

**Application of Pennsylvania-American Water Company for Acquisition of Assets of
The Municipal Authority of the City of McKeesport
66 Pa. C.S. §1329
Application Filing Checklist – Water/Wastewater
Docket No. A-2017-_____**

22. Other requirements. Demonstrate compliance with the following:
- a. For **wastewater** system acquisitions, demonstrate compliance with the DEP-approved Act 537 Official Sewage Facilities Plans for the affected municipalities (including the extent of the requested service territory).

RESPONSE:

- a. See enclosed Act 537 Official Sewage Facilities Plans.

In addition, see Direct Testimony of David R. Kaufman, Vice President – Engineering, on behalf of Pennsylvania-American Water Company, PAWC Statement No. 3 enclosed at Appendix A-14.

**MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
CITY OF DUQUESNE AND BOROUGH OF DRAVOSBURG**

**Act 537 Sewage Facilities Plan Update
August 2014**

KLH



**ENGINEERS, INC.
5173 CAMPBELLS RUN ROAD
PITTSBURGH, PA 15205-9733**

**Municipal Authority of the City of McKeesport
Act 537 Sewage Facilities Plan Update
City of Duquesne and Borough of Dravosburg**

Table of Contents

Plan Summary.....	1
Municipal Adoption.....	3
Planning Agency Correspondence	3
Publication.....	3
Comments and Responses	3
Implementation Schedule	4
Consistency Determination.....	4
I. Previous Wastewater Planning	6
I.A Analysis of Past Wastewater Planning	6
II. Physical and Demographic Analysis	7
II.A Identification of Planning Area.....	7
II.B Physical Characteristics of the Planning Area	7
II.C Soils Analysis.....	7
II.D Geologic Features.....	9
II.E Topography	9
II.F Potable Water Supplies	9
II.G Wetlands	10
III. Existing Sewage Facilities in the Planning Area.....	11
III.A Sewerage Systems in the Planning Area	11
III.B On-Lot Sewage Disposal Systems in the Planning Area.....	16
III.C Wastewater Sludge and Septage Generation, Transport and Disposal Methods.....	16
IV. Future Growth and Land Development	18
IV.A Municipal and County Planning Documents Adopted Pursuant to the Pennsylvania Municipalities Planning Code (Act 247).....	18
IV.B Land Use and Future Growth.....	19

- V. Identification of Alternatives to Provide New or Improved Wastewater Disposal Facilities21
 - V.A Conventional Collection, Conveyance, Treatment and Discharge Alternatives21
 - V.B Use of Individual Sewage Disposal Systems22
 - V.C Use of Small Flow Sewage Treatment Facilities22
 - V.D Use of Community Land Disposal Alternatives22
 - V.E Use of Retaining Tank Alternatives22
 - V.F Sewage Management Programs23
 - V.G Non-Structural Comprehensive Planning Alternatives23
 - V.H No Action Alternative23

- VI. Evaluation of Alternatives24
 - VI.A Consistency Determination24
 - VI.B Resolution of Inconsistencies38
 - VI.C Water Quality Standards, Effluent Limitations or Other Technical, Legislative or Legal Requirements29
 - VI.D Cost Estimates and Present Worth Analysis29
 - VI.E Analysis of Funding Methods30
 - VI.F Analysis of Need for Immediate or Phased Implementation of Alternatives31
 - VI.G Administrative Organizations and Legal Authority31

- VII. Institutional Evaluation32
 - VII.A Analysis of Existing Wastewater Treatment Authorities32
 - VII.B Analysis of Institutional Alternatives Necessary for Implementation33
 - VII.C Administrative and Legal Activities Necessary for Implementation33

- VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives35
 - VIII.A Best Technical Alternative35
 - VIII.B Capital Financing Plan Chosen for Implementation35
 - VIII.C Implementation Schedule36

- IX. Environmental Report Generated from the Uniform Environmental Review (UER) Process37

APPENDICES:

