



City of **GREENSBORO** *North Carolina*

Jordan Lake Wastewater Rule

Compliance Plan

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Presentation Goals

- **Define Jordan Wastewater Rule requirements for the City of Greensboro**
- **Discuss activities that the City has completed to comply with the Wastewater Rule to date**
- **Provide information on the plan for full Wastewater Rule compliance by 2021**



Water Resources Department

Provides Water, Wastewater and Stormwater Services to approximately 275,000 in the City Limits of Greensboro and surrounding Guilford County.

Currently staffed with 339 full time employees with an operational budget of \$116 million per year.




Of this, about \$47 million is dedicated to the capital, operations and maintenance of our two water reclamation facilities and the sewer collection system.



**NORTH BUFFALO CREEK
WATER RECLAMATION
FACILITY BUILT 1938
16 MGD**

**T. Z. OSBORNE
WATER RECLAMATION
FACILITY BUILT 1984
40 MGD**

Legend

-  Wastewater Treatment Plants
-  Water Sewer Service Area Boundary
-  City of Greensboro





Rule Requirements

Although the overall required reductions seem relatively modest at 8% Nitrogen and 5% Phosphorus, the individual wastewater plant impacts are much more substantial.

For Greensboro, the Rules require that at full capacity:

Phosphorus be reduced from a pre Jordan Limit of 2.0 mg/L to 0.66 mg/L, representing a reduction of 67%.

For 2006 average Nitrogen discharge(no permit limit) to the Rule Limit of 5.29 mg/L represents a reduction of:

North Buffalo: 74%

T.Z. Osborne: 43%



Completed Activities to Date

Based on the required reductions, in 2005 the City began studying a variety of options for compliance.

Professional Engineering Studies:

- Alternatives & Optimization Analysis \$ 1 million
- Environmental Assessment & Design \$ 5 million

Capital Expenditures:

- Nitrogen Removal (IFAS) Pilot \$ 3.6 million

These efforts identified near term optimization options to enhance nutrient removal with existing facilities.



Current Phosphorus Results

2013 Phosphorus Limit: 113,515 pounds

2013 Phosphorus Discharge: 41,596 pounds

Annual Chemical Cost: \$800,000

The City is currently in compliance with the Phosphorus portion of the rule discharging at 63% below the established limit. Capital expenses associated with this process change were relatively modest and funded in the annual operating budgets.



Current Nitrogen Results

2019(21) Nitrogen Limit: 902,715 pounds

2013 Nitrogen Discharge: 1,127,366 pounds

Annual Pumping Cost: \$120,000

The City is currently exceeding the future Nitrogen limit by 25%. This results from implementing the optimization recommendation to pump as much flow from North Buffalo to T.Z. Osborne to gain the superior Nitrogen removal with the facilities already in place. Removal of the remaining Nitrogen requires sizable additional capital expenditures.



Local and State Elected Officials

To achieve final rule compliance for Nitrogen, the City Council has general consensus on a phased capital approach to upgrade the T.Z. Osborne plant in conjunction with decommissioning North Buffalo.

This phased approach allows for the City to begin upgrades now while allowing time to incorporate the results of the State's current efforts authorized in the most recent Legislative extension and associated study.



Modernization Upgrade Schedule

Construction Contracts:

- Package 1 – Summer 2014 - \$8.4 million
- Package 2 – Summer 2014 - \$31 million
- Package 3 – Winter 2014 - \$18.4 million
- Package 4 – Spring 2017 - \$29.4 million

Engineering Contracts:

- Services Contract package 1,2,3 - \$5 million
- Services Contract package 4 - \$3.4 million

Total Program Cost Estimate: \$95.6 million



Compliance Summary

- Phosphorus is in compliance (-63%)
- Current Nitrogen process optimized for facilities but exceeds future (2019(21)) compliance target (+25%)
- A plan is in place that begins construction this year to meet the Nitrogen target while deferring a final implementation phase to incorporate results of the State's current efforts