pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

# NPDES PERMIT FACT SHEET
# INDIVIDUAL SEWAGE

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0101702** |
| Facility Type | **Non-Municipal** | APS ID | **1023881** |
| Major / Minor | **Minor** | Authorization ID | **1328131** |

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Rocky Ridge Village LLC** | Facility Name | **Rocky Ridge Village MHP** |
| Applicant Address | 156 Maple Grove Circle | Facility Address | Washington Boulevard |
| | Franklin, PA 16323-3662 | | Franklin, PA 16323 |
| Applicant Contact | Ryan Williams | Facility Contact | Ryan Williams |
| Applicant Phone | (814) 516-5900 | Facility Phone | (814) 516-5900 |
| Client ID | 307509 | Site ID | 239527 |
| Ch 94 Load Status | Not Overloaded | Municipality | Sandycreek Township |
| Connection Status | | County | Venango |
| Date Application Received | September 1, 2020 | EPA Waived? | Yes |
| Date Application Accepted | September 30, 2020 | If No, Reason | |
| Purpose of Application | Renewal of an NPDES Permit for an existing discharge of treated sewage. | | |

## Summary of Review

The permittee is currently registered for and is using the eDMR system for reporting.

No changes to the permit were proposed by the permittee as part of this renewal.

There is currently one open violation for this permittee in EFACTS (11/01/2021), for a plant operator not being fully certified, and for failure to maintain calibration reports per the NOV dated 02/13/2020 and mailed to the permittee.

The existing facility predates the watershed designation as Exceptional Value (EV), and as the plant's treatment discharge quantity and treatment process remains unchanged. Therefore, anti-degradation requirements are satisfied by continuing to model the discharge as being to a WWF.

Sludge use and disposal description and location(s): Hauled offsite.

Due to ongoing compliance issues, daily monitoring for pH, TRC, and DO is proposed in the draft permit. The previous permit relaxed the monitoring for these parameters to 4/week.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Jordan A. Frey, E.I.T.<br>Jordan A. Frey, E.I.T. / Civil Engineer Trainee | November 1, 2021 |
| X | | Justin C. Dickey<br>Justin C. Dickey, P.E. / Environmental Engineer Manager | November 2, 2021 |

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

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | .015 |
| Latitude | 41º 20' 5.97" | Longitude | -79º 51' 5.59" |
| Quad Name | Kenderell | Quad Code | 41079C7 |
| Wastewater Description: | Effluent | | |
| Receiving Waters | Unnamed Tributary to Ditzenberger Run (EV - existing use) | Stream Code | 51324 |
| NHD Com ID | 100478185 | RMI | 0.4 |
| Drainage Area | 0.0361 | Yield (cfs/mi$^2$) | 0.001 |
| $Q_{7-10}$ Flow (cfs) | 0 dry stream / 0.06 perennial reach | $Q_{7-10}$ Basis | Previous model |
| Elevation (ft) | 1360 | Slope (ft/ft) | 0.18227 |
| Watershed No. | 16-G | Chapter 93 Class. | WWF |
| Existing Use | EV (EXCEPTIONAL VALUE) | Existing Use Qualifier | RBP - Antidegradation |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Attaining Use(s) | | |
| Cause(s) of Impairment | | | |
| Source(s) of Impairment | | | |
| TMDL Status | | Name | |

| Background/Ambient Data | | Data Source |
|---|---|---|
| pH (SU) | 7.0 | Default |
| Temperature (°F) | 20 | Default |
| Hardness (mg/L) | 100 | Default |
| Other: NH3-N | 0.1 | Default |

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | | Aqua Pennsylvania, Inc. - Emlenton | |
| PWS Waters | Allegheny River | Flow at Intake (cfs) | 1376 |
| PWS RMI | 90.0 | Distance from Outfall (mi) | 24.3 |

Changes Since Last Permit Issuance: None.

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

**Treatment Facility Summary**

**Treatment Facility Name:** Rocky Ridge Village MHP

| WQM Permit No. | Issuance Date |
|---|---|
| 6176401 T-2 | 12/19/2013 |

| Waste Type | Degree of Treatment | Process Type | Disinfection | Avg Annual Flow (MGD) |
|---|---|---|---|---|
| Sewage | Tertiary | Extended Aeration With Solids Removal | No Disinfection | 0.0125 |

| Hydraulic Capacity (MGD) | Organic Capacity (lbs/day) | Load Status | Biosolids Treatment | Biosolids Use/Disposal |
|---|---|---|---|---|
| 0.0125 | 30.3 | Not Overloaded | | |

Changes Since Last Permit Issuance: The existing facility predates the watershed designation as Exceptional Value (EV), and as the plant's treatment process remains unchanged, current anti-degradation limits associated with an EV discharge are not applied as the limits associated with a WWF discharge should be protective.

