

**TOWN OF RIVER BEND
REQUEST FOR QUALIFICATIONS FOR
ENGINEERING SERVICES**

Posted October 24, 2024

The Town of River Bend has received funding from the State of North Carolina for the engineering and construction of a new Water Treatment Plant (WTP). The town currently operates 3 wells with a 12-hour pump capacity of 950,000 gallons per day and 2 WTPs. The current treatment units are approximately 40 years old. The project will consist of the construction of a new WTP constructed on a 4.25 acre site owned by the town. It is anticipated that the new WTP will consist of greensand filtration and zeolite softening to enhance the removal of iron, manganese and hardness and improve potable water quality and the extension of transmission lines from the existing wells to the new WTP. Additionally, it is anticipated that lined waste settling lagoons and supplemental pumps will be installed on the new site for settling of waste and a force main will be extended from the site to the existing gravity sewer system. The project will not increase existing production capacity. Upon completion of the new WTP, the current treatment units will be abandoned. The anticipated scope is subject to change if additional funding is secured for the project. If necessary, that will be addressed with an amendment to the engineering services agreement. The Town is soliciting Request For Proposals (RFQ) for engineering services for the project as herein described.

This project is being funded through the State of North Carolina and is being administered by the Division of Water infrastructure. This project does not include APRA funding and is therefore not subject to ARPA regulations. The project must meet any applicable state laws for this type of project.

Scope of Services:

Engineering services shall include, but are not limited to, standard tasks necessary for the completion of the project in conformance with all applicable funding agency guidelines. These tasks will include, but are not limited to:

1. Environment Review Compliance and Release of Funds and other Funding Conditions
2. Engineering Report Preparation and Environmental Document Preparation
3. Engineering Design and Permitting Requirements for the Project
4. Any Required WTP Permitting Revisions
5. Construction Administration
6. All Required Plan and Record Drawing Preparation
7. Administration of any Wetlands Mitigation Activities/Permitting
8. Field Surveying
9. Completion of Bid Documents including Specifications and Design Drawings
10. Bidding and Recommendation of Award
11. Completion of all Required Reports, Documentation and Permit Acquisition Activities
12. Preparation of Financial Reimbursements Forms and Pay Requests
13. Construction Observation and Administration

14. Construction Closeout
15. Serve as liaison between town and contractor for initial step in any dispute resolution

Proposal Submission:

This RFQ is intended to provide consultants with an opportunity to demonstrate their ability to perform the required tasks. The content of the response should respond to the information presented in this RFQ. The town will accept electronic submissions. Responses shall not exceed 20 (single spaced, one sided) pages and must contain the following information:

1. Cover
2. Cover Letter
3. Table of Contents
4. Background Information about the firm including the consultant or firm's legal name, address, email, and telephone number and the principal(s) of the firm
5. A description of the background, experience, and qualifications of the project team including identification of the project manager, project engineer, and other key team members
6. Similar projects completed by the firm
7. Other grant funded utility projects completed by the firm
8. Any previous work with the Town of River Bend
9. References (minimum of 5)
10. Resumes of key team members
11. Availability of the firm to begin work and proposed project schedule

Proposal Evaluation Criteria:

Proposals will be evaluated by members of the town's management staff (committee). The following criteria will be used in the evaluation process:

	MAX Points
1. General qualifications, competence and reputation of firm or individual consultant.....	15
2. Familiarity with federal and state regulations	15
3. Previous experience with similar projects	15
4. Qualifications of key members	15
5. Proposed project schedule	15
6. Previous experience with grant funded projects	15
7. Previous experience with the Town of River Bend	10

Supplemental Materials- Respondents may review excerpts from the grant application, Letter of Intent to Fund, etc. which includes a more detailed description of the proposed project including activities, proposed budget, schedule, and other pertinent information by visiting the town's webpage at www.riverbendnc.org and clicking on "Current Bid Opportunities." The response to RFQ must be submitted no later than November 22, 2024, at 2:00 p.m. to Town Manager, Delane Jackson, Town of River Bend, 45 Shoreline Dr., River Bend, NC 28562 or via

email to manager@riverbendnc.org Questions may be directed to Delane Jackson at 252-638-3870 x 3.

