

**Plan of Special Study and Task Activity Report  
Official Act 537 Sewage Facility Plan Update  
Monessen Equalization Tank**

**Serving**

**City of Monessen, Westmoreland County**

Prepared For  
Mon Valley Sewage Authority

September 2021



THIS PAGE INTENTIONALLY LEFT BLANK

**Plan of Study and Task Activity Report**  
**Act 537 Sewage Facility Plan**  
**Monessen Equalization Tanks**  
**(Revision No. 00)**

**TABLE OF CONTENTS**

**1.0 Previous Wastewater Planning..... 9**

1.1 Updates to Act 537 Plan.....9

    1.1.1 Phase 1..... 10

    1.1.2 Phase II..... 10

    1.1.3 Phase III..... 10

**2.0 Physical and Demographic Analysis..... 13**

2.1 Introduction..... 13

2.2 Planning Area..... 13

2.3 Physical Characteristics..... 13

2.4 Soils..... 15

2.5 Geologic Features..... 15

2.6 Potable Water Supplies..... 15

2.7 Wetlands..... 15

**3.0 Existing Sewage Facilities..... 16**

3.1 Narrative..... 16

3.2 System Improvements..... 17

    3.2.1 Combined Sewer Overflow (CSO) Long Term Control Plan..... 17

    3.2.2 Disinfection Upgrade.....;..... 18

    3.2.3 Replacement of Pump Station Comminutor With Mechanical Bar Screens..... 18

    3.2.4 Blower Improvements Project..... 18

3.3 Operation and Maintenance..... 18

3.4 Biosolids and Sludge Disposal..... 19

**4.0 Future Growth and Development..... 20**

**5.0 Alternatives to Provide New or Improved Wastewater Disposal Facilities..... 21**

5.1 Conventional Collection, Conveyance, Treatment and Discharge Alternatives..... 21

5.2 Operations and Maintenance Updates..... 22

5.3 No-Action Alternative..... 22

    5.3.1 Water Quality/Public Health..... 22

    5.3.2 Growth Potential..... 22

5.3.3 Community Economic Conditions..... 22

5.3.4 Recreational Opportunities..... 23

5.3.5 Drinking Water Sources..... 23

5.3.6 Other Environmental Concerns.....23

**6.0 Evaluation of Alternatives..... 24**

6.1 Consistency Analysis..... 24

6.1.1 Municipal Wasteload Management Plans.....24

6.1.2 Comprehensive Plans..... 24

6.1.3 Chapter 93, 95, and 102 Antidegradation Requirements..... 24

6.1.4 Prime Agricultural Land Policy..... 25

6.1.5 County Stormwater Management Plans..... 25

6.1.6 Wetlands..... 25

6.1.7 Pennsylvania Natural Diversity Inventory..... 25

6.1.8 Historical and Archeological Resource Protection..... 25

6.2 Resolution of Inconsistencies..... 26

6.3 Water Quality Standards, Effluent Limitation and Other Technical, Legislative or Legal Requirements  
26

6.4 Cost Estimates for the Alternatives.....26

6.5 Funding Methods..... 27

6.5.1 Funding Sources Available.....27

6.6 Cost-Effectiveness of Funding Options..... 29

6.7 Evaluate Administrative Organization and Legal Authority for Plan Implementation..... 30

**7.0 Institutional Evaluation..... 31**

7.1 Existing Wastewater Authorities..... 31

7.1.1 Financial and Debt Status.....31

7.1.2 Available Staff and Administrative Resources..... 31

7.1.3 Existing Authority Responsibilities..... 31

7.2 Institutional Alternatives Necessary to Implement Plan..... 32

7.2.1 Functions of Existing and Proposed Organizations..... 32

7.3 Administrative and Legal Activities Necessary to Implement Plan..... 32

7.3.1 Development of All Required Ordinances, Regulations, Standards and Inter-Municipal  
Agreement.....32

7.3.2 Timeline for Administrative and Legal Activities..... 32

7.4 Proposed Institutional Alternative for Implementing the Chosen Technical Wastewater Disposal  
Alternative..... 32

**8.0 Implementation Schedule and Justification..... 33**

8.1 Selected Wastewater Disposal Alternative..... 33

8.1.1 Existing Wastewater Disposal Needs..... 33

8.1.2 Future Wastewater Disposal Needs..... 33

8.1.3 Operation and Maintenance Considerations..... 33

8.1.4 Cost Effectiveness..... 34

8.1.5 Available Management and Administrative Systems..... 34

8.1.6 Available Financing Method..... 34

8.1.7 Environmental Soundness and Compliance with Natural Resource Planning and Preservation Programs..... 34

8.2 Selected Capital Financing Plan..... 34

8.3 Implementation..... 34

**9.0 Environmental Report.....36**

**LIST OF EXHIBITS**

Exhibit 2-1: Monessen Equalization Tank Project Area..... 14

Exhibit 3-1: Process Flow Diagram..... 16

**LIST OF TABLES**

Table 1-1: Preliminary Project Schedule.....8

Table 6-1 Equalization Facility Opinion of Probable Cost.....26

**LIST OF APPENDICES**

Appendix A. Planning Area Location Map

Appendix B. Act 537 Plan Content and Environmental Assessment Checklist

Appendix C. 2020 Annual Report

Appendix D. City of Monessen Grand Boulevard Equalization Facility

Appendix E. Preliminary Design and Opinion of Probable Construction Costs

Appendix F. Soils Map

Appendix G. WetLands Map

Appendix H. Biosolids Permit

Appendix I. PNDI Results

Appendix J. Pennsylvania Historical and Museum Commission Response Letter

Appendix K. Equalization Tank Project Intergovernmental Cooperation Agreement

Appendix L. Resolutions

Appendix M. Planning Commission and City Notification and Response Letters

Appendix N. Proof of Publication

Appendix O. Public Comment and Responses

**LIST OF ACRONYMS**

AWWA	American Water Works Association
BHP	Bureau of Historic Protection
CSO	Combined Sewer Overflow
CSOP	Combined Sewer Overflow Policy
CSS	Combined Sewer System
CWA	Clean Water Act
DCED	Department of Community and Economic Development
PaDEP	Pennsylvania Department of Environmental Protection
EDU	Equivalent Dwelling Unit
EI	Elevation
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
gpm	gallons per minute
LSA	Local Share Account
LTCP	Long Term Control Plan
LxF	Lowell-Culleoka complex
MG	Million Gallon
MGD	Million Gallons per Day
MVSA	Mon Valley Sewage Authority
NPDES	National Pollutant Discharge Elimination System
PA	Pennsylvania
PENNVEST	Pennsylvania Infrastructure Investment Authority
PHMC	Pennsylvania Historical and Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory
RUS	Rural Utility Service
SSO	Sanitary Sewer Overflow
SSS	Sanitary Sewer System
SWD	Side Water depth
WWTP	Wastewater Treatment Plant

---

## Plan Summary

### Introduction

The Pennsylvania Sewage Facilities Act (Act 537) requires that every municipality within the Commonwealth develop and maintain an up-to-date sewage facilities plan. This Plan was required by the Pennsylvania Department of Environmental Protection (PaDEP) upon submission of the Water Quality Management Permit for Phase III of the Mon Valley Sewage Authority's (MVSA, or Authority) Long Term Control Plan (LTCP). This Plan shall modify the previous Act 537 Plan update dated 2014.

The Mon Valley Sewage Authority (Authority) sewerage system was constructed in 1968-70 to intercept and treat wastewater from the Combined Sewer Systems (CSS) owned and operated by the City of Monessen (Monessen), in Westmoreland County, and the Borough of Donora (Donora), in Washington County. In the mid-1970s, part of the Separate Sanitary Sewer System (SSS) owned and operated by the Carroll Township Authority (Carroll Authority), Washington County, was connected to the Authority system. Following implementation of Phases I and II of the LTCP, the Authority's system consists of eight (8) CSOs, 27,000 linear feet of gravity sewer, 7 sewage pumping stations, 19,000 linear feet of force main, and a 4.96 MGD wastewater treatment plant (WWTP), a 3.0 MG equalization tank and a 44 MGD satellite treatment facility. Monessen, Donora, and Carroll Authority currently maintain their own individual sewage collection systems. The construction of these collection systems, except for the Carroll Township Authority system, predates the inception of the Authority with much of the sewer systems dating to the early 1900's. Both systems were constructed as combined sewer systems (CSS).

The Monessen and Donora collection systems reportedly do not experience overflows within their respective systems. Therefore, the City of Monessen and the Borough of Donora are not required to obtain NPDES Permits (PA CSO General Permit PAG-6). Because the Authority owns and operates CSOs along the main interceptor, it is obligated to meet the requirements of the Combined Sewer Overflow Policy (CSOP) first adopted by the United States Environmental Protection Agency (EPA) in 1994.

