



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

Ms. Cathy Myers, Acting Deputy Director
Water Management
Pennsylvania Department of
Environmental Protection
Rachel Carson State Office Building
P. O. Box 2063
Harrisburg, PA 17105-2063

Dear Ms. Myers:

The U. S. Environmental Protection Agency (EPA) is pleased to approve Total Maximum Daily Loads (TMDLs) for 42 watersheds, submitted to EPA for review and approval by the Pennsylvania Department of Environmental Protection (DEP) by letter dated March 13, 2003. The TMDLs were established and submitted in accordance with Sections 303(d)(1)(c) and 303(d)(2) of the Clean Water Act (CWA). The TMDLs were established to address impairments of water quality as identified in Pennsylvania's 1996 and 1998 Section 303(d) lists of impaired waters still needing TMDLs. Impairments addressed in these TMDLs include: sediment and nutrients from urban, suburban and agricultural areas; and pH and metals from existing or past mining activities. A list of the TMDLs included in this approval is enclosed.

In addition to the TMDL approvals, EPA is counting the removal of 15 water quality limited segments (WQLS) from Pennsylvania's 1996 Section 303(d) list towards the sixth year TMDL milestone in accordance with paragraph 16(b) of the Consent Decree. As set forth in the Consent Decree, TMDLs do not need to be established for any WQLS which EPA determines does not need TMDLs consistent with Section 303(d) of the CWA and 40 CFR §130.7, as amended. Fourteen of the 15 listed segments were removed from Pennsylvania's 1998 Section 303(d) list, which was approved by EPA. A list of the segment delistings counted towards credit, as well as the underlying rationale is enclosed.

Due to time constraints caused by the efforts needed to address the issues dealing with the non-acid mine drainage (AMD) TMDLs, we were unable to review all of the mining-related TMDLs submitted on March 13, 2003. We did, however, review and approve TMDLs for 33 AMD stream segments as required by the Consent Decree. The remainder of these TMDLs will be reviewed in the near future.

In accordance with Federal regulations at 40 CFR 130.7, a TMDL must: 1) be designed to meet water quality standards; 2) include, as appropriate, both waste load allocations (for point sources) and load allocations (for non point sources); 3) consider the impacts of background



pollutant contributions; 4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); 5) consider seasonal variations; 6) include a margin of safety which accounts for any uncertainties in the relationship between pollutant loads and instream water quality; and 7) be subject to public participation. EPA's Decision Rationales for each of the watersheds, which describe how each of the approved TMDLs satisfy the above listed requirements, are enclosed.

Fifteen additional non-mining TMDLs were due to be completed by the Consent Decree deadline. Two of these 15, Glanraffan Creek and Brush Run, were submitted but cannot be approved because they do not include wasteload allocations to point sources. EPA is responsible for two TMDLs in the Wissahickon Creek Watershed, and 11 TMDLs have yet to be submitted by DEP. We have received a 60-day extension from plaintiffs to complete these remaining 15 TMDLs and are pursuing a full 6-month extension. In discussions with plaintiffs, they have proposed two alternatives that would allow us the full extension. One alternative involves aggressive use of the model storm water ordinance and Act 167 Storm Water Plans in TMDL municipalities. The second involves accelerating the completion of TMDLs due in the future by six months as equal compensation to the plaintiffs for an extension.

Together, EPA and DEP have made some improvements in our coordinating process over the past two-year TMDL development cycles such as quarterly meetings to address some policy and training issues. However, the need for an extension and the complexities involved with TMDLs as they apply to NPDES permits magnifies the need for increased cooperation at a much earlier point in the TMDL process. TMDLs need to be started earlier to allow more time for stakeholder comments to be considered before the final TMDL is issued. In many cases, this year's TMDLs have shown us that the impact on the regulated community requires that additional time and possible policy level discussions need to be built into any timeline.

In order to avoid surprises and promote continual improvement in the process, EPA requests copies of preliminary drafts earlier in the timeline, and a process that ensures that our comments are incorporated in documents prior to public notice. We also need to develop a better process to discuss the drafts that go to public notice so that problems do not arise during our formal review and approval of the final TMDL.

