High Rock Lake NMS Stakeholder Process

Wastewater Technical Advisory Group

Report for the HRL Steering Committee

2/15/2023

TAG Charge

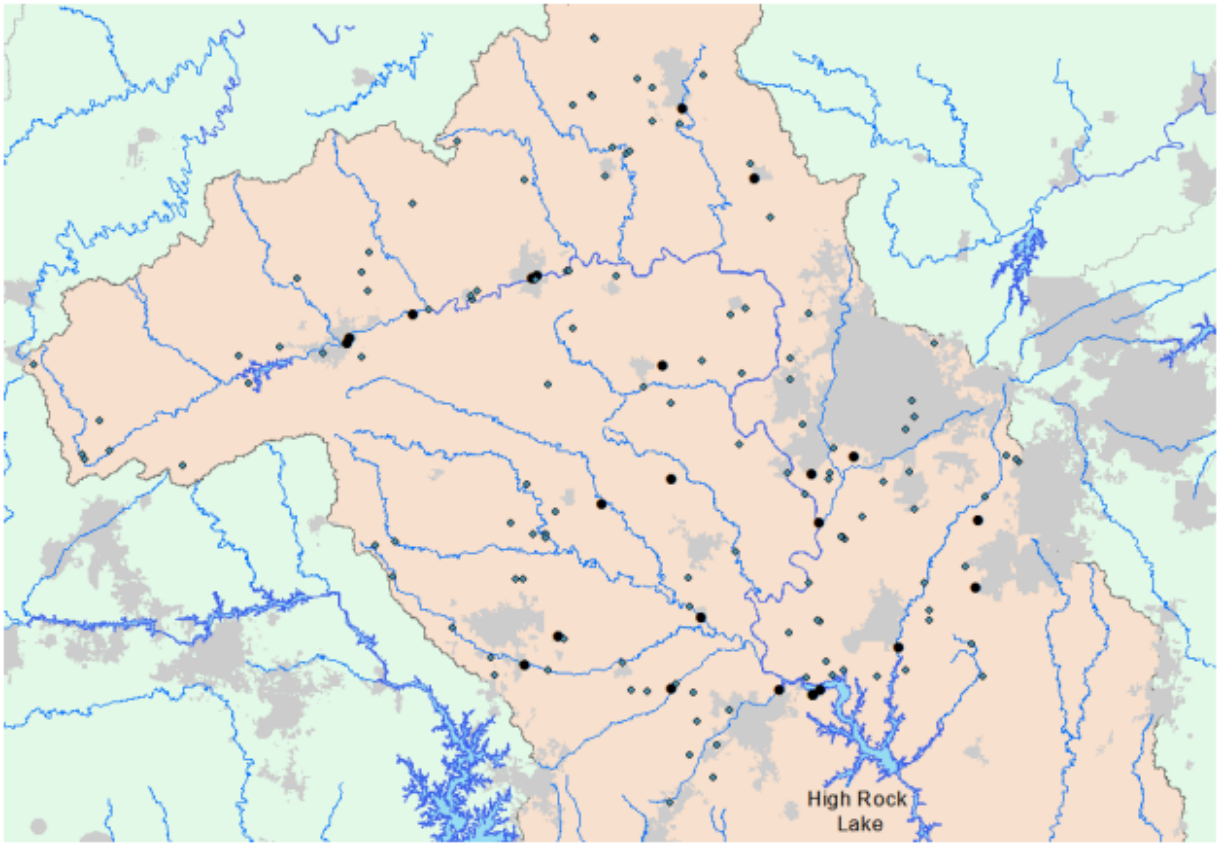
- What specific management improvements has your sector already implemented for nutrient control since 2006?
- What further nutrient reduction management steps can you take that would make sense? Consider both examples of more easily attainable and effective opportunities, as well as more long-term or challenging opportunities for your sector.

TAG Member Report

MAJOR NPDES DISCHARGES

Nineteen of the twenty largest NPDES Permittees in the HRL watershed by flow are members of the Yadkin Pee-Dee River Basin Association (YPDRBA). There are thirty-one dischargers that discharge more than 0.05 MGD into streams in the HRL watershed, and these thirty-one dischargers are responsible for 99 percent of total permitted flow.