These CSO structures are located along the Monongahela River and are designed to activate when hydraulic conditions in the CSS exceed 350% of the average dry weather flow. These conditions occur only during wet weather events when these overflows discharge dilute sewage to the Monongahela River. **Appendix A** includes overall maps of the Authority's system and the proposed LTCP facilities.

CSO policy requires that entities minimize the impact of their CSO discharges by reducing overflows to four (4) to six (6) times a year or capture of 85% of the combined sewage that enters your system during precipitation events on an annual average basis. PaDEP approved the Authority's CSO LTCP on April 30, 2008. The Plan outlined three phases to be implemented over a 12-year period with a 2007 project cost of \$33.5 million. Phase I consisted of two (2) stream separations, interceptor upgrades, five (5) pump station upgrades and an equalization facility with a total estimated project cost of approximately \$6 million. During Phase II of the LTCP, it was determined that the area of the Monongahela River where

CSO 007 discharges is considered an environmentally sensitive area requiring 100% primary treatment for discharges out of CSO 007 and increasing the proposed size of the Seneca Street CSO Satellite Treatment Facility from 4 MGD to 44 MGD. Additional improvements were incorporated into Phases I and II, include elimination of CSO 005. These improvements increased the percent capture achieved following completion of Phase II from the proposed value of 79.49% to an actual value of 83.54%.

Based on additional improvements incorporated into Phases I and II, implementation of Phase III of the LTCP without modification would produce a system-wide percent capture of 90.51%. This level of percent capture exceeds both the minimum percent capture required by the Clean Water Act (85%) and the percent capture to be achieved by the original approved LTCP (86.45%). During preliminary design of the Phase III facilities the Authority evaluated alternatives to provide the required 85% using various treatment and storage technologies to reduce projected costs. As a result of preliminary evaluation Phase III is proposed to include the construction of a 2 MG equalization tank for CSO 011/0110 as a proposed improvement to be implemented as part of the revised version of Phase III of the LTCP.

With the PaDEP's approval, MVSA revised Phase III of the LTCP, limiting its scope to the construction of a 2 MG equalization tank for CSO 011 in Donora and forgoing construction of solids and floatable removing screens at the remaining CSOs. Construction of this equalization tank is expected to produce a system-wide percent capture of 85.55%, exceeding the 85% percent capture required by the CSOP. A separate Act 537 Plan Update / Special Study will be submitted for the Donora equalization tank.

At the time the Authority's LTCP was prepared and approved by PaDEP, the associated stakeholders believed that the entire collection system within the City was permitted as a combined sewer system. After approval of the LTCP, the City and PaDEP identified approximately five overflows occurring within the Grand Boulevard sewershed. PaDEP determined that the Grand Boulevard area was permitted and constructed as a separate sanitary system and deemed these overflows as illegal sanitary sewer overflows (SSOs) that required elimination.

PaDEP has indicated that 100% of the sanitary sewage from the Grand Boulevard collection system must receive full biological treatment at the Authority's WWTP. The flow from the Grand Boulevard area identified for full biological treatment is required to be conveyed via the Authority's main interceptor to the Monessen Pump Station and across the river to the WWTP. Flow monitoring data collected from the entire CSO 007 drainage area (Seneca Street/Parente Boulevard) demonstrated an average dry weather flow rate of approximately 0.343 MGD and a contributing flow portion from the Grand Boulevard area of 0.179 MGD. Therefore, the LTCP anticipated 0.63 MGD (350% of 0.179 MGD) to be conveyed to the Authority WWTP from the Grand Boulevard drainage area. Subsequent flow monitoring of the Grand Boulevard area conducted in 2012 to 2013 recorded flow rates more than double the flow rate accounted for in the design of the Seneca Street Trunk Sewer constructed during Phase I of the LTCP. The observed flow rates appear to cause surcharging for portions of the Seneca Street Trunk Sewer.

The proposed Monessen Equalization Tank is intended to meet the PaDEP requirement to capture and provide biological treatment for 100% of the sanitary sewage from the Grand Boulevard collection system by storing the volume resulting from this additional flow rate. PaDEP has requested that the Authority update the sewage facilities Act 537 plan to account for the proposed facilities. This plan has been developed to satisfy that requirement. The total cost for construction of the Monessen Equalization Tank is anticipated to be approximately \$4,000,000. The Authority has obtained a bond for this amount for the construction of the Monessen Equalization Tank.

Included in this Plan is the financing recommendation to secure bond issues for the implementation of the Monessen Equalization Tank. This funding method is consistent with the recommended financing alternative for previous projects, including the LTCP. The Authority has agreed to finance the project for the City of Monessen, with the understanding that the bond will be repaid using a portion of the line service fee that the Authority collects from Monessen customers on behalf of the City. The project is not anticipated to cause an increase in the sewage fees charged by the Authority, though the City has committed \$5.00 from the line service fees collected by the Authority on behalf of the City for the repayment of the bond.

This Plan provides information on how these proposed facilities are consistent with the requirements of the Pennsylvania Sewage Facilities Act 537. The proposed facilities were reviewed for consistency using the Act 537 Plan Content and Environmental Assessment Checklist, and a copy of the completed checklist is included in **Appendix B**. The institutional arrangements necessary for implementation of this Plan already exist, and the Authority currently operates similar facilities as those proposed. As with the previous Authority projects implemented under the LTCP, the Authority will be responsible for designing, permitting and financing for the Monessen Equalization Tank. Additional information on the operation and maintenance of the Authority system as well as descriptions of system improvements conducted by the Authority are provided in the 2020 Annual Report, included as **Appendix C**.

## Project Schedule

**Table 1-1** displays an overall schedule of the proposed project.

<b>Table 1-1: Preliminary Project Schedule</b>	
<b>Task</b>	<b>Target Completion Date</b>
Start Act 537 Plan	March 2021
Close on Bond Issue	Completed April 2021
Submit Task Activity Report to PaDEP for approval	Completed April 2021
Submit Draft Act 537 Plan to Planning Agencies, MVSA and Municipalities	June 2021
Comments Received on Act 537 Plan	July 2021
Finalize Act 537 Plan and Publish for Public Comment	September 2021
Adopt Final Act 537 Plan by Resolution (MVSA and City of Monessen)	October 2021
Start Design	October 2021
Complete Design and Submit Permits	July 2022
Receive Permits	October 2022
Open Bids	November 2022
Award	December 2022
Start Construction	January 2023
Complete Construction	December 2023

## 1.0 PREVIOUS WASTEWATER PLANNING

The Authority's system consists of four (4) sewage regulators and six (6) diversion manholes, 27,000 linear feet of gravity sewer, 7 sewage pumping stations, 19,000 linear feet of force main, and a 4.96 MGD wastewater treatment plant (WWTP), a 3.0 MG equalization tank and a 44 MGD satellite treatment facility. Monessen, Donora, and Carroll Township currently maintain their own individual sewage collection systems. The construction of these collection systems, except for the Carroll Township system, predates the inception of the Authority, with much of the sewer system dating to the early 1900's. Both networks were constructed as combined sewer systems. The NPDES Permit issued on October 2, 2002 approved re-rating of the WWTP from 3.66 MGD to 4.96 MGD.

The Monessen and Donora collection systems do not experience overflows within their respective systems. Therefore, the City of Monessen and the Borough of Donora are not required to obtain NPDES Permits (PA CSO General Permit PAG-6). Because the Authority owns and operates the CSOs along the main interceptor, it is obligated to meet the requirements of the CSOP first adopted by the United States EPA in 1994.

In August 1995, the PaDEP issued an NPDES Permit for the Authority sewerage system. The Authority's NPDES Permit No. PA0026158 allows for the discharge from seventeen (17) CSOs. Through implementation of Phases I and II of the LTCP nine (9) CSOs have been eliminated and eight (8) remain. These CSO structures are located along the Monongahela River and are designed to activate when hydraulic conditions in the CSS exceed 350% of the average dry weather flow. These conditions occur only during wet weather events when these overflows discharge dilute raw sewage to the Monongahela River.

### 1.1 UPDATES TO ACT 537 PLAN

Wade Trim provides consulting engineering services on an ongoing basis to help the Authority properly own and operate their system and remain in compliance with their NPDES permit and EPA's National CSO Policy. CSO policy requires that entities minimize the impact of their CSO discharges by reducing overflows to four (4) to six (6) times a year or capture of 85% of the combined sewage that enters the system during precipitation events on an annual average basis. All entities are required to develop a CSO LTCP which outlines how the above goal will be achieved. The Authority has been working towards this goal starting with submittal of the CSO Plan of Action in 1996 which contained the "Proposed Approach to the Long Term Control Plan." A finalized version of the LTCP was submitted to PaDEP in September 2007, and over the last 14 years since its submittal the Authority has consistently and proactively collected the data needed to outline a capitially intensive program.