According to Federal regulations at 40 CFR 130.7(d)(2), a state must incorporate an approved TMDL into the appropriate water quality management plan. In addition, any new or revised National Pollutant Discharge Elimination System permit that includes any of the pollutants addressed in an approved TMDL must be consistent with conditions and assumptions of the TMDL pursuant to 40 CFR 122.44(d)(1)(VII)(B). Any such permit should be submitted to EPA for review consistent with our letter dated October 1, 1998.

We look forward to working with you on the last option to finalize our Consent Decree deadline extensions and improve the cooperation between DEP and EPA.

If you have any questions, please call me or have your staff contact Mr. Thomas Henry, EPA Region III TMDL Program Manager, at (215) 814-5752.

Sincerely,

/Signed on 6-3-03/

Jon M. Capacasa, Director
Water Protection Division

Enclosures (36)

cc: Mr. Fred Marrocco, PADEP
Mr. Edward Brezina, PADEP

WATERSHEDS COVERED UNDER THIS APPROVAL

Watershed Name	Type of Impairment	Number of Segments from the 1996 Section 303(d) List
Babb Creek	AMD	2
Bear Loop Run	AMD	1
Beaver Run	AMD	1
Catawissa Creek	AMD	5
Cats Run	AMD	1
Chartiers Creek	AMD	5
Cooks Run	AMD	4
Douglass Run/Jones Run	AMD	2
Fowler Run	AMD	1
Laurel Run	AMD	1
Longs/Sandy Runs	AMD	2
Montgomery Creek	AMD	2
Panther Creek	AMD	1
Potato Garden Run	AMD	2
Thompson Run	AMD	1
Wabash Creek	AMD	1
Plum Creek	Non-AMD	1
Dutch Fork Lake	Non-AMD	1
Harvey's Lake	Non-AMD	1
Hospital Creek	Non-AMD	1
Little Cacoosing Creek	Non-AMD	1
Oil Creek	Non-AMD	1
Owl Creek	Non-AMD	1

Pinchot Lake	Non-AMD	1
Schuylkill River - UNT	Non-AMD	1
Tulpehocken Creek	Non-AMD	1
Total Watersheds Approved		42

**SEGMENT DELISTINGS USED TOWARDS CREDIT
FOR THE SIXTH YEAR TMDL MILESTONE**

Segment Name	1996 Stream Code	Type of Impairment
Brodhead Creek	4750	Non-Mining
Unt French Creek	1550	Non-Mining
Unt Chester Creek	526	Non-Mining
Unt West Branch Chester Creek	570	Non-Mining
East Branch Brandywine Creek	229	Non-Mining
Indian Run	360	Non-Mining
West Branch White Clay Creek	465	Non-Mining
Unt Kinzua Creek	56711	Mining
West Branch Tunungwant Creek	56990	Mining
East Branch Tunungwant Creek	57031	Mining
Unt East Branch Tunungwant Creek	57105	Mining
Cole Creek	57663	Mining
Pithole Creek	54745	Mining
West Branch Blue Jay Creek	55252	Mining
Buck Run	38284	Mining
Total Segment Delistings		15



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

**Decision Rationale
Total Maximum Daily Loads
Chartiers Creek Watershed
For Acid Mine Drainage Affected Segments**

/s/

**Jon M. Capacasa, Acting Director
Water Protection Division**

Date: 4/9/2003



**Decision Rationale
Total Maximum Daily Loads
Chartiers Creek Watershed
For Acid Mine Drainage Affected Segments**

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed by the state for those waterbodies identified as impaired 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, that may be discharged to a water quality-limited waterbody without violating water quality standards.

The Pennsylvania Department of Environmental Protection (PADEP), Bureau of Watershed Conservation, submitted the *Chartiers Creek Watershed TMDL*, dated April 2003 (TMDL Report), to EPA for final Agency review on March 14, 2003. This report included TMDLs for three metals (aluminum, iron, and manganese) and addressed seven (7) segments on Pennsylvania's 1996 Section 303(d) list of impaired waters.

EPA's rationale is based on the TMDL Report and information contained in the attachments to the report. Our review determined that portions of the TMDL did not meet the following eight regulatory requirements pursuant to 40 CFR Part 130. EPA is, therefore, approving the TMDLs for Campbells Run, Robinson Run, Millers Run, Half Crown Run, Little Chartiers Creek and Chartiers Run, *i.e.*, six (6) segments. EPA is unable to approve the TMDLs for Chartiers Creek due to a lack of specific point source data.