- Appendix A – Uniform Environmental Review (UER)
- Appendix B – Act 537 Plan Content and Environmental Assessment Checklist
- Appendix C – City of Duquesne Combined Sewer System Long Term Control Plan
- Appendix D – Borough of Dravosburg Combined Sewer System Long Term Control Plan
- Appendix E – Municipal Adoption Through Resolution
- Appendix F – ACHD and Municipal Planning Department General Correspondence
- Appendix G – Proof of Publication for Comment Period
- Appendix H – Public Comment and Responses
- Appendix I – Exhibits
- Appendix J – PNDI Search Results
- Appendix K – PHMC General Correspondence
- Appendix L – User Rate Analysis

EXHIBITS:

- Exhibit 1 – Planning Area Map
- Exhibit 2 – Soils Map
- Exhibit 3 – Prime Farmlands Map
- Exhibit 4 – Geologic Features Mapping
- Exhibit 5 – National Wetlands Inventory (NWI) Wetlands Mapping and Hydric Soils Mapping
- Exhibit 6 – FEMA Floodplain Map
- Exhibit 7 – Land Use Map

TABLES:

- Table 1 – Schedule of Implementation
- Table 2 – City of Duquesne Alternatives Comparison
- Table 3 – Borough of Dravosburg Alternatives Comparison
- Table 4 – Recommended Alternative Costs
- Table 5 – MACM Projected Monthly Sewage Charges
- Table 6 – MACM Revenue and Expenditures
- Table 7 – Schedule of Implementation

MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
ALLEGHENY COUNTY, PENNSYLVANIA
ACT 537 SEWAGE FACILITIES PLAN UPDATE
CITY OF DUQUESNE AND BOROUGH OF DRAVOSBURG

PLAN SUMMARY

The Pennsylvania Sewage Facilities Act (Act 537) was enacted by the Pennsylvania Legislature in 1966. It requires every municipality in the Commonwealth of Pennsylvania (Commonwealth) to develop and maintain an up-to-date Act 537 Sewage Facilities Plan (Plan). The purpose of Act 537 planning is to protect the health, safety, and welfare of the citizens living in a municipality, to prevent future sewage disposal problems from occurring, and to provide protection for the groundwater and surface waters of the Commonwealth. An Act 537 Plan should be updated when the existing Plan is out of date, is inconsistent with other municipal planning, does not provide adequate solutions to resolve existing sewage disposal problems, or is needed to provide for planned growth.

This update is focused on the interconnection of sewerage facilities between the Borough of Dravosburg, the City of Duquesne and the City of McKeesport and will be implemented by the Municipal Authority of the City of McKeesport (MACM). This will serve as a companion update to the existing Act 537 Plan and was prepared in conjunction with the following documents with the purpose of further evaluating the proposed wastewater treatment plant (WWTP) and combined sewer system (CSS) upgrades:

- City of Duquesne Combined Sewer System Long Term Control Plan (Duquesne LTCP).
- Borough of Dravosburg Combined Sewer System Long Term Control Plan (Dravosburg LTCP).

These documents are included in Appendices C and D, respectively.

The Plan update was developed according to the Pennsylvania Department of Environmental Protection (PADEP) guidelines set forth in the PADEP document entitled, *A Guide for Preparing Act 537 Update Revisions*, and includes all applicable information to provide adequate planning, as outlined on the PADEP document entitled, *Act 537 Plan Content and Environmental Assessment Checklist*, provided herein as Appendix B.

The sewerage facilities in the City of Duquesne and Borough of Dravosburg are owned and operated by the Municipal Authority of the City of McKeesport. For descriptions, locations, and

sizes of the existing facilities, please reference the LTCs found in Appendix C and Appendix D, respectively.

In the Duquesne system, two (2) sections of the CSS in the planning area lack capacity to convey the 10-year, 24-hour design storm, causing manhole overflows. In addition, the WWTP lacks treatment capacity to process peak wet weather flows. Detailed planning evaluations were completed for three (3) alternatives.

- Alternative 1 – Existing WWTP + new pump station + CSO bypass treatment.
- Alternative 2 – New pump station to MACM WWTP + flow storage.
- Alternative 3 – Existing WWTP + new pump station + flow storage.

All alternatives include two (2) gravity relief sewers totaling 1,025 lineal feet. It was determined that these CSS upgrades are required to convey the 10-year, 24-hour design storm flow (without manhole overflows) while maintaining greater than 85% capture of all combined flow during a typical year.