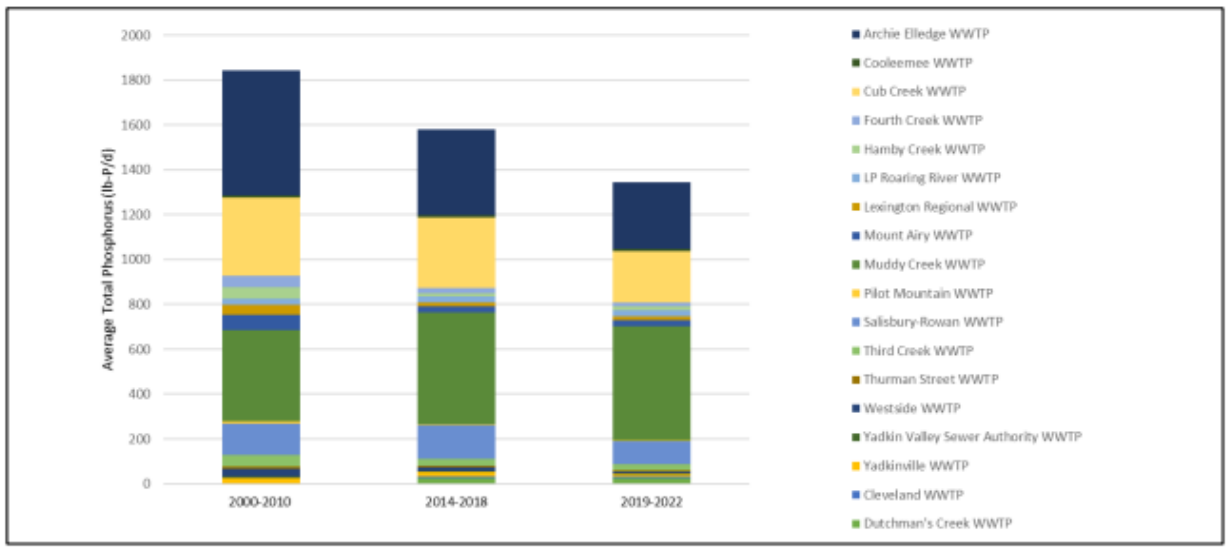
A map of all 150 NPDES dischargers in the watershed is shown below:



LOADING TRENDS

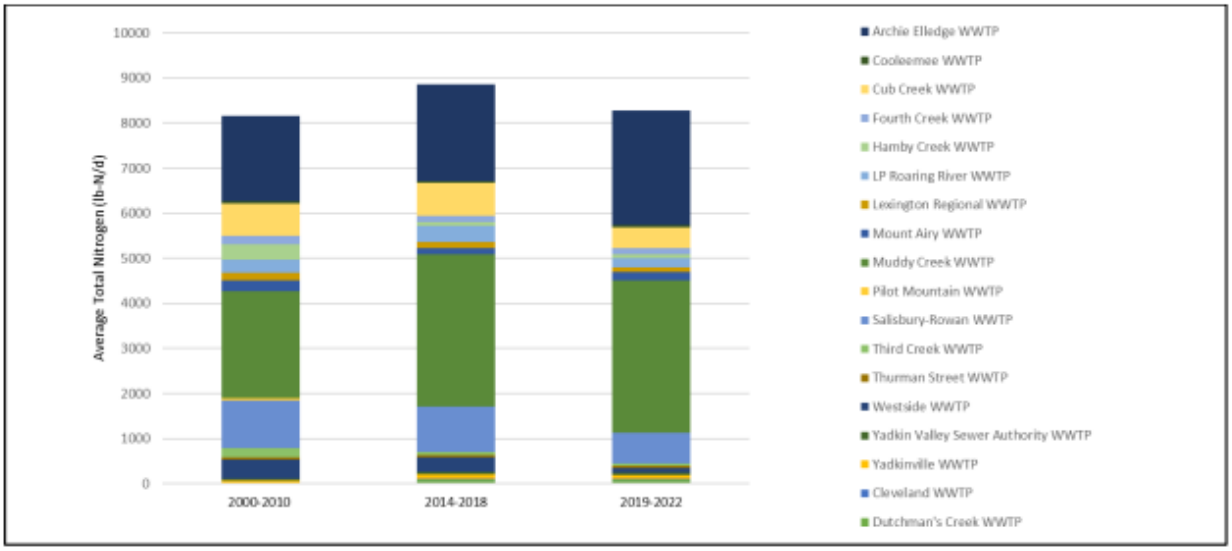
Total Phosphorus

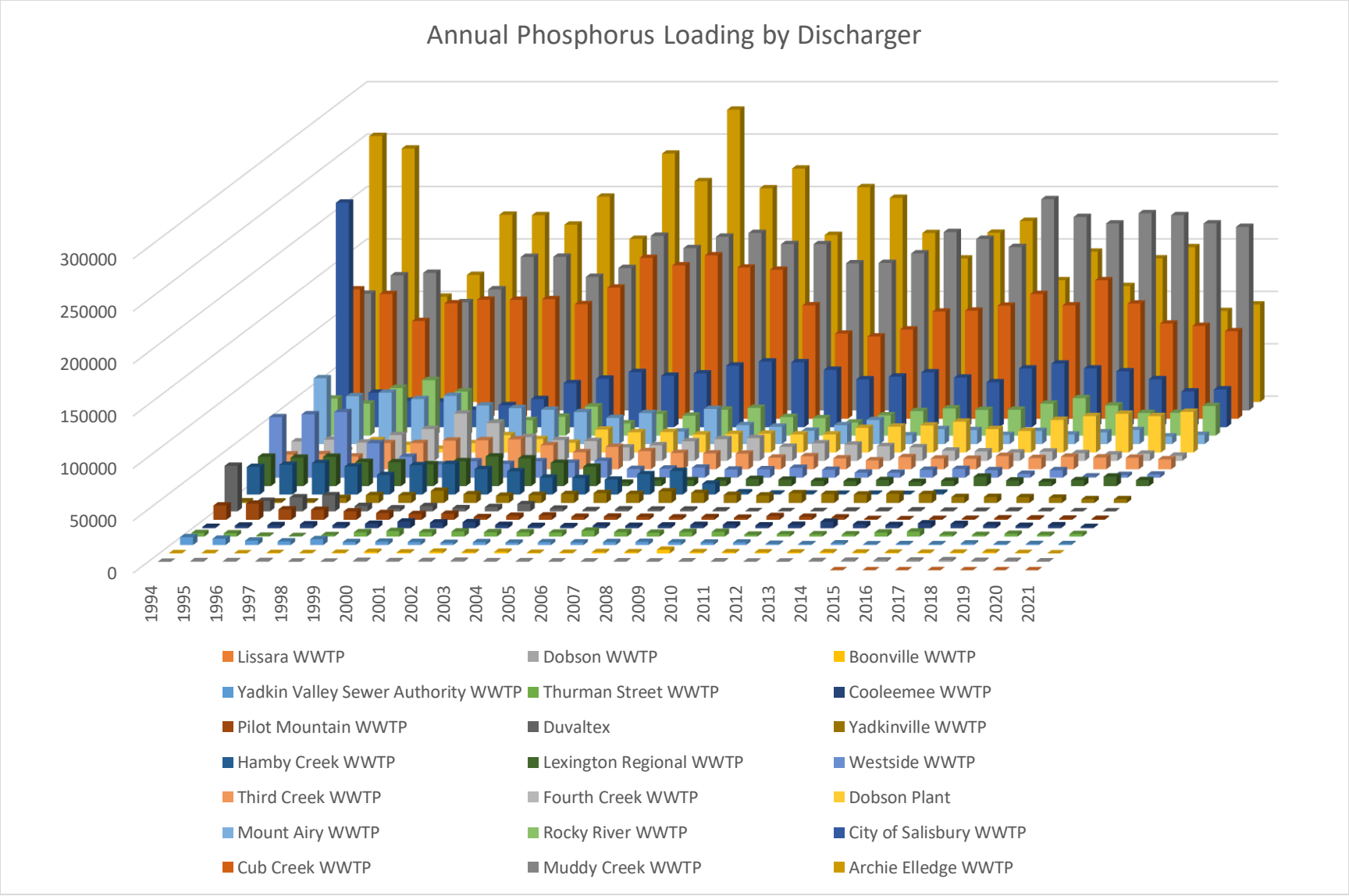
The average TP discharge rate from 2019 through 2022 is approximately 27 percent lower than the baseline TP discharge rate from 2000 through 2010. The 2019 through 2022 TP loading rate is approximately 15 percent lower than the 2014 through 2018 rate, as depicted in Figure 1-2. Reduction in the TP loading rate for this period can be attributed in part to facility improvements at several WWTPs.



