pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0033901**
Facility Type	**Non-Municipal**	APS ID	**1090143**
Major / Minor	**Minor**	Authorization ID	**1442777**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Harold P Newton Jr**	Facility Name	**Willow Bend MHP**
Applicant Address	112 Timber Village Center	Facility Address	1309 Bend Road Lot 100
	Mercer, PA 16137-8991		Mercer, PA 16137-2526
Applicant Contact	Harold Newton	Facility Contact	Jeffrey Staul
Applicant Phone		Facility Phone	724-813-4888
Client ID	300454	Site ID	244052
Ch 94 Load Status	Not Overloaded	Municipality	Lackawannock Township
Connection Status		County	Mercer
Date Application Received	May 25, 2023	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Renewal application for an NPDES Permit for a non-municipal minor sewage facility.

Summary of Review

The renewal of this NPDES Permit is for an existing discharge that serves as the disinfection of domestic wastes for the Willow Bend Mobile Home Park.

Treatment consists of four 1,000-gallon and three 1,500-gallon in series septic tanks, 4,000-gallon dosing-recirculation tank, four 625-sq-ft cell 2520-sq-ft recirculating sand filter, recirculation chamber, and chlorinator with a 400-gallon contact tank.

Act 14 – Notification was submitted and received.

There are currently 7 open violations in WMS for Client ID (300454) as of 2/28/24. Open violations consist of several violations with the Safe Drinking Water program. The violations occurred on 02/07/2023.

EPA Waiver is in effect.

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		Dustin Hargenrater Dustin Hargenrater / Civil Engineer Trainee	February 28, 2023
		Justin C. Dickey, P.E. / Program Manager	Okay to Draft JCD 4/8/2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0075
Latitude	41º 13' 30.36"	Longitude	-80º 20' 47.29"
Quad Name	Greenfield	Quad Code	41080B3
Wastewater Description:	Sewage Effluent		

Receiving Waters	Unnamed Tributary to Little Neshannock Creek	Stream Code	35586
NHD Com ID	130026593	RMI	1.0400
Drainage Area	0.12	Yield (cfs/mi^2)	0.0057
Q_{7-10} Flow (cfs)	0.00062	Q_{7-10} Basis	USGS - StreamStats
Elevation (ft)	1269	Slope (ft/ft)	0.0091
Watershed No.	20-A	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.72	Monitoring Point 154222 – West Branch Little Neshannock Creek (Approx. 8.2 miles downstream) Average of Dry Period testing Results
Temperature (°F)	68	Default
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake		Beaver Falls Municipal Authority	
PWS Waters	Beaver River	Flow at Intake (cfs)	561
PWS RMI	3.5	Distance from Outfall (mi)	44.7

Changes Since Last Permit Issuance: None

Other Comments: None

Treatment Facility Summary

Treatment Facility Name: Willow Bend MHP

WQM Permit No.	Issuance Date
4397401 T-1	August 31, 2012
4397401	September 17, 1997

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Septic Tank Sand Filter	Hypochlorite	0.0075

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0075	21.9	Not Overloaded	Anaerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments: None

Compliance History

DMR Data for Outfall 001 (from May 1, 2022 to April 30, 2023)

Parameter	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22
Flow (MGD) Average Monthly	0.001599	0.00203	0.003	0.00356	0.005	0.003	0.002	0.002	0.002	0.003	0.002	0.003
Flow (MGD) Daily Maximum	0.0033	0.00346	0.007	0.00487	0.009	0.007	0.003	0.005	0.005	0.005	0.004	0.006
pH (S.U.) Minimum	6.53	6.26	6.2	6.19	7.1	6.6	6.7	6.6	6.4	6.1	6.7	6.8
pH (S.U.) Maximum	6.99	7.33	7.2	7.45	8.8	7.9	8.0	7.3	7.6	7.5	7.7	8.2
DO (mg/L) Minimum	8.88	9.5	10.6	8.95	8.3	9.1	8.4	7.5	7.6	7.5	7.6	8.4
TRC (mg/L) Average Monthly	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2
TRC (mg/L) Instantaneous Maximum	1.01	1.27	1.3	1.4	0.4	1.0	1.2	0.4	1.4	0.3	0.8	0.67
CBOD5 (mg/L) Average Monthly	2.7	< 3.6	< 3.2	< 2.0	< 2.14	< 2.14	7.0	2.7	9.0	6.7	3.9	< 5.3
CBOD5 (mg/L) Instantaneous Maximum	3.1	5.2	4.3	< 2.0	< 2.14	< 2.14	7.1	3.3	9.1	8.0	5.4	8.5
TSS (mg/L) Average Monthly	< 5.0	< 5.0	< 5.0	< 5.0	< 2.50	< 2.50	< 2.50	< 2.50	< 2.5	< 2.8	< 2.50	< 2.5
TSS (mg/L) Instantaneous Maximum	< 5.0	< 5.0	< 5.0	< 5.0	< 2.50	< 2.50	< 2.50	< 2.50	< 2.5	3	< 2.50	< 2.5
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	15	< 18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	< 1	< 1	238	316.9	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Nitrogen (mg/L) Average Quarterly		1.27			< 18.23			< 0.5			< 0.50	
Ammonia (mg/L) Average Monthly	< 0.4	< 0.8	< 0.8	< 0.8	< 0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10	< 0.10
Ammonia (mg/L) Instantaneous Maximum	< 0.4	< 0.8	< 0.8	< 0.8	< 0.10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10	< 0.10
Total Phosphorus (mg/L) Average Quarterly		0.41			1.40			1.37			0.590	

