**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION III**
**1650 Arch Street**
**Philadelphia, Pennsylvania 19103-2029**

# Decision Rationale
# Total Maximum Daily Loads
# Reeds Run Watershed
# For Acid Mine Drainage Affected Segments
# Indiana County, Pennsylvania

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## I. Introduction

The Clean Water Act (CWA) requires that Total Maximum Daily Loads (TMDLs) be developed for those waterbodies identified as impaired by the state where technology-based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), that may be discharged to a waterbody without exceeding water quality standards.

The Pennsylvania Department of Environmental Protection (PADEP) Bureau of Watershed Management electronically submitted the *Reeds Run Watershed TMDL, Indiana County, For Acid Mine Drainage Affected Segments* (TMDL Report), dated March 27, 2007, to the U.S. Environmental Protection Agency (EPA) for final Agency review on March 27, 2007. This report includes the TMDLs for the three primary metals associated with acid mine drainage (AMD) (i.e., iron, manganese, and aluminum) and pH and addresses one segment on Pennsylvania's 1996 Section 303(d) list of impaired waters and ten tributaries.

EPA's rationale is based on the TMDL Report and information contained in the attachments to the report. EPA's review determined that the TMDL meets the following eight regulatory requirements pursuant to 40 CFR Part 130:

1. The TMDLs are designed to implement the applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs include a MOS.
7. There is reasonable assurance that the proposed TMDLs can be met.
8. The TMDLs have been subject to public participation.

## II. Summary

Table 1 presents the 1996, 1998, 2002, and 2004 Section 303(d) listing information for the impaired segment first listed in 1996.[1]

[1]Pennsylvania's 1996, 1998, 2002, and 2004 Section 303(d) lists were approved by the Environmental Protection Agency (EPA). The 1996 Section 303(d) list provides the basis for measuring progress under the 1997 lawsuit settlement of *American Littoral Society and Public Interest Group of Pennsylvania v. EPA.*

**Table 1. 303(d) Sublist for the Reeds Run Watershed, Indiana County, Pennsylvania**

| State Water Plan (SWP) Subbasin: 18-D | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **Miles** | **Segment ID Assessment ID** | **DEP Stream Code** | **Stream Name** | **Designated Use** | **Data Source** | **Source** | **EPA 305(b) Cause Code** |
| 1996 | 3.4 | 5061 | 43950 | Reeds Run | TSF | 303(d) List | RE | Metals |
| 1998 | 3.42 | 5061 | 43950 | Reeds Run | TSF | SWMP | AMD | Metals |
| 2002 | 3.42 | 5061 | 43950 | Reeds Run | TSF | SWMP | AMD | Metals |
| 2004 | 3.43 | 5061 | 43950 | Reeds Run | TSF | SWMP | AMD | Metals |

Resource Extraction = RE
Trout Stocked Fishery = TSF
Surface Water Monitoring Program = SWMP
Abandoned Mine Drainage = AMD

See Attachment D of the TMDL Report, *Excerpts Justifying Changes Between the 1996, 1998, 2002, and 2004 Section 303(d) Lists*. The use designations for the stream segments in this TMDL can be found in PA Title 25 Chapter 93.9. Section IV, Table 3, shows the TMDLs for the Reeds Run Watershed.

In 1997, PADEP began utilizing the Statewide Surface Waters Assessment Protocol to assess Pennsylvania's waters. This protocol is a modification of EPA's 1989 Rapid Bioassessment Protocol II and provides for a more consistent approach to conducting biological assessments than previously used methods. The biological assessments are used to determine which waters are impaired and should be included on the State's Section 303(d) list.

The TMDLs in this report were developed using a statistical procedure to ensure that water quality criteria are met 99% of the time as required by Pennsylvania's water quality standards at Pennsylvania Code Title 25, Chapter 96.3c. Table 3 of the TMDL Report lists the TMDLs for the Reeds Run Watershed, addressing metals and pH in the stream segments listed as PADEP stream codes 43950, 43951, 43952, 43953, 43954, 43956, 43957, 43958, 43960 and 43961, as well as one unnamed tributary without a stream code.