PaDEP approved the Authority's CSO LTCP on April 30, 2008. The Plan outlined three phases to be implemented over a 12-year period with a 2007 project cost of \$33.5 million. The implementation of all

three (3) phases will bring the Authority into compliance with EPA's National CSO Policy by eliminating or minimizing the impacts of 17 CSOs located throughout their service area.

### 1.1.1 Phase I

Phase I consisted of two (2) stream separations, interceptor upgrades, five (5) pump station upgrades and an equalization facility with a total estimated project cost of approximately \$6 million. Engineering and construction management fees exceeded \$1 million over the four (4) years required to design, permit, bid and construct the facilities outlined in Phase I of the project. Construction of projects associated with Phase I of the LTCP was completed in 2014.

### 1.1.2 Phase II

In 2014, the Authority submitted an Act 537 Plan Special Study which described the alternatives evaluation and ultimate recommendation for the implementation of Phases II and III of the LTCP. The 2014 Act 537 Plan Special Study was required by the PaDEP upon submission of the Water Quality Management Part II Permit application for Phase II of the LTCP.

During design of the facilities for Phase II, it was determined that the area of the Monongahela River where CSO 007 discharges is considered an environmentally sensitive area. As a result, PaDEP required 100% primary treatment for discharges out of CSO 007. This effectively increased the required percent capture at CSO 007 from the proposed value of 85% to 100%. Based on this requirement, the proposed size of the Seneca Street CSO Satellite Treatment Facility was increased from 4 MGD to 44 MGD. Additional improvements that were incorporated into Phase II, including increasing the size of the Seneca Street CSO Satellite Treatment Facility and elimination of CSO 005, have increased the percent capture achieved following completion of Phase II from the proposed value of 79.49% to an actual value of 83.54%. Construction of projects associated with Phase I of the LTCP was completed in 2019.

### 1.1.3 Phase III

Based on additional improvements incorporated into Phases I and II, implementation of Phase III of the LTCP without modification would produce a system-wide percent capture of 90.51%. This level of percent capture exceeds both the minimum percent capture required by the Clean Water Act (85%) and the percent capture to be achieved by the original approved LTCP (86.45%). During preliminary design of the Phase III facilities, the Authority evaluated alternatives to provide the required 85% capture using various treatment and storage technologies to reduce the original projected costs. This alternatives evaluation was used to select a cost-effective method for achieving compliance with the CWA.

With the PaDEP's approval, MVSA revised Phase III of the LTCP to include construction of a 2 MG equalization tank for CSO Oil (Alternative 2A) and forgoing construction of solids and floatable removing screens at the remaining CSOs. Construction of this equalization tank is expected to produce a system-wide percent capture of 85.55%, exceeding the 85% percent capture required by the CWA.

The Authority has authorized Wade Trim to complete a separate Act 537 Plan Special Study of design alternatives for the Donora Equalization Tank as part of Phase III of its CSO LTCP. At the time the Authority's LTCP was prepared and approved by PaDEP, the associated stakeholders believed that the entire collection system within the City was permitted as a combined sewer system. After approval of the LTCP, the City and PaDEP identified approximately five overflows occurring within the Grand Boulevard sewer shed. PaDEP determined that the Grand Boulevard area was permitted and constructed as a separate sanitary system and deemed these overflows as illegal sanitary sewer overflows (SSOs) that required elimination.

Previous conversations have taken place with PaDEP and the City regarding the Authority's Seneca Street Trunk Sewer capacity to handle the City's Grand Boulevard sanitary sewer flows. The Authority's Seneca Street Trunk Sewer was increased in size from what was approved in the Authority's LTCP as a sewer ranging from 15" to 24" to a sewer ranging from 24" to 42" in diameter. The Seneca Street Trunk Sewer provides the necessary capacity to convey the dry weather flow from the Grand Boulevard area down to the bottom of Parente Boulevard where the diversion structure (CSO 007) and the recently constructed Seneca Street CSO Satellite Treatment Facility are located. Flow is then conveyed to the Authority's Monessen Interceptor that runs parallel to the Monongahela River and onto the WWTP.

PaDEP has indicated that 100% of the sanitary sewage from the Grand Boulevard collection system must receive full biological treatment at the Authority's WWTP. The flow from the Grand Boulevard area identified for full biological treatment is required to be conveyed via the Authority's main interceptor to the Monessen Pump Station and across the river to the WWTP.

Preparation of the Authority's LTCP started in the year 2000 with flow monitoring data collected from 2003 until present. The period of flow monitoring data used to develop the LTCP extended from September 2004 to August 2005. The dry weather flow from the entire CSO 007 (Seneca Street/Parente Boulevard) drainage area was documented as approximately 0.343 MGD with the portion from the Grand Boulevard area recorded as 0.179 MGD. Therefore, the LTCP anticipated approximately 0.63 MGD (350% of 0.179 MGD) to be conveyed to the Authority WWTP from the Grand Boulevard drainage area.

Following completion of Phase I of the City's Grand Boulevard project, a flow meter was installed in the connection manhole between the City and Authority's facilities. This meter collected data from April 2012 through September 2013. The meter was reinstalled from September 2015 through November 2015. Results of this monitoring showed that the flow rates recorded from the Grand Boulevard collection system are more than double the flow rate accounted for in the design of the Seneca Street Trunk Sewer constructed during Phase I of the Authority's LTCP, causing surcharging in portions of the Seneca Street Trunk Sewer.

The proposed Monessen Equalization Tank is intended to meet the PaDEP requirement to capture and provide biological treatment for 100% of the sanitary sewage from the Grand Boulevard collection

system by storing the volume resulting from this additional flow rate. PaDEP has requested that the Authority update the sewage facilities Act 537 plan to account for the proposed facilities. This plan has been developed to satisfy that requirement.

---

## 2.0 PHYSICAL AND DEMOGRAPHIC ANALYSIS

### 2.1 INTRODUCTION

This report is a special study focused on the construction of wet weather facilities discussed in a preliminary evaluation report titled *City of Monessen Grand Boulevard Equalization Facility*, prepared by Wade Trim, dated January 2017 and previously provided to PaDEP. A copy of this report is included as **Appendix D**. This report outlined preliminary sizing for a proposed equalization tank in Monessen to satisfy the PaDEP requirement to capture and provide biological treatment for 100% of the sanitary sewage from the Grand Boulevard collection system. An additional report prepared by Wade Trim in September 2017 titled *City of Monessen Grand Boulevard Equalization Facility Preliminary Design and Opinion of Probable Construction Costs* provided alternative site and facility type analysis and recommendations, including anticipated costs. A copy of this report is included as **Appendix E**.

