pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0060089**
Facility Type	**Municipal**	APS ID	**822220**
Major / Minor	**Major**	Authorization ID	**1210492**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Middle Smithfield Township**	Facility Name	**Fernwood WWTP**
Applicant Address	147 Municipal Drive	Facility Address	Leroys Lane
	East Stroudsburg, PA 18302		Bushkill, PA 18324
Applicant Contact	Joan Woisin	Facility Contact	Joan Woisin
Applicant Phone	(570) 223-8920	Facility Phone	(570) 223-8920
Client ID	44038	Site ID	240767
Ch 94 Load Status	Not Overloaded	Municipality	Middle Smithfield Township
Connection Status	No Limitations	County	Monroe
Date Application Received	December 4, 2017	EPA Waived?	No
Date Application Accepted	December 4, 2017	If No, Reason	Major Facility

Purpose of Application: Renewal of NPDES permit to discharge treated sewage.

Summary of Review

The applicant is requesting renewal of an NPDES permit to discharge 1.0 MGD of treated sewage to Bush Kill, a HQ-TSF/MF designated receiving stream in state water plan basin 01-D (Shohola – Bushkill Creeks). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use.

Data from upstream stream gage 01439500 (Bush Kill at Shoemakers, PA) was used to model the discharge, resulting in a low flow yield (LFY) of 0.0639 cfs/mi^2. The gage is approximately 1.1 miles upstream from Outfall 001. For modeling inputs, RMI values were obtained using the "PA Historic Streams" feature of eMapPA as well as the "measure" tool. Drainage areas were delineated using USGS's StreamStats Interactive Map and elevations were obtained using the elevation profile feature of StreamStats (see Watershed Information attachment). The stream hardness and pH values used in the Toxics Management Spreadsheet are carried over from the previous permit and were obtained from data collected at a Water Quality Network station established at USGS Gage #01439500 on Bush Kill at Shoemakers, PA. Recent review of data from Water Quality Network station 139 indicates that the hardness and pH assumptions are accurate.

The pH, $CBOD_5$, TSS and Fecal Coliform limits are technology-based limits carried over from the previous permit. The Ammonia-Nitrogen, Dissolved Oxygen and Total Dissolved Solids limitations are water quality-based and carried over from the previous permit. WQM modeling (attached) did not recommend more stringent limitations.

Total Copper limitations (0.023 mg/L monthly average, 0.037 mg/L daily maximum) were established in the previous permit based on the Pollutant Group sampling results submitted with the 2011 permit renewal application. A Phase I Toxics Reduction Evaluation (TRE) report was completed and received by DEP on November 20, 2014. At that time, a draft permit amendment was prepared and issued. A final permit amendment was not issued due to discrepancies with DEP's antibacksliding requirements regarding the established Total Copper concentrations. The permit amendment authorization was replaced by the renewal authorization when DEP received the permit renewal application on December 4, 2017.

Approve	Deny	Signatures	Date
X		*Brian Burden* Brian Burden, E.I.T. / Project Manager	October 22, 2021
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Environmental Engineer Manager	10-28-21

Summary of Review

The permittee's conclusions in the TRE include:

1.) "The observed influent total copper concentration to the Fernwood Treatment Plant is higher than the proposed 2016 NPDES effluent limits. This indicates that the source of copper in the MST Sewer System is the public water supply distribution system and not within the control of Middle Smithfield Township."

2.) "The total concentration of copper was observed to be higher in the public water supply distribution system than in the water supply sources. This result indicates that the corrosion of copper pipes in the public water supply system is a contributing source of copper to the Fernwood sewer system."

3.) "The observed total copper concentrations in the public water supply distribution system were higher than the total copper concentrations in the Fernwood sewer collection system. This possibly indicates dilution of copper concentrations from inflow and infiltration in the sewer collection system."

4.) "While the total copper concentrations do not change significantly through the Fernwood Treatment plant, concentrations of dissolved copper appear to increase through the plant."

5.) "Based on the site-specific data collected during this study, several inputs used in the PENTOXSD model to calculate the WQBEL for copper should be updated as follows:

a.) Complete Mix Time (CMT) at Q_{7-10} conditions set to 15 minutes based on the results of the in-stream mixing study (See Appendix B).
b.) Average effluent total copper concentration reset from 38.6 µg/L to 83.6 µg/L based on the results of effluent monitoring during this study.
c.) Average effluent hardness concentration reset from 220 mg/L to 247 mg/L based on the results of effluent monitoring during this study.
d.) The default chemical translator for dissolved to total concentrations of copper of 0.96 should be reduced to 0.602 based on the observed percentage of dissolved copper in the effluent monitoring during this study."

