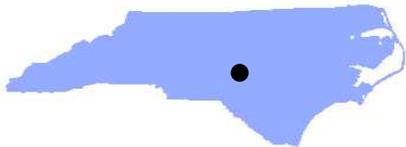


**DEQ/DWR**  
**FACT SHEET FOR NPDES PERMIT MODIFICATION**

NPDES No. NC0026441

FACILITY INFORMATION			
Permittee:	Siler City		
Permittee Address:	P.O. Box 769, Siler City, NC 27344-0769		
Facility Name:	Siler City WWTP		
Facility Address:	370 Waste Treatment Pond Road	Facility County:	Chatham
Permitted Flow:	4.0 MGD	Facility Status:	Existing
Waste Type:	Municipal (domestic and industrial)	WWTP Grade:	WW-IV
Facility Type:	Municipal, with Full Pretreatment/ LTMP	SIC Code(s):	4952
WATERBODY INFORMATION		ADDITIONAL INFORMATION	
Waterbody Name:	Loves Creek	River Basin:	Cape Fear
Classification:	C	Regional Office:	Raleigh
Subbasin:	03-06-02	USGS Topo Quad:	E21NW
HUC8/12:	03030003/0503	Permit Action:	Reopening/ Modification
Drainage Area (mi <sup>2</sup> ):	7.9	Permit Writer:	Mike Templeton
Assessment Unit:	17-43-10c	Date:	April 30, 2019 – Final Permit
7Q10 S/W (cfs):	0.25 / 0.4		
Average Flow (cfs):	8.7		
Listed:	Biological integrity (benthos) Chl-a (Rocky River, downstream)		
IWC (%):	96.1%		

## I. PERMIT ACTION

The Division reopened permit NC0026441 for the Siler City Wastewater Treatment Plant (WWTP) and proposed to incorporate an effluent limit for total nitrogen (TN) load and related control requirements and compliance schedules. A public hearing was requested and held, and the results of that process are presented in full in the April 25, 2019 Hearing Officer's report. The Director accepted most of the Hearing Officer's recommendations and prescribed additional changes to the permit. The permit was issued

The Director signed the permit on April 30, 2019, with an effective date of May 1, 2019 and the current expiration date of May 31, 2019. (The Town has submitted timely application, so the permit will be administratively continued until it is renewed.)

This Fact Sheet describes the permitted facility, wastewater nutrient sources, receiving streams, and current nutrient requirements; the revised terms and conditions of the permit and the rationale for the proposed changes; the schedule and process for accepting and considering public comments; the results of a public hearing on the permit; and final action on the permit.

## II. BACKGROUND INFORMATION

### A. Facility and Permit Overview

Siler City owns and operates the Siler City WWTP, a 4.0 MGD activated sludge treatment plant. Treatment units include bar screens, grit removal, influent pump station, flow equalization basin (2.0 MG), dual oxidation ditches (2.015 MG each) with surface jet aeration, dual flocculating clarifiers (90' Ø) with chemical addition, four effluent filters, chlorine contact chamber, and dechlorination. Solids are aerobically digested and removed as liquid sludge after thickening.

The Siler City WWTP has long treated a combination of high-strength wastewaters from two poultry processing facilities (Pilgrim's Pride and Townsend Poultry) and its own municipal wastes. The plant was designed to treat these mixed wastes and comply with the discharge limits for BOD<sub>5</sub>, ammonia nitrogen (NH<sub>3</sub>-N), and total phosphorus (TP) presented in Table 1.

**Table 1. Existing Effluent Limitations (Partial List)**

PARAMETER	EFFLUENT LIMITATIONS	
	Monthly Average	Weekly Average
BOD <sub>5</sub>	(April 1- Oct 31)	5.0 mg/L
	(Nov 1 – March 31)	10.0 mg/L
NH <sub>3</sub> as N	(April 1- Oct 31)	1.0 mg/L
	(Nov 1 – March 31)	2.0 mg/L
Total Phosphorus	(April 1 – Sept30)*	0.5 mg/L (quarterly average)
	(Oct 1 – March 31)*	2.0 mg/L (quarterly average)
Total Nitrogen	Monitor Only	

\* Timeframes were modified to accommodate quarterly limits.