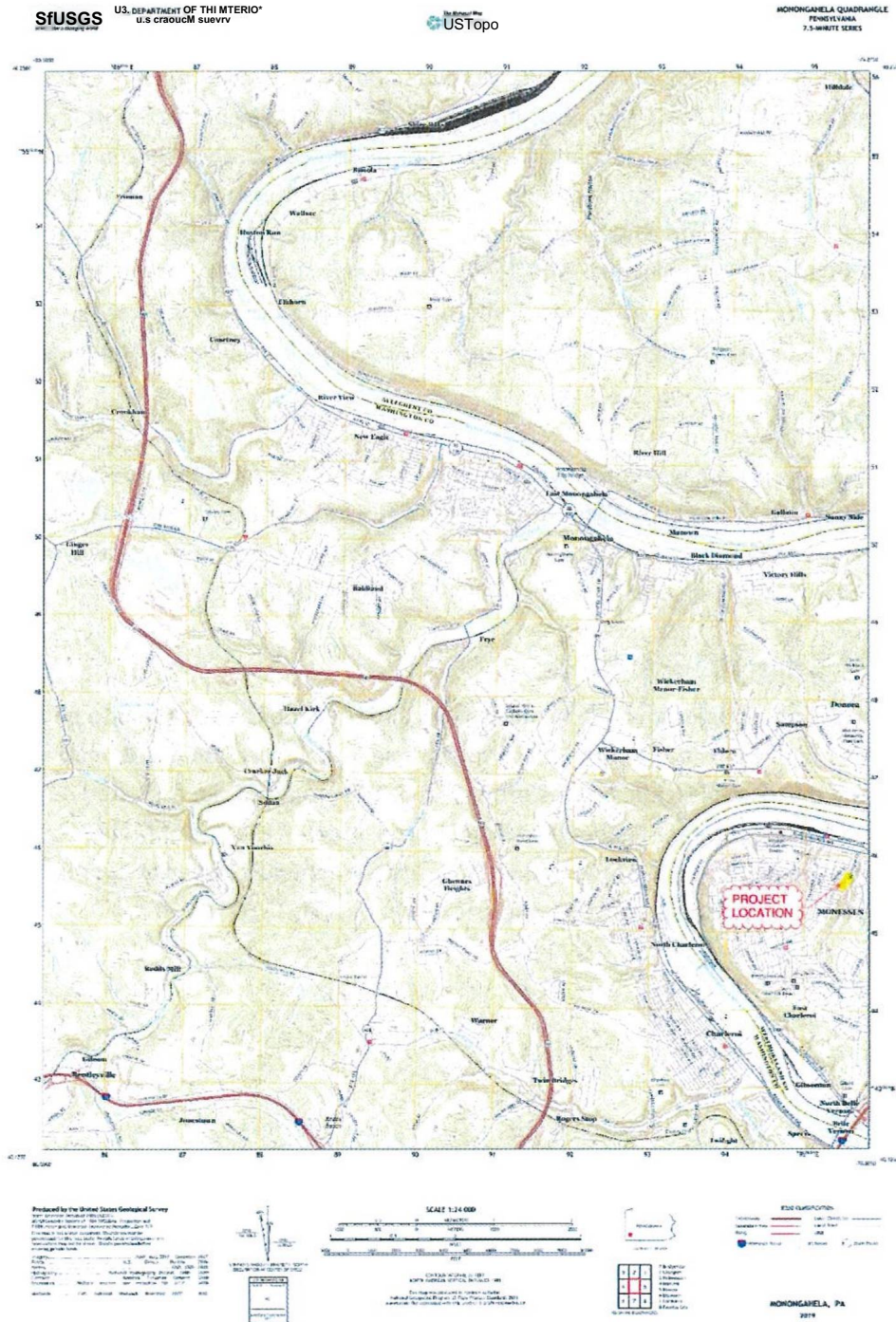
### 2.2 PLANNING AREA

The Authority sewerage system was constructed in 1968-70 to intercept and treat wastewater from the CSS owned and operated by the City of Monessen, in Westmoreland County, and the Borough of Donora, in Washington County. In the mid-1970s, part of the SSS owned and operated by the Carroll Township Authority, Washington County, was connected to the Authority's system.

### 2.3 PHYSICAL CHARACTERISTICS

The project location and planning area are in the Monongahela River basin and drain to both the Monongahela River and Unnamed Tributaries to the Monongahela River. **Exhibit 2-1** includes a USGS quad map showing the general location of the project area. The proposed site is located near the intersection of Parente Boulevard / Seneca Street and Huron Street in the City of Monessen, Pennsylvania as shown on **Exhibit 2-2** in **Appendix A**. The site is generally sloped at approximately 7 to 10% with existing contours ranging from approximate Elevations (Els.) 764 to 760 ft.

Exhibit 2-1: Monessen Equalization Tank Project Area



## 2.4 SOILS

All soils in the project area are classified as Lowell-Culleoka complex, LxF, with slopes of 25 to 80 percent and very rocky. These soils are well drained with moderately low to moderately high permeability, high available water capacity, and rapid runoff. Limited by the slopes and rapid runoff. The project area is relatively flat due to previous development. A copy of the soil map is in **Appendix F**.

## 2.5 GEOLOGIC FEATURES

According to the Pennsylvania Department of Conservation and Natural Resources' Physiographic Provinces of Pennsylvania map, the site is in the Waynesburg Hills Section of the Appalachian Plateaus Province. The Waynesburg Hills Section is characterized as very hilly with narrow hilltops and steep-sloped, narrow valleys. The Greater Pittsburgh Region Geologic Map, compiled by W.R. Wagner, J.L. Craft, L. Heyman and J.A. Harper and dated 1975, shows the majority of the plan area located in the Monongahela Group Formation. The formation includes cyclic sequences of shale, limestone, sandstone and coal and contains Pittsburgh coal bed at the base. Water quality is affected by calcium bicarbonate content. Dissolved solids range from 272 to 610 mg/l and iron ranges from 0.08 to 35 mg/l. No surface water features were observed on the site. Based on the topographic gradient near the site, shallow groundwater is anticipated to flow towards the Monongahela River to the north.

## 2.6 POTABLE WATER SUPPLIES

The nearest public potable water supply intake on the Monongahela River is operated by the Authority of the Borough of Charleroi and is located approximately 3.8 miles upstream of the project location.

## 2.7 WETLANDS

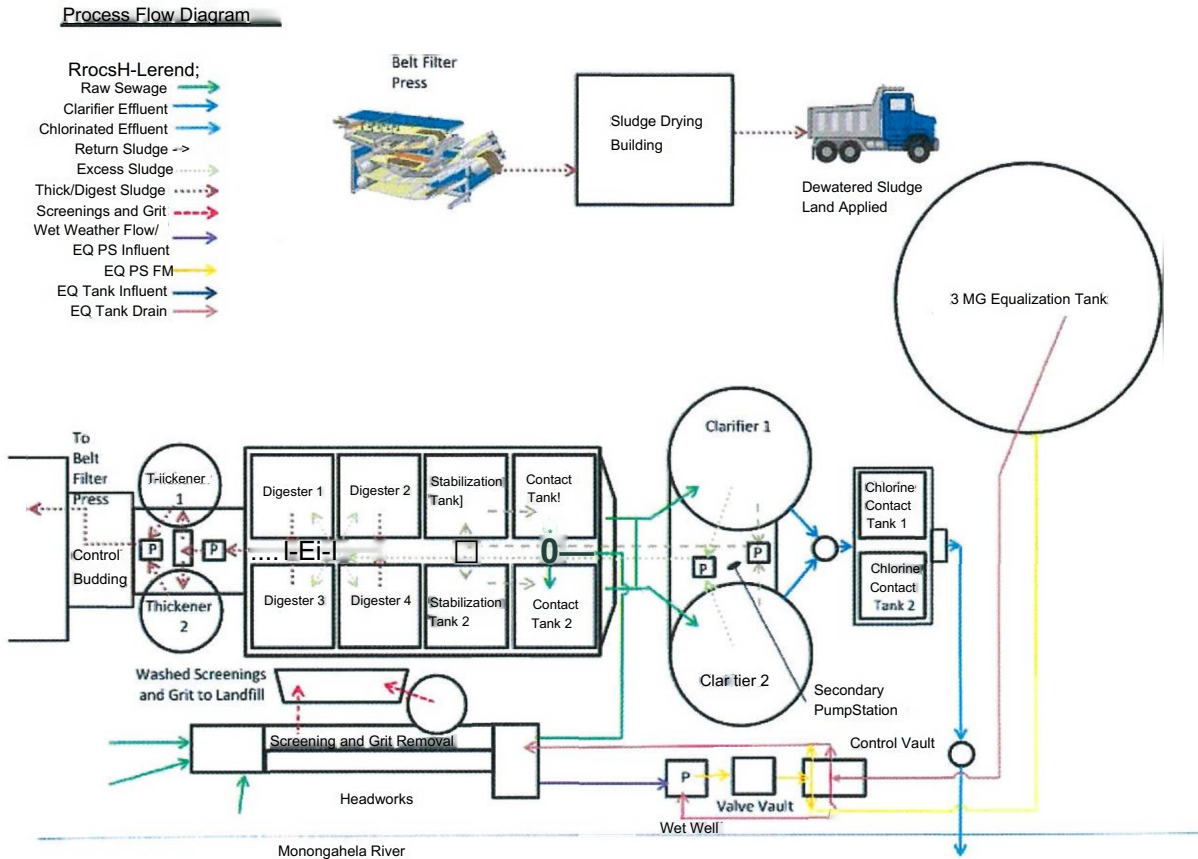
Based on the National Wetlands Inventory Maps, there are no wetlands shown in the areas of the proposed facilities for the project area. Two riverine wetlands are identified, which are culverted streams in the area. Appropriate stream crossing permits will be obtained for the project. A copy of the wetland maps is also located in **Appendix G**.

### 3.0 EXISTING SEWAGE FACILITIES

#### 3.1 NARRATIVE

The Authority's system consists of four (4) sewage regulators and six (6) diversion manholes, 16,900 linear feet of intercepting sewer, seven (7) sewage pumping stations, 11,500 linear feet of force main, and a 4.96 MGD WWTP. Monessen, Donora, and Carroll Township Authority currently maintain their own individual sewage collection systems. The construction of these collection systems, except for the Carroll Township Authority system, predates the inception of the Authority with much of the sewer system dating to the early 1900's. Each of these systems was constructed as a combined sewer system. The NPDES Permit issued on October 2, 2002 approved re-rating of the WWTP from 3.66 MGD to 4.96 MGD. **Exhibit 3-1** displays the process flow diagram for the WWTP.

