

**FINDING OF NO SIGNIFICANT IMPACT  
AND ENVIRONMENTAL ASSESSMENT**

**CITY OF GRAHAM  
WASTEWATER TREATMENT PLANT IMPROVEMENT PROJECT**

**RESPONSIBLE AGENCY: NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENTAL QUALITY**

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## FINDING OF NO SIGNIFICANT IMPACT

Article I, Chapter 113A of the North Carolina General Statutes requires an action to be subject to the requirements of the North Carolina Environmental Policy Act (NCEPA) if it involves the expenditure of public funds and if a potential impact is anticipated to the environment. The project has been evaluated for compliance with the NCEPA and is determined to be a major agency action, which will affect the environment.

<b>Project Applicant:</b>	City of Graham, North Carolina
<b>Project Description:</b>	The proposed project will expand the City of Graham's existing Graham Wastewater Treatment Plant (GWWTP) from 3.5 million gallons per day (MGD) to 5.0 MGD and relocate the facilities outside of the floodplain to increase the plant's resilience and reduce the risk of impacts from future storms. The expansion project will include the following components: conversion of existing aeration basins to 5-stage biological nutrient removal (BNR) basins with additional 1.25 million gallons of removal volume; a new supplemental carbon facility that feeds into the BNR basins; replacement of splitter box and a new parallel secondary effluent 42-inch pipe heading to new disk filters; small additional pump to increase flow capacity at each return activated sludge pump station; new chlorine contact tank and new chemical storage facilities; a new Parshall flume; replacement of current reaeration system with new cascade aeration facility built outside of the 100-year floodplain; new effluent line from the new aeration facility to the effluent manhole; relocation of current digesters 1&2 outside of the 100-year floodplain and convert them to sludge storage; convert digester 3 to sludge storage and install new mixing system; add 2.6 million gallons of new aerobic digesters with fine bubble diffusers and blowers; construction of a new maintenance building located to the east of the main WWTP facility.
<b>Project Number:</b>	CS370563-04
<b>Project Cost:</b>	\$45,445,000
<b>Clean Water State Revolving Loan Fund:</b>	\$12,294,000
<b>Additional Supplemental Appropriation for Disaster Relief:</b>	\$23,000,000
<b>Bonds or CWSRF</b>	\$10,151,000 *Town Intends to apply for additional CWSRF funding and will use Bonds if additional funds are not awarded
<b>Local Funds:</b>	\$906,400

The review process indicated that significant adverse environmental impacts should not occur if mitigative measures are implemented, and an environmental impact statement will not be required. The decision was based on information in the Engineering Report/Environmental Information Document (ER/EID) submitted by the applicant and reviews by governmental agencies. The attached Environmental Assessment (EA), prepared by the Division based on the ER/EID, supports this action and outlines mitigative measures that must be followed. This Finding of No Significant Impact (FONSI) completes the environmental review record, which is available for inspection at the State Clearinghouse.

No administrative action will be taken on the proposed project for at least 30 days after notification that the FONSI has been published in the North Carolina Environmental Bulletin.

Sincerely,



Jon Risgaard, Section Chief  
State Revolving Fund Section  
Division of Water Infrastructure

## ENVIRONMENTAL ASSESSMENT

### A. Proposed Facilities and Actions

The proposed project will expand the City of Graham's existing Graham Wastewater Treatment Plant (GWWTP) from 3.5 million gallons per day (MGD) to 5.0 MGD and relocate the facilities outside of the floodplain to increase the plant's resilience and reduce the risk of impacts from future storms. The expansion project will include the following components: conversion of existing aeration basins to 5-stage biological nutrient removal (BNR) basins with additional 1.25 million gallons of removal volume; a new supplemental carbon facility that feeds into the BNR basins; replacement of splitter box and a new parallel secondary effluent 42-inch pipe heading to new disk filters; small additional pump to increase flow capacity at each return activated sludge pump station; new chlorine contact tank and new chemical storage facilities; a new Parshall flume; replacement of current reaeration system with new cascade aeration facility built outside of the 100-year floodplain; new effluent line from the new aeration facility to the effluent manhole; relocation of current digesters 1&2 outside of the 100-year floodplain and convert them to sludge storage; convert digester 3 to sludge storage and install new mixing system; add 2.6 million gallons of new aerobic digesters with fine bubble diffusers and blowers; construction of a new maintenance building located to the east of the main WWTP facility.

