pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Northwest Regional Office**
**CLEAN WATER PROGRAM**

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0222674** |
| Facility Type | **Municipal** | APS ID | **1086260** |
| Major / Minor | **Minor** | Authorization ID | **1435746** |

# NPDES PERMIT FACT SHEET
# INDIVIDUAL SEWAGE

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **McKean Township Sewer Authority** | Facility Name | **McKean Township Sewer Authority STP** |
| Applicant Address | 9231 Edinboro Road, PO Box 88<br>Mc Kean, PA 16426-1845 | Facility Address | Near Intersection of SR 832 and West Road<br>Mckean, PA 16426 |
| Applicant Contact | Janice Dennis (secretary@mckeantownship.com) | Facility Contact | Janice Dennis (secretary@mckeantownship.com) |
| Applicant Phone | (814) 476-7414 | Facility Phone | (814) 476-7414 |
| Client ID | 118541 | Site ID | 492215 |
| Ch 94 Load Status | Not Overloaded | Municipality | McKean Township |
| Connection Status | No Limitations | County | Erie |
| Date Application Received | March 30, 2023 | EPA Waived? | Yes |
| Date Application Accepted | April 14, 2023 | If No, Reason | - |
| Purpose of Application | Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater from a municipal sewer system. | | |

## Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The Permittee should be able to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts for Client ID (118541) as of 1/18/2024.

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Stephen A. McCauley<br>Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist | 1/18/2024 |
| X | | <br>Vacant / Environmental Engineer Manager | Okay to Draft<br>JCD 1/22/2024 |

**Discharge, Receiving Waters and Water Supply Information**

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 0.25 |
| Latitude | 42º 00' 10.00" | Longitude | -80º 12' 16.00" |
| Quad Name | - | Quad Code | - |
| Wastewater Description: | Sewage Effluent | | |
| Receiving Waters | Elk Creek (WWF, MF) | Stream Code | 62491 |
| NHD Com ID | 123926245 | RMI | 17.85 |
| Drainage Area | 35.7 | Yield (cfs/mi$^2$) | 0.067 |
| $Q_{7-10}$ Flow (cfs) | 2.39 | $Q_{7-10}$ Basis | calculated |
| Elevation (ft) | 871 | Slope (ft/ft) | 0.005417 |
| Watershed No. | 15-A | Chapter 93 Class. | WWF, 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 | Pennsylvania - Canada International border | | |
| PWS Waters | Lake Erie | Flow at Intake (cfs) | - |
| PWS RMI | - | Distance from Outfall (mi) | 40.0 |

Sludge use and disposal description and location(s): All sludge is hauled to the Chautauqua Landfill.

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.25 MGD of treated sewage from an existing Publicly Owned Treatment Works (POTW) in McKean Township, Erie County.

Treatment permitted under WQM Permit 2599409 consists of the following: A bar screen, grit removal, skimming / separators, dual oxidation ditches, alum addition for Phosphorus control, dual clarifiers, dual aerobic digesters, a belt press, liquid hypochloride disinfection with a contact tank, and post aeration.

**1. Streamflow:**

Brandy Run near Girard, PA Streamgage No. 4213075 (1988-2008)

| | | | |
|---|---|---|---|
| Drainage Area: | 4.45 | sq. mi. | (USGS StreamStats) |
| $Q_{7-10}$: | 0.3 | cfs | (USGS StreamStats) |
| Yieldrate: | 0.067 | cfsm | (Calculated) |

Elk Creek at Outfall 001:

| | | | |
|---|---|---|---|
| Drainage Area: | 35.7 | sq. mi. | (USGS StreamStats) |
| Yieldrate: | 0.067 | cfsm | (Calculated above) |
| % of stream allocated: | 100% | Basis: | No nearby discharges |
| $Q_{7-10}$: | 2.39 | cfs | (Calculated) |

**2. Wasteflow:**

Maximum discharge: 0.25 MGD = 0.38 cfs

Runoff flow period: 24 hours Basis: Runoff flow for municipal STPs

The calculated stream flow (Q7-10) is greater than 3 times the permitted discharge flow. In accordance with the SOP, since this is an existing discharge, the treatment requirements in document number 391-2000-014, titled, "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", dated April 12, 2008, were not evaluated for this facility.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