**Exhibit 3-1: Process Flow Diagram**



The Monessen and Donora collection systems do not experience overflows within their respective systems. Therefore, the City of Monessen and the Borough of Donora are not required to obtain NPDES Permits (PA CSO General Permit PAG-6). Because the Authority owns and operates the CSOs along the

main interceptor, it is obligated to meet the requirements of the National CSOP first adopted by the United States EPA in 1994.

In August 1995, the Pennsylvania Department of Environmental Protection (PaDEP) issued an NPDES Permit for the Authority sewerage system. The Authority's original NPDES Permit No. PA0026158 allows for the discharge from seventeen (17) CSOs, though through implementation of Phases I and II of the LTCP nine (9) CSOs have been eliminated and eight (8) remain. These CSO structures are located along the Monongahela River and are designed to activate when hydraulic conditions in the CSS exceed 350% of the average dry weather flow. These conditions occur only during wet weather events when these overflows discharge dilute raw sewage to the Monongahela River.

Exhibits displaying the Authorities facilities are included in **Appendix A**.

## 3.2 SYSTEM IMPROVEMENTS

The Authority has made many improvements to the system over the years, which are summarized in the 2020 Annual Report included in **Appendix C**. The following major capital additions have been completed or are in construction to maintain the Sewage Disposal System in good condition, repair and working order and to provide for improved operation.

### 3.2.1 Combined Sewer Overflow (CSO) Long Term Control Plan

The Authority submitted its CSO LTCP in 2007 outlining capital expenditures of \$33.5 million (Year 2007 dollars) over 12 years. The LTCP was approved by PaDEP on April 30, 2008, and Authority implementation is in progress. Phase I Construction Contracts 1, 2, 5, 6, 7 and 8 were completed in 2012 and Phase I Construction Contracts 3A, 3B and 4 (Equalization Tank and Headworks) were completed in 2013. Phase II design was initiated in 2012 and completed in 2013. Act 537 Planning approval was received in 2014 and the Water Quality Part II Permits for the Sewer Separation Projects and CSO Satellite Facility were issued in June of 2015 and October of 2015, respectively. Construction of the sewer separation projects started in the Fall of 2015 and were completed in 2016. Construction of the Seneca Street CSO Satellite Treatment Facility commenced in the Summer of 2016 and was completed in November 2018.

In 2020, as required by PaDEP, Wade Trim (in cooperation with Authority Management and Personnel) continued to conduct the Seneca Street CSO facility startup, commissioning, and testing services. At the conclusion of the 6-month testing period, a 3-month period of data analysis and reporting will begin. At the conclusion of this project, a technical memorandum outlining the testing period, summarizing the results, and providing any recommendations moving forward as Authority staff takes on full-time operation of the facility will be drafted. This program has been delayed due to COVID-19 pandemic.

### 3.2.2 Disinfection Upgrade

Due to the risks involved in using chlorine gas, the Authority completed final design of the 2017 WWTP Safety Improvements Project which included the replacement of chlorine gas in favor of a chlorine tablet feed system as well as installation of new safety railings around digesters and new coatings on plant walkway surfaces to reduce risk of slips. A Washington County Local Share Account (LSA) Grant Application in the amount of \$210,500 was awarded in December 2016 for partial funding of the Project. The bidding phase was completed in January 2018 with a total project bid of \$1,029,815. Construction began in Summer 2018 and was completed November 2019.

### 3.2.3 Replacement of Pump Station Comminutor With Mechanical Bar Screens

The comminutors at the pump station have reached their useful life and have become very expensive to replace upon failure. In addition, the technology has become obsolete and is not manufactured any longer. The Authority authorized their Consulting Engineer to conduct a preliminary study evaluating replacement of the comminutors with mechanical bar screens at the Donora, Donner, and Monessen Pump Stations. The opinion of probable project cost was \$643,000 for the Donora Pump Station and \$1.4 million for the Donner and Monessen Pump Stations. A Washington County LSA Grant Application in the amount of \$285,250 was submitted in October 2017 for partial funding of the Donora Pump Station Screenings Improvements Project. The Donora Pump Station Screenings Project grant was awarded, and construction started in October 2019. It was completed in July 2020.

### 3.2.4 Blower Improvements Project

The existing aeration system at the WWTP needs an upgrade due to the inefficiency of the blowers to adjust airflow in response to the varying flow and oxygen demand of the plant influent flow. The 2019 WWTP Blower Improvements Project included an upgrade to the existing aeration system to allow plant staff to vary the airflow to the aeration tanks, thereby improving the overall plant process and providing substantial energy reduction and operational cost savings. A grant in the amount of \$350,000 was awarded for this project. Construction began in October 2020.

## 3.3 OPERATION AND MAINTENANCE

The Authority General Manager, Chief Operator and eight other plant personnel (two pump station staff members, two CSO staff members, one maintenance staff member, two lab staff members, and one plant operator) have been certified by the State Board for Certification of Sewage Treatment Plant and Waterworks Operators for this type of plant, pump stations and interceptors and are fully competent to perform all the operation and maintenance activities to assure compliance with the Clean Streams Regulations. Only one plant operator is not certified at this time. The operating personnel routinely perform required maintenance, equipment lubrication and cleaning in a satisfactory manner.

A summary of the Authority's operations and maintenance responsibilities and organization is included in the Chapter 94 Wasteload Management Plan submitted annually.

---

### 3.4 BIOSOLIDS AND SLUDGE DISPOSAL

A portion of the biosolids collected by the final clarifiers is transferred to one of the four available aerobic digesters for stabilization. The digestion process produces a chocolate brown, liquid biosolids mixture. The biosolids mixture has an earthy smell and contains approximately 1.0 percent solids. The biosolids mixture is conveyed from the aerobic digesters to the belt filter presses for dewatering, producing a dewatered biosolid material that contains approximately 20% solids. Dewatered biosolids are hauled off for beneficial use (land application) in accordance with General Permit PAG-086113. This permit was authorized on February 4, 2019. A copy of the permit is included as **Appendix H**.

Samples are collected from the dewatered biosolids on a quarterly basis for analysis of physical, chemical, and biological parameters. Analysis of these samples indicates that all measured concentrations of regulated chemical pollutants are below the ceiling concentrations established by the PaDEP for beneficial use.

Aerobic digestion reduces the concentration of fecal coliform bacteria present within the biosolids, allowing them to meet the beneficial use criteria established for fecal coliforms. Biosolids samples are collected regularly as part of WWTP operations for analysis of fecal coliforms concentration. Based on data collected between September 2015 and August 2018, the average observed fecal coliforms geometric mean concentration was 665 CFU/g. The maximum observed fecal coliforms geometric mean concentration during this timeframe was 3,995 CFU/g. Each of these values is below the established ceiling concentration of 2,000,000 CFU/g.

## **4.0 FUTURE GROWTH AND DEVELOPMENT**

The City of Monessen is a built-out community with no proposed future development and no recent growth. The population of the City peaked in the 1930s at approximately 20,000 people, though has been steadily decreasing in each Census since 1930. According to 2020 Census data, the population is approximately 7,200 people.

---

## 5.0 ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

Early conceptual evaluations reviewed equalization, conveyance, and satellite treatment as potential alternatives. Conveyance and satellite treatment were eliminated from consideration due to both cost and public impacts. Several equalization alternatives were further evaluated and summarized in the *Preliminary Design and Opinion of Probable Construction Costs* included as **Appendix E**.

### 5.1 CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT AND DISCHARGE ALTERNATIVES

The Monessen Equalization Tank Sizing Report recommended that the equalization facility be located upstream of the Authority's Seneca Street Trunk Sewer Manhole S-3, adjacent to the Monessen City Garage located on Parente Boulevard near the intersection with Huron Street. The street and the trunk sewer slope downhill from south to north near the Monessen City Garage. The topography of this general area is marked by steep hillsides on the east and west sides of Parente Boulevard and by a relatively flat area immediately north of the Monessen City Garage. Most of the properties along the road in this area are privately owned, except for some of the property on which the Monessen City Garage sits and the property immediately north of this.

To fit the equalization facility options into the existing topography and properties, two different geometries were considered: round storage facilities and long rectangular storage facilities. The round storage facility would be located immediately north of the Monessen City Garage. This facility would consist of a precast concrete tank. The tank could be located aboveground or buried, either partially with an exposed roof or completely buried. The long rectangular storage facility would be located along the east side of Parente Boulevard, south of the Monessen City Garage. This facility would consist of a buried precast box culvert. The facility would be in the right-of-way or on adjacent property, depending on its dimensions. The following sections describe the developed options in further detail.

Several elements are common to each of the options, as described below:

- Diversion structure located on the trunk sewer upstream of the equalization facility. This will consist of large diameter manhole with a manually adjustable weir gate.
- New sewer line from the diversion structure to the equalization facility. For estimating purposes, the new sewer's diameter and materials will match the existing sewer where the diversion structure is located.
- Drain sewer for return flow to the trunk sewer. For estimating purposes, this drain sewer is assumed to be 8-inch based on draining a flow volume of 0.5 MG over a period of 24 hours, for a flow rate of approximately 350 gpm.
- Drain manhole for return flow to the trunk sewer.