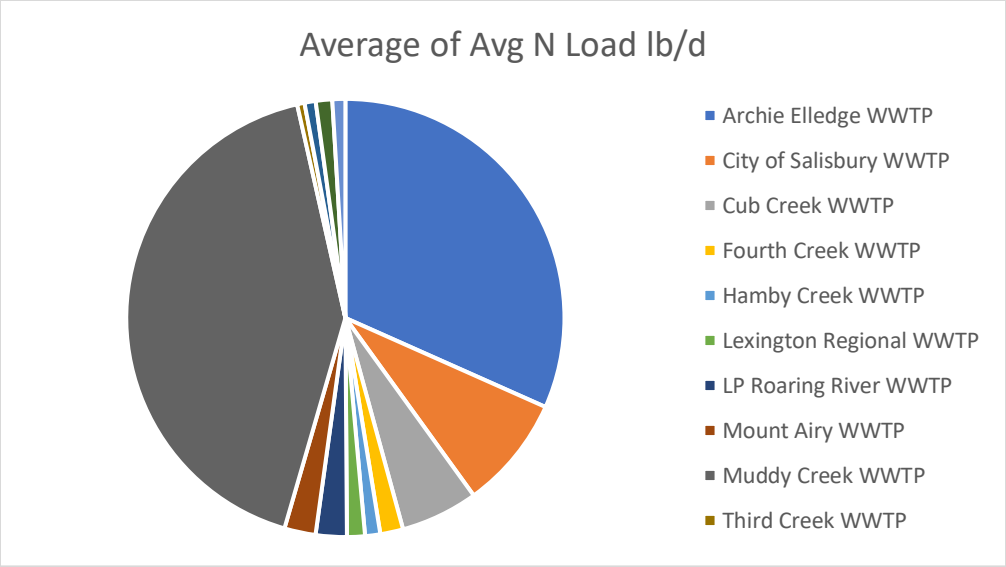
Total Nitrogen

TN varies significantly from day to day so monitoring of this parameter inherently includes a high amount of variability. Review of the discharge data indicates the average TN discharge rate from 2019 through 2022 is approximately 1 percent higher than the baseline TN discharge rate from 2000 through 2010 and is 7 percent lower than the 2014 through 2018 rate, as depicted in Figure 1-3. This is a negligible change over the entire data period given the inherent variability in TN. While TP loading is recognized as decreasing in the HRL watershed, TN loading is staying relatively flat.