Funding Status: The estimated total cost for the project is \$45,445,000. The Town is applying for a Clean Water State Revolving Fund (CWSRF) loan of \$12,294,000 and Additional Supplemental Appropriation for Disaster Relief (ASADRA) loan of \$23,000,000. And additional \$10,151,000 will be funded through an additional CWSRF loan (if funded) or with bonds. Closing costs/administrative fees of \$906,400 will be paid with local funds.

### B. Existing Environment

Topography and Soils. The City of Graham is located in the Piedmont Physiographic Province. Topography in the service area includes rolling hills with floodplains along larger rivers and streams. Elevation at the project site ranges from 478 to 530 feet mean sea level, with topography impacted by previous construction of the existing WWTP. The westernmost portion and some of the southern portion of the plant site are in the 100-year floodplain associated with Town Branch. The southeastern most portion of the WWTP site abuts, but does not encroach on, the floodway for Town Branch. The project site is within the Carolina Slate Belt, which is comprised of mineral-rich metavolcanic and sedimentary rocks.

The dominant soil in the project site includes Udorthents loam with 0 to 25 percent slopes. This soil is a well-drained, sandy clay loam. The next most common soil type in the project site is Enon sandy loam with 10 to 15 percent slopes. This is also a well-drained soil.

Surface Water. Town Branch runs along the project site on two sides and flows into the Haw River east of the plant site. Town Branch and Haw River are both classified as WS-V, NSW. Town Branch is impaired for fecal coliform.

Water Supply. The primary source of drinking water for the City’s service area is Graham-Mebane Lake located in the northeastern portion of Alamance County.

**C. Existing Wastewater Facilities**

The City of Graham owns and operates a WWTP and wastewater collection system. The collection system includes approximately 89 miles of 27-inch concrete sewer pipe and seven lift stations with a combined maximum pumping capacity of 18.7 MGD. The City has actively pursued a collection system maintenance program to limit sanitary sewer overflows. The program includes annual inspections, and hydraulic cleaning of ten percent of the system annually. The collection system sends wastewater flow to the City’s GWWTP.

The GWWTP was originally constructed in 1960 as a 2.0 MGD trickling filter plant. It was expanded to 3.5 MGD in 1978 and converted to a two-stage activated sludge process. The secondary process was converted to single stage extended aeration in 200. The re-aeration basin and digesters 1 and 2 are located within the 100-year floodplain. From 2016-2019, the influent flow has steadily increased from an average of 1.38 MGD to 2.10 MGD, and the frequency of high flow events has increased resulting in maximum month flows over 3.0 MGD and maximum daily flows over 8.0 MGD.

The GWWTP operates under NPDES permit number NC0021211 and discharges 3.5 MGD to the Haw River. The plant currently utilizes the following process units: mechanical screens, grit vortex separator, primary clarification (currently flow-through only), aeration basins, final clarification, effluent filtration (currently flow-through only), and chlorine disinfection. The GWWTP’s solids processing system utilizes aerated Sludge Digestion Tanks to produce sludge that meets the criteria for Class B 503 biosolids which are then sent offsite for land application. The GWWTP is in good working order.

**D. Need for Proposed Facilities and Actions**

The GWWTP is currently receiving flow in excess of 80% of the design capacity and, based on future maximum monthly flow projects is expected to exceed 100% of the capacity by 2028. The project will ensure that the plant can provide 20 years of sustainable capacity for the service area’s growing population. The project will also move treatment infrastructure out of the floodplain to reduce the risk of damage from extreme weather events and improve resiliency, and the project will replace aging infrastructure to reduce risk of failures and increase treatment efficiency.