Upon completion of the review, the committee will make its recommendation to the Town Council for final consideration and approval. It is anticipated that Council approval will occur on December 12, 2024. The firm that has been recommended by the committee will be notified of their recommendation for award by November 27, 2024 and will be required to submit the proposed engineering services agreement to the Town Manager by 2:00 p.m. on December 10, 2024.

The Town of River Bend is an Equal Opportunity Employer and invites the submission of proposals from minority and women-owned firms.

ROY COOPER

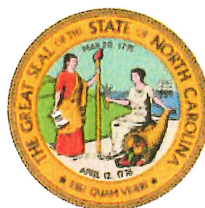
Governor

ELIZABETH S. BISER

Secretary

SHADIESKAF

Director

NORTH CAROLINA
Environmental Quality

February 2, 2024

Mr. Delane Jackson, Town Manager
Town of River Bend
45 Shoreline Drive
River Bend, NC 28562

Subject: Letter of Intent to Fund
S.L. 2023-134 Appropriations Act Directed Project
Water Treatment Improvements (Construction)
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 \$9,111,210 from the Drinking Water/Wastewater State Reserve as established in Session Law (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, 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		\$9,111,210
Project Name	Project Number	Maximum Funding Amount
Water Treatment Improvements	SRP-D-134-0033	\$9,111,210
Total Appropriations requested		\$9,111,210
Total Appropriations remaining		\$0



North Carolina Department of Environmental Quality | Division of Water Infrastructure
512 N. Salisbury Street | 1633 Mail Service Center | Raleigh, North Carolina 27699-1633
919.707.9160

Mr. Delane Jackson, Town Manager
Town of River Bend
February 2, 2024
Page 2 of 3

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

*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 Assistance

We are offering 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> and a regional environmental coordinator will contact you. When applying for a permit, attach a copy of this letter to your permit application. Additional information on DEQ permit scoping services can be found at:

www.deq.nc.gov/regional-office-scoping-meeting-flyer-deacs/download

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. 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.


Mr. Delane Jackson, Town Manager
Town of River Bend
February 2, 2024
Page 3 of 3

Electronic Document Submittal:

Recipients should now submit all project documents via the new 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 regarding your project's Division-awarded funding, please contact, Dustin Rhodes, P.E., either by telephone at 919.707.3888 or by e-mail at dustin.rhodes@deq.nc.gov.

Sincerely,

DocuSigned by:

6300A872077B4C5...

Shadi Eskaf, Director
Division of Water Infrastructure

ec: Karen Tybush, Rivers & Associates, Inc. (ktybush@riversandassociates.com)
Gregory J. Churchill, P.E., Rivers & Associates, Inc. (gchurchill@riversandassociates.com)
Kavitha Ambikadevi, P.E. (DWI, via e-mail)
Dustin Rhodes, P.E. (DWI, via e-mail)
Mark Hubbard, P.E. (DWI, via DocuSign)
LF Project File (COM – LOIF)
DWI Agreement ID: 2000073755

Delane Jackson

From: Lau, Aisha <aisha.lau@deq.nc.gov>
Sent: Wednesday, October 23, 2024 11:59 AM
To: Delane Jackson
Cc: Rhodes, Dustin; Press, Jeannine M
Subject: RE: Funding Deadline Extension for The Town of River Bend's SRP-D-134-0033 Water Treatment Improvements Project

Hello Delane,

As requested, the milestone dates for the Town of River Bend's SRP-D-134-0033 Water Treatment Improvements Project have been pushed back 6 months. Your new milestones are reflected in the following Table:

Milestone	Milestone Date*	Modified Milestone Dates
Apply for all Necessary Permits**	ASAP	ASAP
Bid-and-Design/Permit Package Submittal	April 1, 2025	October 1, 2025
Bid-and-Design Package Approval	August 1, 2025	February 2, 2026
Advertise Project, Receive Bids, Submit Bid Information, <u>and</u> Receive Authority to Award	December 1, 2025	June 1, 2026
Execute Construction Contract(s)	January 31, 2026	July 1, 2026

Per the milestones, the next anticipated paperwork currently required of the town will be the signed and sealed plans and specifications (PS) for the Town of River Bend.

If the Town of River Bend is awarded any funds in this Fall's funding round, the milestones reflected in that future LOIF will be the same as those provided above.