TMDLs are defined as the summation of the point source WLAs plus the summation of the nonpoint source LAs plus a MOS and are often shown as follows:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain applicable water quality standards. The TMDL is a scientifically-based strategy which considers current and foreseeable conditions, utilizes the best available data, and accounts for uncertainty with the inclusion of a MOS value. Since conditions, available data,

and the understanding of natural processes can change more than anticipated by the MOS, there exists the option of refining the TMDL for resubmittal to EPA.

## III. Background

The Reeds Run Watershed consists of 7.32 square miles and is located in Southwest Pennsylvania, in the southwest portion of Indiana County. Land uses within the watershed include forestland, open land (composed of reclaimed surface mines and agriculture), and rural residential. Three villages are located in the watershed. The village of Jacksonville is situated at the mouth of Reeds Run. Reeds Run at this point flows into Aultmans Run at the intersection of SR 286 and LR 32033. The next village upstream in the watershed is Coal Run, followed by the village of McIntyre in the headwaters. These villages were established primarily during the late 1800's to early 1900's as mining towns.

Indiana County has been an important coal producing region in Pennsylvania. The Upper Freeport coal seam is the most mined seam in the county. In addition, the Lower Freeport, Lower Kittanning, and Pittsburgh coal seams are mined in the county, along with incidental amounts of other seams. Numerous deep and surface coal mining operations have occurred in the watershed since the late 1800's. As a result, the Reeds Run Watershed is affected by pollution from AMD. This pollution has caused high levels of metals and low pH in the main stem of Reeds Run and in some of its tributaries. The sources of the AMD are seeps, refuse piles and discharges from areas disturbed by surface mining. There are a number of permits that are in various stages of bond release and no longer active. These include Kent Coal Mining Co. (NPDES PA0124419,
SMP# 32803037), Big Mack Leasing Co. Inc. (NPDES PA0599182, SMP# 32910103), Big Mack Leasing Co, Inc. (NPDES PA0212962, SMP# 32940110), Amerikohl Mining Inc. (NPDES PA0234826, SMP# 32980108), Big Mack Leasing Co. Inc. (NPDES PA0249173, SMP# 32020102) and Amerikohl Mining, Inc. (NPDES PA0249572, SMP# 32010103). All discharges in the watershed result from abandoned mines and are treated as nonpoint sources.

PADEP treats each segment on the Section 303(d) list as a separate TMDL and expresses each TMDL as a long-term average loading. (See the *Reeds Run Watershed TMDL* Report, Attachment C, for the TMDL calculations.)

The Surface Mining Control and Reclamation Act of 1977 (SMCRA, Public Law 95-87) and its subsequent revisions were enacted to establish a nationwide program to, among other things, protect the beneficial uses of land or water resources, protect public health and safety from the adverse effects of current surface coal mining operations, and promote the reclamation of mined areas left without adequate reclamation prior to August 3, 1977. SMCRA requires a surface mining permit for the development of new, previously mined, or abandoned sites for the purpose of surface mining. Permittees are required to post a performance bond that will be sufficient to ensure the completion of reclamation requirements by the regulatory authority in the event that the applicant forfeits. Mines that ceased operating by the effective date of SMCRA (often called "pre-law" mines) are not subject to the requirements of SMCRA.

Reeds Run was on the 1996 Section 303(d) list of impaired waters and counts toward the twelfth year (2009) TMDL milestone commitment under the requirements of the 1997 TMDL lawsuit settlement agreement. The twelfth year milestone is the development of TMDLs, or delisting, for all remaining waters listed as impaired by AMD impacts on Pennsylvania's 1996 Section 303(d) list of impaired waters.

***Computational Procedure***

The TMDLs were developed using a statistical procedure to ensure that water quality criteria are met 99% of the time as required by Pennsylvania's water quality standards. A two-step approach was used for the TMDL analysis of impaired stream segments.

