CITY OF BARTLETT
DEPARTMENT OF ENGINEERING & UTILITIES

June 15, 2022

Vojin Janjić
Department of Environment and Conservation
Division of Water Resources
312 Rosa L. Parks Ave, 11th Floor
Nashville TN 37243-1534

RE: Nutrient Optimization/Management Annual Update TN0066800

Dear: Vojin

I have attached along with this letter the 2021 Nutrient Optimization update on progress report. I have also attached Nutrient data results for 2021. Please call me at (901) 385-6499 if you have any questions.

Sincerely,

Larry A. Gamblin

Larry A. Gamblin
Divisional Manager, Wastewater

XC: Rick McClanahan, City of Bartlett
Eddy Bozeid, TDEC Memphis Field Office
Karina Bynum, TDEC
Ariel Wessel-Fuss, TDEC

Nutrient Optimization/Management Annual Update Report

Bartlett WWTP # 1 TN0066800

June 15, 2022

The Plan

During the last 12 months, we have continued to try to optimize our phosphorus removal and develop a better strategy for effluent total phosphorus of 1.0 mg/l.

2021 Summary

This year 2021 has continued to be a challenge for us due to the Corona virus pandemic. The Covid-19 corona virus has caused us to continue to split shifts and work in two separate teams to prevent the whole staff from being infected or quarantined from the virus. This has stopped us from being able to focus on the increased testing involved in conducting these changes in our process to see new results.

We had a total phosphorus removal of 35% in 2021, the same as we had in 2020, and an effluent average of 3.22 mg/l for 2021. That is up from 2.71 mg/l for 2020.

We also have a total nitrogen removal of 89% for 2021, up from 88% for the calendar year of 2020. We had an effluent average of 4.57 mg/l for 2021, down from 4.76 mg/l for 2020.

So below is our averages for the year 2021:

TP 3.22 mg/l at 35% removal TN 4.57 mg/l at 89% removal

We will rebound from this setback. We have continued to work very hard to make these strategies work.

One of our main obstacles of maintaining the lowest effluent Total Phosphorus is still decanting our digester and running our belt filter press. The TP of the decant from the digester and the filtrate from the belt press tests between 60-90 mg/l. This takes place 96 days of the year. This process results in a 75% increase in Effluent TP. Recovery time for this increase can be up to 14 days.

Activities completed since the last report

We were not able to address the increase of TP related to the digester and belt press by adding Fermented Bio P sludge to feed polyphosphate-accumulating organisms (PAO's) into the oxidation ditch to see new results due to the staffing setbacks caused by the Covid-19 corona virus.

We have completed talks with Hach Instruments and will be installing real time phosphorus analyzer and chemical feed control in August of this year to address the higher TP during our press runs and digester decanting. This will also help us in all other process procedures we use to lower our TP.

Discussion

Our team continues to work very hard to maintain and improve our nutrient removal process. Our goal still is to try and determine what actions work the best to lower the discharge of TP and TN and seek to replicate that month to month.

Data

I have attached spreadsheet data of nutrient test analysis for 2021.

City of Bartlett WWTP # 1
Nutrient Data Summary

TOTAL P	2021	TOTAL P	2021	TOTAL P
INF	mg/L	EFF	mg/L	%
Avg	4.94	Avg	3.22	REMOVAL
Max	5.33	Max	6.80	34.8
Min	4.18	Min	1.00	

TOTAL N	2021	TOTAL N	2021	TOTAL P
INF	mg/L	EFF	mg/L	%
Avg	40.3	Avg	4.57	REMOVAL
Max	55.9	Max	10.30	88.7
Min	36.3	Min	1.00	

TN0066800 Permit limit for Total P is: 23,725 lb/yr 12 Month Rolling Average started in February 2018

TOTAL P	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Yearly Avg	Yearly Max	Yearly Min
EFF	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
Avg	4.05	2.90	3.30	1.00	2.80	3.83	2.60	3.00	6.80	3.20	2.40	2.80	3.22		
Max	5.42	2.90	3.30	1.00	2.80	5.18	2.60	3.00	6.80	3.20	2.40	2.80		6.80	
Min	2.67	2.90	3.30	1.00	2.80	2.47	2.60	3.00	6.80	3.20	2.40	2.80			1.00
12 Month Rolling Average limit 23,725 lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr	lbs/yr			
	12,695	12,783	13,624	13,140	13,735	14,629	12,026	11,753	13,423	13,640	13,671	13,894			

TOTAL N	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Yearly Avg	Yearly Max	Yearly Min
EFF	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
Avg	4.70	4.50	1.00	1.10	2.60	10.30	4.40	4.50	3.40	5.80	7.90	4.60	4.57		
Max	4.70	4.50	1.00	1.10	2.60	10.30	4.40	4.50	3.40	5.80	7.90	4.60		10.30	
Min	4.70	4.50	1.00	1.10	2.60	10.30	4.40	4.50	3.40	5.80	7.90	4.60			1.00