---

## 5.2 OPERATIONS AND MAINTENANCE UPDATES

As the Authority currently operates and maintains existing infrastructure of similar equipment and technology as the proposed facilities, no updates or significant revisions to the current operation and maintenance protocols are anticipated, though the current practices will be extended to cover the constructed facilities.

## 5.3 NO-ACTION ALTERNATIVE

### 5.3.1 Water Quality/Public Health

The national CSO Control Strategy developed by the EPA recommends that all CSOs be identified and categorized according to their status of compliance with these requirements. It also set forth three objectives:

- Ensure that if CSOs occur, they are only because of wet weather.
- Bring all wet weather CSO discharge points into compliance with the technology based and water quality-based requirements of the CWA.
- Minimize the impacts of CSOs on water quality, aquatic biota, and human health.

Based on the ultimate goal of the LTCP, provisions of the CSO Control Policy, and the reality of wet weather water pollution in the receiving body, the following Water Quality Goal was established:

- To attain applicable Water Quality Standards in the Monongahela River at all times, provided all non-CSO and other upstream pollution sources are adequately controlled by others so as to allow this attainment.

If the recommended alternative is not implemented, the Authority will not meet the requirements of the CSOP and Water Quality Goal that was established. Both the short-term and long-term impact is that CSO discharges will not be reduced and will continue to have a negative impact on water quality, aquatic biota, and human health.

### 5.3.2 Growth Potential

The recommended alternative provides equalization and treatment of CSOs to improve water quality which makes development more attractive along the riverfront. These projects alleviate overloads to the system which improve interest in potential developers in the area. If the recommended alternative is not constructed, the short-term and long-term impacts are that overload conditions will continue and water quality goals will not be achieved.

### 5.3.3 Community Economic Conditions

Infrastructure, such as public sanitary sewage treatment facilities, is critical for growth and development. Vacant land becomes more attractive for development if an adequate sewage system is available and water quality goals are met. The short-term and long-term impacts of inaction include failed economic development resulting from a lack of growth and development.

#### 5.3.4 Recreational Opportunities

Recreational opportunities downstream of the CSOs are negatively impacted by raw sewage entering the river. The short and long-term impact of inaction is the closure of areas for swimming, fishing, and other recreational activities.

#### 5.3.5 Drinking Water Sources

CSO discharges of untreated sewage in the streams can affect drinking water intakes downstream of the CSO. The potential short- and long-term impacts of inaction include contamination of drinking water sources with pathogens, sediment, and/or elevated nutrient loads.

#### 5.3.6 Other Environmental Concerns

The no-action alternative would continue to allow CSO discharges of untreated sewage into the waters of the Commonwealth. This untreated sewage has a negative impact on the stream biome, including potential degradation of aquatic plant and animal species that currently populate the waterways. The passage of untreated sewage into the water of the Commonwealth also increases the risk of human exposure to pathogens. The no-action alternative does not address any of these additional environmental concerns.

---

## 6.0 EVALUATION OF ALTERNATIVES

### 6.1 CONSISTENCY ANALYSIS

Wastewater management alternatives developed as part of the Act 537 planning process must be evaluated in terms of their relationship to the goals and objectives of various planning, environmental, and natural resource laws and policies of the Commonwealth of Pennsylvania. Chapter 71.21(a) (5) of PaDEP's regulations requires that the Act 537 Plan address the consistency of each wastewater management alternative with 11 of the Commonwealth's goals and policies. If a recommended alternative is determined to conflict with or is inconsistent with one of the goals and objectives, the conflict and inconsistencies must be resolved before PaDEP will approve the alternative.

The following sections discuss the eight evaluation categories and the consistency analysis. Consistency analyses were performed only for the recommended alternative, Alternative 1. Based on the following analysis, the alternatives are consistent with all eight criteria.

#### 6.1.1 Municipal Wasteload Management Plans

MVSA submits a Chapter 94 Municipal Wasteload Management Report to PaDEP annually for its WWTP and Conveyance System. The 2020 Chapter 94 Report indicates that the plant was not hydraulically or organically overloaded and is not projected to be overloaded within the next five years. As part of the Chapter 94 report, the Authority additionally provides an annual CSO Status Report. This report provides frequency, duration, and volume of the CSOs recorded within the past year. Discharge Monitoring Reports for the WWTP and CSOs are also submitted monthly and summarized in the report.

The CSO Status report includes descriptions of the operational status of the overflows, any water quality impacts, overflows associated with dry or wet weather, summaries of the inspection and maintenance on the diversion manholes and regulator structures and identifies the presence of chronic or continuous discharges.

The recommended alternative was developed to meet the requirements of the CSOP, and the Authority will continue to provide the annual CSO Status Report as part of the Municipal Wasteload Management Report.

#### 6.1.2 Comprehensive Plans

The proposed alternative is consistent with the Westmoreland County Comprehensive Plan, dated January 2005, in that it will reduce the frequency of CSOs and meet the requirements of the CSOP.

#### 6.1.3 Chapter 93, 95, and 102 Antidegradation Requirements

Under Pennsylvania's Clean Streams Law, Chapters 93 and 95 classify all surface waters according to use which shall be protected and establishes water quality criteria which need to be maintained in the surface waters.

CSOP identifies two general approaches for the attaining Water Quality Standards, Demonstration Approach, and the Presumption Approach. MVSA's LTCP was developed based on the "Presumption Approach" with the goal of the LTCP providing for provisions of the CSO Control Policy and the reality of wet weather water pollution in the receiving body is to attain applicable Water Quality Standards in the Monongahela River always provided all non-CSO and other upstream pollution sources are adequately controlled by others to allow this attainment.

Chapter 102 requires a soil erosion and sedimentation control plan be approved and followed for any construction activity impacting greater than one acre. The project will be completed in compliance with necessary erosion and sedimentation and post construction stormwater management control plans.

#### 6.1.4 Prime Agricultural Land Policy

The Prime Agricultural Land Policy protects prime agricultural land from irreversible conversions to uses that result in the loss of the land as an environmental or essential food source resource. The equalization tank is proposed in a built-up area and along a road right of way within the City of Monessen.

#### 6.1.5 County Stormwater Management Plans

The recommended alternative is consistent with the County Stormwater Management Plans. NPDES Permits for Stormwater discharged During Construction Activities were obtained for Phase I and II projects and will be obtained as required for the proposed Monessen Equalization Tank.

#### 6.1.6 Wetlands

Review of the U.S. Fish and Wildlife Service National Wetlands Inventory of digital map data for the Monessen Equalization Tank did not identify any wetlands in the project area. A copy of National Wetlands Inventory of digital map data results of the project area is included in **Appendix G**.

#### 6.1.7 Pennsylvania Natural Diversity Inventory

Pennsylvania Natural Diversity Inventory (PNDI) maintains a data base containing site information on regulated plant and animal species, outstanding geological features, and significant natural communities. A PNDI Project Environmental Review Receipt was completed for Phase II and Phase III facilities. A PNDI review was completed for the proposed project and the receipts indicate there are no known impacts of threatened and endangered species in the project area. Copies of the receipts are included in **Appendix I**.

#### 6.1.8 Historical and Archeological Resource Protection

Pennsylvania Title 37, Section 507 requires cooperation between public officials and the Pennsylvania Historical and Museum Commission. A cultural resource notice request was sent to the Bureau of Historic Preservation (BHP) for a list of known historical sites and potential impacts on known archeological and historic sites on the site of the WWTP. On May 5, 2021, PHMC responded that the

project should have no effect on historic buildings, structures and/or archeological resources. A copy of the Pennsylvania Historical and Museum Commission's letter is in **Appendix J**.

## 6.2 RESOLUTION OF INCONSISTENCIES

No inconsistencies have been identified at the planning stage of the project between the proposed alternatives and the policies of the Commonwealth of Pennsylvania.

## 6.3 WATER QUALITY STANDARDS, EFFLUENT LIMITATION AND OTHER TECHNICAL, LEGISLATIVE OR LEGAL REQUIREMENTS

The proposed Monessen Equalization Tank is intended to meet the PaDEP requirement to capture and provide biological treatment for 100% of the sanitary sewage from the Grand Boulevard collection system resulting from a 2-year, 24-hour design storm. Each of the alternatives evaluated provided the estimated volume necessary to achieve this requirement.

## 6.4 COST ESTIMATES FOR THE ALTERNATIVES

**Table 6-1** summarizes the project cost estimates for each of the conceptual options presented in Appendix E. These project cost estimates include the construction cost estimates plus additional markups for legal, financing, land and easement acquisition, permitting, construction management, commissioning, and engineering. The project cost markups total 25% of the construction cost estimate.