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 (WLA) and load allocations (LA).
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 margin of safety (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 and 1998 Section 303(d) listing information for the water quality limited segments within the Chartiers Creek Watershed.

Table 1. State Water Plan (SWP) Subbasin: 20-F Ohio River								
Year	Mile	Segment	Stream Code	Stream Name	Designated Use	Data Source	Source	EPA Cause
1996	2.0	N/A	36786	Campbells Run	WWF	305(b) Report	RE	Metals
1998	2.0	N/A	36786	Campbells Run	WWF	305(b) Report	RE	Metals
1996	0.8	4686	36787	UNT Campbells Run	WWF	305(b) Report	RE	Metals
1998	0.8	4686	36787	UNT Campbells Run	WWF	SWMP	AMD	Metals
1996	6.5	4681	36777	Chartiers Creek	WWF	305(b) Report	RE	Metals
1998	19.9	4681	36777	Chartiers Creek	WWF	SWMP	AMD	Metals
1998	3.11	971001-1040-TVP	37135 37139	UNTs Chartiers Creek	WWF	UP	UR/SS AMD AMD	Siltation Metals Siltation
1998	3.2	971024-0940-ALF	37043 37050	Chartiers Run UNT. Chartiers Run	WWF	UP	AMD Cn HM HM AMD Cn	Siltation Siltation OHA Metals OHA
1998	5.97	971024-1030-ALF	37051 37052 37055	UNTs Chartiers Run	WWF	UP	AMD Cn AMD HM HM Cn	Metals OHA Siltation Siltation
1998	4.11	971028-1000-ALF	37052 37058 37059 37060 37061	UNTs Chartiers Run	WWF	UP	Ag Ag Ag HM HM	Siltation Nutrients Turbidity Turbidity pH
1996	1	5846	63300	Half Crown Run	WWF	305(b)	RE	Metals
1998	1.1	5846	63300	Half Crown Run	WWF	SWMP	AMD	Metals

Table 1. State Water Plan (SWP) Subbasin: 20-F Ohio River								
1998	6.35	971009-1245-TVP	36989 37004 - 37009	UNTs Little Chartiers Creek	WWF	UP	UR/SS AMD AMD	Siltation Suspended Solids Metals
1998	6.19	971009-1050-TVP	36989 37001 37002 37003 37015	UNTs Little Chartiers Creek	WWF	UP	AMD AMD	Suspended Solids Metals
1996	2.5	4688	36827	Millers Run	WWF	305(b)	RE RE	Suspended Solids Metals
1998	5.13	4688	36827	Millers Run	WWF	SWMP	RE RE	Suspended Solids Metals
1996	6.0	5842	63294	N. Branch Robinson Run	WWF	305(b)	RE	Other Inorganics Metals
1998	2.42	5842	63294	N. Branch Robinson Run	WWF	SWMP	AMD AMD	Metals Other Inorganics
1998	1.55	5843	63294	N. Branch Robinson Run	WWF	SWMP	AMD	Metals
1996	4.2	5845 6610	63295	UNT. N. Branch Robinson Run	WWF	305(b)	RE	Metals
1998	1.85	5845	63295	UNT. N. Branch Robinson Run	WWF	SWMP	AMD	Metals
1998	1.5	6610	63295	UNT. N. Branch Robinson Run	WWF	SWMP	AMD	Metals

Other Inorganics are sulfates

RE = Resource Extraction

WWF = Warm Water Fishes

SWMP = Surface Water Monitoring Program

AMD = Acid Mine Drainage

Ag = Agriculture

Cn = Construction

HM = Habitat Modification

UR/SS = Urban Runoff/Storm Sewers

OHA = Other Habitat Alterations

UNT = Unnamed Tributaries

See Attachment E, Excerpts Justifying Changes Between the 1996, 1998 and Draft 2000 Section 303(d) Lists.

The use designations for the stream segments in this TMDL can be found in PA Code Title 25 Chapter 93.