Detailed evaluation of the proposed alternatives led to the recommendation of Alternative 1 for the City's upgrades. The total estimated project cost is \$7,424,000. This alternative is recommended for the following reasons:

- All three (3) alternatives are classified as "high burden."
- Alternative 2 project cost is \$8,087,000 more than the recommended Alternative 1, and Alternative 3 project cost is \$5,483,000 more.
- The existing WWTP is in good operating condition with adequate capacity for dry weather flows, and Alternative 1 allows the WWTP to continue operation under these conditions.

In Dravosburg, it was determined that no CSS upgrades are required to convey the 10-year, 24-hour design storm flow while maintaining greater than 85% capture of all combined flow during a typical year, given a free discharge at the WWTP pump station. The Borough of Dravosburg WWTP, however, does not have capacity to process peak wet weather flows. Detailed evaluation was completed for two (2) alternatives.

- Alternative 1 – Modify existing WWTP to Sequencing Batch Reactor (SBR).
- Alternative 2 – Pump Station to MACM WWTP + existing tanks as flow storage.

The evaluation of the proposed alternatives led to the recommendation of Alternative 2 for the Borough's upgrades. The total estimated project cost is \$5,503,000. This alternative is recommended for the following reasons:

- Alternative 1 project cost is \$3,371,000 more than the recommended Alternative 2.
- Alternative 2 eliminates operation and maintenance requirements of a WWTP.

The combined project cost to the MACM is \$12,927,000. This debt will be distributed among the MACM's customers as outlined in the user rate analysis in Appendix L. For implementation of this Plan, the MACM intends to explore PENNVEST funding options. If PENNVEST funding cannot be obtained, the MACM will then pursue municipal bonds.

MUNICIPAL ADOPTION

Original signed and sealed Resolutions of Adoption of this Act 537 Plan Update by the Borough of Dravosburg, the City of Duquesne and the City of McKeesport are included in Appendix E. The selected alternative will be implemented according to the implementation schedule provided in Table 1.

PLANNING AGENCY CORRESPONDENCE

General correspondence with the Allegheny County Health Department and the appropriate planning departments in the Borough of Dravosburg, the City of Duquesne and the City of McKeesport is included in Appendix F. All applicable comments provided by the planning agencies have been addressed within this Plan update as necessary.

PUBLICATION

Proof of Public Notice documents the adoption, summary, and 30-day comment period for the proposed Plan update. A copy of this documentation is included in Appendix G.

COMMENTS AND RESPONSES

All applicable comments and the municipal responses resulting from the 30-day public comment period are included in Appendix H.

IMPLEMENTATION SCHEDULE

The anticipated schedule of implementation of this Plan update is provided in Table 1.

Table 1: Schedule of Implementation

Task	Completion Date
Submit the Final Plan Update to the PADEP	November 1, 2015
Receive the Approval of the PADEP	January 1, 2016
Obtain funding for design related services	January 1, 2017
Begin design of upgrades	January 1, 2017
Apply for MACM WWTP re-rate	July 1, 2017
Apply for Part II Permits	July 1, 2018
Receive Part II Permits	January 1, 2019
Obtain funding for construction	January 1, 2021
Begin construction for upgrades	March 1, 2021
Complete construction	March 1, 2023

CONSISTENCY DETERMINATION

According to Act 537, all technically feasible sewage facility alternatives must be evaluated for consistency with certain acts, programs and policies. The sewage collection, conveyance and treatment technologies identified and evaluated herein are consistent with the following Acts, programs and policies, and do not require resolution during this planning phase of the project:

- Sections 4 and 5 of the Clean Streams Law.
- Section 208 of the Clean Water Act.
- Municipal Wasteload Management under PA Code, Title 25, Chapter 94.
- Title II of the Clean Water Act.
- Titles II and VI of the Water Quality Act of 1987.
- Comprehensive planning under the Pennsylvania Municipalities Planning Code.
- Anti-degradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102.
- State Water Plan developed under the Water Resources Planning Act.
- Pennsylvania Prime Agricultural Land Policy.
- Stormwater management requirements.
- Wetland Protection under Chapter 105.
- Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania Natural Diversity Inventory (PNDI).