**E. Alternatives Analysis**

The following alternatives were considered for expanding wastewater treatment capacity:

Alternative 1 – No-Action: This alternative would continue operation of the GWWTP without any improvements. Under this alternative, the City will run out of wastewater treatment capacity.

Existing infrastructure will become overloaded and fail, releasing hazardous waste into the environment. This alternative was determined to be infeasible and does not meet the City's needs.

Alternative 2 – Expansion without Primary Clarifiers (Preferred): This alternative would expand the GWWTP to 5.0 MGD without using the existing clarifiers, which are currently passed through without collection of primary sludge. This alternative would either install equalization basins or repurpose the existing primary settling tanks as equalization basins. The current aeration basin would be modified for flexible 5-stage biological nutrient removal. Existing equipment located within the floodplain would be relocated to higher elevation. This alternative is preferred because it meets the purpose and need for the project, minimizes environmental impacts, and has a lower present worth cost analysis.

Alternative 3 – Expansion with Primary Clarifiers: This alternative would expand the GWWTP's capacity to 5.0 MGD similar to Alternative 2 but would utilize the primary settling tanks currently on site. Similar to Alternative 2, this alternative would include modifications for flexible 5-stage biological nutrient removal and relocation of equipment that is currently in the floodplain. This alternative was rejected based on higher capital costs and reduced operational efficiency of the plant.

Alternative 4 – Reuse: This alternative would involve beneficial reuse of tertiary treated wastewater effluent. The WWTP would require modifications to implement new treatment processes to achieve the standards for reuse water. An analysis of potential reuse partners was conducted and determined that the seasonal low demand for reuse water from potential partners is significantly less than the required increase in the WWTP's capacity to meet needs. This alternative was rejected because there is not a reliable, year-round demand for reuse water.

Alternative 5 – Land Application: This alternative would require acquiring land for an application system, construction of storage ponds, and a conveyance system to transport wastewater to the application site. This alternative was determined to be infeasible because the projected flow exceeds the recommended maximum daily flow for land application systems.

Alternative 6 – Decentralized System: This alternative would address the increasing need for wastewater treatment through installation of septic tanks and cluster systems rather than expanding the GWWTP's capacity. Given the potential for septic systems to fail causing greater environmental risk, this alternative was determined to be infeasible.

Alternative 7 – Regionalization: This alternative would involve conveying 1.5 MGD of wastewater to another treatment plant in close proximity. The receiving plant would need to have sufficient capacity beyond the needs for their own growth. Analysis of this alternative considered the South Burlington WWTP, East Burlington WWTP, and Mebane WWTP. Neither the Mebane WWTP nor the South Burlington WWTP have sufficient capacity to take on the additional flow from Graham and meet their own projected needs. The East Burlington WWTP has sufficient capacity but is evaluating challenges including potential law suit related to treatment and potential contaminants and possible remediation actions. These challenges would make negotiating a partnership very difficult, and the cost to build infrastructure for conveyance of

wastewater to East Burlington is prohibitive. This alternative was determined to be infeasible due to lack of a suitable partner for regionalization.

Alternative 8 – Combination of Reuse and Regionalization: This alternative would combine reuse and regionalization options, but it was determined to be infeasible due to lack of consistent demand for reuse water and lack of regionalization partners.

Along with the alternatives considered for increasing treatment capacity, the following two options were considered for handling the increased production of solids that will result from increased treatment capacity:

Solids Treatment Option 1 – Aerobic Digestion with Land Application: Under this option, the existing solids handling train would be expanded to increase the solids storage and aerobic digester volumes. Class B 503 biosolids would be produced and loaded into trucks for land application. This is the preferred option for solids handling based on land availability, design criteria, operator expertise, reduced environmental impact, and present worth cost analysis.