**3. Parameters:**

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, E. Coli, Total Phosphorus, Total Nitrogen, $NH_3$-N, $CBOD_5$, Dissolved Oxygen, and Disinfection.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits.

c. Fecal Coliform

| | | |
|---|---|---|
| 05/01 - 09/30: | 200/100ml | (monthly average geometric mean) |
| | 1,000/100ml | (instantaneous maximum) |
| 10/01 - 04/30: | 2,000/100ml | (monthly average geometric mean) |
| | 10,000/100ml | (instantaneous maximum) |

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/quarter.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows greater than 0.05 MGD and less than 1 MGD.

e. Phosphorus

The Phosphorus limit of 1.0 mg/l for Lake Erie based on the 1969 International Joint Committee (IJC) agreement will be retained.

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61.

g. Ammonia-Nitrogen ($NH_3$-N)

| | | |
|---|---|---|
| Median discharge pH to be used: | 7.9 | Standard Units (S.U.) |
| | | Basis: eDMR data from previous 12 months |
| Discharge temperature: | 25°C | (default value used in the absence of data) |
| Median stream pH to be used: | 7.0 | Standard Units (S.U.) |
| | | Basis: default value used in the absence of data |
| Stream Temperature: | 20˚C | (default value used for CWF modeling) |
| Background $NH_3$-N concentration: | 0.0 | mg/l |
| | | Basis: Default value |
| Calculated $NH_3$-N Summer limits: | 11.4 | mg/l (monthly average) |
| | 22.8 | mg/l (instantaneous maximum) |
| Calculated $NH_3$-N Winter limits: | 25.0 | mg/l (monthly average) |
| | 50.0 | mg/l (instantaneous maximum) |

Result: WQ modeling resulted in the summer NH3-N limits above (see Attachment 1). The winter limits are calculated as three times the summer limits, but since the technology-based limits would govern, they will be used. The calculated limits are less restrictive than in the previous permit. Based on eDMR data, the more restrictive limits are attainable so they will be retained with this renewal.

h. $CBOD_5$

Median discharge pH to be used: 7.9 Standard Units (S.U.)

Basis: eDMR data from previous 12 months

Discharge temperature: 25°C (default value used in the absence of data)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: default value used in the absence of data

Stream Temperature: 20˚C (default value used for CWF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

Calculated $CBOD_5$ limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated CBOD5 limits above (see Attachment 1). The calculated limits are less restrictive than in the previous permit. Based on eDMR data, the more restrictive limits are attainable so they will be retained with this renewal. Per the SOP, the previous winter limits were removed and the previous summer limits were set year round.

i. Influent Total Suspended Solids and $BOD_5$

Monitoring for these two parameters will be retained as recommended in the SOP for POTWs, as authorized under Chapter 92a.61.

j. Dissolved Oxygen (DO)

The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. This limit is the same as the previous permit and will be retained.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

k. Disinfection

☐ Ultraviolet (UV) light monitoring

☒ Total Residual Chlorine (TRC) limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The technology-based TRC limits above were calculated using the Department's TRC Calc Spreadsheet (see Attachment 2). The limits are less restrictive than the previous NPDES Permit. Based on the eDMR data, the current limits are attainable, so they will be retained with this renewal.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

**4. Industrial/Commercial users:**

| Business Name | Business Type | Average Flow (gpd) |
|---|---|---|
| Presque Isle Passage | Seasonal Campground | 2995 |
| Burger King | Restaurant | 0 |
| Howard Industries | Commercial | 592 |
| Schneider | Commercial | 41 |
| Urraro Oil Company | Gas Station | 277 |
| Exit 18 Shell | Gas Station | 0 |
| West Haven Holding Company | Seasonal Campground | 3195 |
| Hanisek | Commercial | 66 |
| Marp LTD, LLC Quality Inn | Hotel | 1315 |
| Hammel Green, LLC | Restaurant | 22 |
| Elk Creek Partnership | Restaurant | 49 |
| Highway Equipment | Commercial | 55 |
| KMB Leasing Co. | Industrial | 101 |
| Crystal Lakes Development | Industrial | 66 |
| McKean Realty Holding | Industrial | 5 |
| Peter's Heat Treat | Industrial | 197 |
| McKean Heavy Duty Trucks | Industrial | 38 |
| KOA Campground | Seasonal Campground | 658 |
| Beachwood Golf Course | Golf Course | 279 |
| FedEx | Industrial | 589 |
| Birkmire Trucking Company | Industrial | 233 |
| Plyer Entry Systems | Industrial | 66 |

**5. Reasonable Potential Analysis for Receiving Stream:**

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

**6. Reasonable Potential for Downstream Public Water Supply (PWS):**

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate).