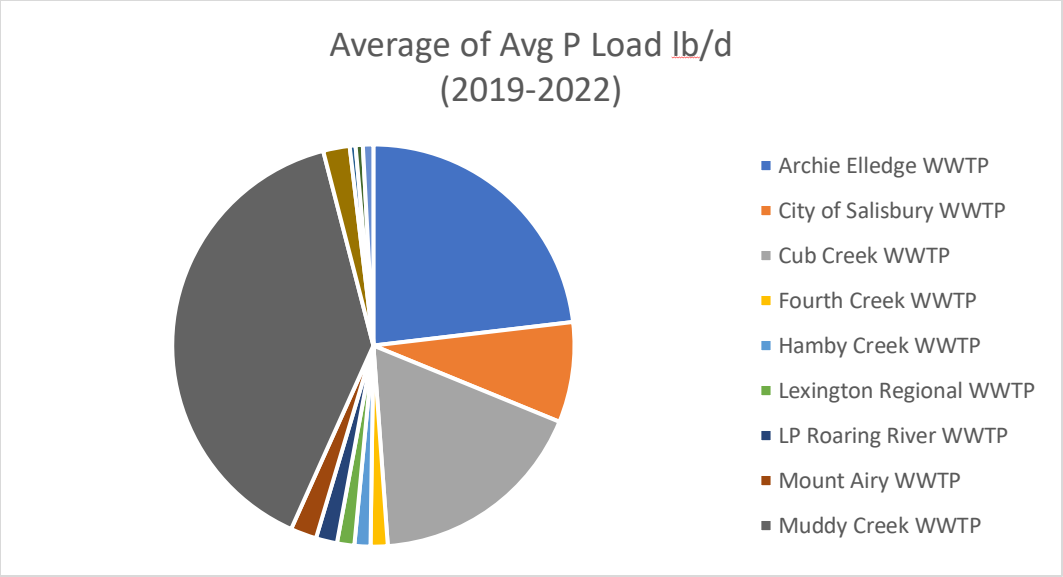


Source: Division of Water Resources, 2022



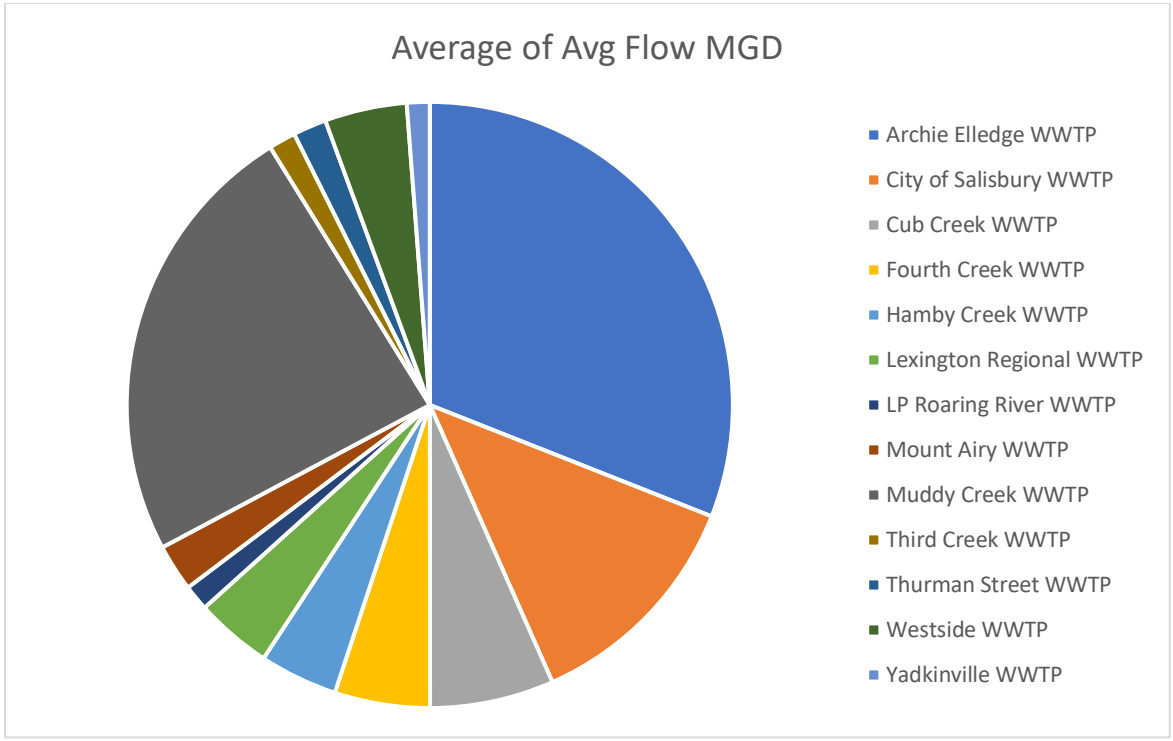
Summary of Nitrogen Changes and Survey Comments
[DRAFT 2]

Owner	WWTP	Average of Avg N Load lb/d		% Change	Survey Comments on Nitrogen Change	Treatment Upgrade Plans
		2000-2010	2019-2022			
City of Winston-Salem	Archie Elledge WWTP	4281.8	2549.3	38.5%	No treatment changes implemented	Side-stream process being evaluated for biosolids lagoon that would remove nitrogen
City of Winston-Salem	Muddy Creek WWTP		3379.6			
City of Salisbury	Salisbury WWTP	1064.9	674.3	-36.7%	No treatment changes implemented	
Town of Wilkesboro	Cub Creek WWTP	721.1	460.6	-36.1%	No treatment changes implemented	Expansion plans include a new process with N & P removal capability
City of Statesville	Fourth Creek WWTP	376.2	135.8	-52.3%	Implemented process changes due to limits changes	Any upgrades will include a BNR process
City of Statesville	Third Creek WWTP		43.8			
City of High Point	Westside WWTP	416.4	97.9	-76.5%	BNR Process implemented in 2019	No further plans
City of Thomasville	Hamby Creek WWTP	354.7	90.2	-74.6%	No treatment changes implemented	
City of Lexington	Lexington Regional WWTP	159.7	106.5	-33.3%	No treatment changes implemented	Just solids handling as noted in Flow summary
City of Mount Airy	Mount Airy WWTP	239.0	185.7	-22.3%		
Town of North Wilkesboro	Thurman Street WWTP	61.5	66.2	7.6%		
Louisianna Pacific Corp	LP Roaring River WWTP	289.8	184.7	-36.3%		
Town of Yadkinville	Yadkinville WWTP	80.0	77.0	-3.7%		
Totals (end of pipe)		**8045.1**	**8051.7**	**0.1%**		