Option	Description	Construction Cost	Project Cost
1	Above Ground Precast Concrete Tank with Domed Roof	\$2,365,000	\$2,956,000
1.1	Above Ground Precast Concrete Tank without Roof	\$2,177,000	\$2,721,000
2	Partially Buried Precast Concrete Tank with Domed Roof	\$2,917,000	\$3,647,000
2.1	Below Grade Precast Concrete Tank with Flat Roof	\$3,497,000	\$4,371,000
3	Buried 10'x10' Precast Concrete Box Culvert	\$4,672,000	\$5,840,000
4	Buried 20'x10' Precast Concrete Box Culvert	\$2,966,000	\$3,708,000

The below grade precast concrete tank Options 2 and 2.1 are 23.3% and 47.9% higher than the above ground tank with a domed roof; consequently, Options 2 and 2.1 are not recommended for further consideration. Option 3 (the buried 10'x10' precast concrete box culvert) is 52.9% greater than Option 4 (the buried 20'x10' precast concrete box culvert), primarily because of its greater length and consequently longer temporary earth retention system.

The remaining competitive options are as follows:

- Option 1 - Above Ground Precast Concrete Tank with Domed Roof - \$3.0 Million
- Option 1.1 - Above Ground Precast Concrete Tank without Roof - \$2.7 Million
- Option 4 - Buried 20'x10' Precast Concrete Box Culvert - \$3.7 Million

Option 4 is 29.2% and 40.4% more expensive than Options 1 and 1.1, respectively; however, non-cost factors need to be considered. The buried box culvert would be completely out of view. Both tank options would result in a tank approximately 35 feet tall located adjacent to Parente Blvd. Although Option 1.1 is the least expensive option, the lack of a roof would result in odor being an issue with this option. Option 1 was selected by the Authority in agreement with the City as the recommended alternative to advance during final design.

## 6.5 FUNDING METHODS

PaDEP guidelines for preparation of Act 537 Plans specify that an analysis be made of funding methods available to finance the proposed improvements/expansion.

### 6.5.1 Funding Sources Available

The Authority will need to obtain financing for the implementation and construction of the Donora Equalization Tank. Funding method alternatives were reviewed, and a brief description is provided for each of the available funding sources.

#### Grants-in-Aid

A grant is a monetary award to a project without provision for reimbursement. The grant programs which may apply to this project are provided below.

#### *Pennsylvania Community Development Block Grant Competitive Program (CDBG-CP)*

The CDBG-CP provides grants and technical assistance for eligible municipalities as identified under Pennsylvania Act 179 of 1984 as amended, for any eligible community development activities. Municipal authorities are not eligible for this highly competitive program, although the City of Monessen is eligible. The next funding round is in Fall 2021. With over 61% of the residents of Monessen considered Low and Moderate Income, this program will be evaluated for potential grant funding during the 2021 funding cycle.

#### *Pennsylvania Infrastructure Investment Authority (PENNVEST)*

PENNVEST has been capitalized by State and Federal Funds to provide an innovative approach to financing local infrastructure in Pennsylvania. The PENNVEST Board meets several times each year to consider funding applications and award funds to water and sewage infrastructure development projects. Most of the funding through PENNVEST are loans, although projects may receive PENNVEST grant awards in conjunction with a loan offer for additional project funds. Grant fund availability differs each fiscal year.

### *Pennsylvania First Program (PA First)*

Pennsylvania First (PA First) is a comprehensive funding tool to facilitate increased investment and job creation within the commonwealth. This program is typically tied to business and/or economic expansion, requiring a private match of funds and job creation. Although economic expansion may be an indirect component of this project, it is not anticipated to effect direct economic expansion.

### *Commonwealth Financing Authority (CFA)*

The CFA assists municipalities and municipal authorities with the construction, improvement, expansion, or rehabilitation or repair of a water supply system, sanitary sewer system, storm sewer system, or flood control projects.

### *Act 13 Marcellus Legacy Fund*

The Legacy Fund provides funding for planning activities that enable local communities and other entities comply with Act 537 of 1966, known as the Pennsylvania Sewage Facilities Act. Planning activities have already been completed, so this does not apply.

### *H2O PA*

The H2O PA Program provides single-year or multi-year grants to municipalities or municipal authorities to assist with the construction of drinking water, sanitary sewer and storm sewer projects. Last time grants were offered was in late 2019 and the program is not currently seeking applications.

### *PA Small Water and Sewer Grants*

The PA Small Water and Sewer Grants program assists with the construction, improvement, expansion, or rehabilitation or repair of a water supply system, sanitary sewer system, storm sewer system, or flood control projects. The last time grants were offered was in late 2019 and the program is not currently seeking applications.

### *Appalachian Regional Commission (ARC)*

The ARC awards grants and contracts from funds appropriated by the US Congress annually. Funding for the construction of water and sewer infrastructure is just one of many eligible project types. Municipal authorities are not eligible for support, although the City of Monessen is an eligible community.

### *Loans*

Loans are repaid at an agreed upon rate of return over a stipulated time. The loan programs which may apply to private as well as public facilities are discussed below.

### *Commercial or Bank Loans*

Bank financing is readily accessible and requires a much shorter interval from project start to construction. This loan option requires fewer administrative costs than are expected with a bond issue. The main disadvantage to a bank loan is that the term usually does not extend beyond 15 years and requires significant guaranty requirements.

### *Pennsylvania Infrastructure Investment Authority (PENNVEST)*

Projects selected for PENNVEST funding receive below market loan funding, typically determined by prevailing economic conditions.

### *Clean Water State Revolving Fund (CWSRF)*

The CWSRF program offers low interest loans for wastewater and certain other projects throughout Pennsylvania for the construction, improvement, extension, expansion, repair or rehabilitation of wastewater collection, treatment, or disposal facilities.

### *USDA Rural Utility Service (RUS)*

The RUS loan and supplemental grant program was established to provide human amenities, alleviate health hazards, and promote the orderly growth of rural areas by meeting the need for new and improved water and waste disposal systems. Restrictions about population of the area, financing capability, and project administration must be met. RUS usually provides a combination grant/loan. The population in the MVSA service area exceeds 10,000, which is the maximum threshold for RUS funding.

### *Bond Issues*

Bond issues are a common method by which municipalities and authorities obtain money to fund projects. Revenue bond issues are normally calculated to achieve a level annual payment for each year of the issue and are presently issued for a maximum term of 30 years at prevailing interest rates. A 20-year term is more common. The annual payment for debt service (interest and principal) is made from annual operating revenues. Bond Issues normally require 10 to 20 percent coverage on top of the average annual debt service cost.

The costs for legal services and printing of bonds are substantial. As a rule, bond issues may be considered for total project costs more than \$500,000.

## 6.6 COST-EFFECTIVENESS OF FUNDING OPTIONS

During development of the Act 537 Plan Special Study for the LTCP Phases II and III approved in 2014, the Authority reviewed the cost effectiveness of the funding options and determined that for Phase II, Bond Issue was the most cost-effective option. Similarly, a Bond Issue was determined to be the most cost-effective option for the funding of the Monessen Equalization Tank.

## 6.7 EVALUATE ADMINISTRATIVE ORGANIZATION AND LEGAL AUTHORITY FOR PLAN IMPLEMENTATION

There are no anticipated changes to the functions of the Authority and municipalities, which will remain as they are now. An intergovernmental cooperation agreement between the City of Monessen and the Authority has been developed and executed for the reimbursement of engineering and legal fees and expenses associated with the equalization tank. A copy of this agreement is included in **Appendix K**. The Authority will be responsible for design, permits and financing of the recommended alternative.

## 7.0 INSTITUTIONAL EVALUATION

### 7.1 EXISTING WASTEWATER AUTHORITIES

The Authority was formed on June 24, 1963 under the Municipality Authorities Act of 1945, its supplements and amendments by the City of Monessen, Borough of Charleroi and the Borough of Donora. The Authority was formed to construct facilities necessary to furnish and treat the sewage wastes from the municipalities. The Borough of Charleroi subsequently withdrew from participation in the Authority. The Authority's sewage system was constructed in 1968-70 to intercept and treat wastewater from the CSS owned and operated by the City of Monessen, in Westmoreland County, and the Borough of Donora, in Washington County. In the mid-1970s, part of the Separate Sanitary Sewer System (SSS) owned and operated by the Carroll Township Authority, Washington County, was connected to the Authority system. The Authority system consists of eight (8) CSOs, 27,000 linear feet of gravity sewer, seven (7) sewage pumping stations, 19,000 linear feet of force main, a 4.96 MGD WWTP, a 3.0 MGD equalization tank and a 44.0 MGD satellite treatment facility.

