pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0228273**
Facility Type	**Municipal**	APS ID	**1028045**
Major / Minor	**Minor**	Authorization ID	**1335400**

Applicant and Facility Information

Applicant Name	**Locust Township Municipal Authority**	Facility Name	**Numidia Wastewater Treatment Plant**
Applicant Address	1223a Numidia Drive	Facility Address	32 Country Acres Lanes
	Catawissa, PA 17820-8632		Numidia, PA 17820
Applicant Contact	Susan Adam	Facility Contact	Thomas Runge
Applicant Phone	(570) 799-5710	Facility Phone	(570) 799-5710
Client ID	241299	Site ID	538212
Ch 94 Load Status	Not Overloaded	Municipality	Locust Township
Connection Status	No Limitations	County	Columbia
Date Application Received	December 1, 2020	EPA Waived?	Yes
Date Application Accepted	December 16, 2020	If No, Reason	
Purpose of Application	Renewal of an existing NPDES permit for the discharge of treated sewage.		

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		*Derek S. Garner* Derek S. Garner / Project Manager	June 9, 2021
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	June 9, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.05
Latitude	40º 52' 59.39"	Longitude	-76º 24' 21.59"
Quad Name	Catawissa	Quad Code	1134
Wastewater Description:	Sewage Effluent		

Receiving Waters	UNT of Roaring Creek	Stream Code	27498
NHD Com ID	65642637	RMI	0.88
Drainage Area	0.67	Yield (cfs/mi^2)	0.377
Q_{7-10} Flow (cfs)	0.25	Q_{7-10} Basis	Streamgage No. 01468500
Elevation (ft)	890	Slope (ft/ft)	0.01
Watershed No.	5-E	Chapter 93 Class.	CWF
Existing Use	n/a	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	n/a	Name	n/a

Nearest Downstream Public Water Supply Intake	Danville Municipal Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1,120
PWS RMI	138.06	Distance from Outfall (mi)	10.16

Treatment Facility Summary

The Numidia Wastewater Treatment has an annual average design flow and hydraulic design capacity of 0.05 MGD and an organic capacity of 118 lbs/day. Treatment consists of:

- One (1) comminutor
- One (1) equalization tank
- Two (2) aeration basins
- Two (2) secondary clarifiers
- One (1) chlorine contact tank
    - Erosion tablet chlorination and dechlorination
- One (1) aerated digester
    - Digested sludge is hauled to another wastewater treatment plant or landfill.

Treated effluent is ultimately discharged via Outfall 001 to an unnamed tributary of Roaring Creek.

Compliance History

The facility was most recently inspected by DEP on March 4, 2021. The report recommends draining and cleaning the chlorine contact tank and investigate infiltration and inflow within the sewer system as it is found. The report also discusses the below ammonia-nitrogen effluent violations.

The following effluent violations occurred during the existing permit's term:

Noncompliance Date	Noncompliance Category	Parameter	Sample Value	Violation Condition	Permit Value	Units	SBC
9/22/2017	Concentration 3 Effluent Violation	Ammonia-Nitrogen	4.9	>	4.5	mg/L	Wkly Avg
8/24/2018	Concentration 3 Effluent Violation	Ammonia-Nitrogen	4.7	>	4.5	mg/L	Wkly Avg
9/17/2018	Concentration 3 Effluent Violation	Ammonia-Nitrogen	4.6	>	4.5	mg/L	Wkly Avg
6/25/2019	Concentration 3 Effluent Violation	Fecal Coliform	> 2420	>	1000	CFU/100 ml	IMAX
9/17/2019	Concentration 3 Effluent Violation	Fecal Coliform	1300	>	1000	CFU/100 ml	IMAX
8/15/2020	Concentration 2 Effluent Violation	Ammonia-Nitrogen	< 3.6	>	3	mg/L	Avg Mo
8/15/2020	Concentration 3 Effluent Violation	Ammonia-Nitrogen	8.3	>	4.5	mg/L	Wkly Avg
8/15/2020	Concentration 3 Effluent Violation	Fecal Coliform	2420	>	1000	CFU/100 ml	IMAX
10/15/2020	Concentration 2 Effluent Violation	Ammonia-Nitrogen	< 4.7	>	3	mg/L	Avg Mo
10/15/2020	Concentration 3 Effluent Violation	Ammonia-Nitrogen	9.2	>	4.5	mg/L	Wkly Avg
3/18/2021	Concentration 2 Effluent Violation	Ammonia-Nitrogen	14.7	>	9	mg/L	Avg Mo
3/18/2021	Concentration 3 Effluent Violation	Ammonia-Nitrogen	21.1	>	13.5	mg/L	Wkly Avg

The above violations indicate intermittent noncompliance with ammonia-nitrogen effluent violations. The most recent inspection report mentions that a discussion with the facility's operator regarding the violations did not yield a common cause. The operator plans to review operations and keep DEP informed.

