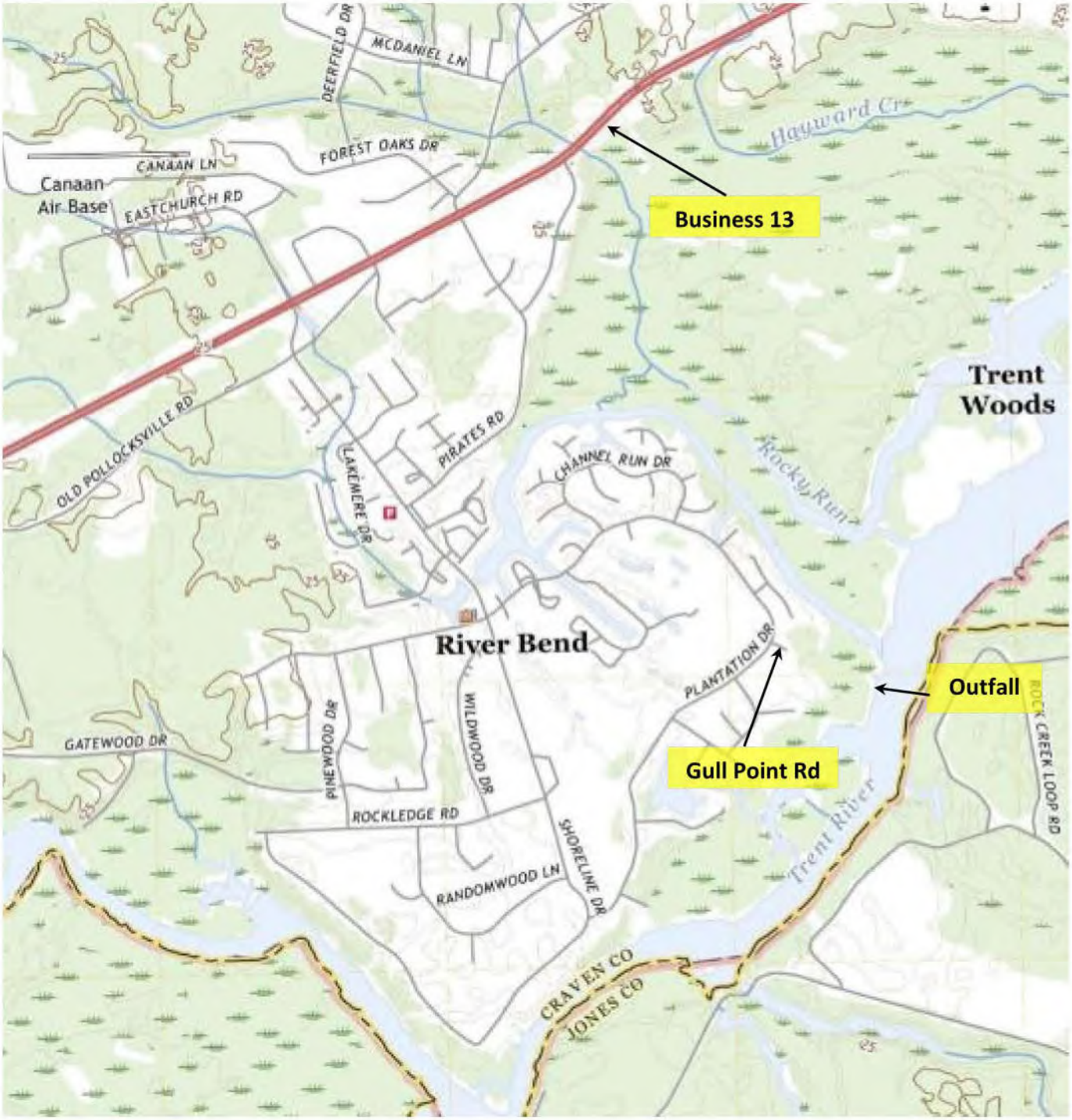

Town of River Bend
River Bend WWTP

Receiving Stream:	Trent River	**Stream Class:**	SB; Sw; NSW
River Basin:	Neuse	**Sub-Basin:**	03-04-011
Outfall Latitude:	35° 04' 13"	**Outfall Longitude:**	77° 07' 59"
Stream Segment	27-101-(31)	**HUC#:**	030202040302
Grid/Quad:	G30SW / Pollocksville	**County:**	Craven

North

Facility Loc
(*not to scale*)

NPDES Permit NC0030406

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PART II
STANDARD CONDITIONS FOR NPDES PERMITS

Section A. Definitions

2/Month
Samples are collected twice per month with at least ten calendar days between sampling events. These samples shall be representative of the wastewater discharged during the sample period.

3/Week
Samples are collected three times per week on three separate calendar days. These samples shall be representative of the wastewater discharged during the sample period.

Act or "the Act"
The Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), as amended, 33 USC 1251, et. seq.

Annual Average
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar year. In the case of fecal coliform, the geometric mean of such discharges.

Arithmetic Mean
The summation of the individual values divided by the number of individual values.

Bypass
The known diversion of waste streams from any portion of a treatment facility including the collection system, which is not a designed or established or operating mode for the facility.

Calendar Day
The period from midnight of one day until midnight of the next day. However, for purposes of this permit, any consecutive 24-hour period that reasonably represents the calendar day may be used for sampling.

Calendar Week
The period from Sunday through the following Saturday.

Calendar Quarter
One of the following distinct periods: January through March, April through June, July through September, and October through December.

Composite Sample
A sample collected over a 24-hour period by continuous sampling or combining grab samples of at least 100 mL in such a manner as to result in a total sample representative of the wastewater discharge during the sample period. The Director may designate the most appropriate method (specific number and size of aliquots necessary, the time interval between grab samples, etc.) on a case-by-case basis. Samples may be collected manually or automatically. Composite samples may be obtained by the following methods:

(1) Continuous: a single, continuous sample collected over a 24-hour period proportional to the rate of flow.
(2) Constant time/variable volume: a series of grab samples collected at equal time intervals over a 24 hour period of discharge and combined proportional to the rate of flow measured at the time of individual sample collection, or
(3) Variable time/constant volume: a series of grab samples of equal volume collected over a 24 hour period with the time intervals between samples determined by a preset number of gallons passing the sampling point. Flow measurement between sample intervals shall be determined by use of a flow recorder and totalizer, and the preset gallon interval between sample collection fixed at no greater than 1/24 of the expected total daily flow at the treatment system, or

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(4) Constant time/constant volume: a series of grab samples of equal volume collected over a 24-hour period at a constant time interval. Use of this method requires prior approval by the Director. This method may only be used in situations where effluent flow rates vary less than 15 percent. The following restrictions also apply:

- Influent and effluent grab samples shall be of equal size and of no less than 100 milliliters
- Influent samples shall not be collected more than once per hour.
- Permittees with wastewater treatment systems whose detention time < 24 hours shall collect effluent grab samples at intervals of no greater than 20 minutes apart during any 24-hour period.
- Permittees with wastewater treatment systems whose detention time exceeds 24 hours shall collect effluent grab samples at least every six hours; there must be a minimum of four samples during a 24-hour sampling period.

Continuous flow measurement
Flow monitoring that occurs without interruption throughout the operating hours of the facility. Flow shall be monitored continually except for the infrequent times when there may be no flow or for infrequent maintenance activities on the flow device.

Daily Discharge
The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants measured in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (40 CFR 122.2; see also "Composite Sample," above.)

Daily Maximum
The highest "daily discharge" during the calendar month.