The first step used a statistical method for determining the allowable instream concentration at the point of interest necessary to meet water quality standards. An allowable long-term average instream concentration was determined at each sample point for metals and acidity. The analysis was performed using Monte Carlo simulation to determine the necessary long-term average concentration needed to attain water quality criteria 99% of the time, and the simulation was run assuming the data set was log normally distributed. Using @RISK[2], each pollutant source was evaluated separately by performing 5,000 iterations of the model where each iteration was independent of all other iterations. This procedure was used to determine the required percent reduction that would allow the water quality criteria to be met instream at least 99% of the time. A second simulation that multiplied the percent reduction by the sampled value was run to ensure that criteria were met 99% of the time. The mean value from this data set represents the long-term average concentration that needs to be met to achieve water quality standards.

The second step was a mass balance of the loads as they passed through the watershed. Loads at these points were computed based on average flow. Once the allowable concentration and load for each pollutant was determined, mass-balance accounting was performed starting at the top of the watershed and working downstream in sequence. This mass balance or load tracking through the watershed utilized the change in measured loads from sample location to sample location as a guide for expected changes in the allowable loads.

The existing and allowable long-term average loads were computed using the mean concentration from @RISK multiplied by the average flow. The loads were computed based on average flow and should not be taken out of the context for which they are intended. They are intended to depict how the pollutants affect the watershed and where the sources and sinks are located spatially in the watershed. A critical flow was not identified, and the reductions specified in this TMDL apply at all flow conditions.

[2]@RISK – Risk Analysis and Simulation Add-in for Microsoft Excel, Palisade Corporation, Newfield, NY.

## IV. Discussions of Regulatory Requirements

EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA policy and guidance.

*1. The TMDLs are designed to implement the applicable water quality standards.*

Water quality standards are state regulations that define the water quality goals of a waterbody. Standards are comprised of three components: (1) designated uses; (2) criteria necessary to protect those uses; and (3) antidegradation provisions that prevent the degradation of water quality. Reeds Run has been designated by Pennsylvania as a trout stocked fishery with criteria to protect the aquatic life use, and the designation can be found at Pennsylvania Title 25 §93.9. To protect the designated use as well as the existing use, the water quality criteria shown in Table 2 apply to all evaluated segments. The table includes the instream numeric criterion for each parameter and any associated specifications.

**Table 2. Applicable Water Quality Criteria**

| Parameter | Criterion Value (mg/l) | Duration | Total Recoverable/ Dissolved |
|---|---|---|---|
| Aluminum (Al) | 0.75 | Maximum | Total Recoverable |
| Iron (Fe) | 1.50<br>0.30 | 30-day Average<br>Maximum | Total Recoverable<br>Dissolved |
| Manganese (Mn) | 1.00 | Maximum | Total Recoverable |
| pH | 6.0 - 9.0 | Inclusive | N/A |

Pennsylvania Title 25 §96.3c requires that water quality criteria be achieved at least 99% of the time, and TMDLs expressed as long-term average concentrations are expected to meet these requirements. That is, the statistical Monte Carlo simulation used to develop TMDL WLAs and LAs for each parameter resulted in a determination that any required percent pollutant reduction would assure that the water quality criteria would be met instream at least 99% of the time. The Monte Carlo analysis performed 5,000 iterations of the model where each iteration was independent of all other iterations and the data set was assumed to be log normally distributed.

EPA finds that these TMDLs will attain and maintain the applicable narrative and numeric water quality standards.