Nearest Downstream potable water supply (PWS): Pennsylvania - Canada International border

Distance downstream from the point of discharge: 40.0 miles (approximate)

Result: No limits or monitoring are necessary as significant dilution is available.

**7. Flow Information:**

This facility receives 100% of flow from the McKean Township. All the sewers are separate sewers.

**8. Anti-Backsliding:**

Since all the permit limits in this renewal are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

**9. Attachment List:**

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

(The Attachments above can be found at the end of this document)

## Compliance History

**DMR Data for Outfall 001 (from December 1, 2022 to November 30, 2023)**

| Parameter | NOV-23 | OCT-23 | SEP-23 | AUG-23 | JUL-23 | JUN-23 | MAY-23 | APR-23 | MAR-23 | FEB-23 | JAN-23 | DEC-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.1289 | 0.094 | 0.088 | 0.152 | 0.161 | 0.131 | 0.166 | 0.184 | 0.245 | 0.197 | 0.271 | 0.178 |
| Flow (MGD) Daily Maximum | 0.174 | 0.135 | 0.121 | 0.246 | 0.226 | 0.204 | 0.422 | 0.380 | 0.410 | 0.321 | 0.429 | 0.389 |
| pH (S.U.) Instantaneous Minimum | 7.8 | 7.9 | 8.0 | 7.8 | 7.9 | 7.5 | 7.6 | 7.7 | 7.7 | 7.6 | 7.6 | 7.8 |
| pH (S.U.) Instantaneous Maximum | 8.3 | 8.3 | 8.3 | 8.3 | 8.2 | 8.1 | 8.2 | 8.2 | 8.1 | 8.1 | 8.1 | 8.1 |
| DO (mg/L) Instantaneous Minimum | 8.76 | 8.9 | 8.76 | 9.03 | 9.14 | 8.32 | 8.20 | 8.96 | 8.9 | 8.89 | 9.05 | 8.89 |
| TRC (mg/L) Average Monthly | 0.15 | 0.17 | 0.02 | 0.02 | 0.02 | 0.02 | 0.20 | 0.21 | 0.17 | 0.16 | 0.17 | 0.15 |
| TRC (mg/L) Instantaneous Maximum | 0.27 | 0.28 | 0.02 | 0.02 | 0.02 | 0.02 | 0.25 | 0.32 | 0.30 | 0.24 | 0.30 | 0.25 |
| CBOD5 (lbs/day) Average Monthly | 2.47 | 1.88 | 2.27 | 5.45 | 3.08 | 8.74 | 3.18 | 3.38 | 5.72 | 4.60 | 4.75 | 9.35 |
| CBOD5 (lbs/day) Weekly Average | 2.58 | 2.24 | 3.97 | 13.69 | 3.57 | 18.03 | 4.06 | 3.68 | 8.62 | 7.02 | 5.42 | 24.49 |
| CBOD5 (mg/L) Average Monthly | 2.3 | 2.4 | 3.1 | 4.30 | 2.3 | 8 | 2.3 | 2.2 | 2.80 | 2.8 | 2.1 | 6.3 |
| CBOD5 (mg/L) Weekly Average | 2.40 | 2.86 | 5.41 | 10.80 | 2.66 | 16.50 | 2.93 | 2.4 | 4.22 | 4.27 | 2.40 | 16.50 |