Daily Sampling
Parameters requiring daily sampling shall be sampled 5 out of every 7 days per week unless otherwise specified in the permit. Sampling shall be conducted on weekdays except where holidays or other disruptions of normal operations prevent weekday sampling. If sampling is required for all seven days of the week for any permit parameter(s), that requirement will be so noted on the Effluent Limitations and Monitoring Page(s).

DWR or "the Division"
The Division of Water Resources, Department of Environmental Quality.

Effluent
Wastewater discharged following all treatment processes from a water pollution control facility or other point source whether treated or untreated.

EMC
The North Carolina Environmental Management Commission

EPA
The United States Environmental Protection Agency

Facility Closure
Cessation of all activities that require coverage under this NPDES permit. Completion of facility closure will allow this permit to be rescinded.

Geometric Mean
The Nth root of the product of the individual values where N = the number of individual values. For purposes of calculating the geometric mean, values of "0" (or "< [detection level]") shall be considered = 1.

Grab Sample
Individual samples of at least 100 mL collected over a period of time not exceeding 15 minutes. Grab samples can be collected manually. Grab samples must be representative of the discharge (or the receiving stream, for instream samples).

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Hazardous Substance
Any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Instantaneous flow measurement
The flow measured during the minimum time required for the flow measuring device or method to produce a result in that instance. To the extent practical, instantaneous flow measurements coincide with the collection of any grab samples required for the same sampling period so that together the samples and flow are representative of the discharge during that sampling period.

Monthly Average (concentration limit)
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar month. In the case of fecal coliform or other bacterial parameters or indicators, the geometric mean of such discharges.

Permit Issuing Authority
The Director of the Division of Water Resources.

Quarterly Average (concentration limit)
The arithmetic mean of all samples taken over a calendar quarter.

Severe property damage
Substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage excludes economic loss caused by delays in production.

Toxic Pollutant:
Any pollutant listed as toxic under Section 307(a)(1) of the CWA.

Upset
An incident beyond the reasonable control of the Permittee causing unintentional and temporary noncompliance with permit effluent limitations and/or monitoring requirements. An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Weekly Average (concentration limit)
The arithmetic mean of all "daily discharges" of a pollutant measured during the calendar week. In the case of fecal coliform or other bacterial parameters or indicators, the geometric mean of such discharges.

Section B. General Conditions

1. Duty to Comply
   The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application [40 CFR 122.41].

   a. The Permittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

   b. The CWA provides that any person who violates section[s] 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $37,500 per day for each violation. [33 USC 1319(d) and 40 CFR 122.41(a)(2)]

   c. The CWA provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or

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imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. [33 USC 1319(c)(1) and 40 CFR 122.41(a)(2)]

d. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. [33 USC 1319(c)(2) and 40 CFR 122.41(a)(2)]

e. Any person who *knowingly* violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions. [40 CFR 122.41(a)(2)]

f. Under state law, a civil penalty of not more than $25,000 per violation may be assessed against any person who violates or fails to act in accordance with the terms, conditions, or requirements of a permit. [North Carolina General Statutes § 143-215.6A]

g. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $37,500. Penalties for Class II violations are not to exceed $16,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $177,500. [33 USC 1319(g)(2) and 40 CFR 122.41(a)(3)]

2. Duty to Mitigate
The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit with a reasonable likelihood of adversely affecting human health or the environment [40 CFR 122.41(d)].

3. Civil and Criminal Liability
Except as provided in permit conditions on "Bypassing" (Part II.C.4), “Upsets” (Part II.C.5) and "Power Failures" (Part II.C.7), nothing in this permit shall be construed to relieve the Permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6 or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the Permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

4. Oil and Hazardous Substance Liability
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USG 1321. Furthermore, the Permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.

5. Property Rights
The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations [40 CFR 122.41(g)].

6. Onshore or Offshore Construction
This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

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7. Severability
The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby [NCGS 150B-23].

8. Duty to Provide Information
The Permittee shall furnish to the Permit Issuing Authority, within a reasonable time, any information which the Permit Issuing Authority may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee shall also furnish to the Permit Issuing Authority upon request, copies of records required by this permit [40 CFR 122.41(h)].

9. Duty to Reapply
If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit [40 CFR 122.41(b)].

10. Expiration of Permit
The Permittee is not authorized to discharge after the expiration date. In order to receive automatic authorization to discharge beyond the expiration date, the Permittee shall submit such information, forms, and fees as are required by the agency authorized to issue permits no later than 180 days prior to the expiration date unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.) [40 CFR 122.21(d)] Any Permittee that has not requested renewal at least 180 days prior to expiration, or any Permittee that does not have a permit after the expiration and has not requested renewal at least 180 days prior to expiration, will subject the Permittee to enforcement procedures as provided in NCGS 143-215.6 and 33 USC 1251 et. seq.

11. Signatory Requirements
All applications, reports, or information submitted to the Permit Issuing Authority shall be signed and certified [40 CFR 122.41(k)].

   a. All permit applications shall be signed as follows:

      (1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (b) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures .

      (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

      (3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official [40 CFR 122.22].

   b. All reports required by the permit and other information requested by the Permit Issuing Authority shall be signed by a person described in paragraph a. above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

      (1) The authorization is made in writing by a person described above;

      (2) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

      (3) The written authorization is submitted to the Permit Issuing Authority [40 CFR 122.22]

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c. Changes to authorization: If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative [40 CFR 122.22]

d. Certification. Any person signing a document under paragraphs a. or b. of this section shall make the following certification [40 CFR 122.22]. NO OTHER STATEMENTS OF CERTIFICATION WILL BE ACCEPTED:

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

12. Permit Actions
This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition [40 CFR 122.41(f)].

13. Permit Modification, Revocation and Reissuance, or Termination
The issuance of this permit does not prohibit the permit issuing authority from reopening and modifying the permit, revoking and reissuing the permit, or terminating the permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 02H .0100; and North Carolina General Statute 143.215.1 et. al.

14. Annual Administering and Compliance Monitoring Fee Requirements
The Permittee must pay the annual administering and compliance monitoring fee within thirty days after being billed by the Division. Failure to pay the fee in a timely manner in accordance with 15A NCAC 02H .0105(b)(2) may cause this Division to initiate action to revoke the permit.

Section C. Operation and Maintenance of Pollution Controls

1. Certified Operator
Owners of classified water pollution control systems must designate operators, certified by the Water Pollution Control System Operators Certification Commission (WPCSOCC), of the appropriate type and grade for the system, and, for each classification must [T15A NCAC 08G .0201]:

a. designate one Operator In Responsible Charge (ORC) who possesses a valid certificate of the type and grade at least equivalent to the type and grade of the system;

b. designate one or more Back-up Operator(s) in Responsible Charge (Back-up ORCs) who possesses a valid certificate of the type of the system and no more than one grade less than the grade of the system, with the exception of no backup operator in responsible charge is required for systems whose minimum visitation requirements are twice per year; and

c. submit a signed completed "Water Pollution Control System Operator Designation Form" to the Commission (or to the local health department for owners of subsurface systems) countersigned by the designated certified operators, designating the Operator in Responsible Charge (ORC) and the Back-up Operator in Responsible Charge (Back-up ORC):

(1) 60 calendar days prior to wastewater or residuals being introduced into a new system; or

(2) within 120 calendar days following:

- receiving notification of a change in the classification of the system requiring the designation of a new Operator in Responsible Charge (ORC) and Back-up Operator in Responsible Charge (Back-up ORC) of the proper type and grade; or
- a vacancy in the position of Operator in Responsible Charge (ORC) or Back-up Operator in Responsible Charge (Back-up ORC).

