pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0046868**
Facility Type	**Municipal**	APS ID	**1069193**
Major / Minor	**Minor**	Authorization ID	**1406174**

Applicant and Facility Information

Applicant Name	**Lower Moreland Township Municipal Authority**	Facility Name	**Lower Moreland Chapel Hill STP**
Applicant Address	640 Red Lion Road	Facility Address	3865 Heaton Road
	Huntingdon Valley, PA 19006		Huntingdon Valley, PA 19006
Applicant Contact	Christopher Hoffman	Facility Contact	Frank Kolanko
Applicant Phone	(215) 947-3100	Facility Phone	(215) 947-3100
Client ID	52545	Site ID	457812
Ch 94 Load Status	Not Overloaded	Municipality	Lower Moreland Township
Connection Status	Self Imposed Connection Prohibition	County	Montgomery
Date Application Received	August 1, 2022	EPA Waived?	Yes
Date Application Accepted		If No, Reason	
Purpose of Application	NPDES permit renewal.		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from CKS Engineers (consultant) on behalf of Lower Moreland Township Municipal Authority (permittee/authority) on August 1, 2022 for permittee's Chapel Hill STP (facility). The facility is in Lower Moreland Township, Montgomery County. The treated effluent is discharged through Outfall 001 into an UNT to Southampton Creek in State Watershed 3-J, classified as TSF/MF. The facility is a minor sewage facility (MISF2). The current permit will expire on January 31, 2023. The terms and conditions of the permit will be automatically extended since the renewal application was received at least 180 days prior to the expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this renewal: Total copper limits more stringent, total lead, total zinc, and e-coli monitoring added.

Sludge use and disposal description and location(s): Liquid biosolids are stored in sludge holding tank and hauled off to Hatboro Incinerator for final disposal.

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
√		Reza H. Chowdhury, E.I.T. / Project Manager	September 7, 2022
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	09/07/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.279
Latitude	40º 9' 39.4"	Longitude	-75º 3' 40.05"
Quad Name	Hatboro	Quad Code	1745
Wastewater Description:	Sewage Effluent		
Receiving Waters	UNT to Southampton Creek (TSF, MF)	Stream Code	02453
NHD Com ID	25599695	RMI	0.4900
Drainage Area	0.63 mi^2	Yield (cfs/mi^2)	0.25
Q_{7-10} Flow (cfs)	0.158	Q_{7-10} Basis	Please see below
Elevation (ft)	190.2	Slope (ft/ft)	
Watershed No.	3-J	Chapter 93 Class.	TSF, MF
Existing Use	**TSF/MF**	Existing Use Qualifier	Ch. 93
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	DEWATERING, FLOW REGIME MODIFICATION, HABITAT ALTERATIONS, NUTRIENTS, ORGANIC ENRICHMENT, PATHOGENS		
Source(s) of Impairment	MUNICIPAL POINT SOURCE DISCHARGES, MUNICIPAL POINT SOURCE DISCHARGES, MUNICIPAL POINT SOURCE DISCHARGES, RURAL (RESIDENTIAL AREAS), RURAL (RESIDENTIAL AREAS), RURAL (RESIDENTIAL AREAS)		
TMDL Status	Final	Name	Southampton Creek

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°C)	20	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake	None before PA-DE-NJ border.		
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on August 26, 2022) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The drainage area was found to be 0.63 mi^2. Data from the nearby StreamGage 01467042 was also considered. This gage is located on Pennypack Creek at Pine Road in Philadelphia, PA. Q_{7-10}, Q_{1-10}, and Q_{30-10} values at this gage are 9.3 cfs, 8.6 cfs, and 11.3 cfs respectively for the reporting years of 1965-1981. The drainage area at this gage was found to be 37.9 mi^2. These values were obtained from the latest USGS streamflow report (1).

Q_{7-10} runoff rate = 9.3 cfs/37.9 mi^2 = 0.25 cfs/mi^2
Q_{7-10} = 0.25 cfs/mi^2 * 0.63 mi^2 = 0.158 cfs
Q_{1-10}/Q_{7-10} = 8.6 cfs/9.3 cfs = 0.92
Q_{30-10}/Q_{7-10} = 11.3 cfs/9.3 cfs = 1.22

(1) Stuckey, M.H., Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2011-1070, PP 10, PP 22.

Wastewater Characteristics:
A median pH of 6.9 and hardness of 160 mg/l from eDMR during dry months July through September for the years 2021-2022, and default discharge temperature of 20^0C will be used for modeling, if needed.

Background data:
There is no nearby WQN station from the discharge point. A default pH of 7.0, default stream temperature of 20°C, and default hardness of 100 mg/l will be used, if needed.