Other Comments: None.

## Compliance History

**DMR Data for Outfall 001 (from October 1, 2020 to September 30, 2021)**

| Parameter | SEP-21 | AUG-21 | JUL-21 | JUN-21 | MAY-21 | APR-21 | MAR-21 | FEB-21 | JAN-21 | DEC-20 | NOV-20 | OCT-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.00667 | 0.00654 | 0.0065 | 0.0068 | 0.006475 | 0.006575 | 0.00638 | 0.0078 | 0.007775 | 0.00804 | 0.00727 | 0.00825 |
| Flow (MGD) Daily Maximum | 0.0063 | 0.0075 | 0.0072 | 0.0079 | 0.0073 | 0.0069 | 0.0069 | 0.0085 | 0.0071 | 0.0085 | 0.0079 | 0.0099 |
| pH (S.U.) Minimum | 6.8 | 6.8 | 6.7 | 6.6 | 6.6 | 6.7 | 6.5 | 6.7 | 6.8 | 6.7 | 6.7 | 6.5 |
| pH (S.U.) Maximum | 7.2 | 7.4 | 7.4 | 7.1 | 7.1 | 7.1 | 7.2 | 7.2 | 7.4 | 7.3 | 7.3 | 7.2 |
| DO (mg/L) Minimum | 7.0 | 6.9 | 7.0 | 6.8 | 7.0 | 6.9 | 6.8 | 7.0 | 7.0 | 7.0 | 7.0 | 6.8 |
| TRC (mg/L) Average Monthly | 0.245 | 0.187 | 0.2105 | 0.205 | 0.212 | 0.194 | 0.175 | 0.20 | 0.208 | 0.215 | 0.225 | 0.22 |
| TRC (mg/L) Instantaneous Maximum | 0.37 | 0.29 | 0.37 | 0.31 | 0.31 | 0.29 | 0.24 | 0.26 | 0.32 | 0.31 | 0.36 | 0.31 |
| CBOD5 (mg/L) Average Monthly | 3.1 | 3 | 3 | 9.3 | 3.35 | 7.15 | 5.8 | 6.55 | 3 | 3.3 | 12.35 | 3.7 |
| TSS (mg/L) Average Monthly | 3 | 3.5 | 6 | 3 | 5.5 | 11 | 6 | 8.5 | 3 | 6 | 3 | 3.5 |
| Fecal Coliform (CFU/100 ml) Geometric Mean | 1 | 49.19 | 1 | 1 | 1 | 1 | 49.19 | 1 | 1 | 1 | 1.414 | 20.27 |
| Fecal Coliform (CFU/100 ml) Instantaneous Maximum | 1 | 2420 | 1 | 1 | 1 | 1 | 2420 | 1 | 1 | 1 | 2 | 411 |
| Total Nitrogen (mg/L) Annual Average | | | | | | | | | | 9.39 | | |
| Ammonia (mg/L) Average Monthly | 3.955 | 6.925 | 0.395 | 5.875 | 12.6 | 6.1 | 7.58 | 6.2 | 3.42 | 4.53 | 5.23 | 5.915 |
| Total Phosphorus (mg/L) Annual Average | | | | | | | | | | 1.23 | | |

## Compliance History

**Effluent Violations for Outfall 001, from: November 1, 2020 To: September 30, 2021**

| Parameter | Date | SBC | DMR Value | Units | Limit Value | Units |
|---|---|---|---|---|---|---|
| Fecal Coliform | 08/31/21 | IMAX | 2420 | CFU/100 ml | 1000 | CFU/100 ml |
| Ammonia | 05/31/21 | Avg Mo | 12.6 | mg/L | 6.5 | mg/L |
| Ammonia | 08/31/21 | Avg Mo | 6.925 | mg/L | 6.5 | mg/L |

Summary of Inspections: There is currently one open violation for this permittee in EFACTS (11/01/2021), for a plant operator not being fully certified, and for failure to maintain calibration reports per the NOV dated 02/13/2020 and mailed to the permittee.

Other Comments: None.

## Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** .015
**Latitude** 41º 20' 6.00" **Longitude** -79º 51' 6.00"
**Wastewater Description:** Effluent

### Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

| Pollutant | Limit (mg/l) | SBC | Federal Regulation | State Regulation |
|---|---|---|---|---|
| $CBOD_5$ | 25 | Average Monthly | 133.102(a)(4)(i) | 92a.47(a)(1) |
| | 40 | Average Weekly | 133.102(a)(4)(ii) | 92a.47(a)(2) |
| Total Suspended Solids | 30 | Average Monthly | 133.102(b)(1) | 92a.47(a)(1) |
| | 45 | Average Weekly | 133.102(b)(2) | 92a.47(a)(2) |
| pH | 6.0 – 9.0 S.U. | Min – Max | 133.102(c) | 95.2(1) |
| Fecal Coliform (5/1 – 9/30) | 200 / 100 ml | Geo Mean | - | 92a.47(a)(4) |
| Fecal Coliform (5/1 – 9/30) | 1,000 / 100 ml | IMAX | - | 92a.47(a)(4) |
| Fecal Coliform (10/1 – 4/30) | 2,000 / 100 ml | Geo Mean | - | 92a.47(a)(5) |
| Fecal Coliform (10/1 – 4/30) | 10,000 / 100 ml | IMAX | - | 92a.47(a)(5) |
| Total Residual Chlorine | 0.5 | Average Monthly | - | 92a.48(b)(2) |

Comments: None.

### Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached):

| Parameter | Limit (mg/l) | SBC | Model |
|---|---|---|---|
| Ammonia Nitrogen | 6.5 | Average Monthly | WQM 7.1b |

Comments: New modeling indicated a limit of 8.7 mg/l as an average monthly is protective; however the existing limit will remain due to anti-backsliding provisions. Seasonal multiplier of 3 was used for the wintertime limit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

The calculated WQBEL for TRC at the start of the perennial reach is 0.463 mg/L. Given that the discharge is on a dry stream reach approximately 0.4-miles from the perennial stream, TRC levels are expected to be well below the 0.463 mg/L if the discharge effluent limitation is set at the technology-based limitation of 0.5 mg/L.

### Best Professional Judgment (BPJ) Limitations

Comments: A dissolved oxygen limit of a minimum of 4.0 mg/l and monitoring for total nitrogen and total phosphorus are placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

### Anti-Backsliding

The TRC IMAX limit of 1.2 mg/l is being retained for this discharge due to anti-backsliding provisions. It is based on a sampling frequency of 4/month (previous sampling frequency).