DocuSign Envelope ID: 21C5F3B1-85E7-4119-AEA4-A1BEB447C5A8

(3) within seven calendar days of vacancies in both ORC and Back-up ORC positions replacing or designating at least one of the responsibilities.

The ORC of each Class I facility (or the Back-up ORC, when acting as surrogate for the ORC) must:

- Visit the facility as often as is necessary to insure proper operation of the treatment system; the treatment facility must be visited at least weekly
- Comply with all other conditions of 15A NCAC 08G .0204.

The ORC of each Class II, III and IV facility (or the Back-up ORC, when acting as surrogate for the ORC) must:

- Visit the facility as often as is necessary to insure proper operation of the treatment system; the treatment facility must be visited at least five days per week, excluding holidays
- Properly manage and document daily operation and maintenance of the facility
- Comply with all other conditions of 15A NCAC 08G .0204.

2. Proper Operation and Maintenance
The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the Permittee to install and operate backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit [40 CFR 122.41(e)].

NOTE: Properly and officially designated operators are fully responsible for all proper operation and maintenance of the facility, and all documentation required thereof, whether acting as a contract operator [subcontractor] or a member of the Permittee's staff.

3. Need to Halt or Reduce not a Defense
It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this permit [40 CFR 122.41(c)].

4. Bypassing of Treatment Facilities
   a. Bypass not exceeding limitations [40 CFR 122.41(m)(2)]
   The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Paragraphs b. and c. of this section.
   b. Notice [40 CFR 122.41(m)(3)]
      (1) Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.
      (2) Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required in Part II.E.6. (24-hour notice).
   c. Prohibition of Bypass
      (1) Bypass from the treatment facility is prohibited and the Permit Issuing Authority may take enforcement action against a Permittee for bypass, unless:
         (A) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
         (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
         (C) The Permittee submitted notices as required under Paragraph b. of this section.
      (2) Bypass from the collection system is prohibited and the Permit Issuing Authority may take enforcement action against a Permittee for a bypass as provided in any current or future system-wide collection system permit associated with the treatment facility.

DocuSign Envelope ID: 21C5F3B1-85E7-4119-AEA4-A1BEB447C5A8

(3) The Permit Issuing Authority may approve an anticipated bypass, after considering its adverse effects, if the Permit Issuing Authority determines that it will meet the three conditions listed above in Paragraph c. (1) of this section.

5. Upsets
   a. Effect of an upset [40 CFR 122.41(n)(2)]: An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph b. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
   b. Conditions necessary for a demonstration of upset: Any Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

      (1) An upset occurred and that the Permittee can identify the cause(s) of the upset;

      (2) The Permittee facility was at the time being properly operated; and

      (3) The Permittee submitted notice of the upset as required in Part II.E.6.(b) of this permit.

      (4) The Permittee complied with any remedial measures required under Part II.B.2. of this permit.
   c. Burden of proof [40 CFR 122.41(n)(4)]: The Permittee seeking to establish the occurrence of an upset has the burden of proof in any enforcement proceeding.

6. Removed Substances
   Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be utilized/disposed of in accordance with NCGS 143-215.1 and in a manner such as to prevent any pollutant from such materials from entering waters of the State or navigable waters of the United States except as permitted by the Commission. The Permittee shall comply with all applicable state and Federal regulations governing the disposal of sewage sludge, including 40 CFR 503, Standards for the Use and Disposal of Sewage Sludge; 40 CFR Part 258, Criteria For Municipal Solid Waste Landfills; and 15A NCAC Subchapter 2T, Waste Not Discharged To Surface Waters. The Permittee shall notify the Permit Issuing Authority of any significant change in its sludge use or disposal practices.

7. Power Failures
   The Permittee is responsible for maintaining adequate safeguards (as required by 15A NCAC 02H .0124) to prevent the discharge of untreated or inadequately treated wastes during electrical power failures either by means of alternate power sources, standby generators or retention of inadequately treated effluent.

Section D. Monitoring and Records

1. Representative Sampling
   Samples collected and measurements taken, as required herein, shall be representative of the permitted discharge. Samples collected at a frequency less than daily shall be taken on a day and time that is representative of the discharge for the period the sample represents. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Permit Issuing Authority [40 CFR 122.41(j)].

2. Reporting
   Monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a monthly Discharge Monitoring Report (DMR) Form (MR 1, 1.1, 2, 3) or alternative forms approved by the Director, postmarked no later than the last calendar day of the month following the completed reporting period.

   The first DMR is due on the last day of the month following the issuance of the permit or in the case of a new facility, on the last day of the month following the commencement of discharge. Duplicate signed copies of these, and all other reports required herein, shall be submitted to the following address:

DocuSign Envelope ID: 21C5F3B1-85E7-4119-AEA4-A1BEB447C5A8

NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

3. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from the true discharge rates throughout the range of expected discharge volumes. Flow measurement devices shall be accurately calibrated at a minimum of once per year and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. The Director shall approve the flow measurement device and monitoring location prior to installation.

Once-through condenser cooling water flow monitored by pump logs, or pump hour meters as specified in Part I of this permit and based on the manufacturer's pump curves shall not be subject to this requirement.

4. Test Procedures
Laboratories used for sample analysis must be certified by the Division. Permittees should contact the Division's Laboratory Certification Section (919 733-3908) or visit https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch for information regarding laboratory certifications.

Facilities whose personnel are conducting testing of field-certified parameters only must hold the appropriate field parameter laboratory certifications.

Test procedures for the analysis of pollutants shall conform to the EMC regulations (published pursuant to NCGS 143-215.63 et. seq.), the Water and Air Quality Reporting Acts, and to regulations published pursuant to Section 304(g), 33 USC 1314, of the CWA (as amended), and 40 CFR 136; or in the case of sludge use or disposal, approved under 40 CFR 136, unless otherwise specified in 40 CFR 503, unless other test procedures have been specified in this permit [40 CFR 122.41].

To meet the intent of the monitoring required by this permit, all test procedures must produce minimum detection and reporting levels that are below the permit discharge requirements and all data generated must be reported down to the minimum detection or lower reporting level of the procedure. If no approved methods are determined capable of achieving minimum detection and reporting levels below permit discharge requirements, then the most sensitive (method with the lowest possible detection and reporting level) approved method must be used.

5. Penalties for Tampering
The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both [40 CFR 122.41].

6. Records Retention
Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR 503), the Permittee shall retain records of all monitoring information, including:

- all calibration and maintenance records
- all original strip chart recordings for continuous monitoring instrumentation
- copies of all reports required by this permit
- copies of all data used to complete the application for this permit

DocuSign Envelope ID: 21C5F3B1-85E7-4119-AEA4-A1BEB447C5A8

These records or copies shall be maintained for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time [40 CFR 122.41].

7. Recording Results
For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information [40 CFR 122.41]:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

8. Inspection and Entry
The Permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to;

   a. Enter, at reasonable times, upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
   b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
   c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
   d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location [40 CFR 122.41(i)].

Section E Reporting Requirements

1. Change in Discharge
All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

2. Planned Changes
The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility [40 CFR 122.41(l)]. Notice is required only when:

   a. The alteration or addition to a permitted facility may meet one of the criteria for new sources at 40 CFR 122.29(b); or
   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1); or
   c. The alteration or addition results in a significant change in the Permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

3. Anticipated Noncompliance
The Permittee shall give advance notice to the Director of any planned changes to the permitted facility or other activities that might result in noncompliance with the permit [40 CFR 122.41(l)(2)].