Solids Treatment Option 2 – Dewatering and Landfill: This option would thicken and dewater the waste activated sludge for transport to and disposal at a landfill. Additional equipment would be required for the thickening and dewatering process. This option is feasible but rejected because it does not build on existing infrastructure or staff expertise and has a higher cost.

## **F. Environmental Consequences and Mitigative Measures**

Topography and Soils: Significant impacts to topography and soils are not anticipated. Minor alterations to topography and soil disturbance will be required for new equipment at the GWWTP site. Installation of the effluent line will require work in the 100-year floodplain including temporary encroachments, but no change in flood elevation or capacity of the floodplain or floodway to convey flood waters will result. A Floodplain Development Permit will be obtained from the City of Graham. Secondary and cumulative impacts (SCI) may result from growth and development in the service area and could have impacts such as removal of soils along ridges and placement of fill in lower elevations. These impacts are not expected to be significant and will be mitigated through adherence to the City's Development Ordinance and Flood Damage Prevention Program.

Land Use: Impacts to land use are not expected to be significant. The project site is already in use for wastewater treatment facilities, and the proposed project will not change land use patterns. SCI in the service area may include some conversion of undeveloped areas to urban land, continuing growth that the County has been experiencing since 1990. Development will be in accordance with the City's Development Ordinance and Comprehensive Plan.

Wetlands: Significant impacts to wetlands are not anticipated. No jurisdictional wetlands are present on the project site. Some impacts to wetlands in the service area may occur as result of development, but such development is not anticipated to be induced by the proposed project. Local erosion and sedimentation control programs and stormwater ordinances will mitigate SCI.



Important Farmlands: Direct impacts to important farmlands are not anticipated. The WWTP site includes small areas of prime farmland and soil of statewide importance, but none of these areas are currently in agricultural use. Some loss of important farmlands in the service area is anticipated as result of development, but such development is not anticipated to be induced by the proposed project. The City's 2035 Comprehensive Plan and Alamance County's Land Development Plan identify areas for development with impacts to important farmlands expected to be insignificant and mitigated through local programs and ordinances.

Public Lands and Scenic, Recreational, and State Natural Areas: Significant impacts to public lands, scenic, recreational, or state natural areas are not expected. No such areas are located in the immediate project vicinity. The Haw River, which is used for recreational purposes, runs through the service area. Recreational uses will not be impacted by the project. Potential SCI related to development will be minimized through adherence with the City's Development Ordinance and Comprehensive Plan.

Cultural Resources: Impacts to cultural and historic resources are not anticipated. The North Carolina State Historic Preservation Office (SHPO) is not aware of any historic resources that will be impacted by the project (January 7, 2021, ER 21-0086). SCI will be minimized through consultation with SHPO and compliance with the Archaeological Historic Preservation Act and the National Historic Preservation Act.

Air Quality: No significant impacts to air quality are anticipated. Construction activities will have temporary and localized impacts related to exhaust from construction equipment and dust from exposed construction areas. Disturbed areas will be promptly reseeded to minimize impacts. No open burning will be allowed. Minor emissions may be associated with testing the generator at the PS. SCI will be limited through requirements in the City of Belmont's Code of Ordinances, Town of Cramerton's Code of Ordinances, and Gaston County's 2035 Comprehensive Land Use Plan.

Noise Levels: No significant permanent noise impacts are anticipated. Construction activities will be limited to daylight hours (weekdays from 7:00 am to 6:00 pm). The only anticipated operational impact will be noise from generator testing and emergency use, as needed, at the Armstrong Ford Regional Pump Station. SCI will be limited through the City of Belmont's Noise Ordinance, Town of Cramerton's Noise Ordinance, and Gaston County's 2035 Comprehensive Land Use Plan.