The TMDLs were developed using the Watershed Analysis Risk Management Framework (WARMF) model to ensure that water quality standards are attained as required by Pennsylvania's water quality standards Pennsylvania Code Title 25, Chapter 93.5(b). Tables 2a, 2b, and 2c summarize the TMDLs for the Chartiers Creek Watershed as determined by PADEP.

Table 2A. TMDLs, WLA, LA, and MOS for Aluminum

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
36777	Mouth of Chartiers Creek	67,334	2,766	3,689	73,790
36786	Campbells Run	1,277	0	67	1,344
36787	UNT Campbells Run	484	0	25	509
36794	Mouth of Robinson Run	15,820	0	833	16,652
63294	North Branch Robinson Run	1,751	0	92	1,843
63295	UNT. North Branch Robinson Run	343	0	18	361
63300	Half Crown Run	575	0	30	605
36827	Mouth of Millers Run	15,595	0	821	16,415
36943	Mouth of Little Chartiers Creek	25,089	2,766	1,466	29,321
37015	UNT Little Chartiers Creek	179	0	9	188
37001	UNT Little Chartiers Creek	1,573	0	83	1,656
37002	UNT Little Chartiers Creek	304	0	16	319
37003	UNT Little Chartiers Creek	330	25	19	374
36989	UNT Little Chartiers Creek	6,251	659	364	7,274
37004	UNT Little Chartiers Creek	289	0	15	304
37005	UNT Little Chartiers Creek	137	0	7	145
37006	UNT Little Chartiers Creek	111	0	6	117
37007	UNT Little Chartiers Creek	121	0	6	127
37008	UNT Little Chartiers Creek	60	0	3	63
37009	UNT Little Chartiers Creek	154	0	8	162
37043	Mouth of Chartiers Run	5,588	0	294	5,882
37050	UNT Chartiers Run	1,916	0	101	2017
37051	UNT Chartiers Run	84	0	4	89
37055	UNT Chartiers Run	1,942	0	102	2,044
37052	UNT Chartiers Run	665	0	35	700
63869	UNT Chartiers Creek	1,238	0	65	1,303

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
37135	UNT Chartiers Creek	1,811	0	95	1,907
37139	UNT Chartiers Creek	752	0	40	792

Table 2B. TMDLs, WLA, LA, and MOS for Iron

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
36777	Mouth of Chartiers Creek	210,995	4,581	11,346	226,922
36786	Campbells Run	12,460	0	656	13,116
36787	UNT Campbells Run	3,845	0	202	4,048
36794	Mouth of Robinson Run	39,435	0	2,076	41,510
63294	North Branch Robinson Run	10,852	0	571	11,423
63295	UNT North Branch Robinson Run	1,437	0	76	1,513
63300	Half Crown Run	2,537	0	134	2,671
36827	Mouth of Millers Run	8,409	0	443	8,851
36943	Mouth of Little Chartiers Creek	844	4,517	282	5,643
37015	UNT Little Chartiers Creek	1	0	<1	1
37001	UNT Little Chartiers Creek	17	0	1	18
37002	UNT Little Chartiers Creek	3	0	<1	3
37003	UNT Little Chartiers Creek	<1	75	4	79
36989	UNT Little Chartiers Creek	276	1,318	84	1,678
37004	UNT Little Chartiers Creek	16	0	1	17
37005	UNT Little Chartiers Creek	7	0	<1	8
37006	UNT Little Chartiers Creek	6	0	<1	6
37007	UNT Little Chartiers Creek	7	0	<1	7
37008	UNT Little Chartiers Creek	3	0	<1	3
37009	UNT Little Chartiers Creek	8	0	<1	9
37043	Mouth of Chartiers Run	28,223	64	1,572	29,859
37050	UNT Chartiers Run	22,885	0	1,271	24,157
37051	UNT Chartiers Run	310	0	17	327
37055	UNT Chartiers Run	4,454	0	247	4,701

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
37052	UNT Chartiers Run	485	0	27	512
63869	UNT Chartiers Creek	329	0	18	348
37135	UNT Chartiers Creek	45	0	2	47
37139	UNT Chartiers Creek	18	0	1	19