## Proposed Effluent Limitations and Monitoring Requirements

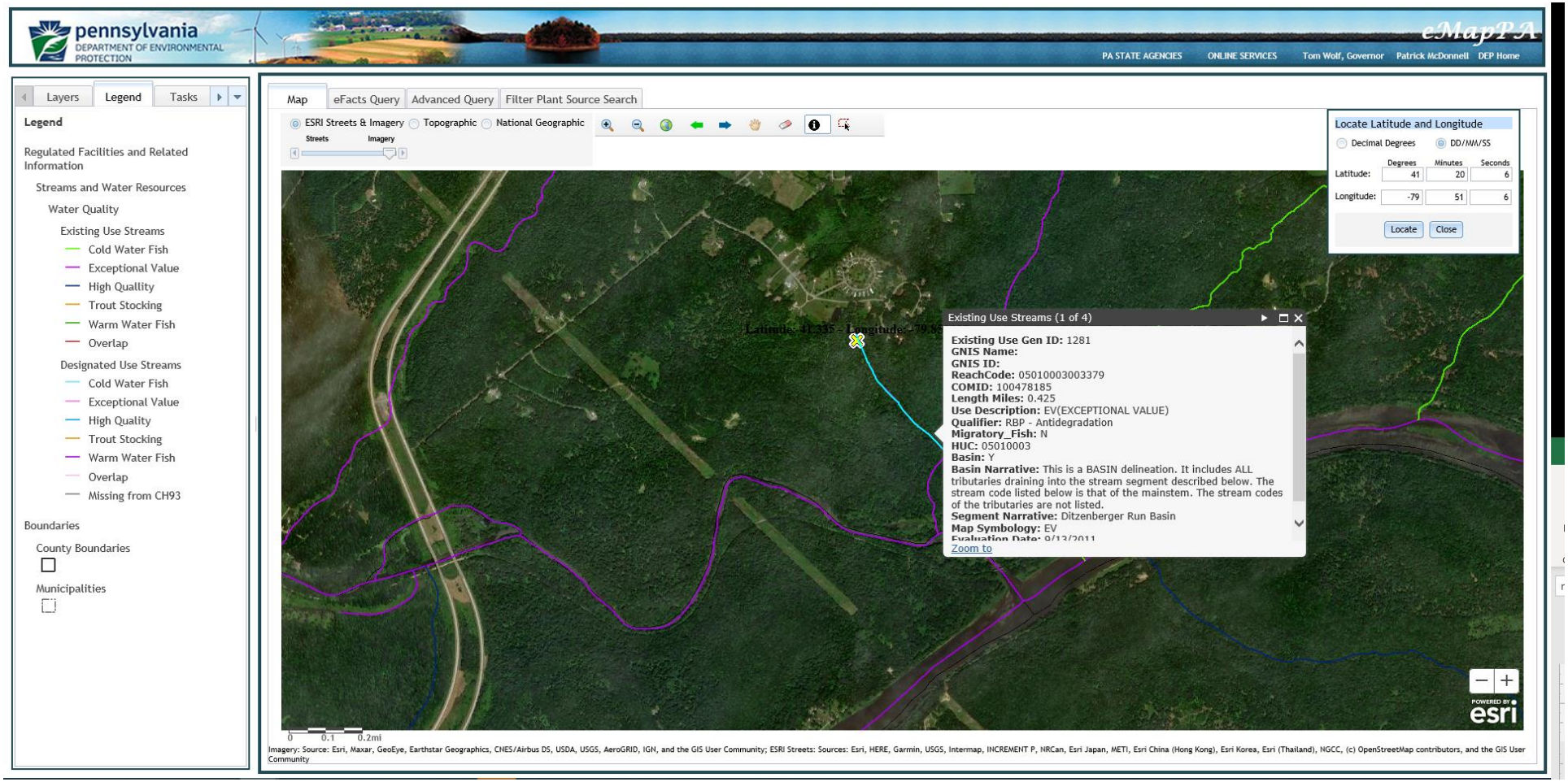
The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date**.

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| Flow (MGD) | Report | Report Daily Max | XXX | XXX | XXX | XXX | 1/week | Measured |
| pH (S.U.) | XXX | XXX | 6.0 Inst Min | XXX | XXX | 9.0 | 1/day | Grab |
| DO | XXX | XXX | 4.0 Inst Min | XXX | XXX | XXX | 1/day | Grab |
| TRC | XXX | XXX | XXX | 0.5 | XXX | 1.2 | 1/day | Grab |
| CBOD5 | XXX | XXX | XXX | 25 | XXX | 50 | 2/month | 8-Hr Composite |
| TSS | XXX | XXX | XXX | 30 | XXX | 60 | 2/month | 8-Hr Composite |
| Fecal Coliform (No./100 ml) Oct 1 - Apr 30 | XXX | XXX | XXX | 2000 Geo Mean | XXX | 10000 | 2/month | Grab |
| Fecal Coliform (No./100 ml) May 1 - Sep 30 | XXX | XXX | XXX | 200 Geo Mean | XXX | 1000 | 2/month | Grab |
| E. Coli (No./100 ml) | XXX | XXX | XXX | XXX | XXX | Report | 1/year | Grab |
| Total Nitrogen | XXX | XXX | XXX | Report Annl Avg | XXX | XXX | 1/year | 8-Hr Composite |
| Ammonia Nov 1 - Apr 30 | XXX | XXX | XXX | 20 | XXX | 40 | 2/month | 8-Hr Composite |
| Ammonia May 1 - Oct 31 | XXX | XXX | XXX | 6.5 | XXX | 13 | 2/month | 8-Hr Composite |
| Total Phosphorus | XXX | XXX | XXX | Report Annl Avg | XXX | XXX | 1/year | 8-Hr Composite |

Compliance Sampling Location: Outfall 001, after disinfection.
Other Comments: E. Coli limit added per PADEP SOP for Establishing Effluent Limitations in Individual Sewage Permits.