6.) "Based on the results of the acute WET testing for the fathead minnow and rainbow trout, the Fernwood WWTP's effluent is not acutely toxic to fish."

The permittee conducted an in-stream mixing study to determine the complete mixing time (CMT) of the discharge into Bush Kill.

The permittee's conclusions in the in-stream mixing study include:

1.) "Complete mixing was not observed to occur within the length of the study area, which extended approximately 650 feet down-stream from the outfall."

2.) "The mixing study was conducted during a period of relative low flow (near 25% percentile flow)."

3.) "The detected concentration of TDS during the time period when the Fernwood WWTP was actively discharging indicates that the effluent was approximately 50% mixed with the Bush Kill at the end of the study area of 650 feet. Given that the down-stream reach of the Bush Kill was observed to be fairly straight and calm, an approximation of the distance to complete mixing would be 1,300 feet (650 x2). Using the average travel time of 1.91 ft/s this is equal to a complete mixing time of 681 seconds or 11.4 minutes (1,300/1.91)."

4.) Results of Run 3 indicate that the effluent from the outfall is approximately 50% mixed with the Bush Kill at 510 feet downstream from the outfall. An approximation of the distance to complete mixing would then be 1,020 feet (510 x2). Using the average travel time of 1.91 ft/s this is equal to a complete mixing time of 534 seconds or 8.9 minutes (1,020/1.91)."

Based on the conclusion above, the permittee recommends "the use of 15 minutes for the criteria compliance time input for the PENTOXSD model at Q_{7-10} conditions appears to be a reasonable assumption for this reach of the Bush Kill."

Summary of Review

DEP has the following comments/suggestions regarding the TRE, in-stream mixing study, and toxics modeling inputs:

- The permittee conducted a TDS tracer field study to determine the complete mixing time of the discharge with Bush Kill. After finding the distance of an approximate 50% mix, the study then suggests multiplying the distance by 2 to determine the 100% mixing distance. As per EPA's NPDES Permit Writers' Course, when field studies are conducted to collect mixing data in the stream, the results of field studies should then be used to calibrate a water quality model, such as CORMIX, to determine the complete mixing time. The model would then be used to simulate mixing under critical conditions. Multiplying the approximate 50% mixing distance by 2 is not an approved method for determining complete mixing time.

- Results from five effluent samples were used to calculate the average discharge hardness. To recalculate the Total Copper WQBEL using this data, it's recommended to obtain at least five more effluent hardness values for a total of at least ten. The average of the larger set of data would then be used to update the model.

- The average concentration of four samples of effluent dissolved copper was compared to the average concentration of four samples of Total Copper to modify the chemical translator used for modeling. To recalculate the Total Copper WQBEL using a different chemical translator, it's recommended to obtain at least six more samples for a total of at least ten. The averages of the larger set of data would then be used to update the model.

- In response to the submitted acute WET test results: It's agreed that at the time of the tests the effluent wasn't acutely toxic to fish, but the results don't include any Total Copper concentrations. Regardless, acute/chronic WET testing results cannot be utilized to update acute/chronic limitations or monitoring requirements for toxic pollutants.

- The suggested pH input of 7.5 S.U. doesn't appear to be representative of the discharge. Review of eDMR data throughout 2021 suggests that a value closer to 7.1 S.U. would be more appropriate. Since pH is measured every day at the WWTP, the permittee should utilize the data to determine a long-term average for inclusion in the model.

If the permittee choses to conduct the additional sampling and/or mixing model calibration, the data obtained will be utilized to determine new WQBELs for Total Copper and other toxic pollutants (if needed). Upon receiving the data, DEP will recalculate the limitations and initiate an amendment to update the final permit. Since the data would be new information regarding the discharge scenario, the Total Copper limitations can be relaxed without violating DEP's antibacksliding rules.