Table 2C. TMDLs, WLA, LA, and MOS for Manganese

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
36777	Mouth of Chartiers Creek	190,386	2,994	10,178	203,558
36786	Campbells Run	7,224	0	380	7,604
36787	UNT Campbells Run	2,637	0	139	2,776
36794	Mouth of Robinson Run	63,661	0	3,351	67,012
63294	North Branch Robinson Run	17,501	0	921	18,422
63295	UNT North Branch Robinson Run	1,705	0	90	1,794
63300	Half Crown Run	2,782	0	146	2,928
36827	Mouth of Millers Run	5,749	0	303	6,051
36943	Mouth of Little Chartiers Creek	2,029	2,994	264	5,288
37015	UNT Little Chartiers Creek	5	0	<1	5
37001	UNT Little Chartiers Creek	19	0	1	20
37002	UNT Little Chartiers Creek	4	0	<1	4
37003	UNT Little Chartiers Creek	1	50	3	54
36989	UNT Little Chartiers Creek	312	862	62	1,235
37004	UNT Little Chartiers Creek	5	0	<1	5
37005	UNT Little Chartiers Creek	2	0	<1	2
37006	UNT Little Chartiers Creek	2	0	<1	2
37007	UNT Little Chartiers Creek	2	0	<1	2
37008	UNT Little Chartiers Creek	1	0	<1	1
37009	UNT Little Chartiers Creek	3	0	<1	3
37043	Mouth of Chartiers Run	32,098	0	1,689	33,787
37050	UNT Chartiers Run	9,164	0	482	9,647

Stream Code	Stream Name	LA lbs/yr	WLA lbs/yr	MOS lbs/yr	TMDL lbs/yr
37051	UNT Chartiers Run	422	0	22	444
37055	UNT Chartiers Run	6,391	0	336	6,727
37052	UNT Chartiers Run	707	0	37	744
63869	UNT Chartiers Creek	297	0	16	312
37135	UNT Chartiers Creek	15	0	1	16
37139	UNT Chartiers Creek	27	0	1	28

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically-based strategy which considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. Conditions, available data, and the understanding of the natural processes can change more than anticipated by the MOS. If this occurs, the option is always available to refine the TMDL for resubmittal to EPA. Pennsylvania's Unassessed Waters Protocol, PADEP's method of conducting biological assessments of Pennsylvania's waters, was developed in 1996 and implementation began in 1997. PADEP's goal is a statewide assessment of surface waters in Pennsylvania. After completion of the initial assessments, the long-range goal is to reassess all waters on a five-year cycle. Therefore, while the TMDL should not be modified at the expense of achieving water quality standards expeditiously, the TMDL may be modified when warranted by additional data or other information.

III. Background

The Chartiers Creek Watershed is approximately 260 square miles in area. Chartiers Creek and several of its tributaries were listed on the 1996 Section 303(d) list of impaired waters due to AMD. The geology of the basin consists of sedimentary rocks of shale, sandstone and siltstone, coal, and limestone. The Pittsburgh Coal seam is exposed on the stream banks where the stream erodes below the coal seam. This seam has been and continues to be mined for its coal. The majority of the mines are in the northwest portion of the watershed. The major landuses within the watershed include forest land, cropland, and strip mines.

The Chartiers Creek Watershed is affected by pollution from AMD. This pollution has caused high levels of metals and elevated sulfates in several waters within the watershed including the mainstem of Chartiers Creek.

The Eighty-Four Mine is the only active mining operation in the watershed. A nonmining facility within the watershed, Allegheny Ludlum, is permitted to discharge iron. At the time of this report Allegheny Ludlum did not have a numeric effluent limit for iron but was required to monitor for its presence in one of its discharge points. Two other facilities are identified by EPA as point sources discharging to Chartiers Creek but are not provided with WLAs in the TMDL Report. For this reason, EPA is not approving the TMDLs for Chartiers Creek.

The remaining discharges in the watershed are from abandoned mines and will be treated as nonpoint sources. For purposes of these TMDLs only, point sources are identified as permitted discharge points and nonpoint sources are identified as other discharges from abandoned mine lands which include tunnel discharges, seeps (although none were specifically identified), and surface runoff. Abandoned and reclaimed mine lands are treated in the allocations as nonpoint sources because there are no National Pollutant Discharge Elimination System (NPDES) permits associated with these areas. As such, the discharges associated with these landuses were assigned LAs (as opposed to WLAs). The decision to assign LAs to abandoned and reclaimed mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these landuses. EPA is not determining that these discharges are exempt from NPDES permitting requirements. Each segment on the Section 303(d) list will be addressed as a separate TMDL.