The pH values shown in Table 2 were used as the endpoints for these TMDLs. In the case of freestone streams with little or no buffering capacity, the allowable TMDL endpoint for pH may be the natural background water quality, and these values can be as low as 5.4 (Pennsylvania Fish and Boat Commission). However, PADEP chose to set the pH standard between 6.0 to 9.0, inclusive, which is presumed to be met when the net alkalinity is maintained above zero. This presumption is based on the relationship between net alkalinity and pH, on which PADEP based its methodology to addressing pH in the watershed (see the *Reeds Run*

*Watershed TMDL* Report, Attachment B). A summary of the methodology is presented as follows:

The parameter of pH, a measurement of hydrogen ion acidity presented as a negative logarithm of effective hydrogen ion concentration, is not conducive to standard statistics. Additionally, pH does not measure latent acidity that can be produced from the hydrolysis of metals. PADEP has been using an alternate approach to address the stream impairments noted on the Section 303(d) list due to pH. Because the concentration of acidity in a stream is partially dependent upon metals, it is extremely difficult to predict the exact pH values which would result from treatment of AMD. Therefore, net alkalinity will be used to evaluate pH in these TMDL calculations. This methodology assures that the standard for pH will be met because net alkalinity is able to measure the reduction of acidity. When acidity in a stream is neutralized or is restored to natural levels, pH will be acceptable ($\geq$6.0). Therefore, the measured instream alkalinity at the point of evaluation in the stream will serve as the goal for reducing total acidity at that point. The methodology that is used to calculate the required alkalinity (and therefore pH) is the same as that used for other parameters such as iron, aluminum, and manganese that have numeric water quality criteria. EPA finds this approach to addressing pH to be reasonable.

PADEP also has an alkalinity standard. Alkalinity (of a minimum 20 mg/l calcium carbonate except where natural conditions are less) is related but not identical to pH. Alkalinity is a measure of the buffering capacity of the water. Adequate buffering prevents large swings in pH with additions of small amounts of acid. Although many of the AMD-impacted streams are naturally low in alkalinity, available monitoring data do not always include upstream waters not impacted by AMD.

*2. The TMDLs include a total allowable load as well as individual WLAs and LAs.*

For purposes of these TMDLs only, point sources are identified as permitted discharge points or discharges having responsible parties, and nonpoint sources are identified as any pollution sources that are not point sources. Abandoned mine lands were treated in the allocations as nonpoint sources. As such, the discharges associated with these land uses were assigned LAs (as opposed to WLAs). The decision to assign LAs to abandoned mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these land uses. In addition, by approving these TMDLs with mine drainage discharges treated as LAs, EPA is not determining that these discharges are exempt from National Pollutant Discharge Elimination System (NPDES) permitting requirements.

Once PADEP determined the allowable concentration and load for each pollutant, a mass balance accounting was performed starting at the top of the watershed and working downstream in sequence. Load tracking through the watershed utilizes the change in measured loads from sample location to sample location as a guide for expected changes in the allowable loads.

PADEP used two basic rules for the load tracking between two ends of a stream segment: (1) if the measured upstream loads are less than the downstream loads, it is indicative that there

is an increase in load between the points being evaluated, and no instream processes are assumed; (2) if the sum of the measured loads from the upstream points is greater than the measured load at the downstream point, it is indicative that there is a loss of instream load between the points, and the ratio of the decrease shall be applied to the allowable load being tracked from the upstream point.

Tracking loads through the watershed provides a picture of how the pollutants are affecting the watershed based on the available information. The analysis is performed to ensure that water quality standards will be met at all points in the stream. EPA finds this approach reasonable.

Table 3 presents a summary of the allowable loads, LAs, and WLAs for the Reeds Run Watershed.