There are no open violations associated with the permittee.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.05
Latitude 40º 52' 59.20" **Longitude** -76º 24' 20.90"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

A “Reasonable Potential Analysis” was conducted in WQM 7.0 v1.1 (attached). The model indicates that the existing limits and monitoring requirements for CBOD5, ammonia-nitrogen, and dissolved oxygen are protective of the receiving surface water.

TRC effluent limitations were evaluated using the TRC_CALC spreadsheet (attached). The spreadsheet’s results indicate that the existing effluent limitations are protective of the receiving surface water.

Best Professional Judgment (BPJ) Limitations

DEP recommends the existing monitoring requirements for dissolved oxygen remain in the permit to continue to help characterize the wastewater.

DEP also recommends that existing requirements for BOD5 and TSS influent monitoring remain in the permit to continue to characterize the influent and help with Chapter 94 reporting requirements.

An annual E. Coli monitoring requirement has been included in the permit per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Chesapeake Bay Considerations

The permittee previously completed over two years of nutrient monitoring from October 2005 to March 2008. The data was summarized in the fact sheet developed for the 2016 renewal. Per Phase 3 of Pennsylvania’s Chesapeake Bay Watershed Implementation Plan, the Numidia Wastewater Treatment Plant is considered a Phase 5 facility (annual average design flow > 0.002 MGD and < 0.2 MGD). The WIP states that Phase 5 facilities that have completed at least two years of nutrient monitoring do not need to continue monitoring. Accordingly, DEP does not propose any further monitoring requirements for total nitrogen or total phosphorus.

Monitoring Frequencies

The existing permit establishes a 5/week monitoring frequency for pH, dissolved oxygen, and total residual chlorine. The 5/week frequency was a result of negotiations between DEP and Schlesinger & Kerstetter, LLP, acting on behalf of the Authority.

Anti-Backsliding

No effluent limits have been proposed to be made less stringent. Anti-backsliding is not applicable.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	5/week	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	5/week	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.24	XXX	0.77	5/week	Grab
CBOD5	10	16	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids	12	18	XXX	30	45	60	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia-Nitrogen Jun 1 - Oct 31	1.2	1.8	XXX	3.0	4.5	6.0	2/month	Grab
Ammonia-Nitrogen Nov 1 - May 31	3.8	5.6	XXX	9.0	13.5	18	2/month	Grab

Compliance Sampling Location: Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	5/week	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	5/week	Grab
TRC	XXX	XXX	XXX	0.24	XXX	0.77	5/week	Grab
CBOD5	10	16	XXX	25.0	40.0	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
TSS	12	18	XXX	30.0	45.0	60	2/month	Grab
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia Nov 1 - May 31	3.8	5.6	XXX	9.0	13.5	18	2/month	Grab
Ammonia Jun 1 - Oct 31	1.2	1.8	XXX	3.0	4.5	6	2/month	Grab

Compliance Sampling Location: Outfall 001

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
05E	27498	Trib 27498 of Roaring Creek	**0.880**	890.00	0.67	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.377	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
Numidia WWTP	PA0228273	0.0500	0.0500	0.0500	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	3.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
05E	27498	Trib 27498 of Roaring Creek	**0.000**	818.00	1.20	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.377	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
05E	27498	Trib 27498 of Roaring Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
0.880	0.25	0.00	0.25	.0773	0.01550	.428	5.69	13.28	0.14	0.397	21.17	6.58
Q1-10 Flow												
0.880	0.17	0.00	0.17	.0773	0.01550	NA	NA	NA	0.12	0.465	21.55	6.60
Q30-10 Flow												
0.880	0.45	0.00	0.45	.0773	0.01550	NA	NA	NA	0.18	0.304	20.73	6.55

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.68	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.8	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
05E	27498	Trib 27498 of Roaring Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.880	Numidia WWTP	19.09	6	19.09	6	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.880	Numidia WWTP	2.02	3	2.02	3	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.88	Numidia WWTP	25	25	3	3	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
05E	27498	Trib 27498 of Roaring Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
0.880	0.050	21.172	6.576
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
5.688	0.428	13.283	0.135
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.39	1.103	0.70	0.766
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.014	28.068	Owens	5
Reach Travel Time (days)			
0.397			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.040	7.06	0.68	7.96
0.079	6.74	0.66	8.07
0.119	6.44	0.64	8.07
0.159	6.14	0.62	8.07
0.199	5.87	0.60	8.07
0.238	5.60	0.59	8.07
0.278	5.35	0.57	8.07
0.318	5.11	0.55	8.07
0.357	4.88	0.53	8.07
0.397	4.66	0.52	8.07

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
05E	27498	Trib 27498 of Roaring Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.880	Numidia WWTP	PA0228273	0.050	CBOD5	25		
				NH3-N	3	6	
				Dissolved Oxygen			3

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	0.25	= Q stream (cfs)		0.5	= CV Daily	
5	0.05	= Q discharge (MGD)		0.5	= CV Hourly	
6	20	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 1.050		1.3.2.iii	WLA cfc = 1.016
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.391		5.1d	LTA_cfc = 0.591
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.288			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.563			

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)