| BOD5 (lbs/day) Raw Sewage Influent Average Monthly | 127 | 123 | 118 | 129 | 138 | 176 | 141 | 98 | 218 | 280 | 217 | 266 |
| BOD5 (lbs/day) Raw Sewage Influent Daily Maximum | 160 | 203 | 187 | 204 | 224 | 271 | 220 | 156 | 400 | 757 | 467 | 620 |
| BOD5 (mg/L) Raw Sewage Influent Average Monthly | 118 | 156 | 174 | 108 | 107 | 158 | 116 | 72 | 117 | 169 | 91 | 184 |
| TSS (lbs/day) Average Monthly | 8.27 | 3.52 | 3.59 | 5.16 | 7.11 | 10.27 | 7.48 | 11.97 | 22.88 | 14.46 | 16.0 | 10.99 |
| TSS (lbs/day) Raw Sewage Influent Average Monthly | 159 | 251 | 170 | 115 | 461 | 139 | 194 | 260 | 315 | 616 | 313 | 588 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSS (lbs/day)<br>Raw Sewage Influent Daily<br>Maximum | 243 | 481 | 308 | 242 | 1059 | 196 | 525 | 641 | 754 | 1751 | 687 | 1377 |
| TSS (lbs/day)<br>Weekly Average | 16.12 | 4.70 | 4.40 | 9.82 | 11.41 | 17.64 | 13.15 | 16.88 | 44.95 | 21.36 | 20 | 22.27 |
| TSS (mg/L)<br>Average Monthly | 7.7 | 4.5 | 4.9 | 4.1 | 5.3 | 9.4 | 5.4 | 7.8 | 11.2 | 8.8 | 6.9 | 7.4 |
| TSS (mg/L)<br>Raw Sewage Influent<br>Average Monthly | 142 | 497 | 253 | 91 | 383 | 122 | 166 | 165 | 170 | 370 | 128 | 403 |
| TSS (mg/L)<br>Weekly Average | 15 | 6.0 | 6.0 | 7.5 | 8.5 | 16.15 | 9.5 | 11 | 22 | 13 | 9 | 15 |
| Fecal Coliform (No./100 ml)<br>Geometric Mean | 104.1 | 18.9 | 21.4 | 6.2 | 3.8 | 5.3 | 59 | 69.5 | 30.2 | 97.1 | 42.8 | 169.1 |
| Fecal Coliform (No./100 ml)<br>Instantaneous Maximum | 2419.6 | 145 | 365.4 | 35 | 9.8 | 20.3 | 2419.5 | 2420 | 1046.2 | 1986.3 | 2419.6 | 2416 |
| Total Nitrogen (mg/L)<br>Average Monthly | 8.25 | 11.34 | 12.04 | 11.41 | 3.622 | 4.79 | 8.28 | 9.83 | 8.80 | 12.64 | 11.65 | 11.93 |
| Ammonia (lbs/day)<br>Average Monthly | 0.10 | 0.23 | 0.44 | 0.12 | 0.40 | 3.39 | 1.80 | 0.31 | < 0.20 | < 0.17 | 0.23 | < 0.15 |
| Ammonia (mg/L)<br>Average Monthly | 0.1 | 0.3 | 0.60 | 0.1 | 0.30 | 3.1 | 1.3 | 0.2 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Total Phosphorus (mg/L)<br>Average Monthly | 0.40 | 0.35 | 0.69 | 0.49 | 0.21 | 0.47 | 0.41 | 0.17 | 0.19 | 0.24 | 0.17 | 0.27 |

