pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0228320**
Facility Type	**Municipal**	APS ID	**1027831**
Major / Minor	**Minor**	Authorization ID	**1335040**

Applicant and Facility Information

Applicant Name	**Davidson Township Sewer Authority**	Facility Name	**Davidson Township Sewer Authority Water Pollution Control Facility**
Applicant Address	32 Michelle Road Sonestown, PA 17758-5358	Facility Address	32 Michelle Road Sonestown, PA 17758-5358
Applicant Contact	Linda Gavitt	Facility Contact	Adam Maczuga
Applicant Phone	(570) 482-3761	Facility Phone	(570) 482-3761
Client ID	157715	Site ID	530938
Ch 94 Load Status	Not Overloaded	Municipality	Davidson Township
Connection Status	No Limitations	County	Sullivan

Date Application Received: November 24, 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	April 7, 2021

X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	April 7, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.024
Latitude	41º 21' 7.03"	Longitude	-76º 33' 14.30"
Quad Name	Sonestown	Quad Code	0833
Wastewater Description:	Sewage Effluent		

Receiving Waters	Muncy Creek	Stream Code	19402
NHD Com ID	66910847	RMI	24.5
Drainage Area	37.7	Yield (cfs/mi^2)	0.055
Q_{7-10} Flow (cfs)	2.09	Q_{7-10} Basis	Streamgage No. 01552500
Elevation (ft)	947	Slope (ft/ft)	0.003
Watershed No.	10-D	Chapter 93 Class.	CWF, MF
Existing Use	Exceptional Value (EV) [1]	Existing Use Qualifier	RBP - Antidegradation
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	PA American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	679.73
PWS RMI	10.66	Distance from Outfall (mi)	52

[1] DEP has evaluated information indicating that the existing use of the receiving waters is different than the designated use under 25 Pa. Code § 93.9. In developing the draft NPDES permit, DEP is proposing to protect the existing use of the receiving waters. Following DEP's notice of the receipt of the application and the draft permit in the Pennsylvania Bulletin, DEP will accept written comments during the public comment period regarding DEP's tentative determination to protect the existing use. DEP will make a final determination on existing use protection for the receiving waters as part of the final permit action.

Treatment Facility Summary

The Davidson Township Sewer Authority Water Pollution Control Facility was constructed and operates under WQM Permit No. 5701401, issued June 1, 2001. The permit was amended July 5, 2012 to approve construction and operation of new sand filters after the existing sand filters were damaged from flooding in 2011. Additionally, the influent/recirculation wet well and concrete chlorine contact tank were replaced due to severe leaking. A dechlorination unit was approved via letter amendment in February 2017. The facility has an annual average design flow of 0.024 MGD, hydraulic capacity of 0.032 MGD, and an organic capacity of 50 lbs/day.

The facility receives raw wastewater from fifty individual septic tanks. The septic tank effluent is conveyed via gravity to an influent/recirculation wet well at the treatment plant. From the wet well, the wastewater is pumped to two intermittent sand filters. From the sand filters, the wastewater is either recirculated to the wet well at the head of the plant or conveyed to the chlorine contact tank for disinfection and dechlorination. The final effluent is discharged to Muncy Creek via Outfall 001. Sludge is pumped from the individual septic tanks and hauled to another wastewater treatment plant.

Compliance History

The facility was most recently inspected by DEP on February 6, 2020. The inspection report notes that all required treatment units were operational and online, effluent was clear, and that no impacts were observed in the receiving stream. No violations were identified during the inspection.

A query of eDMR submissions did not yield any effluent violations during the existing permit's term.

There are no open violations associated with the permittee.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.024
Latitude 41º 21' 9.00" **Longitude** -76º 33' 13.00"
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	0.02	Average Monthly	-	92a.48(b)(3)

Water Quality-Based Limitations

A “Reasonable Potential Analysis” (attached) was conducted in WQM 7.0 v1.1. The model output (below) indicates that the existing effluent limits for CBOD5 and monitoring requirements for dissolved oxygen and ammonia-n are protective of Muncy Creek.