The Town has complied with these limits (2012-2018) with a few minor exceptions. The plant has bypassed its final filters multiple times due to storm events and inflow and infiltration (I/I) into its collection system, but it has still met the limits.

The permit has not included TN limits; thus, the plant was not designed with denitrification for nitrogen removal.

## B. Receiving Waters

The plant discharges treated wastewaters to Loves Creek, which flows 0.4 mile to the Rocky River and then to the Cape Fear River. The IWC at Loves Creek is 96.1% (7Q10S = 0.25 cfs/0.16 MGD).

Although the plant has generally complied with its BOD<sub>5</sub>, NH<sub>3</sub>-N, and TP limits, a 2011 evaluation by the Division found that:

- high nitrogen levels in its discharge (31.5 mg/L average, 2004-2008) were resulting in high nitrogen concentrations downstream in Loves Creek and further downstream in the Rocky River, and
- the high levels of nitrogen likely contributed to the excess aquatic plant and algal growth observed in the Rocky River downstream of the WWTP and chlorophyll-a violations at Woody's Dam.

The locations and median TN concentrations at the monitoring sites are shown in Figure 1.

Woody's Dam Lake (Reaves Lake) was found to be impaired due to the chlorophyll-a violations and was added to the state's 303(d) list of impaired waters, where it remains. (The lake was drained in the summer of 2017, and the dam is scheduled for demolition.) Other impoundments in the Middle Cape Fear watershed, such as the Cape Fear River behind Buckhorn Dam, have also shown signs of nutrient impacts from a variety of upstream sources and have been added to the 303(d) list.

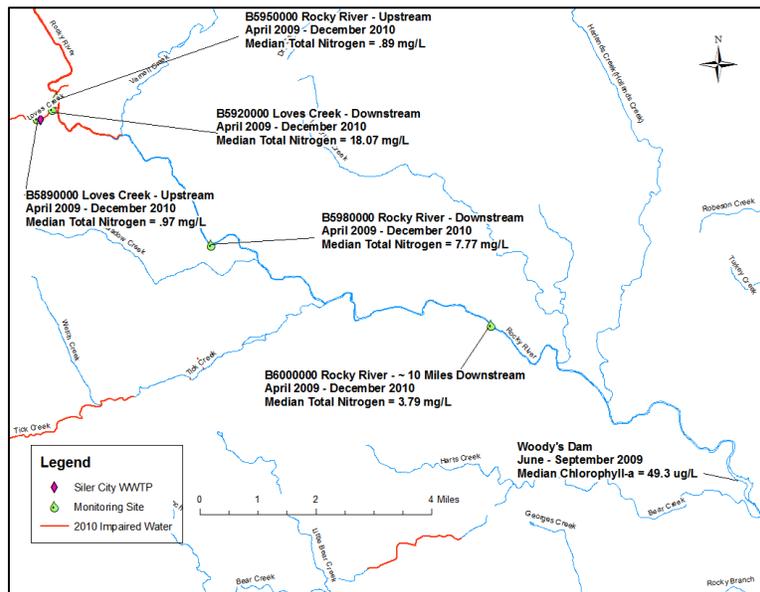
The Division has not yet conducted nutrient studies in the watershed necessary to develop a comprehensive nutrient management strategy. The Division's Scientific Advisory Council is beginning work on water quality criteria for nutrients. However, that process is just beginning, and results could still be several years away.

Thus, while there is a clear need to control Siler City's nitrogen discharge in order to protect designated uses in Loves Creek and downstream waters, it has not yet been determined what numeric nutrient limits are necessary and sufficient to protect water quality.

### C. Projected Nitrogen Increases; Permit Action

The Division's report (April 2011) recommended that total nitrogen limits representing best available technology be added to the permit at its 2011 renewal. However, the need for the limits changed. Pilgrim's Pride had already closed its facility (May 2008), Townsend Poultry closed in October 2011, and neither plant was expected to reopen in the foreseeable future. Without these industrial inputs, effluent TN concentrations from the WWTP declined significantly.