The previously issued permit didn't include TRC limitations since the facility utilizes ultraviolet radiation for primary disinfection. An IMAX limitation of 1.4 mg/L is included in this renewal with a sampling frequency of "daily when discharging". When the permittee utilizes chlorine for backup disinfection, cleaning, or other purposes, TRC shall be analyzed and reported on their DMR. The permittee shall report operation of the ultraviolet (UV) disinfection system on a daily basis using the Daily Effluent Monitoring Form (3800-FM-BCW0435) and the parameter named "UV Functional" The permittee shall report values of "1" for Yes (i.e., the UV system is functional) and "< 1" for No (i.e., the UV system is not functional).

Weekly influent monitoring for BOD_5 and TSS is continued in this permit renewal. As per DEP guidance, 1/month E. Coli monitoring/reporting is added to the permit.

DEP's Toxics Management Spreadsheet recommends the limitations and monitoring requirements in the table below. Limitations will come into effect four years after the permit effective date. **Note:** Limitations and monitoring requirements were recommended for several parameters not detected in the effluent for the Pollutant Group sampling results provided with the application and in subsequent submittals. Those parameters are identified below and the permittee may choose to resample for them during the draft permit public notice period at the Department's target QLs found in the current application instructions document.

				Limitations (µg/L)		
Pollutants	**Max Application Concentration (µg/L)**	**Governing WQBEL (µg/L)**	**WQBEL Basis**	**Average Monthly**	**Daily Maximum**	**IMAX**
Total Antimony*	< 6*	33.1	THH	Report	Report	Report
Total Copper**	28**	35.2	AFC	35.2	54.9	88

Summary of Review

Free Cyanide	20	23.7	THH	23.7	36.9	59.2
Total Lead*	< 5*	12.2	CFC	Report	Report	Report
Total Silver*	< 6*	9.57	AFC	9.57	14.9	23.9
Total Thallium	0.8	1.42	THH	1.42	2.21	3.55
Total Zinc	38.4	301	AFC	Report	Report	Report
1,3-Dichloropropylene*	< 2*	7.91	CRL	Report	Report	Report
2,4-Dinitrophenol*	< 26.2*	59.2	THH	Report	Report	Report
Butyl Benzyl Phthalate*	< 10.5*	0.59	THH	0.59	0.92	1.48
1,3-Dichlorobenzene*	< 10.5*	41.4	THH	Report	Report	Report
3,3-Dichlorobenzidine*	< 10*	1.46	CRL	1.46	2.28	3.66
2,4-Dinitrotoluene*	< 10.5*	1.46	CRL	1.46	2.28	3.66
2,6-Dinitrotoluene*	< 10.5*	1.46	CRL	1.46	2.28	3.66
Hexachloroethane*	< 10*	2.93	CRL	2.93	4.57	7.32
1,2,4-Trichlorobenzene*	< 10.5*	0.41	THH	0.41	0.65	1.04

* Pollutant was not detected in the sampling results using the laboratory's highest QL of the three submitted sampling results. Three additional non-detect samples at the Department's target QL (or sufficiently sensitive QL) are required to remove this pollutant from the final permit.

** eDMR data used to determine max concentration.

Note: Using the pollutant group sampling data from the permit application, the governing WQBEL for Total Copper is 35.2 µg/L. The limitation is higher than the Total Copper limitations developed in previous permit renewals mainly due to the relatively high discharge hardness data. Due to antibacksliding regulations, the limitations can't be relaxed using this data alone. As described above, the permittee may choose to conduct additional sampling and/or mixing model calibration to provide "new information" to be used in the water quality models. The limitations can be adjusted if DEP receives an adequate amount of site-specific data for the parameters of concern without violating antibacksliding rules.

The Part C.III.C condition regarding Toxics Reduction Evaluations (TREs) is added to the permit and applies to each of the toxic pollutants. The permittee will have the option to accept the implementation of the limitations or to perform site-specific studies to verify or refine the WQBELs. Quarterly monitoring/reporting requirements are included in the permit for the toxic parameters without recommended limitations. Limitations for toxic pollutants will come into effect 4 years after the permit effective date and must be sampled for weekly. Monthly monitoring requirements are included for those parameters until the limitations come into effect.

To remain consistent with 40 CFR 122.47, milestones are added to Part C.III.D requiring the permittee to develop a schedule/plan for meeting the final WQBELs for all new water-quality based effluent limitations/monitoring requirements in the permit.