**Table 3. TMDL Component Summary for the Reeds Run Watershed**

| Parameter (lbs/day) | Existing Load (lbs/day) | TMDL Allowable Load (lbs/day) | WLA (lbs/day) | LA (lbs/day) | Load Reduction (lbs/day) | Percent Identified* (%) |
|---|---|---|---|---|---|---|
| **R (43961) Tributary to Reeds Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 1.4 | 0.3 | 0.0 | 0.3 | 1.1 | 82 |
| Manganese | 1.6 | 0.1 | 0.0 | 0.1 | 1.5 | 92 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **V Headwaters of Reeds Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Manganese | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **25 Upstream on Unt 43960 to Reeds Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| Manganese | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **26 Downsteam on Unt 43960 to Reeds Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 0.4 | 0.2 | 0.0 | 0.2 | 0.3 | 63* |
| Manganese | 0.3 | 0.1 | 0.0 | 0.1 | 0.2 | 66* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **L11 Reeds Run Downstream of Unt 43960** | | | | | | |
| Aluminum | 11.4 | 2.1 | 0.0 | 2.1 | 9.4 | 82* |
| Iron | 7.7 | 3.3 | 0.0 | 3.3 | 3.0 | 48* |
| Manganese | 12.0 | 2.5 | 0.0 | 2.5 | 7.7 | 76* |
| Acidity | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 | 0* |

| Parameter (lbs/day) | Existing Load (lbs/day) | TMDL Allowable Load (lbs/day) | WLA (lbs/day) | LA (lbs/day) | Load Reduction (lbs/day) | Percent Identified* (%) |
|---|---|---|---|---|---|---|
| **5 Headwaters of Neal Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 1.2 | 0.1 | 0.0 | 0.1 | 1.1 | 90 |
| Manganese | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **35 Neal Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 0.5 | 0.4 | 0.0 | 0.4 | 0.0 | 0* |
| Manganese | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **S5 Headwaters (43957) Unt to Neal Run** | | | | | | |
| Aluminum | - | - | - | - | - | - |
| Iron | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Manganese | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **S6 Downstream (43957) Unt to Neal Run** | | | | | | |
| Aluminum | 1.5 | 0.1 | 0.0 | 0.1 | 1.5 | 97* |
| Iron | 0.2 | 0.2 | 0.0 | 0.2 | 0.0 | 0* |
| Manganese | 0.3 | 0.1 | 0.0 | 0.1 | 0.2 | 65* |
| Acidity | 8.5 | 1.5 | 0.0 | 1.5 | 7.1 | 83* |
| **S8 (43958) Unt to Neal Run** | | | | | | |
| Aluminum | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| Iron | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 27 |
| Manganese | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **S7 Mouth of Unt (43958) to Neal Run** | | | | | | |
| Aluminum | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 22* |
| Iron | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0* |
| Manganese | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **S4 (43957) Mouth of Unt Upstream of confluence with Neal Run** | | | | | | |
| Aluminum | 0.6 | 0.4 | 0.0 | 0.4 | 0.0 | 0* |
| Iron | 0.4 | 0.4 | 0.0 | 0.4 | 0.0 | 0* |
| Manganese | 0.4 | 0.4 | 0.0 | 0.4 | 0.0 | 0* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **L25 (43954) Neal Run Downstream of Unt 43957 to Neal Run** | | | | | | |
| Aluminum | 251.3 | 1.3 | 0.0 | 1.3 | 249.9 | 99.5* |
| Iron | 247.3 | 2.0 | 0.0 | 2.0 | 245.1 | 99.2* |
| Manganese | 15.0 | 0.7 | 0.0 | 0.7 | 13.4 | 89* |
| Acidity | 1,634.4 | 0.0 | 0.0 | 0.0 | 1,634.4 | 100* |
| **S1 Most Upstream Sample Point on Unt (43955) to Neal Run** | | | | | | |