Figure 1. Water quality monitoring sites



Rather than add TN limits to the Town's permit, the Division added a reopener condition that provided for the addition of nutrient limits if needed in the future. Special Condition A.(3.), Nutrient Reopener, requires the Town to notify the Division if it intends to accept new industrial wastes with nutrients greater than typical domestic wastes (40 mg/L TN, 5 mg/L TP). It then authorizes the Division to reopen the permit to add supplemental nutrient limits as necessary.

In May 2016, Siler City announced that Mountaire Farms Inc. would operate a new poultry processing facility at the former Townsend Poultry site. Per Condition A.(3.) of its permit, the Town notified the Division on December 9, 2016, that it intended to accept wastewater from the industry beginning in early 2019. Per its permit, the Town conducted a treatability analysis to evaluate the impact of Mountaire Farms' initial (Phase 1) production levels on the Town's discharge. It later conducted a second analysis to examine the impacts at full production (Phase 2).

Mountaire Farms will employ dissolved air floatation to reduce solids, organic wastes, and fats, oils and grease prior to discharging to the Town's treatment plant. However, the pretreatment system is not designed to remove total nitrogen.

The Town estimates that, with the addition of the pretreated poultry wastes, its plant's nitrogen discharge will likely return to previous (2004-2008) levels or greater and impact the receiving waters as before unless significant controls are implemented. The Town's effluent TN concentrations are predicted to be 30 mg/L in Phase 1 and 38 mg/L at Phase 2.

The Division notified the Town by letter on June 8, 2017, that it planned to reopen the permit to address the nutrient issues. These proposed modifications are the result of that action.

### III. RATIONALE FOR PROPOSED MODIFICATIONS

The reintroduction of poultry processing wastewaters presents several issues. The expected increase in the Town's nitrogen discharge raises significant concerns about downstream water quality. The

lack of a definitive treatment standard means that a chosen TN limit could either result in insufficient nutrient removal if too lenient or unnecessary expense to the Town if too stringent, or both.

A tiered strategy emerged from discussions between the Division and the Town. It provides a balanced approach for addressing these issues:

1. The Town will evaluate operational and low-cost measures in order to optimize the existing plant's removal of nitrogen in the near term.
2. If it finds the plant can consistently meet its TN limit by these simpler means, the Town will implement these measures rather than upgrade the plant.
3. If the results are less successful, the Town will:
  - upgrade the plant as soon as reasonably possible to meet its annual TN Load limit and
  - complete the optimization study and implement the selected measures while the plant upgrade is underway. A 30% reduction of TN would prevent the Town's effluent loads from surpassing historic levels and so will serve as a working target.

The result of this strategy will be that, by the start of 2023, the nitrogen loads from the Town's expanded plant will not exceed its current municipal-only discharge loads (that is, with no poultry processing wastewaters). Loads will most likely increase in the interim, while plant improvements are underway, but the optimization of plant performance will serve to offset that increase to some degree.

The Town's TN loads for past, present, and estimated future discharges are summarized below and illustrated in Figure 2.

- From January 2005 through December 2007, when the Pilgrim's Pride and Townsend Poultry facilities were both operational, the Siler City WWTP discharged an average of 32 mg/L TN at 2.5 MGD, or 667 lb/day TN.
- From February 2016 through August 2017, after both poultry plants had closed, the Town discharged an average of 14 mg/L TN at 1.77 MGD, or 202 lb/day TN.
- The Town estimates that the first phase of production (0.7 MGD from Mountaire Farms) will result in an average discharge of 30 mg/L at 2.57 MGD, or 643 lb/day TN, assuming no improvements or optimization.
- Mountaire Farms now expects that it will increase production much sooner (Phase 2, 1.25 MGD), and the Town estimates that this will increase its discharge to 38 mg/L at 3.12 MGD, or 989 lb/day TN.
- If optimization is effective, it can help offset the increased input from Mountaire Farms. Figure 1 shows the results of 20% and 30% reductions.
- Upgrading its existing 4.0 MGD plant to achieve 6.0 mg/L TN will result in an average design load of 200 lb/day TN at full flow.

It appears that, in order to prevent the Town's discharge from exceeding historic nitrogen loads, either the Town will have to achieve greater than 30% reduction through optimization or Mountaire Farms will have to limit its production until the start of 2023, when the Town's plant upgrades come online.