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, and public health and safety from the adverse effects of current surface coal mining operations, as well as promote the reclamation of mined areas left without adequate reclamation prior to August 3, 1977. SMCRA requires a 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.

These TMDLs were completed by PADEP to meet the sixth year (2003) TMDL milestone commitments under the requirements of the 1997 TMDL lawsuit settlement agreement. Sixth year milestones include the development of TMDLs for 20% of the waters listed on Pennsylvania’s 1996 Section 303(d) list of impaired waters by the effects of AMD or 40 waters since 2001, and 60% of waters listed impaired by non-AMD related impacts or 27 waters since 2001. Delisted waters may count for 20% of the requirement.

Modeling Procedure

Beginning in 1998, Systech Engineering and the electric power industry, Allegheny Power, Electric Power Research Institute (EPRI), and the American Electric Power, approached Region III with a proposal to provide a calibrated watershed model for use in developing TMDLs in the Cheat River Watershed in West Virginia. Subsequently, the offer was extended to PADEP. The model to be used was the Watershed Analysis Risk Management Framework (WARMF), a proprietary computer program developed by Systech Engineering, Inc., under the sponsorship of EPRI. The regulatory agency, in this case, PADEP, develops the TMDLs.

WARMF contains catchment, river, and reservoir models that use meteorology, air quality, managed flow, observed hydrology and water quality, landuse, and point source data to support TMDL development on a subwatershed basis. Refer to *Users’ Guide to WARMF* (Herr et al., 2000) for a more detailed discussion of simulated processes and model parameters.

Adaptation of WARMF to Calculate TMDLs for Chartiers Creek Watershed in Pennsylvania (Chen, Loeb and Herr, 2001) describes the modeling approach for the Chartiers Creek Watershed in detail. Configuration of WARMF involved the subdivision of the Chartiers Creek Watershed into modeling units and continuous simulation of flow and water quality for these units using meteorological, landuse, stream, mining, and pollutant-specific data. Pollutants that were simulated include metals, dissolved and suspended solids, carbon, nutrients, fecal coliform, dissolved oxygen, alkalinity, and pH.

After the model was configured, calibration was performed at multiple locations throughout the Cheat Watershed. Calibration refers to the adjustment or fine-tuning of modeling parameters to reproduce observations. Model calibration focused on two main areas: hydrology and water quality. Model calibration is also described in the report *Adaptation of WARMF to Calculate TMDLs for Chartiers Creek Watershed in Pennsylvania* (Chen, Loeb and Herr, 2001).

The Chartiers Creek Watershed drains a 257 square mile area southeast of Pittsburgh. Site-specific data was compiled for the watershed and used in the WARMF model. The first step in developing a TMDL through WARMF is to delineate the watershed. This task was completed through the use of United States Geological Survey (USGS) digital elevation maps (DEMs). DEMs provide the model with relief patterns and allow the modeler to demarcate the subbasins in the watershed. Landuse data for the watershed was imported into WARMF via GIS ArcInfo files. Ten landuse categories are used to represent the watershed.

Meteorological data was obtained from the National Climatic Data Center's (NCDC) database. Pittsburgh International Airport meteorologic station was used to represent the watershed's climatological patterns. The Pittsburgh station is a few miles east of the watershed. USGS stream flow data was imported into the WARMF model as well. Data was collected from various gaging stations in the watershed. The USGS gages on Chartiers Creek at Lagonda and Carnegie had daily flow records over an extended period of time. The remaining stations had sporadic data. Water quality data was collected from a wide range of sources over differing time frames. Although most of the data was collected sporadically, two stations were monitored monthly over an extended period of time. Most of the data was collected from Chartiers Creek.