| Parameter (lbs/day) | Existing Load (lbs/day) | TMDL Allowable Load (lbs/day) | WLA (lbs/day) | LA (lbs/day) | Load Reduction (lbs/day) | Percent Identified* (%) |
|---|---|---|---|---|---|---|
| Aluminum | 1.0 | 0.7 | 0.0 | 0.7 | 0.3 | 30 |
| Iron | 0.5 | 0.5 | 0.0 | 0.5 | 0.0 | 0 |
| Manganese | 0.5 | 0.5 | 0.0 | 0.5 | 0.0 | 0 |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| **S3 Mouth of Unt (43955) to Neal Run** | | | | | | |
| Aluminum | 1.2 | 0.9 | 0.0 | 0.9 | 0.0 | 0* |
| Iron | 0.6 | 0.6 | 0.0 | 0.6 | 0.0 | 0* |
| Manganese | 0.6 | 0.6 | 0.0 | 0.6 | 0.0 | 0* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **L4 (43954) Mouth of Neal Run before confluence with Reeds Run** | | | | | | |
| Aluminum | 242.2 | 2.4 | 0.0 | 2.4 | 0.0 | 0* |
| Iron | 162.5 | 3.3 | 0.0 | 3.3 | 0.0 | 0* |
| Manganese | 20.9 | 2.3 | 0.0 | 2.3 | 5.2 | 70* |
| Acidity | 1,651.4 | 8.3 | 0.0 | 8.3 | 8.8 | 52* |
| **L3 Reeds Run Upstream of confluence with Neal Run** | | | | | | |
| Aluminum | 8.6 | 1.3 | 0.0 | 1.3 | 0.3 | 17* |
| Iron | 10.6 | 3.6 | 0.0 | 3.6 | 2.6 | 42* |
| Manganese | 12.2 | 2.6 | 0.0 | 2.6 | 0.2 | 6* |
| Acidity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0* |
| **27 Reeds Run Downstream of confluence with Neal Run** | | | | | | |
| Aluminum | 25.0 | 2.8 | 0.0 | 2.8 | 0.0 | 0* |
| Iron | 23.3 | 4.4 | 0.0 | 4.4 | 0.0 | 0* |
| Manganese | 21.6 | 5.6 | 0.0 | 5.6 | 0.0 | 0* |
| Acidity | 59.3 | 29.6 | 0.0 | 29.6 | 0.0 | 0* |
| **14 Mouth of Unt (43953) to Reeds Run at confluence with Reeds Run** | | | | | | |
| Aluminum | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 78* |
| Iron | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 65* |
| Manganese | 0.9 | 0.1 | 0.0 | 0.1 | 0.8 | 94* |
| Acidity | 3.8 | 0.1 | 0.0 | 0.1 | 2.6 | 96* |
| **15 Mouth of Unt (43953) near confluence with Reeds Run** | | | | | | |
| Aluminum | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 83 |
| Iron | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 |
| Manganese | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 76 |
| Acidity | 1.2 | 0.0 | 0.0 | 0.0 | 1.2 | 99 |
| **17 Unt (43952) to Reeds Run Downstream of Unt 43953** | | | | | | |
| Aluminum | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 78 |
| Iron | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 76 |
| Manganese | 0.3 | 0.1 | 0.0 | 0.1 | 0.3 | 85 |
| Acidity | 1.0 | 0.2 | 0.0 | 0.2 | 0.7 | 78 |
| **4 Unt 43951 to Reeds Run** | | | | | | |
| Aluminum | 0.3 | 0.0 | 0.0 | 0.0 | 0.3 | 95 |
| Iron | 3.2 | 0.0 | 0.0 | 0.0 | 3.2 | 99 |
| Manganese | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 | 97 |

| Parameter (lbs/day) | Existing Load (lbs/day) | TMDL Allowable Load (lbs/day) | WLA (lbs/day) | LA (lbs/day) | Load Reduction (lbs/day) | Percent Identified* (%) |
|---|---|---|---|---|---|---|
| Acidity | 10.3 | 0.1 | 0.0 | 0.1 | 10.3 | 99 |
| **28 Reeds Run near Mouth** | | | | | | |
| Aluminum | 172.3 | 3.5 | 0.0 | 3.5 | 146.0 | 98* |
| Iron | 80.0 | 16.0 | 0.0 | 16.0 | 41.8 | 73* |
| Manganese | 67.5 | 5.4 | 0.0 | 5.4 | 44.4 | 90* |
| Acidity | 1,221.9 | 12.2 | 0.0 | 12.2 | 1,165.3 | 99* |

ND = not detected
NA = not applicable, meets water quality standards, no TMDL necessary
* Percent reduction after upstream reductions are made

PADEP allocated loads to nonpoint sources only, as all permits are in various stages of bond release and no longer active in the watershed. Where there are active mining operations, Federal regulations require that point source permitted effluent limitations be water quality-based subsequent to TMDL development and approval.[3] In addition, PA Title 25, Chapter 96, Section 96.4d requires that WLAs serve as the basis for determination of permit limits for point source discharges regulated under Chapter 92 (relating to NPDES permitting, monitoring, and compliance). Therefore, no new mining may be permitted within the watershed without reallocation of the TMDL.