# eMAP with Aerial Imagery and Stream Existing Use Information



DRY STREAM REACH

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run | **0.400** | 1364.00 | 0.01 | 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** | 0.001 | 0.00 | 0.00 | 0.000 | 0.000 | 0.0 | 0.00 | 0.00 | 20.00 | 6.90 | 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 |
|---|---|---|---|---|---|---|---|
| Rocky Ridge | PA0101702 | 0.0125 | 0.0125 | 0.0125 | 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 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 3.00 | 8.24 | 0.00 | 0.00 |
| NH3-N | 25.00 | 0.00 | 0.00 | 0.70 |

## Input Data WQM 7.0

| SWP Basin | Stream Code | Stream Name | RMI | Elevation (ft) | Drainage Area (sq mi) | Slope (ft/ft) | PWS Withdrawal (mgd) | Apply FC |
|---|---|---|---|---|---|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run | **0.010** | 960.00 | 0.24 | 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** | 0.001 | 0.00 | 0.00 | 0.000 | 0.000 | 0.0 | 0.00 | 0.00 | 20.00 | 6.90 | 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 |



0.06

# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run |

| 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** | | | | | | | | | | | | |
| 0.400 | 0.00 | 0.00 | 0.00 | .0193 | 0.19619 | .389 | .58 | 1.49 | 0.09 | 0.277 | 20.00 | 6.90 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 0.400 | 0.00 | 0.00 | 0.00 | .0193 | 0.19619 | NA | NA | NA | 0.09 | 0.277 | 20.00 | 6.90 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 0.400 | 0.00 | 0.00 | 0.00 | .0193 | 0.19619 | NA | NA | NA | 0.09 | 0.277 | 20.00 | 6.90 |

# 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 | 6 | | |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run |

## 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 |
|---|---|---|---|---|---|---|---|
| 0.400 | Rocky Ridge | NA | 50 | 18.18 | 50 | 0 | 0 |

## NH3-N Chronic Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 0.400 | Rocky Ridge | NA | 25 | 1.95 | 25 | 0 | 0 |

## Dissolved Oxygen Allocations

| RMI | Discharge Name | CBOD5 | | NH3-N | | Dissolved Oxygen | | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|---|---|
| | | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | | |
| 0.40 | Rocky Ridge | 25 | 25 | 25 | 25 | 6 | 6 | 0 | 0 |

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 0.400 | 0.012 | 20.000 | 6.900 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 0.578 | 0.389 | 1.485 | 0.086 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 24.99 | 1.500 | 24.99 | 0.700 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 6.001 | 24.094 | Owens | NA |
| **Reach Travel Time (days)** | | | |
| 0.277 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.028 | 23.97 | 24.51 | 4.83 |
| 0.055 | 23.00 | 24.04 | 4.31 |
| 0.083 | 22.06 | 23.58 | 4.11 |
| 0.111 | 21.17 | 23.12 | 4.08 |
| 0.138 | 20.31 | 22.68 | 4.13 |
| 0.166 | 19.48 | 22.25 | 4.23 |
| 0.194 | 18.69 | 21.82 | 4.34 |
| 0.221 | 17.93 | 21.40 | 4.46 |
| 0.249 | 17.20 | 20.99 | 4.58 |
| 0.277 | 16.50 | 20.59 | 4.70 |

INPUT INTO PERENNIAL MODEL

TRAVEL TIME TO ENTER INTO NH3-N DECAY CALCULATION

PERENNIAL REACH

## WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51324 | Trib 51324 to Ditzenberger Run |

| 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) |
|---|---|---|---|---|---|---|---|
| 0.400 | Rocky Ridge | PA0101702 | 0.013 | CBOD5 | 25 | | |
| | | | | NH3-N | 25 | 50 | |
| | | | | Dissolved Oxygen | | | 6 |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16G | 51322 | SANDY CREEK | **0.500** | 980.00 | 1.56 | 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** | 0.038 | 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 |
|---|---|---|---|---|---|---|---|
| Rocky Ridge 2 | PA0101702_2 | 0.0125 | 0.0125 | 0.0125 | 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 | 16.50 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.70 | 7.54 | 0.00 | 0.00 |
| NH3-N | 20.59 | 0.10 | 0.00 | 0.70 |

FROM DRY REACH MODEL

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16G | 51322 | SANDY CREEK | **0.260** | 935.00 | 1.59 | 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** | 0.038 | 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 |
|---|---|---|---|---|---|---|---|
| | | 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 |
|---|---|---|
| 16G | 51322 | SANDY 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** | | | | | | | | | | | | |
| 0.500 | 0.06 | 0.00 | 0.06 | .0193 | 0.03551 | .348 | 4.19 | 12.02 | 0.05 | 0.272 | 23.77 | 6.97 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 0.500 | 0.04 | 0.00 | 0.04 | .0193 | 0.03551 | NA | NA | NA | 0.05 | 0.325 | 23.31 | 6.96 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 0.500 | 0.08 | 0.00 | 0.08 | .0193 | 0.03551 | NA | NA | NA | 0.06 | 0.238 | 24.03 | 6.98 |