Part of the PS submittal includes copies of any approved required permits or easements, or copies of their applications with submittal and anticipated issuance dates, which is why the Permits milestone is encouraged ASAP.

If you have any questions or concerns regarding this project going forward please don't hesitate to contact me.

Aisha Lau (she/her)

Engineer II, Drinking Water Unit

Division of Water Infrastructure

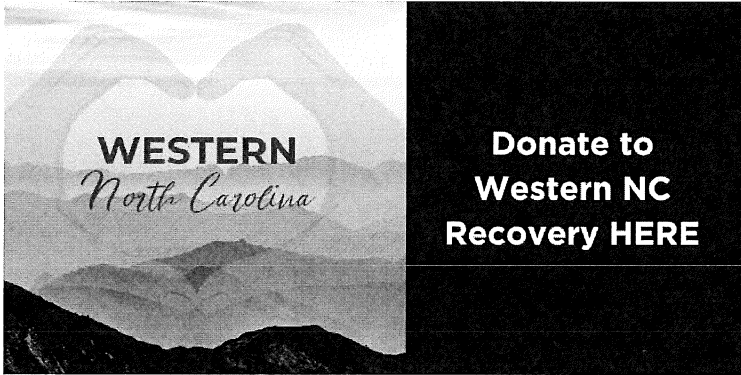
Wilmington Regional Office, 127 Cardinal Dr. Ext, Wilmington, NC 28405

Cell: (910) 970-6400 Email: aisha.lau@deq.nc.gov

Courier # 04-16-33



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.



From: Delane Jackson <manager@riverbendnc.org>

Sent: Wednesday, October 23, 2024 8:01 AM

To: Lau, Aisha <aisha.lau@deq.nc.gov>

Subject: RE: [External] project schedule

CAUTION: External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

Aisha,

As discussed yesterday via TEAMS with Dustin and Jeannine, I would like to request a 6-month extension to the current milestone dates contained in the Letter of Intent to Fund, dated February 2, 2024 for DWI Project No. SRP-D-134-0033.

If approved that would push the First milestone from April 1, 2025 to October 1, 2025. As I mentioned yesterday, we have submitted an application for additional funding for this project. If approved, the scope of the project would change.

Thus, the need for an extension.

Also, will you let me know if there is any other paperwork that I need to submit relative to this project?

Thanks

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

252-638-3870 x-213
manager@riverbendnc.org

Pursuant to North Carolina General Statutes Chapter 132, Public Records, this electronic mail message and any attachments hereto, as well as any electronic mail message(s) that may be sent in response to it may be considered public record and as such are subject to request and review (with statutory exceptions) by anyone at any time.

6. Project Description (see Instructions)

Prior to municipal incorporation of the Town of River Bend, the area was developed as a retirement community known as River Bend Plantation. The development was originally constructed 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 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 (Re: 4a_Water Distribution System Map.pdf). 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 current Well #1 is an 8" well 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 installation dates. 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 Well #3 is an 8" well installed in 1983 by Craven Well Drilling Service. The associated WTP (Rhems) supplied by Well #3 was constructed in 1984. Various regulatory and engineering correspondence and calculations have been reviewed to substantiate the age of the system. Based on that review, the existing WTP facilities are 34 – 50 years old. The current 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 (Re: 4b_Preliminary Water System Evaluation.pdf). 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.

The existing WTPs and associated pumping and treatment equipment have outlived their useful service lives (Re: 4c_Photo Log.pdf), and the Town desires to replace both existing WTPs with a single new WTP located near the northwest termination of Plantation Drive across the street from the 300,000 gallon elevated water storage tank (Re: 4a_Water Distribution System Map). The proposed project will include design and construction of a new greensand filtration and zeolite softening WTP to enhance removal of iron, manganese and hardness, and will improve overall potable water quality. The new treatment facility will not increase production capacity from that which currently exists at the two existing WTPs. Raw water transmission mains will be extended from the existing wells to the new WTP site, and the well pumps and associated electrical will be replaced to meet the flow and new head requirements.

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.

Estimated number of new connections served by Drinking Water or Wastewater construction project: 0

For Drinking Water and Wastewater Construction, CDBG-I, CWSRF Green Projects, Pre-Construction Planning Grants:

- ☐ The proposed project is a result of an Asset Inventory and Assessment grant previously awarded by the Division.
- ☐ The proposed project is a result of a Merger / Regionalization Feasibility Study grant previously awarded by the Division.
- ☒ None of the above.