Compliance History

There has only been one effluent violation within the last two years for the month of December in 2021 for TRC. The reported value of TRC Instantaneous Maximum was 1.7 mg/l with the limitation being set at 1.4 mg/l. With that being the only violation within the last two years this facility has shown their ability to comply with the limitations set forth in the previous permit

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0075
Latitude 41º 13' 30.36" **Longitude** -80º 20' 47.29"
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)

Comments: The facilities ability to comply shows that it has no problems reaching the technology-based limitations set above. The more stringent limit for TRC based on TRC_CALC that was set forth in the previous permit will remain as a WQBEL.

Water Quality-Based Limitations

The discharge was modeled using WQM 7.0 to evaluate the CBOD5, Ammonia-Nitrogen, and Dissolved Oxygen parameters. The modeling results show technology based effluent limitations for CBOD5 are appropriate. The modeling results also confirm that Ammonia-Nitrogen and Dissolved Oxygen limitations are necessary to meet in-stream water quality criterion. The modeling suggests a 2.19 mg/L monthly limit with a 4.38 mg/L IMAX concentration. Using the Round-Off Guidelines in the Technical Guidance for the Development and Specification of Effluent Limitations these values will translate to 2.1 mg/L monthly limit and 4.3 mg/L IMAX limit. The Ammonia-Nitrogen parameter will have two per month testing frequency and 2.1 mg/L monthly average concentration with a 4.3 mg/L instantaneous maximum concentration for the months of May through September. This facility will not be subject to Mass Loading Limits for Ammonia-Nitrogen because it is not a Publicly Owned Treatment Works. Based on the SOP for Establishing Effluent Limitations in Sewage Permits, Ammonia-Nitrogen is subject to a seasonal multiplier of 3 times the summertime average monthly limit. This is consistent with the modeling to meet in-stream water quality criterion. A compliance schedule will not be issued for Ammonia-Nitrogen as the facility already meets this limit more than 75% of the time. The Total Suspended Solids, pH, Fecal Coliform, or Total Residual Chlorine parameters are not evaluated using WQM 7.0. The basis for the proposed technology-based limitations are listed in the above table. WQM 7.0 and TRC_CALC output files are attached to this Fact Sheet.

The limits for Ammonia-Nitrogen in the previous permit were set at 6.0 mg/l for monthly average testing requirements. Based on the facilities ability to comply at least 75% of the time no compliance schedule will be set forth in this permit. The facility has consistently reported values under 0.8 for the last 3 years with only one instance that would be in non-compliance with the new limit. This instance happened in September of 2023 and the reported values were 6.5 mg/L monthly average and 6.7 mg/L Instantaneous Maximum. Although these values are over 3 times the new limit, the average over the last 3 years is 0.613 mg/L monthly average and 0.757 mg/L IMAX concentration. This demonstrates that the higher reported values were an outlier to the data set and the facility should be able to comply with the new limits.