# 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 | 6 | | |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51322 | SANDY 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 |
|---|---|---|---|---|---|---|---|
| 0.500 | Rocky Ridge 2 | 13.14 | 38.72 | 13.14 | 38.72 | 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 |
|---|---|---|---|---|---|---|---|
| 0.500 | Rocky Ridge 2 | 1.47 | 7.16 | 1.47 | 7.16 | 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) | | |
| 0.50 | Rocky Ridge 2 | 16.5 | 16.5 | 7.16 | 7.16 | 4.7 | 4.7 | 0 | 0 |

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51322 | SANDY CREEK |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 0.500 | 0.012 | 23.770 | 6.973 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 4.185 | 0.348 | 12.021 | 0.054 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 5.57 | 1.017 | 1.84 | 0.936 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 6.841 | 23.636 | Owens | 6 |
| **Reach Travel Time (days)** | | | |
| 0.272 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.027 | 5.39 | 1.79 | 7.30 |
| 0.054 | 5.21 | 1.75 | 7.54 |
| 0.082 | 5.04 | 1.70 | 7.54 |
| 0.109 | 4.88 | 1.66 | 7.54 |
| 0.136 | 4.72 | 1.62 | 7.54 |
| 0.163 | 4.57 | 1.58 | 7.54 |
| 0.190 | 4.42 | 1.54 | 7.54 |
| 0.217 | 4.28 | 1.50 | 7.54 |
| 0.245 | 4.14 | 1.46 | 7.54 |
| 0.272 | 4.01 | 1.42 | 7.54 |

## WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16G | 51322 | SANDY 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) |
|---|---|---|---|---|---|---|---|
| 0.500 | Rocky Ridge 2 | PA0101702_2 | 0.013 | CBOD5 | 16.5 | | |
| | | | | NH3-N | 7.16 | 14.32 | |
| | | | | Dissolved Oxygen | | | 4.7 |

$C_T = C_0 e^{-kt}$

$C_0 = 7.16e^{(0.7)(0.277)}$

$C_0 = 8.7$ mg/L

CBOD5 and DO limits are the same as the inputs from the dry reach model. Therefore, 25 mg/L CBOD5 and 4.0 mg/L DO are acceptable limits.

# TRC Evaluation at Perennial Conditions (~ 0.4 miles downstream of discharge)

| | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 2 | **TRC EVALUATION** | | | | | |
| 3 | Input appropriate values in B4:B8 and E4:E7 | | | | | |
| 4 | 0.06 | = Q stream (cfs) | | 0.5 | = CV Daily | |
| 5 | 0.0125 | = Q discharge (MGD) | | 0.5 | = CV Hourly | |
| 6 | 30 | = no. samples | | 1 | = AFC_Partial Mix Factor | |
| 7 | 0.3 | = Chlorine Demand of Stream | | 1 | = CFC_Partial Mix Factor | |
| 8 | 0 | = Chlorine Demand of Discharge | | 15 | = AFC_Criteria Compliance Time (min) | |
| 9 | 0.5 | = BAT/BPJ Value | | 720 | = CFC_Criteria Compliance Time (min) | |
| | 0 | = % Factor of Safety (FOS) | | 0 | =Decay Coefficient (K) | |
| 10 | Source | Reference | AFC Calculations | | Reference | CFC Calculations |
| 11 | TRC | 1.3.2.iii | WLA afc = 1.009 | | 1.3.2.iii | WLA cfc = 0.976 |
| 12 | PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | | 5.1c | LTAMULT cfc = 0.581 |
| 13 | PENTOXSD TRG | 5.1b | LTA_afc= 0.376 | | 5.1d | LTA_cfc = 0.567 |
| 14 | | | | | | |
| 15 | Source | | Effluent Limit Calculations | | | |
| 16 | PENTOXSD TRG | 5.1f | AML MULT = 1.231 | | | |
| 17 | PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.463 | | AFC | |
| 18 | | | INST MAX LIMIT (mg/l) = 1.513 | | | |

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