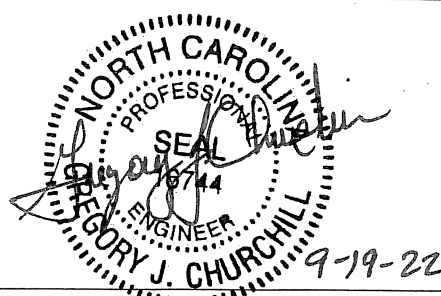
7. Additional Information for Consideration

N/A

8a. Project Budget for All Construction Projects and Drinking Water/Wastewater Pre-Construction Planning Grants only. Do not use for AIA, MRF, Stormwater Planning Grant (LASII), or Develop and Implement a New Stormwater Utility (LASII) projects.

1. Drinking Water/Wastewater: Costs for portions of the project that will fulfill the requirements related to rehabilitating or replacing waterlines, old infrastructure, lead service lines (DW/WW Priority Rating System Line Items 1.C, 1.C.1 or 1.D.1) must be labeled and shown separately to successfully claim points.
2. Stormwater: Costs for stormwater quality project components and costs for stormwater quantity project components (Stormwater Priority Rating System Line Items 1.A or 1.C), must be labeled and shown separately to successfully claim points.
3. All: Costs for portions of the project that will benefit disadvantaged areas (DW/WW Priority Rating System Line Items 1.E or 4.D, Stormwater Priority Rating System Line Item 4.C) must be labeled and shown separately to successfully claim points.
4. Add additional lines as needed.

Indicate construction costs by line item (e.g., linear feet of different-sized lines, each type of stormwater control measure, each stream restoration/enhancement/stabilization reach). Include a more detailed construction cost budget if needed.	Division Funding Requested	Other Secured Funding Source(s)	Total Cost Amount
Construction Costs			
1. LS - Mobilization/Demobilization (3% +/-)	\$216,000	\$0	\$216,000
2. LS - Bonding	\$70,000	\$0	\$70,000
3. LS - Site Work	\$180,000	\$0	\$180,000
4. 4,000 SF - Water Treatment Plant Building	\$1,140,000	\$0	\$1,140,000
5. LS - WTP Equipment (Filters, Softeners, Face Piping, Valves, Chemical Feed Equipment, SCADA)	\$1,700,000	\$0	\$1,700,000
6. LS - Brine System	\$105,000	\$0	\$105,000
7. LS - Aeration/Detention Tank	\$355,000	\$0	\$355,000
8. LS - Waste Treatment Lagoons, Piping and Effluent Pump Station	\$405,000	\$0	\$405,000
9. LS - Yard Piping	\$300,000	\$0	\$300,000
10. LS - Well No. 1 Modifications, Generator and ATS	\$195,000	\$0	\$195,000
11. LS - Well No. 2 Modifications, Generator and ATS	\$195,000	\$0	\$195,000
12. LS - Well No. 3 Modifications, Generator and ATS	\$195,000	\$0	\$195,000
13. Electrical, WTP Generator and ATS	\$860,000	\$0	\$860,000
14. 3,200 LF - 6" PVC Raw Water Main	\$208,000	\$0	\$208,000
15. 3,200 LF - 10" PVC Raw Water Main	\$601,250	\$0	\$601,250
16. 3,400 LF - 6" PVC Treated Waste Effluent Force Main	\$221,000	\$0	\$221,000
17. LS - Undercut Excavation w/ Select Backfill	\$30,000	\$0	\$30,000
18. LS - Testing Allowance	\$40,000	\$0	\$40,000
19. LS - Equipment Allowance	\$25,000	\$0	\$25,000
20. LS - Utility Service Entrance Allowance	\$40,000	\$0	\$40,000
21. LS - Emergency Interconnect w/ New Bern (6" Compound Meter w/ Vault, associated Piping, Valves, etc.)	\$120,000	\$0	\$120,000
<i>Contingency (10% of construction costs):</i>	\$720,750	\$0	\$720,750
Construction Subtotal:	\$7,922,000	\$0	\$7,922,000
Engineering Costs			
Subdivision Plat Preparation	\$5,000	\$0	\$5,000
Boundary and Topographic Survey	\$16,000	\$0	\$16,000
Engineering Design, Construction Plans and Specifications	\$700,000	\$0	\$700,000
Permitting	\$15,000	\$0	\$15,000