*3. The TMDLs consider the impacts of background pollutant contributions.*

The TMDLs were developed using instream data, which account for existing background conditions.

*4. The TMDLs consider critical environmental conditions.*

The reductions specified in these TMDLs apply at all flow conditions. A critical flow condition was not identified from the available data.

*5. The TMDLs consider seasonal environmental variations.*

The data set included data points from all seasons, thereby accounting for seasonal variation implicitly.

[3]It should be noted that technology-based permit limits may be converted to water quality-based limits according to EPA's *Technical Support Document For Water Quality-based Toxics Control*, March 1991, recommendations.

*6. The TMDLs include a MOS.*

The CWA and Federal regulations require TMDLs to include a MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA guidance suggests two approaches to satisfy the MOS requirement. First, it can be met implicitly by using conservative model assumptions to develop the allocations. Alternately, it can be met explicitly by allocating a portion of the allowable load to the MOS.

PADEP used an implicit MOS in these TMDLs by assuming that the treated instream concentration variability was the same as the untreated stream's concentration variability. This is a more conservative assumption than the general assumption that a treated discharge has less variability than an untreated discharge. By retaining variability in the treated discharge, a lower average concentration is required to meet water quality criteria 99% of the time than if the variability of the treated discharge is reduced.

Additionally, calculations were performed using a daily average for iron rather than the 30-day average, thereby, incorporating a MOS.

*7. There is reasonable assurance that the proposed TMDLs can be met.*

The *Recommendations* section of the TMDL Report highlights what can be done in the Reeds Run Watershed to eliminate or treat pollutant sources. Aside from PADEP's primary efforts to improve water quality in the Reeds Run Watershed through reclamation of abandoned mine lands and through the NPDES permit program, additional opportunities for reasonable assurance exist. PADEP expects that activities such as research conducted by its Bureau of Abandoned Mine Reclamation, funding from EPA's §319 grant program, and Pennsylvania's Growing Greener program will help remedy abandoned mine drainage impacts. PADEP also has in place an initiative that aims to maximize reclamation of Pennsylvania's abandoned mineral extraction lands. Through Reclaim PA, Pennsylvania's goal is to accomplish complete reclamation of abandoned mine lands and plugging of orphaned wells. Pennsylvania strives to achieve this objective through legislative and policy land management efforts and activities described in the TMDL Report.

Presently Aultman Watershed Association for Restoring the Environment (AWARE) has a Reeds Run project approved by the Growing Greener Program to evaluate and design a method to improve the headwaters of Reeds Run. The project area is situated adjacent to Kent (SMP#32803037) and is listed under design number CD040319. Also the same watershed group has discussed another project on Reeds Run immediately south of the village of McIntrye. This watershed organization could continue to work to implement projects to achieve the reductions recommended in this TMDL document.