- Historical and archaeological resource protection in conjunction with the Pennsylvania Historical and Museum Commission (PHMC).

Additional action may be required to demonstrate consistency with the above named acts, programs and policies. This will occur during the design and permitting phases upon implementation of the selected sewage facilities alternatives. For more information, refer to Section VI.B.

I. PREVIOUS WASTEWATER PLANNING

I.A. ANALYSIS OF PAST WASTEWATER PLANNING

This Plan was developed as an executive summary type of document to serve as the governing Act 537 Sewage Facilities Plan for the City of Duquesne and Borough of Dravosburg, whose conveyance systems and treatment facilities are now owned and operated by the MACM. Detailed information pertaining to each planning area and proposed upgrades is provided as part of the Duquesne LTCP and Dravosburg LTCP, respectively. These documents are included in Appendices C and D. This Plan will evaluate the feasibility of these alternatives as they relate to the overall impact on the MACM's total service area.

Both systems were recently acquired by the MACM. Prior to the development of the LTCPs, no past wastewater planning studies have been completed by the MACM for these areas. The MACM has an existing Plan that is focused on the treatment facilities and conveyance systems tributary to the McKeesport WWTP. This Plan is intended to propose a solution to the sewage needs of the Duquesne and Dravosburg areas.

II. PHYSICAL AND DEMOGRAPHIC ANALYSIS

II.A. IDENTIFICATION OF THE PLANNING AREA

The planning area for this regional Plan includes the City of Duquesne and Borough of Dravosburg sewersheds. All planning areas are geographically located in Allegheny County, PA. The location of the planning areas, municipal boundaries, sewage service area boundaries and the location of the WWTPs can be found in each area's respective LTCP, found in Appendices C and D.

II.B. PHYSICAL CHARACTERISTICS OF THE PLANNING AREA

Consideration must be given to the environmental impacts on the Monongahela River and the overall planning area. Urbanization has the potential to degrade environmental values of watersheds. For this reason, it is important to identify the physical characteristics of the planning areas to provide protection for important environmental resources during development activities. All work evaluated in this Plan update is within the Upper Monongahela watershed. A major goal of this Plan update is to protect these waters and improve the quality of water discharged into the Monongahela River.

II.C. SOILS ANALYSIS

The distribution of general soil classifications for the soil types found in the proposed project sites is shown on Exhibit 2 in Appendix I. The information regarding the types and characteristics of the soils specific to the planning area were obtained from the United States Department of Agriculture (USDA) Natural Resources Conservation Service. The following is a description of the general soil classifications for each soil type found in the planning area:

Dravosburg WWTP & Force Main Site

- **URB** – Urban land-Rainsboro Complex, Gently Sloping, Slope ranging from 0 to 8%. This soil type receives mean annual precipitation of 36 to 46 inches. It is composed of 75% urban land, 15% Rainsboro soil and 5% minor components. The depth to the restrictive feature is 10 inches. The Rainsboro soil type is moderately well drained. The depth to the water table is approximately 19 to 30 inches in the Rainsboro soil type. This soil is not classified as prime farmland.

Duquesne WWTP, Force Main & Storage Tank Site

- **GQF** – Gilpin-Upshur Complex, Very Steep, 25-75% slopes. This soil type receives mean annual precipitation of 35 to 54 inches. It is composed of 45% Gilpin and similar soils, 35% Upshur and similar soils and 20% minor components. The depth to the restrictive

feature is 20 to 40 inches to lithic bedrock in the Gilpin soil type and 40 to 70 inches to lithic bedrock in the Upshur soil type. Both soil types are well drained and have a water table at a depth greater than 80 inches. This soil is not classified as prime farmland.