Parameter	Monthly Avg (mg/l)	Maximum Daily (mg/l)	Minimum (mg/l)
CBOD5	25	--	--
Ammonia-n	25	50	--
Dissolved Oxygen	3	--	3

The existing TRC limit of 0.02 mg/l was evaluated using the TRC_CLAC spreadsheet (attached). The results indicate the existing requirements are protective of Muncy Creek.

Best Professional Judgment (BPJ) Limitations

DEP proposes to continue requiring monitoring for ammonia-n and dissolved oxygen to characterize the wastewater and any impacts on Muncy Creek.

DEP also proposes to continue influent monitoring for BOD5 and TSS to help with Chapter 94 reporting requirements.

An annual monitoring requirement for E. Coli is proposed per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Chesapeake Bay Requirements

Over two years’ worth of nutrient monitoring was conducted from May 2006 to June 2008. The results were summarized in the previous renewal’s fact sheet, dated November 2015. Per Pennsylvania’s Chesapeake Bay Watershed Implementation Plan, no further nutrient monitoring is required.

Anti-Backsliding

No effluent limits or monitoring requirements are proposed to be made less stringent. Accordingly, anti-backsliding regulations should not impact the permit's renewal.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Outfall 001. Effective Period: Permit Effective Date through January 31, 2018

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	1.0	XXX	2.3	1/day	Grab
CBOD5	5.0	8.0 Wkly Avg	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids	6.0	9.0 Wkly Avg	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	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab

Compliance Sampling Location: Outfall 001

Outfall 001, Effective Period: February 1, 2018 through Permit Expiration Date

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	XXX	XXX	0.02	1/day	Grab
CBOD5	5.0	8.0 Wkly Avg	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids	6.0	9.0 Wkly Avg	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	Report	XXX	XXX	Report	XXX	XXX	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	1/day	Grab
DO	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	XXX	XXX	0.02	1/day	Grab
CBOD5	5.0	8.0	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
TSS	6.0	9.0	XXX	30	45	60	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	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab

Compliance Sampling Location: Outfall 001

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19402	MUNCY CREEK	**24.500**	947.00	37.70	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	0.055	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
DavidsonTwpMA	PA0228320	0.0240	0.0240	0.0240	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

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19402	MUNCY CREEK	**24.100**	940.00	38.50	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	0.055	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
10D	19402	MUNCY 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												
24.500	2.07	0.00	2.07	.0371	0.00331	.608	25	41.12	0.14	0.176	20.09	6.51
Q1-10 Flow												
24.500	1.58	0.00	1.58	.0371	0.00331	NA	NA	NA	0.12	0.205	20.12	6.51
Q30-10 Flow												
24.500	3.42	0.00	3.42	.0371	0.00331	NA	NA	NA	0.18	0.134	20.05	6.50

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	0.76	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.65	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
10D	19402	MUNCY 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
24.500	DavidsonTwpMA	22.4	50	22.4	50	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
24.500	DavidsonTwpMA	2.12	25	2.12	25	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)		
24.50	DavidsonTwpMA	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
10D	19402	MUNCY CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
24.500	0.024	20.088	6.505
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
25.003	0.608	41.118	0.139
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.40	0.246	0.44	0.705
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.151	4.381	Tsivoglou	6
Reach Travel Time (days)			
0.176			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.018	2.39	0.43	8.19
0.035	2.38	0.43	8.22
0.053	2.37	0.42	8.23
0.070	2.36	0.42	8.23
0.088	2.35	0.41	8.23
0.106	2.34	0.41	8.23
0.123	2.33	0.40	8.23
0.141	2.32	0.40	8.23
0.158	2.31	0.39	8.23
0.176	2.30	0.39	8.23

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
10D	19402	MUNCY 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)
24.500	DavidsonTwpMA	PA0228320	0.024	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in B4:B8 and E4:E7

2.07	= Q stream (cfs)	0.5	= CV Daily
0.024	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.703	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.02	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 12.522	1.3.2.iii	WLA cfc = 17.350
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 4.666	5.1d	LTA_cfc = 10.087

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.020	BAT/BPJ
		INST MAX LIMIT (mg/l) = 0.065	

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)