Bidding and Negotiation (3 Contracts)	\$40,000	\$0	\$40,000
Construction Administration	\$250,000	\$0	\$250,000
Resident Project Representation (15 months)	\$300,000	\$0	\$300,000
Operation and Maintenance Manual Preparation	\$40,000	\$0	\$40,000
Record Drawing Preparation	\$20,000	\$0	\$20,000
Engineering Subtotal:	\$1,386,000	\$0	\$1,386,000
Administration Costs			
Engineering Report Preparation	\$25,000	\$0	\$25,000
Environmental Information Document Preparation	\$10,000	\$0	\$10,000
Legal Costs	\$10,000	\$0	\$10,000
Land and Rights-of-Way	\$30,000	\$0	\$30,000
Permit Fees	\$10,000	\$0	\$10,000
Other: N/A			
Administration Subtotal:	\$85,000	\$0	\$85,000
TOTAL PROJECT COST:	\$9,393,000	\$0	\$9,393,000
<p>A Professional Engineer signature and seal for the estimate <u>must be provided</u> in the space to the right for the application to be considered complete.</p>			



**Clean Water State Revolving Fund
Priority Rating System Narrative
Town of River Bend
Water Treatment Improvements**

Category 1 – Project Purpose

1.C – Project will replace infrastructure

Prior to municipal incorporation of the Town of River Bend, the area was developed as a retirement community known as River Bend Plantation. The development was originally constructed 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 currently.

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 (Re: 4a_Distribution System Map.pdf). 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 multi-media 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 a layer of anthracite over 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 installation dates. 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 (Re: 4b_Preliminary Water System Evaluation.pdf). 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.

The existing WTPs and associated pumping and treatment equipment have outlived their useful service lives (Re: 4c_Photo Log.pdf), and the Town desires to replace both existing WTPs with a single new WTP located near the northwest termination of Plantation Drive across the street from the 300,000 gallon elevated water storage tank (Re: 4a_Distribution System Map.pdf). The proposed project will include design and construction of a new greensand filtration and zeolite softening WTP to enhance removal of iron, manganese and hardness, and will improve overall potable water quality. The new treatment facility will not increase production capacity from that which currently exists at the two existing WTPs. Raw water transmission mains will



be extended from the existing wells to the new WTP site, and the well pumps and associated electrical will be replaced to meet the flow and new head requirements.

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.

1.C.1 – Treatment units, pumps and/or pump stations to be rehabilitated or replaced are greater than 20 years old.

As noted in Item 1.C above, the existing treatment plants, filtration equipment and pumping equipment are between 34 – 50 years old. 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 installation dates. Various regulatory and engineering correspondence and calculations (Re: 4d_Existing Well and WTP Documentation.pdf) are provided from Town records to provide appropriate documentation.

Category 2 – Project Benefits

2.1 – Project improves treated water quality by adding or upgrading a unit process

The River Bend Water Treatment Improvements Project includes numerous treated water quality improvements by adding or upgrading unit processes.

The major process and equipment changes to be incorporated into the proposed project include:

- Installation of an updraft aerator to enhance oxidation of soluble iron and manganese versus that provided by compressed air injection at the existing WTPs,
- Installation of pre-detention/pre-filter potassium permanganate feed to enhance precipitation of soluble iron and manganese and to provide continuous regeneration of the greensand filter media (not provided as part of the existing WTP process),
- Installation of a pre-filter detention tank to provide appropriate time and quiescent conditions for oxidation, precipitation and settling of iron and manganese in advance of filtration (not provided as part of the existing WTP process),
- Installation of greensand filters which provide superior oxidation and removal of precipitated iron and manganese versus that provided by the existing Birm® media filters,



- Installation of dual positive displacement blowers to allow air scrubbing of the filter media, in addition to water backwash only, during the normal filter backwash cycle (superior to water backwash only provided at the existing WTPs),
- Installation of zeolite softeners with associated regeneration and backwash capability to allow production and distribution of softened potable water to the customer base (not provided with the existing WTPs),
- Installation of liquid chlorine feed system which is much safer alternative to the gaseous chlorine provided at the existing WTPs,
- Installation of backwash waste settling lagoons to provide greater capacity for storage and settling to enhance removal of precipitated iron and manganese from the waste effluent.
- Installation of a waste effluent supernatant pump station and force main to direct supernatant through the existing gravity sewer collection system, WWTP and its existing discharge to eliminate the need for the two (2) existing WTP NPDES waste discharge permits.