Based on DEM, landuse, mine overburden, and other input information entered into WARMF, the model used the daily meteorology to simulate runoff from the catchments.¹ This runoff is routed to the streams within the watershed. The simulation is performed on every catchment and river segment every day throughout the years modeled.² During the calibration, modeled stream data was compared with the observed flow conditions to insure that the model accurately reflected observed conditions. Parameters within the model, such as evaporation coefficients or soil capacity, were fine tuned to create an accurate calibration. WARMF was calibrated to a three-year period of observed flow on Chartiers Creek at Lagonda. The simulated flow matched the observed general flow patterns well. The model over-predicted the lowest flows and under-predicted the highest flows but the model did match the data trends. A six-year

¹Chen, C.W., C. Loeb, and J. Herr. 2001. *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania*.

²Ibid 2

data set was used for calibrating Chartiers Creek at Carnegie. Once again the simulated results accurately reflected the trends seen in the observed data. The model under-predicted the highest 50 to 80% of flows while over predicting the highest 90 to 95% of flows.

WARMF simulates a wide range of water quality parameters. Water quality calibration was run for eight stations within the watershed. The sporadic sampling location makes it more difficult to determine if the model is truly reflecting observed conditions, since most conditions are never observed. However, the calibration did follow the trends seen in the data for dissolved oxygen, pH, alkalinity, nutrients, and chlorides. For a more detailed account of the calibration process, please see *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania*, Chen 2001.

WARMF calculates the daily loadings of point and nonpoint source pollutants.³ The loading assessment of Chartiers Creek was based on a simulation from 1993 to 1996.⁴ For a more detailed account of the allocation process, please see *Adaptation of WARMF to Calculate TMDL for Chartiers Creek Watershed in Pennsylvania*, Chen 2001.

IV. Discussions of Regulatory Requirements

EPA finds that PADEP has provided sufficient information to meet the eight basic requirements for establishing Metals TMDLs on Campbells Run, Robinson Run, Millers Run, Half Crown Run, Little Chartiers Creek and Chartiers Run. Pennsylvania has not provided enough information to meet the eight basic requirements for establishing a Metals TMDL on Chartiers Creek. The State failed to develop wasteload allocations for point sources discharging to the Chartiers Creek segment. EPA is, therefore, not approving the TMDLs for metals on Chartiers Creek.

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, including designated uses, criteria necessary to protect those uses, and antidegradation provisions that prevent the degradation of water quality. All of the stream segments evaluated in the Chartiers Creek Watershed have been designated by Pennsylvania as warm water fishes with criteria protecting the aquatic life uses. The designations for these stream segments can be found at Pennsylvania Code Title 25 § 93.9. To protect the designated uses, as well as the existing uses, the water quality criteria shown in Table 3 apply to all evaluated segments. The table includes the instream numeric criterion for each parameter and any associated specifications.

Table 3. Applicable Water Quality Criteria

³Ibid 2

⁴Ibid 2

Parameter	Criterion Value (mg/l)	Duration	Total Recoverable/ Dissolved
Aluminum (Al)	0.75	Maximum	Total Recoverable
Iron (Fe)	1.5 0.3	30-day Average Maximum	Total Recoverable Dissolved
Manganese (Mn)	1.0	Maximum	Total Recoverable
pH (units)	6.0 - 9.0	Inclusive	N/A
Sulfate (SO ₄)	250*	Maximum	N/A

*Applicable at potable water supply

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

Although segments are listed for other “inorganics” *i.e.*, sulfate, PADEP recently modified Pennsylvania Code Title 25 § 96.3 to include a new Subsection (d) to limit the application of the sulfate criterion to the intake point of all existing or planned surface potable water supply. North Branch Robinson Run is the only segment listed for “other inorganics.” There are no potable water supply intakes downstream of North Branch Robinson Run within the Chartiers Creek Watershed. Chartiers Creek discharges to the Ohio River downstream of the Allegheny and Monongahela Rivers, therefore, it may be assumed that sulfates in North Branch Robinson Run have no impact on any potable water supply on the Ohio River.