- UB – Urban Land, Slope ranging from 0 to 8%. This soil type receives mean annual precipitation of 40 to 46 inches. It is composed of 90% urban land and 10% minor components. The depth to the restrictive feature is 10 inches. This soil is not classified as prime farmland.
- UCE – Urban Land-Culleoka Complex, Steep, 25-35% slopes. This soil type receives mean annual precipitation of 36 to 50 inches. It is composed of 70% urban land, 15% Culleoka and similar soils and 5% minor components. The depth to the restrictive features is 10 inches in the urban land soil type and 20 to 40 inches to lithic bedrock in the Culleoka soil type. The Culleoka soil type is well drained and the depth to the water table is more than 80 inches. This soil is not classified as prime farmland.
- UGD- Urban Land-Guernsey Complex, Moderately Steep, 8 to 25% slopes. This soil type receives mean annual precipitation of 36 to 46 inches. It is composed of 75% urban land, 15% Guernsey and similar soils and 10% minor components. The depth to the restrictive features is 10 inches in the urban land soil type and 50 to 75 inches to lithic bedrock in the Guernsey soil type. The Guernsey soil type is moderately well drained and the depth to the water table is about 17 to 25 inches. This soil is not classified as prime farmland.
- URB – Urban land-Rainsboro Complex, Gently Sloping, Slope ranging from 0 to 8%. This soil type receives mean annual precipitation of 36 to 46 inches. It is composed of 75% urban land, 15% Rainsboro soil and 5% minor components. The depth to the restrictive feature is 10 inches. The Rainsboro soil type is moderately well drained. The depth to the water table is approximately 19 to 30 inches in the Rainsboro soil type. This soil is not classified as prime farmland.

McKeesport WWTP Site

- URB – Urban land-Rainsboro Complex, Gently Sloping, Slope ranging from 0 to 8%. This soil type receives mean annual precipitation of 36 to 46 inches. It is composed of 75% urban land, 15% Rainsboro soil and 5% minor components. The depth to the restrictive feature is 10 inches. The Rainsboro soil type is moderately well drained. The depth to the water table is approximately 19 to 30 inches in the Rainsboro soil type. This soil is not classified as prime farmland.

Agricultural areas, as defined by the Pennsylvania Code, are areas used primarily for the production of crops and where the soil is without vegetative cover during certain periods of the year. Prime farmland is land that has the best physical and chemical soil properties for the production of food, feed and forage, fiber, and oil seed crops. Pennsylvania's Prime Agricultural Land Policy orders and directs the prevention of irreversible conversion of prime

agricultural land to uses that result in its loss as an environmental or essential food production resource. Prime farmlands are important to examine for scenarios in which future development is expected to occur because of the protective measures in existence to preserve this important resource.

Exhibit 3 in Appendix I depicts which soils in the planning areas are classified as prime farmland, farmland of statewide importance, and areas not considered prime farmland. These classifications are also provided in the soils descriptions above. There are no prime farmlands in the project areas and no expected impacts on prime agricultural lands.

II.D. GEOLOGIC FEATURES

Mapping of the predominant geologic formations in the planning area is displayed on Exhibit 4 in Appendix I. These formations are not considered to adversely affect the study areas and there are no known geologic features that relate to existing or potential nitrate-nitrogen pollution and drinking water sources. The following information regarding the geologic formations was obtained from the United States Geological Survey (USGS):

Monongahela Group: The Monongahela Group is comprised of cyclic sequences of limestone, shale, sandstone and coal. Commercial coals are present. The base is at the bottom of Pittsburgh coal.

Casselman Formation: The Casselman formation is comprised of cyclic sequences of shale, siltstone, sandstone, red beds, thin, impure limestone and thin, non-persistent coal. Red beds are associated with landslides.

Important information regarding geologic features specific to each community is contained in the supporting documents.

II.E. TOPOGRAPHY

The elevations at the WWTP locations and the topography of the areas between the sites are such that connections between the sites will require the installation of force mains. Important information regarding topography specific to each community is contained in the supporting documents.

II.F. POTABLE WATER SUPPLIES

The Borough of Dravosburg purchases its water from the Pennsylvania American Water Company. The City of Duquesne has its own water department.

II.G. WETLANDS

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adopted for life in saturated soil conditions including swamps, marshes, bogs and similar areas. Wetland areas are considered to be a valuable public water resource and are subject to strict conservative regulations. They provide an environment and habitat for aquatic life including fish, amphibians and waterfowl. Additionally, many endangered plant species are thought to exist in wetlands, and wetlands are essential for the maintenance of surface water quality and quantity. Hydric soils are formed in conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils contain the characteristics necessary for potential wetland existence and may indicate the presence of wetlands.