2.J – Water loss in system to be replaced is 30% or greater

As demonstrated below, the Town of River Bend's water system experiences high system losses of approximately 38.9% > 30%. The unaccounted for water loss = 31.8% > 30% .

The following water loss computations are based on the 2021 Local Water Supply Plan (Re: 4e_2021 Local Water Supply Plan.pdf):

Water for Treatment:

Well #1 = 0.133 MGD x 1,000,000 gal/MG x 361 days =	48,0130,000 gal
Well #2 = 0.050 MGD x 1,000,000 gal/MG x 359 days =	17,950,000 gal
Well #3 = 0.077 MGD x 1,000,000 gal/MG x 345 days =	<u>26,565,000</u> gal
Total =	92,528,000 gal

Water Billed:

Residential = 0.137 MGD x 1,000,000 gal/MG x 365 =	50,005,000 gal
Commercial = 0.010 MGD x 1,000,000 gal/MG x 365 =	3,650,000 gal
Industrial = 0.008 MGD x 1,000,000 gal/MG x 365 =	<u>2,920,000</u> gal
Total =	56,575,000 gal

Water Loss = 35,953,000 gal = 38.9%

During the same timeframe, the Town's WTPs system filter backwash process utilized the following water quantity:

Waste = 0.018 MGD x 1,000,000 gal/MG x 365 days = 6,570,000 gal = 7.1%



Unaccounted for Water Loss = 35,953,000 gal – 6,570,000 gal
 29,383,000 gal = 31.8%

Unaccounted for water is attributable to items such as system flushing, fire flow usage, leaks, metering errors, etc.; however, the bulk of this water loss is a function of system flushing to minimize the occurrences of red/brown water in the distribution system.

The new water treatment process with its greensand filtration/zeolite softening treatment process is expected to substantively improve water quality and reduce the need for excessive system flushing with no substantive increase in the filter backwash/softener regeneration waste quantity. It is anticipated that the improved water quality would reduce system flushing by as much as 20,000 gal/day which equates to a reduction of 7,300,000 gal/year of unaccounted for water loss. With this reduction the resulting percentage of unaccounted for water would be reduced to 22,083,000 gal or 23.9% which is a significant improvement from that which currently exists.

2.K.1 – Project creates a new interconnection between systems not previously interconnected

As part of the Water Treatment Plant Improvements project, the Town of River Bend (PWSID #04-25-113) desires to construct a one-way emergency interconnect with the City of New Bern water system (PWSID # 04-25-010) to provide a backup water supply in the event of an emergency outage in the River Bend system. Although the City of New Bern owns and operates an existing 8" diameter water main that extends southward along U.S. Highway 17 to the Town Limits of River Bend, no interconnection currently exists.

In March, 2017, at the Town's request, Rivers & Associates, Inc. evaluated options and prepared budgetary estimates for a River Bend – New Bern Emergency Water Service Interconnect (Re: 4f_River Bend – New Bern Interconnect.pdf). The recommended and proposed interconnect would consist of a 6" compound water meter and vault with associated tapping valves, 8" water main, reducers, double check valve and fittings as required to interconnect the respective systems. A 6" diameter water main would be extended for approximately 500 LF along Old Pollocksville Road to complete a loop with the water main on Efir Boulevard for a more robust supply to meet the Town's demand. A map of the proposed interconnection is provided (Re: 4g_Schematic Interconnect Map.pdf). A draft agreement between the Town of River Bend and the City of New Bern relative to construction of the interconnect is provided (Re: 4h_Interconnect Interlocal Agreement.pdf).