*8. The TMDLs have been subject to public participation.*

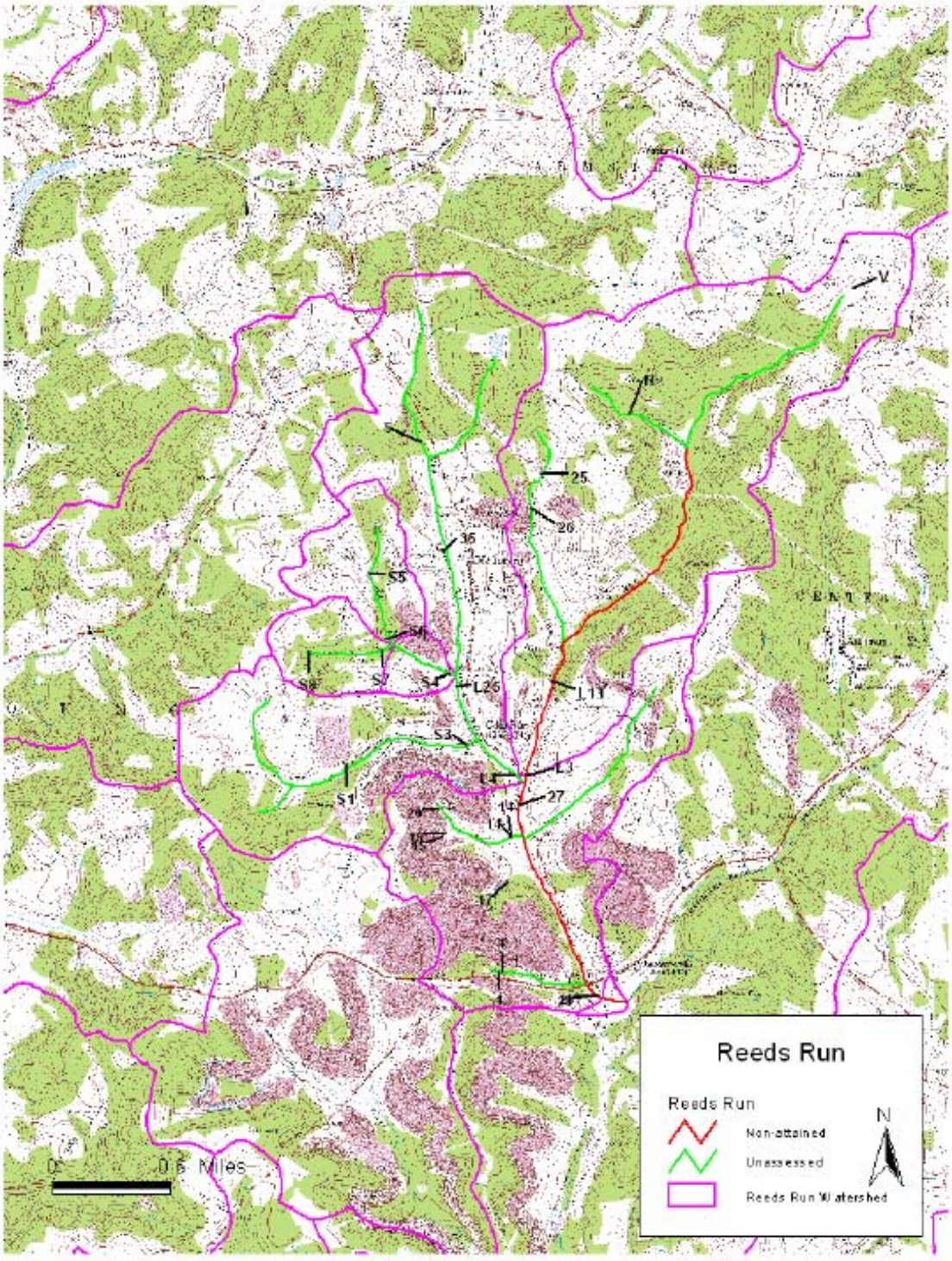
Public notice of the draft TMDL was published in the *Pennsylvania Bulletin* on March 3, 2007, and the *Indiana Gazette* on February 20 and 27, 2007, to foster public comment on the calculated allowable loads. A public meeting was held on March 7, 2007, at Cambria

District Mining Office in Ebensburg, PA, to discuss the proposed TMDL. No comments were received.

Although not specifically stated in the TMDL Report, PADEP routinely posts the approved TMDL Reports on their web site: www.dep.state.pa.us/watermanagement_apps/tmdl/.

# Attachment A

Reeds Run Watershed Map


Reeds Run
Reeds Run
Non-attained
Unassessed
Reeds Run Watershed
N
0
0.5 Miles