Modeling was also performed using TRC_CALC for TRC. Based on the input data and number of samples taken TRC_CALC recommends the same limitations set forth in the previous permit. Stream flow is based on the average yields for nearby Cool Spring near Jackson Center (USGS Station 03104600, 1944 -1957 16-point correlation with the Little Shenango River at Greenville 1915 – 1972 data) and Neshannock Creek at East Brook (USGS Station 03105000, daily correlation 1915-1972 with the Little Shenango River at Greenville 1915 – 1972 data). The average yield is 0.05582-cfs, when multiplying this by the drainage area for the Unnamed Tributary to Little Neshannock Creek of 0.6 it produces a Q7-10 flow of 0.0334. This would be an accurate representation of the stream when comparing it to data from USGS Station 03104760 (Harthegig Run near Greenfield, PA) which has a 2.2 mi^2 drainage area and 0.05 Q7-10 flow.

Best Professional Judgment (BPJ) Limitations

Comments:

A Dissolved Oxygen minimum limitation of 5.0 mg/l will be implemented based on the standard in 25 PA Code Chapter 93 for Trout Stocking Fisheries and best professional judgement.

Anti-Backsliding

N/A

Additional Considerations

Monitoring frequency for the proposed limitations are based on Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations.

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage dischargers with design flows greater than 2,000-gallons per day require monitoring, at a minimum, for Total Nitrogen and Total Phosphorous in new and reissued permits. A monitoring frequency of once per year will be acceptable. Monitoring frequency for this facility will be set at 1/quarter to get a better idea of what loading will be like in high-expectancy months. The discharge is to waters not impaired for nutrients

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) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.4	XXX	1.4	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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
Ammonia Oct 1 - Apr 30	XXX	XXX	XXX	6.3	XXX	12.9	2/month	Grab
Ammonia May 1 – Sept 30	XXX	XXX	XXX	2.1	XXX	4.3	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
Total Phosphorus	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Grab
E. Coli	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001, after disinfection.

Attachment 1
TRC_CALC - Output Files

TRC_CALC - WBMHP

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0334	= Q stream (cfs)	0.5	= CV Daily
0.0075	= Q discharge (MGD)	0.5	= CV Hourly
24	= no. samples	1	= 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)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.937	1.3.2.iii	WLA cfc = 0.906
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.349	5.1d	LTA_cfc = 0.527

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.261	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.440	AFC
		INST MAX LIMIT (mg/l) = 1.406	

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)**

Attachment 2
WQM 7.0 Modeling – Output Files

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
20A	35586	Trib 35586 of Little Neshannock Cr	1.000	1270.00	0.12	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.005	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.72	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 (°C)	Disc pH
Willow Bend MHP	PA0033901	0.0075	0.0075	0.0075	0.000	20.00	6.61

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	4.00	8.24	0.00	0.00
NH3-N	25.00	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
20A	35586	Trib 35586 of Little Neshannock Cr	**0.360**	1229.00	0.45	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.007	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.72	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 (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.72

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	4.00	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
20A	35586	Trib 35586 of Little Neshannock Cr

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 (°C)	Analysis pH
Q7-10 Flow												
1.000	0.00	0.00	0.00	.0116	0.01213	.26	1.54	5.93	0.03	1.278	20.25	6.63
Q1-10 Flow												
1.000	0.00	0.00	0.00	.0116	0.01213	NA	NA	NA	0.03	1.291	20.17	6.62
Q30-10 Flow												
1.000	0.00	0.00	0.00	.0116	0.01213	NA	NA	NA	0.03	1.265	20.34	6.64

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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	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
20A	35586	Trib 35586 of Little Neshannock Cr

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
1.000	Willow Bend MH	21.22	21.95	21.22	21.95	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
1.000	Willow Bend MH	2.04	2.19	2.04	2.19	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)		
1.00	Willow Bend MHP	25	25	2.19	2.19	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20A	35586	Trib 35586 of Little Neshannock Cr

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.000	0.007	20.254	6.631
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.539	0.260	5.928	0.031
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
23.83	1.481	2.07	0.714
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.165	25.597	Owens	5
Reach Travel Time (days)			
1.278			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.128	19.68	1.89	6.98
0.256	16.25	1.73	7.37
0.383	13.42	1.58	7.66
0.511	11.08	1.44	7.89
0.639	9.15	1.31	8.09
0.767	7.56	1.20	8.20
0.895	6.24	1.10	8.20
1.022	5.15	1.00	8.20
1.150	4.25	0.91	8.20
1.278	3.51	0.83	8.20

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20A	35586	Trib 35586 of Little Neshannock Cr

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)
1.000	Willow Bend MHP	PA0033901	0.007	CBOD5	25		
				NH3-N	2.19	4.38	
				Dissolved Oxygen			5