2.N.1 – Project relocates infrastructure from inside 100-year floodplain to outside 500-year floodplain

The River Bend WTP/Water/Wastewater Laboratory is located at Latitude 35°4'20.08"N, Longitude 77°8'48.60"W beside the pond just off of Linksiders Road near the intersection of Shoreline Drive and Plantation Drive. The WTP/Laboratory Building is located within the edge of the 100-year floodplain as indicated on the attached Flood Insurance Rate Map (Re: 4i_Flood Insurance Rate Map.pdf).

The project proposes to construct a new building to house a new WTP/Water/Wastewater Laboratory at Latitude 35°4'15.62"N, Longitude 77°9'26.51"W near the northwest termination of Plantation Drive across the street from the 300,000 gallon elevated water storage tank. The proposed location is well outside of the 500-year floodplain.

2.N.7 – Project provides redundancy/resiliency for critical treatment system functions including backup electrical power source

This project provides replacement of the existing River Bend WTPs without expanding capacity. The design includes the following redundant/resilient treatment and transmission measures:

- The updraft aerator will include bypass piping and control valve to ensure that the wells can continuously supply raw water to the detention tank in the event that the aerator is out of service for maintenance or cleaning. The bypass will allow the WTP to operate at full capacity even if the aerator is temporarily out of service.
- The detention tank will be fitted with bypass piping and control valve to ensure that the wells can continuously supply raw water to the Filter Feed Pumps in the event the detention tank is out of service for cleaning. The bypass piping will be fitted with an auxiliary chemical injector to allow continuous dosing of potassium permanganate ahead of the Greensand Filters even if the detention tank is temporarily out of service.
- Dual Filter Feed Pumps and variable frequency drives (VFDs) will be provided to ensure raw water supernatant from the new detention tank can be continuously transmitted to and through the Greensand Filters and Zeolite Softeners into the distribution system and elevated tanks in the event that a single pump was to fail. The redundant pump and VFD will allow the WTP to operate at full capacity with a single pump and/or VFD out of service without increasing WTP capacity from that which exists.
- The Greensand Filters will be sized and arranged to allow a single filter to be out of service for backwashing while the remaining filters continue to handle the forward flow through the WTP. This standard redundancy allows the WTP to continue to generate potable water even during backwash operations.
- The Zeolite Softeners will be sized and arranged to allow a single softener to be out of service for regeneration and backwashing while the remaining softener(s) continue to



handle the forward flow through the WTP. This standard redundancy allows the WTP to continue to generate softened water during regeneration operations.

- Dual blowers and motor starters will be provided for redundancy to allow continuous operation during backwash operations in the event that one blower or starter fails. This redundancy will ensure the WTP is able to operate with a single blower/starter in failure mode.
- The backwash waste lagoons will be designed and constructed with dual cells and the required piping and valves to allow continuous operation of the WTP and processing of wastewater from one cell while the other cell is being serviced or cleaned of accumulated iron sludge. This standard redundancy allows the WTP to continue to generate potable water and process the associated waste during sludge removal/cleaning operations.
- Dual backwash supernatant pumps and starters will be provided for redundancy to allow continuous pumping and disposal of backwash waste supernatant from the wastewater lagoons in the event that one pump or starter fails or requires service. This redundancy allows the WTP to continue to produce potable water in the event of a single pump/starter failure.
- All chemical feed systems and sample pumps will be supplied with dual pumps and ancillary devices to allow continuous operation of a single feed/sample in the event of a pump failure. This will allow continuous operation of the WTP during failure of a chemical feed or sample pump.
- The new WTP will be supplied with a permanent standby generator and auto-transfer switch to operate all critical functions of the WTP in the event of a power failure to ensure continuous WTP operations.
- The new WTP will be supplied with Supervisory Control and Data Acquisition (SCADA) with associated redundancy in the form of relay-based systems and manual systems to allow the WTP to function in the event of automation failure.

Category 3 – System Management

3.A.2 – Applicant has a current Capital Improvement Plan (CIP) that spans at least 10-years and proposed project is included in the plan

The Town of River Bend's 10-year Capital Improvements Plan is enclosed (Re: 4j_10 Year CIP.pdf). The CIP was adopted on September 27, 2022 and spans ten years from the date of adoption. Cost estimates are included for projects scheduled in the first five years including the proposed project. A resolution is attached (Re: 4k_CIP Resolution.pdf) which documents the adoption of the current CIP in its entirety.