4. Transfers
This permit is not transferable to any person without prior written notice to and approval from the Director in accordance with 40 CFR 122.61. The Director may condition approval in accordance with NCGS 143-215.1, in

DocuSign Envelope ID: 21C5F3B1-85E7-4119-AEA4-A1BEB447C5A8

particular NCGS 143-215.1(b)(4)b.2., and may require modification or revocation and reissuance of the permit, or a minor modification, to identify the new permittee and incorporate such other requirements as may be necessary under the CWA [40 CFR 122.41(l)(3), 122.61] or state statute.

5. Monitoring Reports
Monitoring results shall be reported at the intervals specified elsewhere in this permit [40 CFR 122.41(l)(4)].
   a. Monitoring results must be reported on a Discharge Monitoring Report (DMR) (See Part II.D.2) or forms provided by the Director for reporting results of monitoring of sludge use or disposal practices.
   b. If the Permittee monitors any pollutant more frequently than required by this permit using test procedures approved under 40 CFR Part 136 and at a sampling location specified in this permit or other appropriate instrument governing the discharge, the results of such monitoring shall be included in the calculation and reporting of the data submitted on the DMR.
6. Twenty-four Hour Reporting
   a. The Permittee shall report to the Director or the appropriate Regional Office any noncompliance that potentially threatens public health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance, and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [40 CFR 122.41(l)(6)].
   b. The Director may waive the written report on a case-by-case basis for reports under this section if the oral report has been received within 24 hours.
   c. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 858-0368 or (919) 733-3300.
7. Other Noncompliance
The Permittee shall report all instances of noncompliance not reported under Part II.E.5 and 6. of this permit at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.E.6. of this permit [40 CFR 122.41(l)(7)].
8. Other Information
Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information [40 CFR 122.41(l)(8)].
9. Noncompliance Notification
The Permittee shall report by telephone to either the central office or the appropriate regional office of the Division as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:
   a. Any occurrence at the water pollution control facility which results in the discharge of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a sludge digester; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances.
   b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.
   c. Any failure of a pumping station, sewer line, or treatment facility resulting in a by-pass without treatment of all or any portion of the influent to such station or facility.

   Persons reporting such occurrences by telephone shall also file a written report within 5 days following first knowledge of the occurrence. Also see reporting requirements for municipalities in Part IV.C.2.c. of this permit.
10. Availability of Reports
Except for data determined to be confidential under NCGS 143-215.3 (a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices

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of the Division. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NCGS 143-215.1(b)(2) or in Section 309 of the Federal Act.

11. Penalties for Falsification of Reports
The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation, or by imprisonment for not more than two years per violation, or by both [40 CFR 122.41].

12. Annual Performance Reports
Permittees who own or operate facilities that primarily collect or treat municipal or domestic wastewater and have an average annual flow greater than 200,000 gallons per day shall provide an annual report to the Permit Issuing Authority and to the users/customers served by the Permittee (NCGS 143-215.1C). The report shall summarize the performance of the collection or treatment system, as well as the extent to which the facility was compliant with applicable Federal or State laws, regulations and rules pertaining to water quality. The report shall be provided no later than sixty days after the end of the calendar or fiscal year, depending upon which annual period is used for evaluation.

The report shall be sent to:

NC DEQ / Division of Water Resources / Water Quality Permitting Section
ATTENTION: Central Files
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

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PART III
OTHER REQUIREMENTS

Section A. Construction

a. The Permittee shall not commence construction of wastewater treatment facilities, nor add to the plant's treatment capacity, nor change the treatment process(es) utilized at the treatment plant unless (1) the Division has issued an Authorization to Construct (AtC) permit or (2) the Permittee is exempted from such AtC permit requirements under Item b. of this Section.

b. In accordance with NCGS 143-215.1(a5) [SL 2011-394], no permit shall be required to enter into a contract for the construction, installation, or alteration of any treatment work or disposal system or to construct, install, or alter any treatment works or disposal system within the State when the system's or work's principle function is to conduct, treat, equalize, neutralize, stabilize, recycle, or dispose of industrial waste or sewage from an industrial facility and the discharge of the industrial waste or sewage is authorized under a permit issued for the discharge of the industrial waste or sewage into the waters of the State. Notwithstanding the above, the permit issued for the discharge may be modified if required by federal regulation.

c. Issuance of an AtC will not occur until Final Plans and Specifications for the proposed construction have been submitted by the Permittee and approved by the Division.

Section B. Groundwater Monitoring

The Permittee shall, upon written notice from the Director, conduct groundwater monitoring as may be required to determine the compliance of this NPDES permitted facility with the current groundwater standards.

Section C. Changes in Discharges of Toxic Substances

The Permittee shall notify the Permit Issuing Authority as soon as it knows or has reason to believe (40 CFR 122.42):

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels";

   (1) One hundred micrograms per liter (100 µg/L);

   (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

   (3) Five times the maximum concentration value reported for that pollutant in the permit application.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels";

   (1) Five hundred micrograms per liter (500 µg/L);

   (2) One milligram per liter (1 mg/L) for antimony;

   (3) Ten times the maximum concentration value reported for that pollutant in the permit application.

Section D. Facility Closure Requirements

The Permittee must notify the Division at least 90 days prior to the closure of any wastewater treatment system covered by this permit. The Division may require specific measures during deactivation of the system to prevent adverse impacts to waters of the State. This permit cannot be rescinded while any activities requiring this permit continue at the permitted facility.

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PART IV
SPECIAL CONDITIONS FOR MUNICIPAL FACILITIES

Section A. Definitions

In addition to the definitions in Part II of this permit, the following definitions apply to municipal facilities:

Indirect Discharge or Industrial User
Any non-domestic source that discharges wastewater containing pollutants into a POTW regulated under section 307(b), (c) or (d) of the CWA. [40 CFR 403.3 (i) and (j) and 15A NCAC 02H .0903(b)(11)]

Interference
Inhibition or disruption of the POTW treatment processes; operations; or its sludge process, use, or disposal which causes or contributes to a violation of any requirement of the Permittee's (or any satellite POTW's if different from the Permittee) NPDES, collection system, or non-discharge permit or prevents sewage sludge use or disposal in compliance with specified applicable State and Federal statutes, regulations, or permits. [15A NCAC 02H .0903(b)(14)]

Pass Through
A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or with discharges from other sources, causes a violation, including an increase in the magnitude or duration of a violation, of the Permittee's (or any satellite POTW's, if different from the Permittee) NPDES, collection system, or non-discharge permit. [15A NCAC 02H .0903(b)(23)]

Publicly Owned Treatment Works (POTW)
A treatment works as defined by Section 212 of the CWA, which is owned by a State or local government organization. This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes the collection system, as defined in 15A NCAC 2T .0402, only if it conveys wastewater to a POTW treatment plant. The term also means the local government organization, or municipality, as defined in section 502(4) of the CWA, which has jurisdiction over indirect discharges to and the discharges from such a treatment works. In this context, the organization may be the owner of the POTW treatment plant or the owner of the collection system into which an indirect discharger discharges. This second type of POTW may be referred to as a "satellite POTW organization." [15A NCAC 02H .0903(b)(26)]

"Significant Industrial User" or "SIU"
An Industrial User that discharges wastewater into a publicly owned treatment works and that [15A NCAC 02H .0903(b)(33)]:

1. Discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewaters); or
2. Contributes process wastewater which makes up five percent or more of the NPDES or non-discharge permitted flow limit or organic capacity of the POTW treatment plant. In this context, organic capacity refers to BOD, TSS and ammonia; or
3. Is subject to categorical standards under 40 CFR Part 403.6 and 40 CFR Parts 405-471; or
4. Is designated as such by the Permittee on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, or the POTW's effluent limitations and conditions in its NPDES or non-discharge permit, or to limit the POTW's sludge disposal options;
5. Subject to approval under 15A NCAC 02H .0907(b), the Permittee may determine that an Industrial User meeting the criteria in paragraphs 1 or 2 of this definition above has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the POTW's effluent limitations and conditions in its NPDES or non-discharge permit, or to limit the POTW's sludge disposal options, and thus is not a Significant Industrial User (SIU); or
6. Subject to approval under 15A NCAC 02H .0907(b), the Permittee may determine that an Industrial User meeting the criteria in paragraph 3 of this definition above meets the requirements of 40 CFR Part 403.3(v)(2) and thus is a non-significant categorical Industrial User.