Summary of Phosphorus Changes and Survey Responses
[DRAFT 2]

		Average of Avg P Load lb/d				
Owner	**WWTP**	**2000-2010**	**2019-2022**	**% Change**	**Phosphorus**	**Treatment Upgrade Plans**
City of Winston-Salem	Archie Elledge WWTP	966.4	299.9	-16.3%	No treatment changes implemented	No plans (will be permit driven)
City of Winston-Salem	Muddy Creek WWTP		509.3			
City of Salisbury	Salisbury WWTP	138.6	104.5	-24.6%	No treatment changes implemented	
Town of Wilkesboro	Cub Creek WWTP	347.7	229.1	-34.1%	No treatment changes implemented	Expansion plans include a new process with N & P removal capability
City of Statesville	Fourth Creek WWTP	105.5	17.8	-56.9%	Implemented process changes due to limits	Any upgrades will include a BNR process
City of Statesville	Third Creek WWTP		27.6			
City of High Point	Westside WWTP	33.9	7.5	-77.9%	BNR Process implemented in 2019	No further plans
City of Thomasville	Hamby Creek WWTP	51	16.7	-67.3%	No treatment changes implemented	
City of Lexington	Lexington Regional WWTP	45.3	18.1	-60.1%	No treatment changes implemented	Just solids handling as noted in Flow summary
City of Mount Airy	Mount Airy WWTP	66.4	27.2	-59.1%		
Town of North Wilkesboro	Thurman Street WWTP	12	6.1	-49.1%		
Louisianna Pacific Corp	LP Roaring River WWTP	27.2	22.1	-18.8%		
Town of Yadkinville	Yadkinville WWTP	24.3	10.9	-55.3%		
Totals (end of pipe)		**1818.3**	**1296.8**	**-28.7%**		


Average of Avg Flow MGD
Archie Elledge WWTP
City of Salisbury WWTP
Cub Creek WWTP
Fourth Creek WWTP
Hamby Creek WWTP
Lexington Regional WWTP
LP Roaring River WWTP
Mount Airy WWTP
Muddy Creek WWTP
Third Creek WWTP
Thurman Street WWTP
Westside WWTP
Yadkinville WWTP

Some of Wastewater Flow Changes and Survey Responses
[DRAFT 2]

Owner	WWTP	Average of Avg Flow MGD			Survey Comments on Flow Change	Expansion Plans
		2000-2010	2019-2022	% Change		
City of Winston-Salem	Archie Elledge WWTP	33.5	20.7	9.7%	Loss of industrial flow and an increase in I&I	
City of Winston-Salem	Muddy Creek WWTP		16.0			
City of Salisbury	Salisbury WWTP	8.3	8.3	-0.3%	Recent industrial closures notes	Grants Creek project consisted of a new 24 MGD influent screening and pump station structure, new grit removal structure, new RAS/WAS pump station to replace the existing screw pumps, new precast electrical building and new generator, and conversion of the existing trickling filters to provide a flow equalization facility. This project is part of the adopted SRU Capital Improvement Plan. The construction contract amount totals $26,838,600 and construction is planned to be completed in early Spring 2023.
Town of Wilkesboro	Cub Creek WWTP	3.3	4.4	34.1%	Growth across all classes of customers. Also more I&I in recent years	Capacity expansion in design stage
City of Statesville	Fourth Creek WWTP	4.9	3.4	-10.9%	Currently seeing residential and industrial growtth. (no comment on decrease)	Planning for upgrade of Fourth Creek - not sure when
City of Statesville	Third Creek WWTP		1.0			
City of High Point	Westside WWTP	3.7	2.9	-20.8%	No cause cited	Upgrade/expansion implements in 2019
City of Thomasville	Hamby Creek WWTP	3.1	2.8	-10.1%	Residential growth and industrial flow loss	Planning to add flow equalization tanks for rain events
City of Lexington	Lexington Regional WW	2.6	2.7	5.3%	Population growth 3-6%	Solids handling upgrade. The driving factor is the aging of the 30-year-old Compost facility and replacing it with new and more modern technology. Final product will be Class A dry biosolids. The technology will be a sludge dryer of some sort. Still in the deciding process.
City of Mount Airy	Mount Airy WWTP	1.8	1.7	-7.0%		
Town of North Wilkesboro	Thurman Street WWTP	0.8	1.2	48.7%		
Louisianna Pacific Corp	LP Roaring River WWTP	1.0	0.9	-8.5%		
Town of Yadkinville	Yadkinville WWTP	0.8	0.8	1.7%		
Totals (end of pipe)		**63.8**	**66.8**	**4.8%**		