Southampton Creek Watershed TMDL:
On June 30, 2008, the United States Environmental Protection Agency (USEPA) Region III established nutrient and sediments Total Maximum Daily Load (TMDLs) for the Southampton Creek Watershed, Pennsylvania. The TMDL requires the discharge from Lower Moreland Township Authority's Chapel Hill WWTP to meet final waste load allocation (WLA) of 0.18 lbs./day or 0.079 mg/l (seasonal from May 1 thru Sept 30). For the remaining time-period, the effluent limit includes a seasonal multiplier of 2.0. No sediment reductions for Chapel Hill WWTP are required under the Southampton Creek TMDL. The previous permits offered a 10-year compliance schedule to meet the final total phosphorus limit required by the TMDL. The final action item on the schedule ended in December 31, 2020. The previous permit had a tiered approach for Total Phosphorus with final limit effective from January 1, 2021. The permit will be renewed with final limit from effective date of the permit as a continuation from last permit.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Trout Stocking (TSF). No High-Quality stream is impacted by this discharge. No Exceptional-Value stream is impacted by this discharge.

Class A Wild Trout Fisheries:
No Class A Wild Trout Fisheries are impacted by this discharge.

Biosolids Management: Liquid biosolids are stored in sludge holding tank and hauled off to Hatboro Incinerator for final disposal.

Treatment Facility Summary

Treatment Facility Name: Chapel Hill WWTP

WQM Permit No.	Issuance Date
4600409 A-1	01/23/2018
4600409	4/7/2000

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Activated Sludge With Solids Removal	Ultraviolet	0.279

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.279	653	Not Overloaded	Holding Tank	Other WWTP

Changes Since Last Permit Issuance: None

Treatment Plant Description

Lower Moreland Township Authority owns and operates a WWTP named Chapel Hill Wastewater Treatment Plant, located in Lower Moreland Township, Montgomery County. The WWTP treats up to 279,000 GPD and treated effluent discharges into an UNT to Southampton Creek (TSF/MF). The actual discharge for the years 2021, 2020, and 2019 is 0.191 MGD, 0.176 MGD, and 0.208 MGD, respectively. This WWTP is an activated sludge with solids removal process that includes 1 influent PS and comminutor, one aerated surge tank, two aeration tanks, two final clarifiers, two disk filters, one UV disinfection system, sludge holding tank, chemical addition system, and outfall structure to discharge through

Outfall 001. The major contributor to the STP is Lower Moreland Township (98%) with a little (2%) flow from Supper Southampton Township. 100% of the flow is separated from stormwater. The permit application indicated there is no industrial contributor but several small commercial contributors to this WWTP.

Existing limits

For Outfall 001:

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	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5	23	35	XXX	10	15	20	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	23	35	XXX	10	15	20	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) (*)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
UV Intensity ($\mu w/cm^2$)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
NH3-N Nov 1 - Apr 30	7.0	XXX	XXX	3.0	XXX	6	1/week	24-Hr Composite
NH3-N May 1 - Oct 31	3.5	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Total Phosphorus Nov 1 - Apr 30	0.36	XXX	XXX	0.16	XXX	0.32	1/week	24-Hr Composite
Total Phosphorus May 1 - Oct 31	0.18	XXX	XXX	0.08	XXX	0.16	1/week	24-Hr Composite
Copper, Total	XXX	XXX	XXX	0.023	0.035 Daily Max	0.046	1/week	24-Hr Composite
Hardness, Total (as CaCO3)	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

Compliance History

DMR Data for Outfall 001 (from July 1, 2021 to June 30, 2022)

Parameter	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21
Flow (MGD) Average Monthly	0.1499	0.172	0.1735	0.148	0.173	0.167	0.151	0.1682	0.1638	0.1658	0.1614	0.155
Flow (MGD) Daily Maximum	0.1791	0.228	0.2778	0.1714	0.246	0.197	0.171	0.2091	0.2089	0.2795	0.2107	0.194
pH (S.U.) Instantaneous Minimum	6.6	6.6	6.7	6.8	6.6	6.7	6.8	6.7	6.8	6.7	6.7	6.8
pH (S.U.) IMAX	7.1	7.0	7.4	7.4	7.3	7.4	7.4	7.3	7.7	7.1	7.3	7.4
DO (mg/L) Instantaneous Minimum	7.2	7.5	6.8	8.8	9.0	6.7	8.9	7.7	6.9	6.2	6.5	7.3
CBOD5 (lbs/day) Average Monthly	6.0	3.0	3.0	2.0	6.0	3.0	4.0	4.0	3.7	4.3	4.8	7.0
CBOD5 (lbs/day) Weekly Average	7.0	4.0	4.0	2.0	14.0	4.0	5.0	5.0	4.6	6.5	6.8	9.4
CBOD5 (mg/L) Average Monthly	4.1	2.5	2.0	2.0	4.0	2.0	4.0	3.0	2.7	3.2	3.5	5.4
CBOD5 (mg/L) Weekly Average	4.8	3.4	2.0	4.0	10.0	2.0	5.0	4.0	3.3	4.8	5.3	6.5
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	166	159	206	122	236	183	162	227	139	144	163	145
BOD5 (mg/L) Raw Sewage Influent Average Monthly	117	150	144	100	170	130	124	158	116	110	222	114
TSS (lbs/day) Average Monthly	3.0	2.4	3.0	2.0	2.0	2.0	4.0	3.0	4.0	15.0	3.0	3.2
TSS (lbs/day) Raw Sewage Influent Average Monthly	173	194	287	138	240	137	184	146	162	199	164	185
TSS (lbs/day) Weekly Average	4.0	3.0	4.0	5.0	3.0	3.0	5.0	5.0	4.0	51.8	4.5	4.3
TSS (mg/L) Average Monthly	1.9	1.9	2.0	2.0	2.0	1.0	3.0	2.0	3.0	11.1	2.2	2.6
TSS (mg/L) Raw Sewage Influent Average Monthly	123	122	180	114	173	96	140	103	116	149	119	147
TSS (mg/L) Weekly Average	2.6	2.2	2.0	4.0	2.0	2.0	4.0	4.0	5.0	38.0	3.5	3.5