Note: In a letter dated June 29, 2019, DEP requested additional sampling data to be provided since several parameters were analyzed at QLs higher than the Target QLs and limitations/monitoring requirements were recommended. In an email dated August 14, 2019, the permittee's consultant indicated Suburban Laboratories can meet DEP's Target QL for all requested parameters except Total Cadmium and Hexachlorobutadiene. Two other laboratories, Pace and TestAmerica, could not meet the target QL for Total Cadmium. Pace indicated they could meet the target QL for Hexachlorobutadiene. After completing due diligence, the permittee decided to have the resampling analyses performed by Suburban Laboratories at the lowest QLs available, which was deemed acceptable by the permit reviewer. Since Total Cadmium and Hexachlorobutadiene were analyzed using the lowest available QL and the results were non-detect, monitoring requirements are not included in this permit renewal for those two parameters.

The August 14, 2019 email indicated Suburban Laboratories could meet the target QLs for Total Antimony, 3,3-Dichlorobenzidine and Hexachloroethane, but the non-detect resampling results were not analyzed at the target QLs and

Summary of Review

limits/monitoring requirements were recommended again. The permittee will have the opportunity to resample those parameters again during the draft permit public notice period (in addition to the other identified pollutants above).

Several parameters listed in Part C.V are subject to WQBELs that are necessary to comply with state water quality standards, but may be less than QLs, as defined in 25 Pa. Code § 252.1, that are generally achievable by conventional analytical technology. The permittee shall analyze the parameters using methods that will achieve the QLs listed in Part C.V. For the purpose of compliance, a statistical value reported on the DMR that is less than the QLs (i.e., "non-detect") will be considered to be in compliance.

The permittee was required to conduct annual Whole Effluent Toxicity (WET) testing in the previously issued permit. The WET tests submitted by the permittee in 2017 and 2018 passed the T-test analysis of chronic survival and reproduction data for *Ceriodaphnia dubia* and chronic survival and growth data for *Pimephales promelas*. As per JR Holtsmaster, DEP NERO Aquatic Biologist Supervisor: "The QCL test in 2013 is not valid for WET testing along with the 2015 WET tests." DEP doesn't have records of any other submitted WET tests for review.

The standard Part C condition, Whole Effluent Toxicity – No Permit Limits, is continued in this permit. WET testing shall be conducted annually during the upcoming permit cycle, at a minimum. The WET Analysis Spreadsheet (see WET Dilution Series attachement) was used to determine that the permittee must generate chronic survival and reproduction data for *Ceriodaphnia dubia*, and chronic survival and growth data for *Pimephales promelas*. The permittee shall perform testing using the following dilution series: 4%, 9%, 17%, 59%, and 100% effluent, with a control, where 17% effluent is the facility-specific Target In-Stream Waste Concentration (TIWC). TMS modeling determined the acute and chronic partial mix factors (PMFs) are 0.59 and 1.0, respectively.

An additional requirement for four quarterly WET tests during the first year of permit coverage is included in the permit because of the missing tests from 2019 – 2021. Part C.IV.B.1 is added to the permit requiring the permittee to submit quarterly WET tests for the first year of renewed permit coverage.

Monitoring requirements for Nitrate-Nitrite as N, TKN, Total Nitrogen and Total Phosphorus and UV transmittance are carried over from the previous permit.

DRBC Docket No. D-1990-080 CP-4 did not recommend additional monitoring requirements or limitations for the Fernwood WWTP.

The permit renewal application indicates there are no industrial users discharging to the WWTP, no CSOs in the collection system and no stormwater outfalls. Antibacksliding requirements have been met since no limitations were made less stringent.

Two years of eDMR results revealed the following concentration exceedance:

- August 2020: Fecal Coliform – 1,500 CFU/100mL IMAX (limitation was 1,000 CFU/100mL)

Sludge use and disposal description and location(s): The August 2021 DMR supplemental report for sludge/biosolids indicates 11.886 dry tons of dewatered sludge was disposed of at Grand Central Sanitary Landfill via Waste Management.

There are no projected hydraulic/organic overloads at the WWTP. There are no open WPC NPDES violations for the client that would warrant withholding the issuance of the final permit. EPA waiver is not in effect.


Toxics Management Spreadsheet.pdf


TRC Calculation.pdf


Watershed Information.pdf


WET Dilution Series.pdf


WQM Modeling.pdf


WQBEL Survey.pdf

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*,

Summary of Review
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.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.0
Latitude	41º 5' 2"	Longitude	-75º 1' 23"
Quad Name	Bushkill	Quad Code	1045
Wastewater Description:	Sewage effluent.		