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

A. Wasteload Allocations (WLAs)

Pennsylvania’s report indicates that there are two known point source discharges of metals in the watershed. Therefore, a WLA has been developed for these facilities. The WARMF model does not explicitly simulate contributions from individual precipitation-driven sources in the watershed, *e.g.*, Eighty-Four Mine. The Eighty-Four Mine’s (PA0213608) loads were estimated based on available information on the facility.⁵ Since discharges from permitted mining facilities are directly related to hydrologic processes, it was felt that their discharge would closely follow the simulated flow patterns within the receiving stream. The Eighty-Four Mine’s discharge was an estimated percent of the stream flow based on the relative area of the mine to the drainage area. This assumption was used to determine the WLA for aluminum, iron, and manganese. The Allegheny Ludlum (PA0000273) facility’s discharge is not precipitation driven and the WLA was developed based on its discharge monitoring record from 1996 through 1999. Federal regulations require that subsequent to TMDL development and approval, point sources permitted effluent limitations be water quality-based.⁶ In addition, PA Code Title 25,

⁵Tetra Tech. 2003. *Total Maximum Daily Load for the Chartiers Watershed Pennsylvania.*

⁶It 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.

Chapter 96, Section 96.4(d) requires that WLAs shall serve as the basis for determination of permit limits for point source discharges regulated under Chapter 92 (relating to NPDES permitting, monitoring and compliance).

There are two additional point sources discharging in the watershed. These facilities are CONSOL Coal’s AMD treatment facilities discharging to Chartiers Creek. The TMDL Report does not contain TMDLs for the treatment facilities. Therefore, EPA is not approving the metal TMDLs for Chartiers Creek. ***EPA regulations require that an approvable TMDL include individual Wasteload Allocations (WLAs) for each point source (40 CFR 122.44(d)(1)(vii)(B)).*** Table 4 presents the WLAs for the facilities that were addressed in the TMDL report.

Table 4. WLA for Selected Facilities in the Watershed

Facility Name	Permit Number	Pollutant	WLA (lbs/yr)	WLA (lbs/day)
Eighty-Four Mining Co.	PA0213608	Aluminum	2,766	7.6
Eighty-Four Mining Co.	PA0213608	Iron	4,517	12.3
Eighty-Four Mining Co.	PA0213608	Manganese	2,994	8.2
Allegheny Ludlum	PA0000273	Iron	64	0.2

B. Load Allocations (LAs)

For purposes of these TMDLs only, point sources are identified as permitted discharge points and nonpoint sources are identified as other discharges from abandoned mine lands which include tunnel discharges, seeps (although none were specifically identified), and surface runoff. Abandoned and reclaimed mine lands are treated in the allocations as nonpoint sources because there are no NPDES permits associated with these areas. As such, the discharges associated with these landuses were assigned LAs (as opposed to WLAs). The decision to assign LAs to abandoned and reclaimed mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these landuses. EPA is not determining that these discharges are exempt from NPDES permitting requirements. As stated above, there are four permitted dischargers in the watershed, two of which have been provided with WLA.

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 this TMDL apply at all flow conditions. The TMDL was based on observed data over a six-year period of time. The simulation therefore considered all flows and loads encountered during this period of time.

5. *The TMDLs consider seasonal environmental variations.*

The WARMF model was developed based on simulated data over an extended period of time that captured different seasonal loads and weather conditions. The model was developed to attain standards during the high flow conditions encountered during early spring and the drought conditions expected in early fall and all other conditions encountered during the year.

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 explicit MOS by allocating five percent of the TMDL load toward the MOS.

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

The *Recommendations* section highlights what can be done in the watershed to eliminate and/or treat pollutant sources. Two primary programs that provide reasonable assurance for maintenance and improvement of water quality in the watershed are PA's Growing Greener Grants and EPA's 319 funding. Several projects are being undertaken within the watershed to address the AMD issues occurring in the watershed. The Scott Conservancy has been awarded several EPA grants to reduce AMD in Scrubgrass Run and installed a passive treatment system and a Maelstrom Oxidizer. These abatement technologies have reduced the iron load to the stream by over 50%.

PADEP's efforts to reclaim abandoned mine lands, coupled with its duties and responsibilities for issuing NPDES permits will be critical in improving water quality in the Chartiers Creek Watershed.

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

PADEP public noticed the draft TMDLs in the *Pennsylvania Bulletin* on December 16, 2001. A public meeting with watershed residents to discuss the final TMDLs was held on January 15, 2003, at the Chartiers Valley High School in Bridgeville, PA. PADEP held four previous public meetings in the watershed to present the WARMF program and to request data and to present preliminary TMDLs and allocations. Only EPA commented on the draft TMDL Report during the public comment period.

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

Attachment A

Watershed Maps