Fecal Coliform (No./100 ml) Geometric Mean	1	1	1	2.0	1	2	2	3	6	6	4	3
Fecal Coliform (No./100 ml) IMAX	1	1	2	4.0	1	10	10	10	12	26	7	10
UV Intensity (µw/cm²) Instantaneous Minimum	5.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Nitrogen (lbs/day) Average Monthly	37	33	36	36.0	42	43	43	43	43	24	32	51
Total Nitrogen (mg/L) Average Monthly	26	26	24	29.0	30	30	33	30	31	17.4	24.7	39
Ammonia (lbs./day) Average Monthly	0.08	0.1	0.08	0.2	0.6	0.1	0.1	0.1	0.1	1.4	0.1	0.1
Ammonia (mg/L) Average Monthly	0.055	0.083	0.1	0.1	0.5	0.1	0.1	0.1	0.1	1.012	0.093	0.1
Total Phosphorus (lbs./day) Average Monthly	0.09	0.08	0.100	0.200	0.070	0.07	0.20	0.600	0.30	0.30	0.30	0.30
Total Phosphorus (mg/L) Average Monthly	0.064	0.065	0.0848	0.1334	0.0535	0.051	0.11	0.385	0.230	0.20	0.26	0.20
Total Copper (mg/L) Average Monthly	0.008	0.0100	0.0100	0.0100	0.010	0.010	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200
Total Copper (mg/L) Daily Maximum	0.008	0.011	0.0130	0.0160	0.010	0.012	0.0200	0.0170	0.0200	0.0200	0.0200	0.0200
Total Hardness (mg/L) Average Monthly	213	150	143	164	147	165	185	170	180	145	160	203

Compliance History

Effluent Violations for Outfall 001, from: August 1, 2021 To: June 30, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	09/30/21	Wkly Avg	51.8	lbs/day	35	lbs/day
TSS	09/30/21	Avg Mo	11.1	mg/L	10	mg/L
TSS	09/30/21	Wkly Avg	38.0	mg/L	15	mg/L
Total Phosphorus	11/30/21	Avg Mo	0.600	lbs/day	.36	lbs/day
Total Phosphorus	08/31/21	Avg Mo	0.30	lbs/day	.18	lbs/day

Total Phosphorus	10/31/21	Avg Mo	0.30	lbs/day	.18	lbs/day
Total Phosphorus	09/30/21	Avg Mo	0.30	lbs/day	.18	lbs/day
Total Phosphorus	09/30/21	Avg Mo	0.20	mg/L	.08	mg/L
Total Phosphorus	08/31/21	Avg Mo	0.26	mg/L	.08	mg/L
Total Phosphorus	11/30/21	Avg Mo	0.385	mg/L	.16	mg/L
Total Phosphorus	10/31/21	Avg Mo	0.230	mg/L	.08	mg/L

Summary of Inspections:
January 12, 2022: CEI conducted. No violation noted. The effluent limits violations related to total Phosphorus in the year 2021 was likely due to ACH PAC feed pump not operating properly. The pump was replaced along with new electronics to provide a more consistent chemical feed. After the pump was replaced, the effluent phosphorus concentration was reduced significantly and in compliance with winter effluent limits. The effluent being discharged was very clear.

July 21, 2021: CEI conducted. No violation noted. Many upgrades were made including 0.1-micron membrane filters and associated polymer coagulation, mixing, and floc tanks added; surge tank diffusers replaced, and tank was painted; VFD was added; new DO diffusers were added to the aeration tank etc.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.279
Latitude 40º 9' 39.4" **Longitude** -75º 3' 40.05"
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	200 / 100 ml	Geo Mean	-	DEBC, 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)	1,000 / 100 ml	IMAX, 10% rule	-	DRBC
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

WQM 7.0:

WQM 7.0 is a water quality model designed to assist DEP to determine appropriate permit requirements for $CBOD_5$, NH_3-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. The model was utilized for this permit renewal by using updated Q_{7-10} and historic background water quality levels of the receiving stream. The following data were used in the attached computer model of the stream:

- Discharge pH 6.9 (median Jul-Sep, 2021-2022, eDMR data)
- Discharge Temperature 20°C (Default per 391-2000-007)
- Discharge Hardness 160 mg/l (median Jul-Sep, 2021-2022, eDMR data)
- Stream pH 7.0 (Default per 391-2000-013)
- Stream Temperature 20°C (Default per 391-2000-013, TSF/CWF)
- Stream Hardness 100 mg/l (Default)

The following nodes were considered in modeling:

Node 1: At Outfall 001 on UNT To Southampton Creek (02453)
Elevation: 190.20 ft (USGS National Map viewer, 08/26/2022)
Drainage Area: 0.63 mi^2 (StreamStat Version 3.0, 06/24/2022)
River Mile Index: 0.49 (PA DEP eMapPA)
Low Flow Yield: 0.25 cfs/mi^2
Discharge Flow: 0.279 MGD

Node 2: At confluence with Southampton Creek
Elevation: 174.15 ft (USGS National Map viewer, 08/26/2022)
Drainage Area: 0.79 mi^2 (StreamStat Version 3.0, 08/26/2022)
River Mile Index: 0.0 (PA DEP eMapPA)
Low Flow Yield: 0.25 cfs/mi^2
Discharge Flow: 0.0 MGD

NH_3-N:

WQM 7.0 suggested NH_3-N limit of 1.5 mg/l as monthly average and 3.0 mg/l as IMAX limit during summer to protect water quality standards. These are the same as existing limits and will be carried over. The winter limits are calculated by multiplying the summer limit with a factor of 2. The mass loads are calculated at a flow of 0.279 MGD.

$CBOD_5$:

The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 10 mg/l. this is the same as existing limit and will be carried over. The IMAX limit is calculated by multiplying the average monthly value with a factor of 2. The mass loads are calculated at a flow of 0.279 MGD.

Dissolved Oxygen (DO):

The existing permit has a minimum DO of 6.0 mg/l Per Pa Code 25 Ch.93.7 which is also supported by WMS output and will be carried over.

Toxics:

Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as “non-detect”, but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is “non-detect” at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.052	0.08	22.3	34.6	34.6	µg/L	22.3	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	6.91	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	163	AFC	Discharge Conc > 10% WQBEL (no RP)

Total Copper: The current permit has an average monthly, daily maximum, and IMAX Total Copper limit of 23 ug/l, 35 ug/l, and 46 ug/l respectively. The modeling suggests 22.3 ug/l as AML, 34.6 ug/l as MDL and IMAX, which are a little more

stringent than current permit. More stringent limits will be imposed. Since existing limits and proposed new limits are very close and the permittee is meeting the current limits, no schedule is needed. Please note that per a study performed by the permittee in 2006, a chemical translator of 0.7479 was used in TMS.

Total Lead: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect quarterly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Total Zinc: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect quarterly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Total Hardness: Since Total Copper is a hardness-based pollutant, an effluent Total Hardness reporting requirement was included in the last permit which will be carried over.

Additional Considerations

Fecal Coliform:
The seasonal effluent limitations for fecal coliform are based on Chapter 92a (§ 92a.47(4) & (5)) of DEP's regulations and Delaware River Basin Commission's (DRBC's) Water Quality Regulations at § 4.30.4.A. DEP's regulations govern the summer limits for fecal coliform while the winter limits are based on DRBC's regulations. The DRBC regulations state that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. These are the same as existing permit limits and will be carried over.

E. Coli:
DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring for all dischargers with flow between ≥0.05 MGD to <1.0 MGD, in support of Pa Code 25 §92a.61. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The current permit has AML, Weekly Average, and IMAX concentration-based limits of 10 mg/l, 15 mg/l, and 20 mg/l, respectively which will be carried over. The mass-based AML and weekly average limits are calculated for a flow of 0.279 MGD, which will also be carried over.

UV Disinfection:
PADEP's SOP BCW-PMT-033 recommends UV parameter monitoring where UV is used as a method of disinfection, with the same frequency as would be if Chlorine is used for disinfection. The existing permit has a daily UV intensity reporting requirement in $\mu W/cm^2$ which will be carried over.

Flow, Influent BOD5, and Influent TSS Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). To meet the Ch. 94 requirements, influent BOD5 and TSS monitoring will be continued.

Best Professional Judgement (BPJ):
Total Nitrogen:
PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing requirement and will be carried over.