## 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" (386-0400-001), 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 | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | Continuous | Measured |
| pH (S.U.) | XXX | XXX | 6.0 Daily Min | XXX | 9.0 Daily Max | XXX | 1/day | Grab |
| DO | XXX | XXX | 4.0 Daily Min | XXX | XXX | XXX | 1/day | Grab |
| TRC | XXX | XXX | XXX | 0.25 | XXX | 0.83 | 1/day | Grab |
| CBOD5 | 31.0 | 47.0 | XXX | 15.0 | 22.5 | 30 | 1/week | 24-Hr Composite |
| BOD5 Raw Sewage Influent | Report | Report Daily Max | XXX | Report | Report Daily Max | XXX | 1/week | 24-Hr Composite |
| TSS | 62.5 | 94.0 | XXX | 30.0 | 45.0 | 60 | 1/week | 24-Hr Composite |
| TSS Raw Sewage Influent | Report | Report Daily Max | XXX | Report | Report Daily Max | XXX | 1/week | 24-Hr Composite |
| Fecal Coliform (No./100 ml) Oct 1 - Apr 30 | XXX | XXX | XXX | 2000 Geo Mean | XXX | 10000 | 1/week | Grab |
| Fecal Coliform (No./100 ml) May 1 - Sep 30 | 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 |
| Total Nitrogen | XXX | XXX | XXX | Report | XXX | XXX | 1/week | 24-Hr Composite |
| Ammonia Nov 1 - Apr 30 | 18.7 | XXX | XXX | 9.0 | XXX | 18 | 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 | Minimum | Average Monthly | Weekly Average | Instant. Maximum | | |
| Ammonia<br>May 1 - Oct 31 | 6.2 | XXX | XXX | 3.0 | XXX | 6 | 1/week | 24-Hr Composite |
| Total Phosphorus | XXX | XXX | XXX | 1.0 | XXX | 2 | 1/week | 24-Hr Composite |

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are water quality-based on Chapter 92a.47. The limits for Total Suspended Solids and Fecal Coliforms are technology-based on Chapter 92a.47. Monitoring for influent BOD5 and influent Total Suspended Solids is based on Chapter 92a.61. Monitoring for E. Coli is based on Chapter 92a.61. The limits for CBOD5 and Ammonia-Nitrogen are water quality-based on Chapter 93.7. The limits for Total Phosphorus are technology-based on the IJC agreement for discharges in the Lake Erie Basin. Monitoring for Total Nitrogen is based on Chapter 92a.61.

Attachment 1

# WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 15 | 62491 | ELK 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) |
|---|---|---|---|---|---|---|---|
| 21.870 | Middleboro STP | PA0046418 | 0.100 | CBOD5 | 25 | | |
| | | | | NH3-N | 15.42 | 30.84 | |
| | | | | Dissolved Oxygen | | | 4 |

| 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) |
|---|---|---|---|---|---|---|---|
| 17.850 | McKean Twp | PA0222674 | 0.250 | CBOD5 | 25 | | |
| | | | | NH3-N | 11.46 | 22.92 | |
| | | | | Dissolved Oxygen | | | 4 |

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 15 | 62491 | ELK CREEK |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 21.870 | 0.100 | 25.000 | 7.010 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 18.939 | 0.553 | 34.267 | 0.134 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 4.53 | 0.356 | 1.69 | 1.029 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 7.151 | 7.795 | Tsivoglou | 5 |
| **Reach Travel Time (days)** | | | |
| 1.827 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.183 | 4.17 | 1.40 | 7.11 |
| 0.365 | 3.85 | 1.16 | 7.24 |
| 0.548 | 3.54 | 0.96 | 7.39 |
| 0.731 | 3.27 | 0.80 | 7.52 |
| 0.913 | 3.01 | 0.66 | 7.54 |
| 1.096 | 2.77 | 0.55 | 7.54 |
| 1.279 | 2.56 | 0.45 | 7.54 |
| 1.461 | 2.36 | 0.38 | 7.54 |
| 1.644 | 2.17 | 0.31 | 7.54 |
| 1.827 | 2.00 | 0.26 | 7.54 |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 17.850 | 0.350 | 25.000 | 7.061 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 27.145 | 0.627 | 43.268 | 0.166 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 5.14 | 0.509 | 1.69 | 1.029 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 7.056 | 5.550 | Tsivoglou | 5 |
| **Reach Travel Time (days)** | | | |
| 1.473 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.147 | 4.68 | 1.45 | 6.59 |
| 0.295 | 4.25 | 1.25 | 6.53 |
| 0.442 | 3.87 | 1.07 | 6.63 |
| 0.589 | 3.52 | 0.92 | 6.78 |
| 0.736 | 3.21 | 0.79 | 6.95 |
| 0.884 | 2.92 | 0.68 | 7.11 |
| 1.031 | 2.65 | 0.59 | 7.25 |
| 1.178 | 2.42 | 0.50 | 7.38 |
| 1.325 | 2.20 | 0.43 | 7.50 |
| 1.473 | 2.00 | 0.37 | 7.54 |