Receiving Waters	Bush Kill	Stream Code	5054
NHD Com ID	26138806	RMI	2.4
Drainage Area	119 mi^2	Yield (cfs/mi^2)	0.0639
Q_{7-10} Flow (cfs)	7.6	Q_{7-10} Basis	Gage 01439500
Elevation (ft)	385	Slope (ft/ft)	0.005
Watershed No.	1-D	Chapter 93 Class.	HQ-TSF/MF
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)	-	-
Temperature (°F)	-	-
Hardness (mg/L)	-	-
Other:	-	-

Nearest Downstream Public Water Supply Intake	Easton Area Water System		
PWS Waters	Delaware River	Flow at Intake (cfs)	1105
PWS RMI	109.8	Distance from Outfall (mi)	~44

Treatment Facility Summary

Treatment Facility Name: Middle Smithfield Township WWTP

WQM Permit No.	Issuance Date
4590413	4/10/1991

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Ultraviolet Light	0.338 (2020)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.0	1,668	Not Overloaded	Filter Press	Hauled

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.0
Latitude 41º 5' 2" **Longitude** -75º 1' 23"
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
$CBOD_5$	25.0	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40.0	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
	50.0	IMAX	-	-
Total Suspended Solids	30.0	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45.0	Average Weekly	133.102(b)(2)	92a.47(a)(2)
	60.0	IMAX	-	-
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)
	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)
	10,000 / 100 ml	IMAX	-	92a.47(a)(5)

Water Quality-Based Limitations

The following limitations were determined through water quality modeling:

Parameter	Limit (mg/l)	SBC	Model / Basis
Total Residual Chlorine	1.4	IMAX	2021 TRC Calculation Spreadsheet
Ammonia-Nitrogen (5/1 – 10/31)	3.0	Average Monthly	Previous Modeling
	6.0	IMAX	
Ammonia-Nitrogen (11/1 – 4/30)	9.0	Average Monthly	
	18.0	IMAX	
Dissolved Oxygen	6.0	Minimum	Previous Modeling
Total Dissolved Solids	1,000	Average Quarterly	DRBC Docket D-1990-080 CP-3
Total Copper	0.023	Average Monthly	2013 PENTOX modeling
	0.037	Daily Maximum	
	0.059	IMAX	
Free Cyanide	0.023	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.036	Daily Maximum	
	0.059	IMAX	
Total Silver	0.0095	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0149	Daily Maximum	
	0.0239	IMAX	
Total Thallium	0.0014	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0022	Daily Maximum	
	0.0035	IMAX	
Butyl Benzyl Phthalate	0.0005	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0009	Daily Maximum	
	0.0014	IMAX	
3,3-Dichlorobenzidine	0.0014	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0022	Daily Maximum	
	0.0036	IMAX	

2,4-Dinitrotoluene	0.0014	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0022	Daily Maximum	
	0.0036	IMAX	
2,6-Dinitrotoluene	0.0014	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0022	Daily Maximum	
	0.0036	IMAX	
Hexachloroethane	0.0029	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0045	Daily Maximum	
	0.0073	IMAX	
1,2,4-Trichlorobenzene	0.0004	Average Monthly	2021 Toxics Management Spreadsheet v.1.3
	0.0006	Daily Maximum	
	0.0010	IMAX	

Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

☐ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: **Annually throughout the permit term.**

The dilution series used for the tests was: 100%, 59%, 17%, 9%, and 4%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 17%.

Summary of Most Recent Valid Test Results

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
November 2017	Pass	Pass	Pass	Pass
November 2018	Pass	Pass	Pass	Pass

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☐ **YES** ☒ **NO**

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.59** Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(1.0 MGD x 1.547) / ((7.6 cfs x 0.59) + (1.0 MGD x 1.547))] x 100 = **25.65%**

Is IWCa < 1%? ☐ **YES** ☒ **NO (YES - Acute Tests Required OR NO - Chronic Tests Required)**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

N/A

Type of Test for Permit Renewal: **Chronic**

2b. Determine Target IWCc (If Chronic Tests Required)

$(Q_d \times 1.547) / (Q_{7\text{-}10} \times PMFc) + (Q_d \times 1.547)$

[(1.0 MGD x 1.547) / ((7.6 cfs x 1.0) + (1.0 MGD x 1.547))] x 100 = **17%**

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 59%, 17%, 9%, and 4%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

N/A