#### IV. PROPOSED MODIFICATIONS

Based on these considerations, the Division proposes to modify the Town's permit as follows:

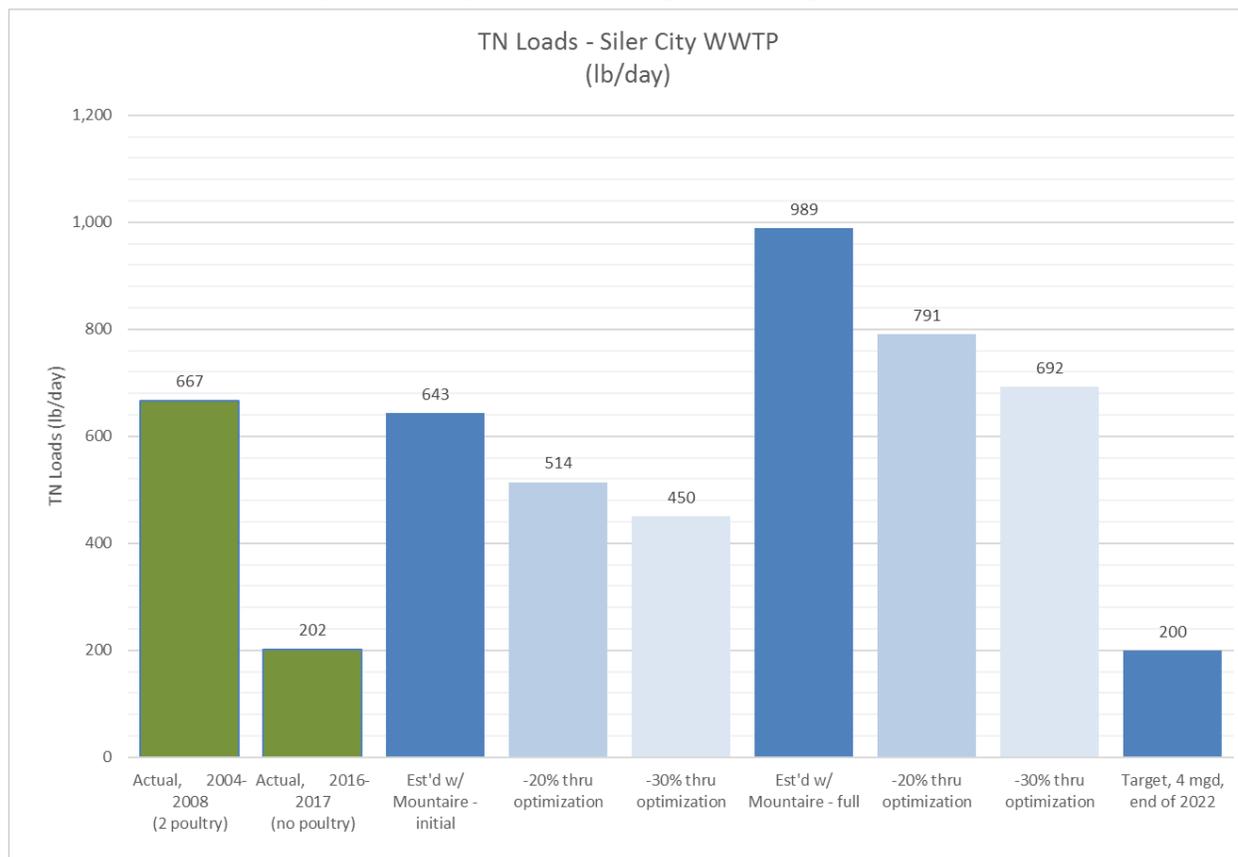
- In Special Condition A.(1.), add an annual TN Load limit to become effective no later than January 1, 2023.

$$\text{TN Load} = 6.0 \text{ mg/L} \times 4.0 \text{ MGD} \times 8.34 \times 365 \text{ days/year} = 73,058 \text{ lb/yr}$$

- Add a new Special Condition A.(10.) to establish a compliance schedule for conducting a nitrogen optimization study and interim plant improvements necessary to meet the TN limit in Condition A.(1.); the schedule is based on the timeline proposed by the Town.
- Add a new Special Condition A.(11.) to set forth requirements for a nitrogen removal optimization study and for reporting the results. Upon Division acceptance, the Town will fully implement the selected measures until the interim plant upgrades are completed.
- Add a new Special Condition A.(12.) to specify how annual mass loads are to be calculated.
- Add Total Monthly Flow reporting requirements to Condition A.(1.) along with footnotes referencing the new special conditions.