Section B. Publicly Owned Treatment Works (POTWs)

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All POTWs must provide adequate notice to the Director of the following [40 CFR 122.42(b)]:

1. Any new introduction of pollutants into the POTW from an indirect discharger, regardless of the means of transport, which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; and
2. Any substantial change in the volume or character of pollutants being introduced by an indirect discharger as influent to that POTW at the time of issuance of the permit.
3. For purposes of this paragraph, adequate notice shall include information on (1) the quality and quantity of effluent introduced into the POTW, and (2) any anticipated impact that may result from the change of the quantity or quality of effluent to be discharged from the POTW.

Section C. Municipal Control of Pollutants from Industrial Users.

1. Effluent limitations are listed in Part I of this permit. Other pollutants attributable to inputs from Industrial Users discharging to the POTW may be present in the Permittee's discharge. At such time as sufficient information becomes available to establish limitations for such pollutants, this permit may be revised to specify effluent limitations for any or all of such other pollutants in accordance with best practicable technology or water quality standards.
2. Prohibited Discharges
   a. The Permittee shall develop and enforce their Pretreatment Program to implement the prohibition against the introduction of pollutants or discharges into the waste treatment system or waste collection system which cause or contribute to Pass Through or Interference as defined in 15A NCAC 02H .0900 and 40 CFR 403. [40 CFR 403.5(a)(1)]
   b. The Permittee shall develop and enforce their Pretreatment Program to implement the prohibitions against the introduction of the following wastes in the waste treatment or waste collection system [40 CFR 403.5(b)]:
      (1) Pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;
      (2) Pollutants which cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works is specifically designed to accommodate such discharges;
      (3) Solid or viscous pollutants in amounts which cause obstruction to the flow in the POTW resulting in Interference;
      (4) Any pollutant, including oxygen demanding pollutants (BOD, etc.) released in a Discharge at a flow rate and/or pollutant concentration which will cause Interference with the POTW;
      (5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference, but in no case heat in such quantities that the temperature at the POTW Treatment Plant exceeds 40°C (104°F) unless the Division, upon request of the POTW, approves alternate temperature limits;
      (6) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;
      (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; or
      (8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.
   c. The Permittee shall investigate the source of all discharges into the POTW, including slug loads and other unusual discharges, which have the potential to adversely impact the Permittee's Pretreatment Program and/or the operation of the POTW.

      The Permittee shall report such discharges into the POTW to the Director or the appropriate Regional Office. Any information shall be provided orally within 24 hours from the time the Permittee became aware of the circumstances. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the discharge; the investigation into possible sources; the period of the discharge, including exact dates and times; if the discharge has not ceased, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance,

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3. With regard to the effluent requirements listed in Part I of this permit, it may be necessary for the Permittee to supplement the requirements of the Federal Pretreatment Standards (40 CFR, Part 403) to ensure compliance by the Permittee with all applicable effluent limitations. Such actions by the Permittee may be necessary regarding some or all of the industries discharging to the municipal system.
4. The Permittee shall require any Industrial User (IU) discharging to the POTW to meet Federal Pretreatment Standards developed under Section 307(b) of the Act as amended (which includes categorical standards and specific local limits, best management practices and narrative requirements). Prior to accepting wastewater from any Significant Industrial User (SIU), the Permittee shall either develop and submit to the Division a new Pretreatment Program or, as necessary, a modification of an existing Pretreatment Program, for approval as required under section D below as well as 15A NCAC 02H .0907(a) and (b). [40 CFR 122.44(j)(2)]
5. This permit shall be modified, or alternatively, revoked and reissued, to incorporate or modify an approved POTW Pretreatment Program or to include a compliance schedule for the development of a POTW Pretreatment Program as required under Section 402 (b)(8) of the CWA and implementing regulations or by the requirements of the approved State pretreatment program, as appropriate.

Section D. Pretreatment Programs

Under authority of sections 307 (b) and (c) and 402(b)(8) of the CWA and implementing regulations 40 CFR 403, North Carolina General Statute 143-215.3(14) and implementing regulations 15A NCAC 02H .0900, and in accordance with the approved pretreatment program, all provisions and regulations contained and referenced in the pretreatment program submittal are an enforceable part of this permit. [40 CFR 122.44(j)(2)]

The Permittee shall operate its approved pretreatment program in accordance with Section 402(b)(8) of the CWA, 40 CFR 403, 15A NCAC 02H .0900, and the legal authorities, policies, procedures, and financial provisions contained in its pretreatment program submission and Division approved modifications thereof. Such operation shall include but is not limited to the implementation of the following conditions and requirements. Terms not defined in Part II or Part IV of this permit are as defined in 15A NCAC 02H .0903 and 40 CFR 403.3.

1. Sewer Use Ordinance (SUO)
   The Permittee shall maintain adequate legal authority to implement its approved pretreatment program. [15A NCAC 02H .0903(b)(32), .0905 and .0906(b)(1); 40 CFR 403.8(f)(1) and 403.9(b)(1) and (2)]

2. Industrial Waste Survey (IWS)
   The Permittee shall implement an IWS consisting of the survey of users of the POTW collection system or treatment plant, as required by 40 CFR 403.8(f)(2)(i-iii) and 15A NCAC 02H .0905 [also 40 CFR 122.44(j)(1)], including identification of all Industrial Users that may have an impact on the POTW and the character and amount of pollutants contributed to the POTW by these Industrial Users and identification of those Industrial Users meeting the definition of SIU. Where the Permittee accepts wastewater from one or more satellite POTWs, the IWS for the Permittee shall address all satellite POTW services areas, unless the pretreatment program in those satellite service areas is administered by a separate Permittee with an approved Pretreatment Program. The Permittee shall submit a summary of its IWS activities to the Division at least once every five years, and as required by the Division. The IWS submission shall include a summary of any investigations conducted under paragraph C.2.c. of this Part. [15A NCAC 02H .0903(b)(13), .0905 and .0906(b)(2); 40 CFR 403.8(f)(2) and 403.9]

3. Monitoring Plan
   The Permittee shall implement a Division-approved Monitoring Plan for the collection of facility specific data to be used in a wastewater treatment plant Headworks Analysis (HWA) for the development of specific pretreatment local limits. Effluent data from the Plan shall be reported on the DMRs (as required by Parts II.D and II.E.5.). [15A NCAC 02H .0903(b)(16), .0906(b)(3) and .0905]

4. Headworks Analysis (HWA) and Local Limits
   The Permittee shall obtain Division approval of a HWA at least once every five years, and as required by the Division. Within 180 days of the effective date of this permit (or any subsequent permit modification) the Permittee shall submit to the Division a written technical evaluation of the need to revise local limits (i.e., an updated HWA or documentation of why one is not needed) [40 CFR 122.44]. The Permittee shall develop, in accordance with 40 CFR 403.5(c) and 15A NCAC 02H .0909, specific Local Limits to implement the prohibitions listed in 40 CFR 403.5(a) and (b) and 15A NCAC 02H .0909. Pursuant to 40 CFR 403.5, local limits are