## 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 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 15 | 62491 | ELK CREEK | **21.870** | 986.00 | 18.70 | 0.00000 | 0.00 | ☑ |

**Stream Data**

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.067 | 0.00 | 0.00 | 0.000 | 0.000 | 0.0 | 0.00 | 0.00 | 25.00 | 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 |
|---|---|---|---|---|---|---|---|
| Middleboro STP | PA0046418 | 0.1000 | 0.0000 | 0.0000 | 0.000 | 25.00 | 7.10 |

**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 | 7.54 | 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 |
|---|---|---|---|---|---|---|---|---|
| 15 | 62491 | ELK CREEK | **17.850** | 871.00 | 34.22 | 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** | 0.067 | 0.00 | 0.00 | 0.000 | 0.000 | 0.0 | 0.00 | 0.00 | 25.00 | 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 |
|---|---|---|---|---|---|---|---|
| McKean Twp | PA0222674 | 0.2500 | 0.0000 | 0.0000 | 0.000 | 25.00 | 7.90 |

### 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 | 7.54 | 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 |
|---|---|---|---|---|---|---|---|---|
| 15 | 62491 | ELK CREEK | **13.840** | 805.00 | 42.05 | 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** | 0.067 | 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 |

# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 15 | 62491 | ELK 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** | | | | | | | | | | | | |
| 21.870 | 1.25 | 0.00 | 1.25 | .1547 | 0.00542 | .553 | 18.94 | 34.27 | 0.13 | 1.827 | 25.00 | 7.01 |
| 17.850 | 2.29 | 0.00 | 2.29 | .5415 | 0.00312 | .627 | 27.15 | 43.27 | 0.17 | 1.473 | 25.00 | 7.06 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 21.870 | 0.80 | 0.00 | 0.80 | .1547 | 0.00542 | NA | NA | NA | 0.11 | 2.268 | 25.00 | 7.01 |
| 17.850 | 1.47 | 0.00 | 1.47 | .5415 | 0.00312 | NA | NA | NA | 0.14 | 1.786 | 25.00 | 7.09 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 21.870 | 1.70 | 0.00 | 1.70 | .1547 | 0.00542 | NA | NA | NA | 0.16 | 1.563 | 25.00 | 7.01 |
| 17.850 | 3.12 | 0.00 | 3.12 | .5415 | 0.00312 | NA | NA | NA | 0.19 | 1.276 | 25.00 | 7.05 |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 15 | 62491 | ELK 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 |
|---|---|---|---|---|---|---|---|
| 21.870 | Middleboro STP | 10.93 | 50 | 10.93 | 50 | 0 | 0 |
| 17.850 | McKean Twp | 10.21 | 48.94 | 10.2 | 48.94 | 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 |
|---|---|---|---|---|---|---|---|
| 21.870 | Middleboro STP | 1.36 | 16.38 | 1.36 | 15.42 | 2 | 6 |
| 17.850 | McKean Twp | 1.34 | 12.17 | 1.34 | 11.46 | 2 | 6 |

## 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) | | |
| 21.87 | Middleboro STP | 25 | 25 | 15.42 | 15.42 | 4 | 4 | 0 | 0 |
| 17.85 | McKean Twp | 25 | 25 | 11.46 | 11.46 | 4 | 4 | 0 | 0 |

Attachment 2

## TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

| | | | |
|---|---|---|---|
| 2.39 | = Q stream (cfs) | 0.5 | = CV Daily |
| 0.25 | = Q discharge (MGD) | 0.5 | = CV Hourly |
| 30 | = 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) | 0 | =Decay Coefficient (K) |

| Source | Reference | AFC Calculations | Reference | CFC Calculations |
|---|---|---|---|---|
| TRC | 1.3.2.iii | WLA afc = 1.990 | 1.3.2.iii | WLA cfc = 1.933 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | 5.1c | LTAMULT cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= 0.742 | 5.1d | LTA_cfc = 1.124 |

| Source | | Effluent Limit Calculations | |
|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = 1.231 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.500 | BAT/BPJ |
| | | INST MAX LIMIT (mg/l) = 1.635 | |

| | |
|---|---|
| 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)** |