The proposed permit modification does not affect other limits or requirements of the permit.

**Figure 2. Comparison of Nitrogen Discharge Loads**



## V. PUBLIC REVIEW, PUBLIC HEARING, AND FINAL ACTION

Public notice of the draft permit was originally published in *The Chatham News* on October 25, 2018 and posted on the DWQ website. In response to multiple requests received, the Division agreed to hold a public hearing. Public notice of the hearing was published in *The Chatham News + Record* on December 20, 2018, and posted on the DEQ website at <https://deq.nc.gov/news/events/public-hearing-siler-city-wwtp-permit-nc002644>. The public hearing was held on January 24, 2019, at 6:00 p.m., at the Siler City Town Hall Courtroom in Siler City. The purpose of the hearing was to gather comments regarding the proposed reopening and modification of the NPDES permit for the Town’s WWTP. Oral and written comments were received at the hearing, and additional written comments were received during the comment period. The comment period ended on January 31, 2019, except that comments from U.S. Fish & Wildlife Service staff were accepted on February 7, in light of the federal government’s partial shutdown in January.

Approximately 54 people attended the public hearing including 38 members of the general public; five Town employees or consultants; ten staff members of DWR's Central Office (Raleigh), the Raleigh Regional Office, and DEQ's Public Information Office; and the hearing officer. Nineteen individuals spoke at the hearing.

The public comments and the Division's responses are contained in the April 25, 2019 Hearing Officer's report. After considering all comments received, the Hearing Officer concluded that the proposed permit action is the most effective and timely approach to limit the impacts of the discharge on downstream waters.

The report recommended the following actions:

- The permit should include the total nitrogen limit and the January 1, 2023, compliance date as originally proposed. This leaves the Town slightly more than 3½ years to complete its treatment plant upgrades.
- The milestones for the optimization study should be extended by four months to allow for the delay in permit issuance. The overall schedule should be shortened to 20 months by reducing the time for report preparation from six months to four months.

The report also recommended that the Division:

- Meet with the Chatham County Soil and Water Conservation staff and the Town to consider how to promote projects that would reduce nutrient contributions from farms and other sites in the watershed.
- Continue the surface water monitoring project begun in January 2019 and use the results in developing a watershed model for the Rocky River.
- Assist the Town in updating its Headworks Analysis for nitrogen if an update is warranted following completion of the treatment plant upgrades.
- Continue to support the Town in its efforts to reduce I/I flows into its collection and treatment systems.
- Continue to support the Town in its water quality protection efforts.
- Support resolution of the low dissolved oxygen problem at the Hackney Millpond, as appropriate.

The Hearing Officer submitted these recommendations to the Director. The Director generally agreed with the recommendations, including the addition of the 2023 Total Nitrogen (TN) Load limit, and instructed the staff to make the following additional changes:

- Interim TN Load limit. A TN Load limit was added to Special Condition A.(1.). The limit is effective from January 1, 2020 through December 31, 2022. It is equivalent to 667 lb/day TN and is meant to ensure the Town's nitrogen load does not exceed historic (2004-2008) levels. This does not affect the 2023 TN Load limit originally proposed.
- Process Optimization. Conditions A.(10.) Compliance Schedule and A.(11.) Treatment Optimization were removed from the permit. The requirements are no longer necessary, given the addition of the interim TN Load limit. The Town may still pursue optimization in its nitrogen removal efforts, but it no longer needs prior approval from the Division to implement measures found to be effective.

The permit was modified accordingly. The Director signed the permit on April 30 with an effective date of May 1, 2019. The permit's expiration date remains May 31, 2019. The Town has submitted its application for renewal, and the permit will be administratively extended after expiration.