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enforceable Pretreatment Standards as defined by 40 CFR 403.3(1). [15A NCAC 02H .0903(b)(10), .0905, and .0906(b)(4)]

5. Industrial User Pretreatment Permits (IUP) & Allocation Tables
In accordance with NCGS 143-215.1, the Permittee shall issue to all Significant Industrial Users, permits for operation of pretreatment equipment and discharge to the Permittee's collection system or treatment works. These permits shall contain limitations, sampling protocols, reporting requirements, appropriate standard and special conditions, and compliance schedules as necessary for the installation of treatment and control technologies to assure that their wastewater discharge will meet all applicable pretreatment standards and requirements. The Permittee shall maintain a current Allocation Table (AT) which summarizes the results of the HWA and the limits from all IUPs. Permitted IUP loadings for each parameter cannot exceed the treatment capacity of the POTW as determined by the HWA. [15A NCAC 02H .0906(b)(6), .0909, .0916, and .0917; 40 CFR 403.5, 403.8(f)(1)(iii); NCGS 143-215.67(a)]

6. Authorization to Construct (AtC)
The Permittee shall ensure that an Authorization to Construct permit (AtC) is issued to all applicable Industrial Users for the construction or modification of any pretreatment facility. Prior to the issuance of an AtC, the proposed pretreatment facility and treatment process must be evaluated for its capacity to comply with all Industrial User Pretreatment Permit (IUP) limitations. [15A NCAC 02H .0906(b)(7) and .0905; NCGS 143-215.1(a)(8)]

7. POTW Inspection & Monitoring of their IUs
The Permittee shall conduct inspection, surveillance, and monitoring activities as described in its Division approved pretreatment program in order to determine, independent of information supplied by Industrial Users, compliance with applicable pretreatment standards. [15A NCAC 02H .0908(e); 40 CFR 403.8(f)(2)(v)] The Permittee must:

   a. Inspect all Significant Industrial Users (SIUs) at least once per calendar year;
   b. Sample all Significant Industrial Users (SIUs) at least once per calendar year for all SIU permit-limited parameters including flow except as allowed under 15A NCAC .0908(e); and
   c. At least once per year, document an evaluation of any non-significant categorical Industrial User for compliance with the requirements in 40 CFR 403.3(v)(2), and either continue or revoke the designation as non-significant.

8. IU Self Monitoring and Reporting
The Permittee shall require all Industrial Users to comply with the applicable monitoring and reporting requirements outlined in the Division-approved pretreatment program, the industry's pretreatment permit, or in 15A NCAC 02H .0908. [15A NCAC 02H .0906(b)(5) and .0905; 40 CFR 403.8(f)(1)(v) and (2)(iii); 40 CFR 122.44(j)(2) and 40 CFR 403.12]

9. Enforcement Response Plan (ERP)
The Permittee shall enforce and obtain appropriate remedies for violations of all pretreatment standards promulgated pursuant to section 307(b) and (c) of the CWA (40 CFR 405 et. seq.), prohibitive discharge standards as set forth in 40 CFR 403.5 and 15A NCAC 02H .0909, specific local limitations, and other pretreatment requirements. All remedies, enforcement actions and other, shall be consistent with the Enforcement Response Plan (ERP) approved by the Division. [15A NCAC 02H .0903(b)(7), .0906(b)(8) and .0905; 40 CFR 403.8(f)(5)]

10. Pretreatment Annual Reports (PAR)
The Permittee shall report to the Division in accordance with 15A NCAC 02H .0908. In lieu of submitting annual reports, Modified Pretreatment Programs developed under 15A NCAC 02H .0904 (b) may be required to submit a partial annual report or to meet with Division personnel periodically to discuss enforcement of pretreatment requirements and other pretreatment implementation issues.

    For all other active pretreatment programs, the Permittee shall submit two copies of a Pretreatment Annual Report (PAR) describing its pretreatment activities over the previous calendar year to the Division at the following address:

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NC DEQ / Division of Water Resources / Water Quality Permitting Section
Pretreatment, Emergency Response, and Collection Systems (PERCS) Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

These reports shall be submitted by March 1 of each year and shall contain the following:

a. Narrative
A narrative summary detailing actions taken, or proposed, by the Permittee to correct significant non-compliance and to ensure compliance with pretreatment requirements;

b. Pretreatment Program Summary (PPS)
A pretreatment program summary (PPS) on forms or in a format provided by the Division;

c. Significant Non-Compliance Report (SNCR)
A list of Industrial Users (IUs) in significant noncompliance (SNC) with pretreatment requirements, and the nature of the violations on forms or in a format provided by the Division;

d. Industrial Data Summary Forms (IDSF)
Monitoring data from samples collected by both the POTW and the Significant Industrial Users (SIUs). These analytical results must be reported on Industrial Data Summary Forms (IDSF) or on other forms or in a format provided by the Division;

e. Other Information
Copies of the POTW's allocation table, new or modified enforcement compliance schedules, public notice of IUs in SNC, a summary of data or other information related to significant noncompliance determinations for IUs that are not considered SIUs, and any other information, upon request, which in the opinion of the Director is needed to determine compliance with the pretreatment implementation requirements of this permit;

11. Public Notice
The Permittee shall publish annually a list of Industrial Users (IUs) that were in significant noncompliance (SNC) as defined in the Permittee's Division-approved Sewer Use Ordinance with applicable pretreatment requirements and standards during the previous twelve month period. This list shall be published within four months of the applicable twelve-month period. [15A NCAC 02H .0903(b)(34), .0908(b)(5) and .0905 and 40 CFR 403.8(f)(2)(viii)]

12. Record Keeping
The Permittee shall retain for a minimum of three years records of monitoring activities and results, along with support information including general records, water quality records, and records of industrial impact on the POTW and shall retain all other Pretreatment Program records as required by 15A NCAC 02H .0908(f). [15A NCAC 02H .0908(f); 40 CFR 403.12(o)]

13. Pretreatment Program Resources
The Permittee shall maintain adequate funding and qualified personnel to accomplish the objectives of its approved pretreatment program. and retain a written description of those current levels of inspection. [15A NCAC 02H .0906(b)(9) and (10) and .0905; 40 CFR 403.8(f)(3), 403.9(b)(3)]

14. Modification to Pretreatment Programs
Modifications to the approved pretreatment program including but not limited to local limits modifications, POTW monitoring of their Significant Industrial Users (SIUs), and Monitoring Plan modifications, shall be considered a permit modification and shall be governed by 40 CFR 403.18, 15 NCAC 02H .0114 and 15A NCAC 02H .0907.

APPENDIX

P

City of New Bern - Town of River Bend
Conceptual Plan – Emergency Water Interconnect
Interlocal Agreement

Rivers & ASSOCIATES, INC.
Since 1918
Engineers Planners Surveyors Landscape Architects
Six Forks Place III
Suite 230
353 E. Six Forks Road
Raleigh, NC 76609
(919) 594-1626
riversandassociates.com

NEW BERN EMERGENCY TIE IN

TOWN OF RIVER BEND

CRAVEN COUNTY NORTH CAROLINA

DESIGNED BY:	GJC
DRAWN BY:	JIM
CHECKED BY:	GJC
PROJECT No.	2023141
DRAWING No.	
SCALE	AS SHOWN
DATE	09/16/24
SHEET No.	01

NORTH CAROLINA

CRAVEN COUNTY

INTERLOCAL AGREEMENT FOR EMERGENCY WATER SUPPLY

THIS INTERLOCAL AGREEMENT FOR EMERGENCY WATER SUPPLY ("Agreement"), made and entered as of the date this Agreement is signed by the last party to execute the same, by and between **CITY OF NEW BERN**, a body politic and municipal corporation of the State of North Carolina ("City"); and the **TOWN OF RIVER BEND**, a body politic and municipal corporation of the State of North Carolina ("Town"), is for emergency water service between City and the Town, as described hereinafter.