Total Phosphorus:
As stated in page 3 of this report, the facility was allocated a WLA in Southampton Creek Watershed TMDL. The summer limits are 0.08 mg/l as AML and 0.16 mg/l as IMAX (corresponding AML mass limit is 0.18 lbs./day). The winter limits are 0.16 mg/l as AML and 0.32 mg/l as IMAX (corresponding AML mass limit is 0.36 lbs./day). As stated in page 7 of this report, the permittee was having difficulties in meeting TP limits, however, after replacing the chemical feed pump the facility is now in compliance with the limits.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Anti-Backsliding
The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

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	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5	23	35	XXX	10	15	20	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	23	35	XXX	10	15	20	1/week	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (µw/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	7.0	XXX	XXX	3.0	XXX	6	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	3.5	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Total Phosphorus Nov 1 - Apr 30	0.36	XXX	XXX	0.16	XXX	0.32	1/week	24-Hr Composite

Outfall 001, Continued (from 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	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus May 1 - Oct 31	0.18	XXX	XXX	0.08	XXX	0.16	1/week	24-Hr Composite
Total Copper	XXX	XXX	XXX	0.0223	0.0346 Daily Max	0.0346	1/week	24-Hr Composite
Total Lead	XXX	XXX	XXX	Report	Report	XXX	1/quarter	24-Hr Composite
Total Zinc	XXX	XXX	XXX	Report	Report	XXX	1/quarter	24-Hr Composite
Total Hardness	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

Compliance Sampling Location: At Outfall 001

Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: BCW-PMT-033
☐	Other:

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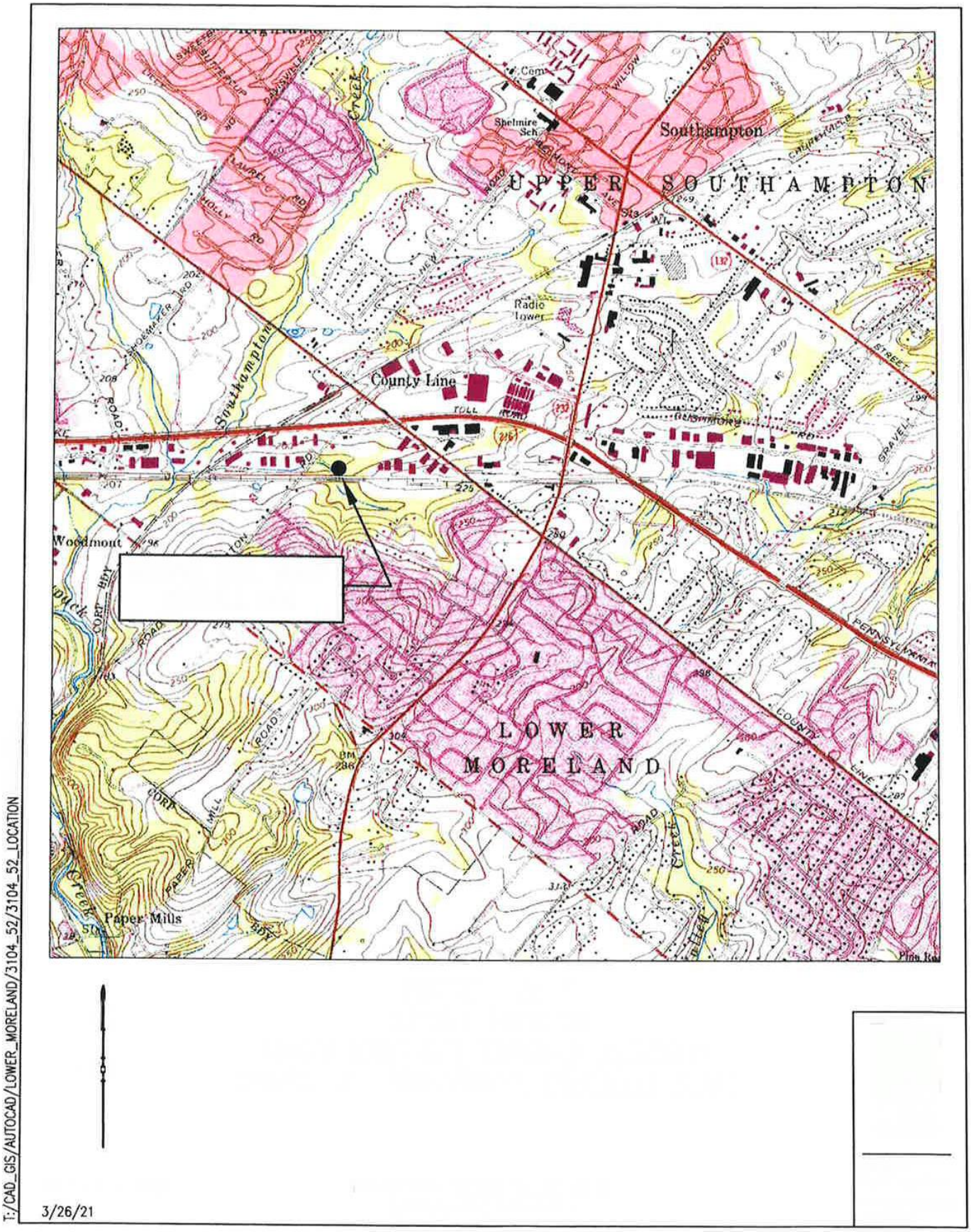
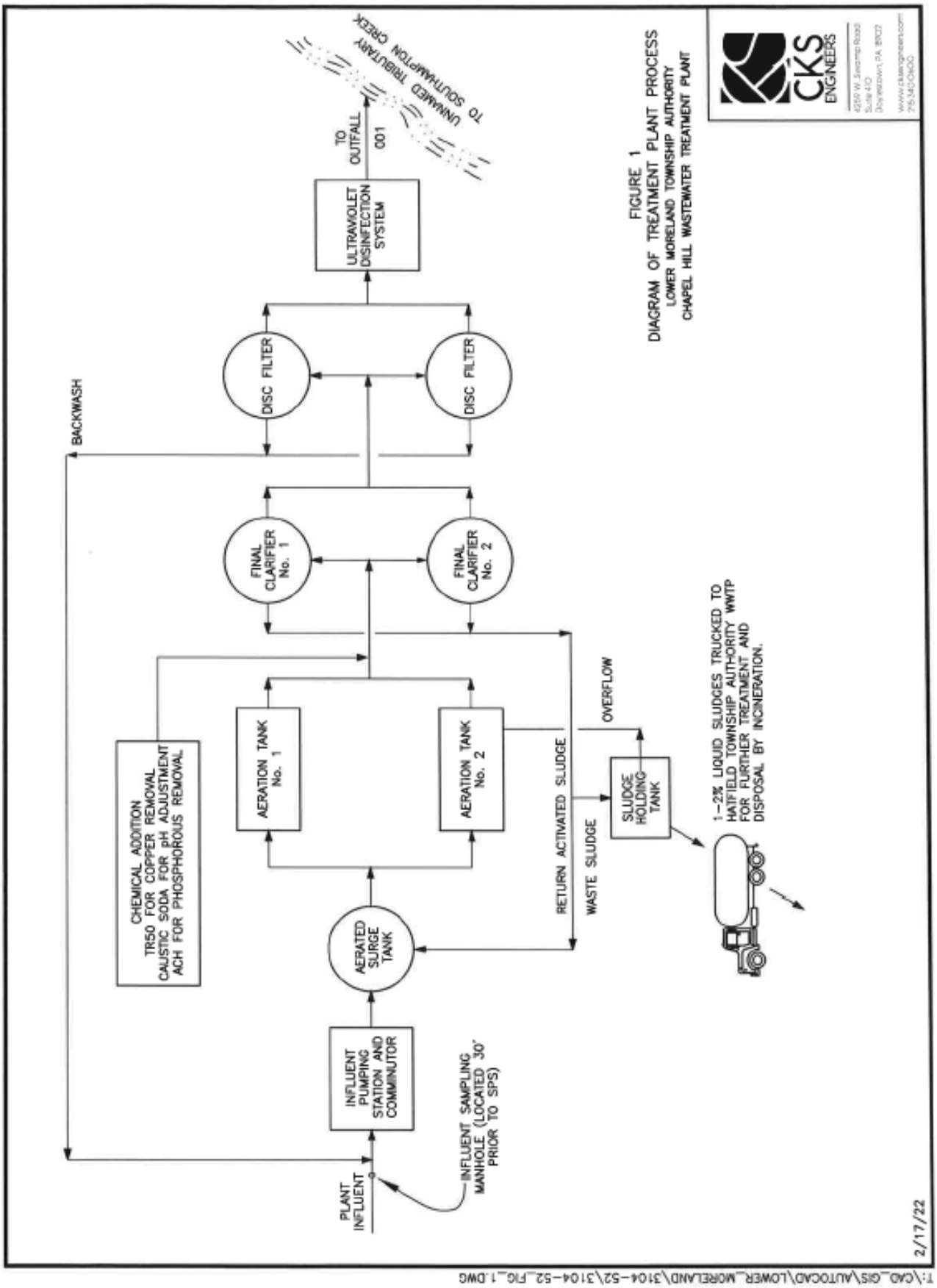