#### 7.1.1 Financial and Debt Status

In accordance with the Trust Indenture and Agreements between the Authority and the City of Monessen and the Borough of Donora, the Authority prepares an annual Sewage Disposal System Report. The report reviews the operations of the system for the prior year, capital additions done in the prior year, recommendations of capital improvements for the next year, and an estimate of revenue required for the next year based on the sewer rental rates in effect and projected expenses and capital improvements. Based on the Sewage Disposal System Annual Report dated November 2020, the current rates are adequate for the projected 2021 budget. In May 2021, the Authority had approximately \$54.8 million in bonds and loans outstanding.

#### 7.1.2 Available Staff and Administrative Resources

The Authority has operated and maintained the system since the completion of construction in 1970. The Authority has maintained adequate staff, and that staff will continue to operate and maintain the system with the additional proposed facilities. The Authority will also continue to utilize their administrative resources for billing, collections, and notifications as they have done in the past.

#### 7.1.3 Existing Authority Responsibilities

##### Implement Wastewater Planning Recommendations

The Authority has implemented wastewater planning recommendations in the past.

##### Implement System-Wide Operation and Maintenance Activities

The Authority, as stated previously, has operated and maintained the system since its completion in 1970. Over the years they have implemented many system-wide operation and maintenance activities.

### Set User Fees and Take Purchasing Actions

Under the trust indentures, the Authority prepares an Annual Report that reviews the past year's expenditures, revenues and capital additions and projects the next year's budget. The budget requirements are compared to the existing user fees and evaluated for adequacy. If it is determined that the current fees are inadequate, the Authority increases the user fees as they have done in the past. The Authority has condemned property for their facilities in the past.

### Take Enforcement Actions Against Ordinance Violators

The Authority has previously taken enforcement actions against ordinance violators.

### Negotiate Agreements with Other Parties

The Authority has previously negotiated agreements with other parties.

### Raise Capital for Construction and Operation and Maintenance of Facilities

The Authority has previously obtained grants from PENNVEST and the Redevelopment Authority of Washington County, loans from PENNVEST and Bond Issues for construction, operation and maintenance of facilities.

## 7.2 INSTITUTIONAL ALTERNATIVES NECESSARY TO IMPLEMENT PLAN

### 7.2.1 Functions of Existing and Proposed Organizations

The functions of the Authority, the Borough of Donora, the City of Monessen, and Carroll Township are anticipated to remain the same.

## 7.3 ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY TO IMPLEMENT PLAN

### 7.3.1 Development of All Required Ordinances, Regulations, Standards and Inter-Municipal Agreement

The Authority and the municipalities have existing ordinances, regulations, and standards pertaining to their sewer systems. An intergovernmental cooperation agreement was executed between the City of Monessen and the Authority for the funding of the project.

### 7.3.2 Timeline for Administrative and Legal Activities

Not Applicable. As stated previously, the Authority and the municipalities have existing ordinances, regulations, and standards pertaining to their sewer systems.

## 7.4 PROPOSED INSTITUTIONAL ALTERNATIVE FOR IMPLEMENTING THE CHOSEN TECHNICAL WASTEWATER DISPOSAL ALTERNATIVE

No new municipal departments or authorities are required to implement the recommended project. As stated previously, the functions of the Authority, the Borough of Donora, the City of Monessen, and Carroll Township are anticipated to remain the same.

---

## 8.0 IMPLEMENTATION SCHEDULE AND JUSTIFICATION

### 8.1 SELECTED WASTEWATER DISPOSAL ALTERNATIVE

The recommended option selected to advance to final design (Option 1) consists of a round, precast concrete tank, typical of an AWWA DUO tank and as manufactured by DN Tanks or Preload Tanks. The tank would include a cast-in-place concrete floor, a wire-wound precast prestressed concrete wall, and a precast clear span concrete dome. For a volume of 0.5 MGD, the manufacturer's recommended dimensions are 53'-4" inside diameter and a side water depth (SWD) of 30 feet. Typically, the lower four (4) feet of an above ground tank is buried to place the tank foundation below the frost line. Allowing for one (1) foot of freeboard inside the tank and a typical dome roof slope of 1:10, the top of the tank wall and the top of the roof dome would be approximately 27 feet and 30 feet, respectively, above surrounding grade. The tank would have provisions for access from grade, roof hatches for access from above, piping and washdown nozzles for cleaning after a storage event, and other standard appurtenances.

The proposed tank will be situated above ground, and as such influent flow will be pumped into the tank using an influent pump. The proposed flow capacity of the pump station will be 5 MGD. This value was selected by rounding the calculated peak flow for the 2-year 24-hour design storm minus 350% of the dry weather flow. The current conceptual design of the pump station includes a triplex submersible pump station installed in a 12-ft diameter wet well. The top of the wet well would be at grade with access hatches for removing the pumps. Effluent flow from the tank back into the Seneca Street Interceptor sewer will be conveyed by gravity and controlled by a control valve located in a valve vault next to the tank.

#### 8.1.1 Existing Wastewater Disposal Needs

The Authority will continue to provide treatment of the existing wastewater disposal needs and will meet the requirements of the National CSO Policy by achieving 85% capture.

#### 8.1.2 Future Wastewater Disposal Needs

The recommended alternative will provide treatment of future wastewater disposal needs and will meet the requirements of the National CSO Policy by achieving 85% capture.

#### 8.1.3 Operation and Maintenance Considerations

The Authority's personnel will continue to operate and maintain the recommended facilities under the recommended alternative. As the Authority's staff is familiar with this type of facility, no additional staffing or training is required for the proposed facility. The facility will be inspected frequently, and the maintenance routine will be integrated into the current operation and maintenance practices of the Authority's staff.

#### 8.1.4 Cost Effectiveness

While the recommended alternative is slightly more costly than that of the lowest cost alternative, the domed roof alternative was preferred by the Authority and the City to alleviate the potential of odors which could negatively impact nearby residential areas. The recommended alternative is still considered a cost-effective means to reduce overflows in the system.

#### 8.1.5 Available Management and Administrative Systems

The Authority's existing management and administrative systems will remain in place for Option 1.

#### 8.1.6 Available Financing Method

PENNVEST and Bond Issue financing methods are available for Option 1.

#### 8.1.7 Environmental Soundness and Compliance with Natural Resource Planning and Preservation Programs

The ultimate goal of the LTCP is compliance with the requirements of the CWA, within the framework provided by the CSO Control Policy. Option 1 will provide treatment of future wastewater disposal needs and will meet the requirements of 100% capture of the Grand Boulevard collection system resulting from a 2-year, 24-hour design storm.

### 8.2 SELECTED CAPITAL FINANCING PLAN

Funds will be needed to finance the recommended project. The Authority has secured a Bond Issue in the amount of \$4,000,000 for the construction of the Monessen Equalization Tank. Additionally, the Authority and the City of Monessen have agreed that repayment of the loan will be achieved using the line service fees that the City charges residents in the sewer bills collected by the Authority. The current and projected user fee for sewage service charged by MVSA is \$144 per quarter (\$48.00 per month) for 0 - 8,000 gallons of water consumption per residential and non-residential establishments. Usage over 8,000 gallons is billed at a cost of \$18.00 per thousand gallons. Additionally, the Authority collects \$27 per EDU as the City of Monessen's line service fee. This fee was increased from \$12 to \$27 due to the need to finance several City of Monessen sewer system improvement projects, including the Monessen Equalization Tank. Approximately \$5.00 (and up to \$6.00 depending on final construction cost) per month per EDU will be retained by the Authority for the repayment of the bond secured to finance construction of the Monessen Equalization Tank.

### 8.3 IMPLEMENTATION

There are no known critical public health hazards in the MVSA service area associated with wastewater that need to be addressed; however, a potential health hazard exists with the discharge of untreated sewage to the waters of the Commonwealth. The tentative completion schedule for the Monessen Equalization Tank project is shown in Table 1-1.

NOTE TO REVIEWER: THE FOLLOWING PARAGRAPH IS A PLACE HOLDER FOR THE INCLUSION OF THE REFERENCED APPENDICES WHICH WILL BE ADDED ONCE THE REPORT IS FINALIZED AND THE DOCUMENTS ARE FINALIZED.

Resolutions of adoption for the City of Monessen and Mon Valley Sewage Authority are included in **Appendix L**. Included in **Appendix M** are the notifications and responses to Westmoreland County Planning Commission and the City of Monessen. Proof of publication of the Plan/Special Study are included in **Appendix N**. **Appendix O** contains the public comments received, as well as responses provided.

## **9.0 ENVIRONMENTAL REPORT**

Wetland, PNDI, PHMC and PaDEP eMAP desktop environmental assessments were completed on the site, and no environment concerns have been identified. Copies of the findings are included in the appropriate Appendices as mentioned throughout this report.