WITNESSETH:

THAT WHEREAS, the parties to this Agreement are both organized and established under the laws of the State of North Carolina, and have the legal authority to operate municipal water supply distribution systems; and,

WHEREAS, this Agreement is made pursuant to the authority granted by N.C.G.S. § 160A-461; and,

WHEREAS, both parties to this Agreement own and operate separate municipal water supply distribution systems, with capacities currently capable of serving the present customers of their respective systems; and,

WHEREAS, the municipal public water distribution systems owned and operated by the City and the Town are both located in proximity to each other at an existing eight inch diameter water main near the corner of East Church Street and US Highway 17 ("Site"); and,

WHEREAS, City has sufficient excess capacity within its current water supply distribution systems to provide water supply to Town during temporary emergencies; and,

WHEREAS, sufficient hydraulic engineering analyses have been performed to determine that water from the City water system can flow into the Town's water system at the Site without adverse consequences to the respective systems; and,

WHEREAS, the purpose of this Agreement is to establish a method of an exchange of water supply from City to Town on a temporary emergency interconnection basis; and,

WHEREAS, the City and the Town acknowledge that this Agreement is in the best interests of their respective systems and customers, and further the public welfare and safety.

NOW, THEREFORE, in consideration of the respective rights, powers, duties and obligations hereinafter set forth to be performed by the parties, they do mutually agree as follow:

1. In the event of an emergency as described hereafter, City shall furnish to the Town water in an amount not to exceed 100,000 gallons per day, and at a rate not to exceed 500 gallons per minute, at the Site. Such water shall be potable treated water meeting applicable purity standards of North Carolina Rules Governing Public Water Systems, North Carolina Administrative Code Title 15A, Subchapter 18C Water Supplies as promulgated by the North Carolina Drinking Water Act (or as may be later amended or recodified). Said water will be furnished by City at a reasonable constant pressure calculated at the point of delivery at the Site.

2. Town hereby agrees to design, install and operate, all at its sole cost and expense, potable water lines from its water system to the point of delivery at the Site, including a master meter and backflow equipment as approved by City and its Engineer. The maintenance of the metering and backflow equipment shall be the sole responsibility of Town. Town shall calibrate such metering equipment whenever requested by City but no more frequently than once every twelve (12) months. A meter registering not more than 2% above or below the test results shall be deemed accurate. If the meter fails to register for any period of time, the parties shall use their best efforts to determine and agree as to the amount believed to have been delivered to Town during such period. The metering equipment shall be read monthly on the final day of the month by both City and Town, during periods when water is being supplied to the Town, by the City.

3. The parties shall choose and retain their respective consulting engineering firm to design and permit all required pipelines and meter system at any portion of the Site owned by it for its improvements. Prior to construction, the parties shall both review and approve, if acceptable, the construction drawings. The parties shall also be responsible for their own respective administrative and legal costs of contract review and approval, and for easement acquisition, if any is needed.

4. City shall own and be responsible for the operation and maintenance of all distribution system facilities located on the City's side of the interconnection point. Town shall own and be responsible for the operation and maintenance of all distribution system facilities located on the Town's side of the interconnection point. The master meter and backflow devices shall be owned by Town of River Bend.

5. The interconnected water systems of the City and the Town will be separated by closed double-check water valves. Under the terms and conditions of this Agreement, these water valves may be opened in a sequence such that the Town may receive water from the City for specified periods using the procedures described hereafter. These specified periods shall only be during temporary water outages in all or part of the Town's water distribution system or other such conditions mutually deemed emergencies by the City and Town utility directors. For the purpose of this Agreement, temporary water outages and emergencies shall include, but are not be limited to, severed or damaged water main(s), a planned water outage, unplanned water outage, or a water supply shortage. Each party recognizes that due to the length and size of the water transmission main that interconnects the City's and the Town's water distribution systems and the infrequent usage of water transmitted through this pipeline per this Agreement, that the initial water quality transmitted when water usage is first activated may be poor and may require flushing from the system by the Town in order to fully meet the potable water requirements.

6. The City shall charge the Town for all water consumed at the published "Inside City Limits" rate, as such fee is set and amended from time to time by the Board of Aldermen of the City of New Bern.

7. City shall bill Town within ten (10) days of the end of each month. Bills shall be paid within 30 calendar days of receipt of the billing statement. Disagreements regarding amounts being billed and regarding the functioning of the meters used to measure the amount of water furnished and received shall be resolved pursuant to Paragraph 13 below if the utility directors of the parties fail to resolve the dispute within 30 days after a request and demand for resolution is delivered.

8. The parties shall each designate in writing a person or persons to administer requests for water under this Agreement. Once designated, such person(s) may make and receive requests orally. The designated representatives are responsible for communicating

with the other party and coordinating operational actions necessary for the water to be transferred. The parties shall notify the other at least 48 hours in advance of any planned temporary water outage permitted under this Agreement. The parties shall also immediately notify the other at the conclusion of a temporary water service event. The parties agree to provide updated emergency contact information for the designated contacts such as cell phone and email addresses.

9. The parties acknowledge and agree that City will normally be using chloramines as its residual disinfectant and agrees to notify Town in writing, in advance of any temporary or permanent switch to use other disinfection residuals or other significant water treatment process or system-wide operation change.

10. City reserves the right to deny emergency water service to the Town for failure to comply with the conditions of this Agreement. City reserves the right to deny emergency water service to the Town in the event that water cannot be practicably furnished to the Town without negatively impacting City, as determined in the reasonable but sole opinion of the City. Such circumstances include but are not limited to periods of water shortage, periods when insufficient water exists to meet the requests of City's customers, emergencies of the City, or periods when depletion of water reserves could endanger City's ability to provide for its customers' needs. In no event shall City be liable for failure to provide water hereunder.

11. The parties agree not to charge each other water capacity "reserve" or "allocation" charges or any charges other than the consumption charges and billing charges as described herein.

12. Except as otherwise provided herein, this Agreement shall expire twenty (20) years from the date this Agreement is signed by the last party executing the same. This Agreement may be extended or modified only by written consent of the parties.

13. In the event of a dispute involving this Agreement, including but not limited to billing disputes, equipment problems, water quality problems, a substantial breach of the terms of this Agreement, or failure to resolve other issues necessary for the continued effective function of the water systems of each party that is not cured by the breaching party, within 30 days after notice, the parties shall have any remedy available to them at law.

14. City shall, as soon as practicable, notify Town of any emergency or condition which may affect the quality of water that may be delivered to Town.

15. If a greater pressure than the normally available pressure at the point of delivery is required by Town, the cost of providing such greater pressure shall be borne by Town.

16. Termination for Any Reason. Either party may terminate this Agreement upon one hundred eighty (180) days written notice to the other party upon a determination by the terminating party that it is not in the best interest of such party to continue this Agreement. This provision does not limit the remedies available under Paragraph 13, and termination may occur earlier pursuant thereto.

17. Indemnification. City shall not be liable to Town, to an end user, to an intermediary, or to any person, firm, corporation, municipality, or other water consumer for failure to supply a sufficient quantity or quality of water under this agreement or from failure to comply with any State or Federal standards relating to drinking water. Notwithstanding the references to third parties in this Agreement, City shall not be liable to those parties for any obligations within this Agreement and shall not be obligated to enforce any requirements imposed by this agreement or by any independent agreement with third parties. A party receiving water as a buyer or as an end user under this Agreement ("the indemnifying party") shall indemnify City and its officials, agents, and employees from and against all claims, judgments, costs, damages, fines, penalties, interest, and expenses (including but not limited to attorney's fees) imposed against such seller that arise from or in connection with the indemnifying party's receipt or non-receipt of water pursuant to this Agreement.