Future Steps

In 2019, the YPDRBA contracted a White Paper that analyzed a proposed nutrient management strategy. This White Paper conveys that a wastewater strategy focusing on phosphorus reduction is a cost-effective approach to achieving water quality goals in High Rock Lake. The cost of phosphorus treatment upgrades is significantly lower than the cost of nitrogen treatment upgrades, though options currently exist for some dischargers in the HRL watershed to optimize to lower their current nitrogen loading rates without significant facility expansions.

Current average day flows for many of these facilities are significantly less than permitted flows and therefore expansions are not on the near-term horizon. Most NPDES permits do not include nutrient limits and instead monitor and report nutrient loading. Two facilities discharging in the Abbott's Creek arm of High Rock Lake have load-based nutrient limits that were established as a result of TMDLs.

Many dischargers have no intention of upgrading or expanding their facilities until DEQ adds nutrient limits to their existing permit.

ON-SITE WASTEWATER

In 2006, legislation passed that developed the North Carolina Onsite Wastewater Contractors and Inspectors Certification Board, an independent Occupational Licensure Board that administers the certification of septic tank system installers and Time-of-Sale Inspectors. There were no protocol or procedures in place prior to this legislation that qualified the persons installing septic tank systems or conducting time-of-sale inspections of existing septic tank systems at time of real estate transfer.

In 2015, legislation passed that established the Engineer Option Permit as an option for developers and homeowners in obtaining a permit for the installation or repair of onsite wastewater systems. Prior to this legislation, only the local environmental health departments within the counties, acting as authorized agents of the State were able to evaluate sites, design systems, or act as an agent of the owner.

In 2018, legislation passed that established a "hybrid" protocol for obtaining a permit from the Local Health Department. Under this hybrid, the owner hires a licensed soil scientist to do soil and site evaluations and then transfer the signed and sealed document to the LHD for continuation of the permitting process.

In 2019, the Authorized Onsite Wastewater Evaluator was created by Session Law. This requires a Licensed Soil Scientist to obtain another level of training and gives the Evaluator the ability to permit sites where non-engineered systems are mandated.

In 2021, 15A NCAC 18E wastewater rules were adopted which added private sector abilities to not only better expedite the turnaround of permits, but to also make sure there were better qualified professionals to conduct site evaluation.

Future Steps

New technologies have been developed to perform better with unsuitable soils but come with a significant increase in cost. NCSTA is working to encourage their implementation where feasible.

POULTRY PROCESSING

Tyson Farms has both a direct discharge on Hunting Creek (South Yadkin River) and a third-party waste treatment agreement with the Town of Wilkesboro.

The Wilkesboro facility undergoes pre-treatment in a 2-lagoon system and then directs their flow to Cub Creek WWTP. The Cub Creek WWTP treats and then directly discharges into the Yadkin River. Cub Creek is currently undergoing a significant treatment upgrade and expansion, which will remove parts of their facility from the floodplain. The expansion will be incorporated into their existing nutrient loading, and the new designs were developed in anticipation of future nutrient limits. Tyson Farms accounts for 80% of Cub Creek WWTP's current flow and is working closely with Cub Creek WWTP operators during their upgrade process. Tyson began monitoring for N and P in 2022.

Tyson's Hunting Creek direct discharge facility underwent an upgrade in 2015 to improve nitrate removal. The facility currently monitors for nitrogen and phosphorus and received lower N limits on their most recent permit renewal.

Future Steps

No other upgrades are planned at this time, and the facility currently maintains flows at roughly half of their permitted capacity.