Permit No. PA0046868



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PA0046868 at Outfall 001

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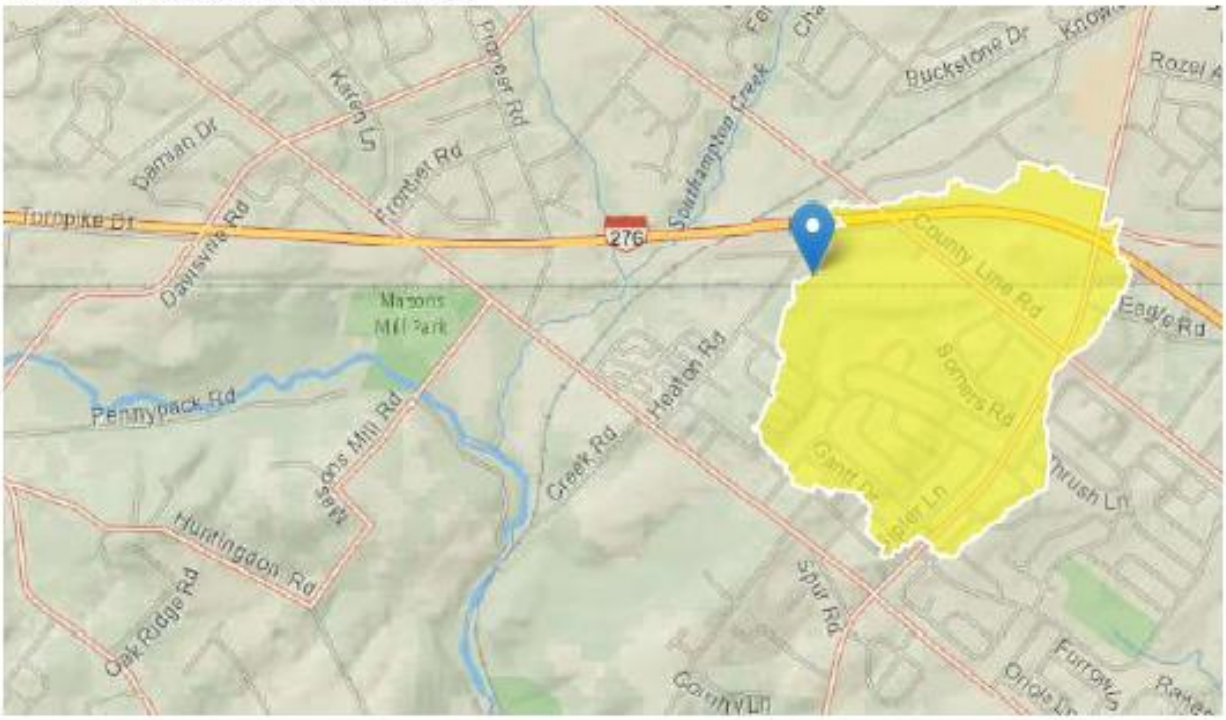
Time: 2022-08-26 10:04:32 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.7606	degrees
DRNAREA	Area that drains to a point on a stream	0.63	square miles
ROCKDEP	Depth to rock	4.7	feet
URBAN	Percentage of basin with urban development	94.3582	percent

Low-Flow Statistics

Permit No. PA0046868

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.63	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.7606	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.7	feet	4.13	5.21
URBAN	Percent Urban	94.3582	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.228	ft^3/s
30 Day 2 Year Low Flow	0.338	ft^3/s
7 Day 10 Year Low Flow	0.108	ft^3/s
30 Day 10 Year Low Flow	0.165	ft^3/s
90 Day 10 Year Low Flow	0.317	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

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PA0046868 at node 2

Region ID: PA
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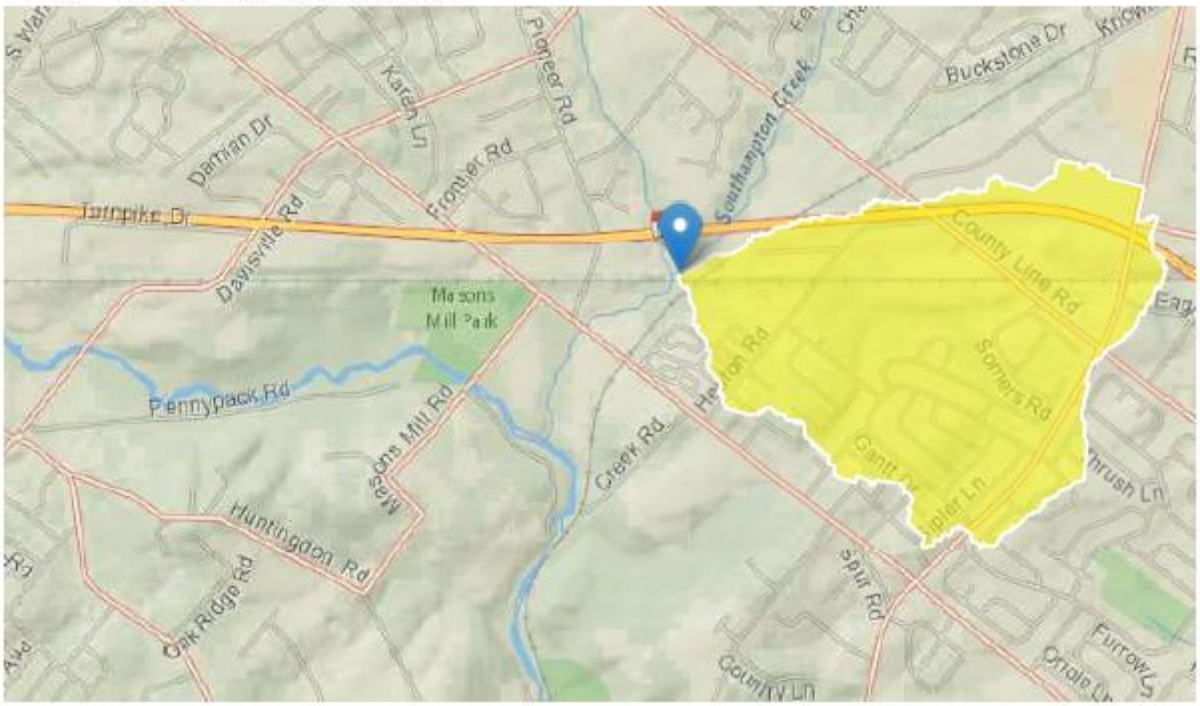