Water Resources: No significant impacts to water resources are anticipated. Adherence to Best Management Practice will protect surface waters from construction related impacts. The project will result in increased discharge to the Haw River, but improvements in the wastewater treatment process will improve the quality of treated water, thus offsetting impacts of increased quantity of water discharged. SCI may include increased silt and sedimentation related to development in the service area. Such impacts will be mitigated through local erosion and sedimentation control programs and stormwater ordinances.

Forest Resources: Significant impacts to forest resources are not expected. Approximately 2.5 acres of forested area within the WWTP property will be cleared to accommodate construction of

a maintenance building and treatment components. SCI in the service area may include some clearing of forested areas. Development will be in accordance with the City's Development Ordinance and Comprehensive Plan.

Shellfish or Fish and Their Habitats: Significant impacts to shellfish, fish, and their habitats are not expected. There is no evidence of threatened or endangered species in or downstream of the project area. Sediment and erosion control measures will minimize impacts from construction activities. The potential impact associated with increased water discharge to the Haw River will be offset by improvements in the treated water quality. SCI may include increased silt and sedimentation related to development in the service area. Such impacts will be mitigated through local erosion and sedimentation control programs and stormwater ordinances.

Wildlife and Natural Vegetation: No significant impacts to wildlife and natural vegetation are expected. Construction activities may temporarily disturb wildlife, but there is sufficient habitat in the surrounding area to accommodate displaced wildlife. There is no evidence of threatened or endangered species in or near the project area. SCI related to development will be minimized through adherence to the City's Development Ordinance and Comprehensive Plan.

Introduction of Toxic Substances: The project is not expected to introduce toxic substances into the environment. During construction, fuels and lubricants needed for equipment will be located in a contained area to control any spills. Contractors will be required to perform vehicle inspections and maintenance to minimize pollution. Concrete will be prevented from entering surface waters.

The U.S. Fish and Wildlife Service reviewed the proposed project and did not object to the project (February 11, 2021). The North Carolina Wildlife Resources Commission, Natural Heritage Program, and DWR Winston-Salem Regional Office do not object to the proposed project. The U.S. Army Corps of Engineers was consulted and did not object to the project. The North Carolina Department of Natural and Cultural Resources is aware of no historic resources that would be affected by the project (January 7, 2021, ER 21-0086).

#### **G. Public Participation, Sources Consulted**

The City of Graham held public meetings on July 7, 2021 and September 1, 2021 and made the engineering report/environmental information document available for review by the public

through the City's website. The meeting included a presentation about the project. There were two questions during the meetings:

- Question: What was the growth rate used for flow projections:
  - Response: 2.3% per year
- Question: Have the 2020 census numbers had been evaluated in comparison to the population and flow projections?
  - Response: A detailed analysis of the most recent census data had not been performed but a review of the WWTP flow data has shown the projections are consistent with observed flows.

The current user charge for a typical residential customer is \$38.30 per month sewer service, based on consumption of 5,000 gallons per month. The proposed project will increase the bill by \$22.07 (approximately 58%), for a future sewer bill of \$60.37. This new rate is within EPA's guidance for affordability for sewer rates based on median household income; therefore, it is not considered a significant financial impact. The City has already begun raising rates in anticipation of the project, so the calculated increase is likely over estimated.

Sources consulted about this project for information or concurrence included:

- 1) City of Graham
- 2) Alamance County
- 3) North Carolina Department of Environmental Quality
  - Wildlife Resources Commission
  - Natural Heritage Program
  - DEQ Winston-Salem Regional Office
  - Division of Air Quality
  - Division of Water Resources
  - Division of Forest Resources
  - Division of Environmental Assistance and Customer Service
  - Division of Waste Management
- 4) North Carolina Department of Natural and Cultural Resources
- 5) North Carolina State Clearinghouse
- 6) North Carolina Department of Public Safety
- 7) U.S. Fish and Wildlife Service
- 8) U.S. Army Corps of Engineers