18. Regulatory Compliance. Town shall be responsible for securing any necessary Federal or State approvals and for compliance with any applicable Federal or State regulations relating to the transfer of water under this Agreement.

19 It is specifically agreed by both parties hereto, as part of the consideration of the signing of this document, that they, their agents, officials, employees, or servants will not discriminate in any manner on the basis of race, color, creed, sexual orientation, or national origin with reference to the subject matter of this agreement, no matter how remote.

20. Miscellaneous.

A. Entire Agreement; Modification. This Agreement supersedes all prior agreements and constitutes the entire agreement between the parties hereto with regard to the subject matter hereof. It may not be amended or modified except by an instrument executed by all parties.

B. Severability. If any of the provisions of this Agreement shall be held by a court of competent jurisdiction to be unconstitutional or unenforceable, the decision of such court shall not affect or impair any of the remaining provisions of this Agreement, and the parties shall, to the extent they deem to be appropriate, take such actions as are necessary to correct any such unconstitutional or unenforceable provision. It is hereby declared to be the intent of the parties to this Agreement that this Agreement would have been approved and executed had such an unconstitutional or unenforceable provision been excluded therefrom.

C. Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective legal representatives, successors, and assigns.

D. Assignment. Except as may otherwise be expressly provided herein, no party may transfer or assign any right, obligation, or liability arising hereunder without the other party's prior written consent. Any such assignment or attempted assignment shall be null and void.

E. Covenant of Further Assurances. The parties agree that from and after the date of execution of this Agreement, each upon the request of the other take such actions as may be reasonably required to carry out the purpose and intent of this Agreement.

F. Governing Law; Exclusive Venue. All matters relating to this Agreement shall be governed by the laws of the State of North Carolina, without regard to its choice of law provisions, and exclusive venue for any action relating to this agreement shall be Craven County.

G. No Joint Venture. This Agreement shall not be construed to create a joint agency, venture or partnership, as the parties are independent political subdivisions of the State of North Carolina.

H. Headings. Headings in this Agreement are for convenience and reference only and shall not be used to interpret or construe its provisions.

I. Multiple Originals. This Agreement may be executed in duplicate multiple originals, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

J. Consideration. The consideration for the execution of this Agreement is the agreement among the parties affixing their signatures hereto to agree to the matters and things set forth herein.

IN TESTIMONY WHEREOF, CITY OF NEW BERN has caused this instrument to be executed in its name by its Mayor, attested by the Clerk to Board of Aldermen, and its seal to be hereunto affixed all by order of said Board duly given; and,

IN TESTIMONY WHEREOF, TOWN OF RIVER BEND has caused this instrument to be executed in its name by its Mayor, attested by the Town Clerk, and its seal to be hereunto affixed all by order of its Town Council duly given.

-City Seal-

CITY OF NEW BERN

Jeffrey T. Odham, Mayor

Date: 9/27/2022

ATTEST:

Brenda Blanco, Clerk

THIS INSTRUMENT has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act as amended.

Date: 9/28/2022

New Bern, Finance Officer

-Town Seal-

TOWN OF RIVER BEND

John R. Kirkland. Mayor

Date: 9/15/22

ATTEST:

Kristie J. Nobles, Town Clerk

THIS INSTRUMENT has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act as amended.

Date: 9/15/22

Town of River Bend Finance Officer

APPENDIX

Q

City of New Bern Water Rates Schedule

AN ORDINANCE TO RESTATE THE SCHEDULE OF WATER RATES APPLICABLE TO CUSTOMERS OF THE CITY OF NEW BERN

BE IT ORDAINED BY THE BOARD OF ALDERMEN OF THE CITY OF NEW BERN:

Section 1. That there is hereby established, as one component of the water rates to be charged all water customers of the City of New Bern, monthly readiness-to-serve charges, based on the customer's water meter size and the customer's location: i.e. within or without the City of New Bern, as follows:

Effective with all billing beginning July 1, 2023

METER SIZE	INSIDE THE CITY OF NEW BERN	OUTSIDE THE CITY OF NEW BERN
5/8" & 3/4"	$23.29	$44.91
1" & 1 ¼"	$55.72	$109.77
1 ½"	$109.77	$217.87
2"	$174.63	$347.59
3"	$358.40	$715.13
4"	$591.90	$1,182.12
6"	$1,210.23	$2,418.79
8"	$1,828.56	$3,655.45
10"	$2,794.97	$5,588.28

Section 2. That there are hereby established, as the second component of water rates to be charged all water customers of the City of New Bern, monthly commodity charges, i.e., rates per thousand gallons of water use, as follows:

Effective with all billing beginning July 1, 2023

Water Customers Located within the City Limits of the City of New Bern.	**$3.03**	**per 1,000 gallons (under 10,000 gallons)**
Water Customers Located within the City Limits of the City of New Bern.	**$4.09**	**per 1,000 gallons (over 10,000 gallons)**
Water Customers Located outside the City Limits of the City of New Bern.	**$6.06**	**per 1,000 gallons (under 10,000 gallons)**
Water Customers Located outside the City Limits of the City of New Bern.	**$8.18**	**per 1,000 gallons (over 10,000 gallons)**

Section 3. All contract rate terms which are based on the in-city rates are hereby changed in accordance with the terms of the contract and with the changes approved herein.

Section 4. That all Ordinances and Resolution heretofore adopted by the Board of Aldermen in fixing water rates to be charged to customers of the City of New Bern which are in conflict with the rates herein set forth be, and the same are hereby repealed.

Section 5. That this Ordinance shall be in full force and effect as of July 1, 2023.

ADOPTED THIS 13TH DAY OF JUNE, 2023.

JEFFREY T. ODHAM, MAYOR

Brenda E. Blanco

BRENDA E. BLANCO, CITY CLERK

APPENDIX

R

City of New Bern – Town of River Bend
Conceptual Plan - Bulk Water Supply Interconnect

TOWN OF RIVER BEND
NEW BERN BULK WATER INTERCONNECT
SHEET 1
TIE INTO EXISTING NEW BERN WATER MAIN AND BOOSTER PUMP STATION SITE
Rocky Run Rd
Laser Property Solutions
Staten Rd
Rocky Run Park
St James AME Zion Church
PROPOSED 10" WATER MAIN
U S Hwy 17 S
Rocky Run Rd
PROPOSED 6" COMPOUND METER SITE
SEE SHEET 2
Hayward Creek
Norbury Dr
Dollar General
Rocky Run
Google Earth
Image © 2024 Airbus
2000 ft
N

TOWN OF RIVER BEND
NEW BERN BULK WATER INTERCONNECT
SHEET 2
SEE SHEET 1
PROPOSED 6" COMPOUND METER SITE
PROPOSED 10" WATER MAIN
TIE INTO EXISTING WATER MAIN AT RIVER BEND ELEVATED TANK SITE
St James AME Zion Church
Forest Oaks Dr
Rocky Run Rd
Barbara Dr
ENC Sports Cards
U.S. Hwy 17 S
Dollar General
Old Pollocksville Rd
Riverstone Assisted Living
Norbury Dr
Rocky Run
RHA Howell's Centers
Pirates Rd
Shoreline Dr
Ohara Dr
Channel Run Dr
Google Earth
Image © 2024 Airbus
2000 ft
N