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.8066	degrees
DRNAREA	Area that drains to a point on a stream	0.79	square miles
ROCKDEP	Depth to rock	4.7	feet
URBAN	Percentage of basin with urban development	87.775	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.79	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.8066	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.7	feet	4.13	5.21
URBAN	Percent Urban	87.775	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.273	ft^3/s
30 Day 2 Year Low Flow	0.403	ft^3/s
7 Day 10 Year Low Flow	0.129	ft^3/s
30 Day 10 Year Low Flow	0.196	ft^3/s
90 Day 10 Year Low Flow	0.375	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Chapel Hill STP** NPDES Permit No.: **PA0046868** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated Wastewater**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.279	160	6.9						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		494									
	Chloride (PWS)	mg/L		122									
	Bromide	mg/L											
	Sulfate (PWS)	mg/L		46									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		18									0.7479
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		1.3									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		34									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

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	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Chapel Hill STP, NPDES Permit No. PA0046868, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: _____ No. Reaches to Model: 1

- (•) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	002453	0.49	190.2	0.63			Yes
End of Reach 1	002453	0	174.15	0.79			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.49	0.25										100	7		
End of Reach 1	0	0.25													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.49														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Chapel Hill STP, NPDES Permit No. PA0046868, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | All | Inputs | Results | Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.188 PMF: 1 Analysis Hardness (mg/l): 143.96 Analysis pH: 6.92

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	18.944	25.3	34.6	Chem Translator of 0.748 applied
Total Lead	0	0		0	95.801	130	177	Chem Translator of 0.738 applied
Total Zinc	0	0		0	159.562	163	223	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.188 PMF: 1 Analysis Hardness (mg/l): 143.96 Analysis pH: 6.92

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	12.227	16.3	22.3	Chem Translator of 0.748 applied
Total Lead	0	0		0	3.733	5.06	6.91	Chem Translator of 0.738 applied
Total Zinc	0	0		0	160.868	163	223	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 0.188 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	

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Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ *CRL* CCT (min): 0.724 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.052	0.08	22.3	34.6	34.6	µg/L	22.3	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	6.91	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	163	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Sulfate (PWS)	N/A	N/A	PWS Not Applicable

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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
03J	2453	Trib 02453 to Southampton Creek	0.490	190.20	0.63	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	0.250	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
Chapel Hill STP	PA0046868	0.2790	0.2790	0.2790	0.000	20.00	6.90

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	10.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	8.24	0.00	0.00
NH3-N	1.50	0.00	0.00	0.70

Permit No. PA0046868

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
03J	2453	Trib 02453 to Southampton Creek	0.000	174.15	0.79	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	0.250	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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	7.00

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

Permit No. PA0046868

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03J	2453	Trib 02453 to Southampton 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 (°C)	Analysis pH
Q7-10 Flow												
0.490	0.16	0.00	0.16	.4316	0.00620	.476	7.03	14.79	0.18	0.170	20.00	6.92
Q1-10 Flow												
0.490	0.14	0.00	0.14	.4316	0.00620	NA	NA	NA	0.17	0.172	20.00	6.92
Q30-10 Flow												
0.490	0.19	0.00	0.19	.4316	0.00620	NA	NA	NA	0.18	0.165	20.00	6.93

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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	0.92	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.22	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

Permit No. PA0046868

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03J	2453	Trib 02453 to Southampton 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
0.490	Chapel Hill STP	10.16	3	10.16	3	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
0.490	Chapel Hill STP	2	1.5	2	1.5	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)		
0.49	Chapel Hill STP	10	10	1.5	1.5	6	6	0	0

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03J	2453	Trib 02453 to Southampton Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.490	0.279	20.000	6.925
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
7.034	0.476	14.788	0.176
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.86	1.385	1.10	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.600	26.791	Owens	6
Reach Travel Time (days)			
0.170			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.017	7.68	1.09	7.27
0.034	7.50	1.07	7.70
0.051	7.32	1.06	7.98
0.068	7.15	1.05	8.16
0.085	6.99	1.04	8.24
0.102	6.83	1.02	8.24
0.119	6.67	1.01	8.24
0.136	6.51	1.00	8.24
0.153	6.36	0.99	8.24
0.170	6.21	0.98	8.24

Permit No. PA0046868

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03J	2453	Trib 02453 to Southampton 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)
0.490	Chapel Hill STP	PA0046868	0.279	CBOD5	10		
				NH3-N	1.5	3	
				Dissolved Oxygen			6