Mapping displaying the known presence of wetlands and the hydric soils within the planning areas is displayed on Exhibit 5 in Appendix I. The only wetland areas in the planning area are located along the Monongahela River and are classified as riverine. Furthermore, there are soils in the planning areas classified as partially hydric.

The MACM will make all attempts to minimize the impact on ecologically sensitive areas during any construction activities. All construction work associated with the chosen alternative will be consistent with all applicable state and federal regulations regarding wetlands. A detailed wetlands delineation analysis to determine the extent of jurisdictional wetlands would be required should any proposed construction encroach on areas conducive to the presence of wetlands. Implementation of this Plan update is not expected to affect wetlands in any way and the selected alternative will be consistent with wetland protection practices and legislation.

III. EXISTING SEWAGE FACILITIES IN THE PLANNING AREA

III.A. SEWERAGE SYSTEMS IN THE PLANNING AREA

III.A.1 Location, Size and Ownership of Sewerage Facilities in the Planning Area

City of Duquesne

The sewerage facilities in the City of Duquesne are owned and operated by the Municipal Authority of the City of McKeesport. For descriptions, locations, and sizes of the existing facilities, please reference the LTCP found in Appendix C.

Borough of Dravosburg

The sewerage facilities in the Borough of Dravosburg are owned and operated by the Municipal Authority of the City of McKeesport. For descriptions, locations, and sizes of the existing facilities, please reference the LTCP found in Appendix D.

III.A.2 Narrative & Schematic Diagram of the Facility's Basic Treatment Processes

A description of the conveyance systems, treatment facilities, process calculations, and process flow diagrams can be found in each respective LTCP.

III.A.3 Problems with Existing Facilities

City of Duquesne

Two (2) sections of the combined sewer system (CSS) in the planning area lack capacity to convey the 10-year, 24-hour design storm, causing manhole overflows. In addition, the WWTP lacks treatment capacity to process peak wet weather flows. More detailed can be obtained in the LTCP.

Borough of Dravosburg

There are no problems with the combined sewer system (CSS) in the planning area. The Borough of Dravosburg WWTP, however, does not have capacity to process peak wet weather flows. More detailed can be obtained in the LTCP.

III.A.4 Scheduled or In-progress Upgrading or Expansion of Treatment Facilities

City of Duquesne

Alternatives were developed for evaluation with the primary focus of providing treatment to 85 percent of CSS flow captured during rain events on an annual average basis. During the development of each alternative, it was high priority to maintain as much of the existing processes as possible. Three (3) alternatives were developed for detailed evaluation.

1. Alternative 1 – Continue operation of existing processes and construct new combined sewer overflow (CSO) bypass treatment facilities. This alternative utilizes the existing WWTP up to peak flows of 2.5 MGD. Peak flows above 2.5 MGD will receive CSO bypass treatment. This alternative includes construction of new headworks facilities, influent pump station, and CSO bypass treatment facilities, as well as the installation of new clarifier equipment to maximize efficiency. Additionally, this alternative includes CSS upgrades required to convey the 10-year, 24-hour design storm to the WWTP. The following items are included in Alternative 1:

- CSS upgrades.
- New automatic bar screen and by-pass channel with static screen.
- New headworks building.
- New raw sewage pump station and controls.
- New raw sewage pump station piping and valve vault.
- New pump flow meter.
- Site gravity and force main piping.
- New CSO bypass treatment.
- Upgrade final clarifier equipment to maximize efficiency.

2. Alternative 2 – Pump to McKeesport WWTP and build new peak flow storage facilities. This alternative includes construction of a new raw sewage pump station, with new headworks facilities, to convey all flow up to 2.5 MGD to the McKeesport WWTP. All flow above 2.5 MGD will be pumped by separate storm pumps and stored in a newly constructed storage facility. It should be noted that the MACM WWTP does not currently have the capacity to accept an additional 2.5 MGD flow, and upgrade costs for the WWTP are not included. Additionally, this alternative includes CSS upgrades required to convey the 10-year, 24-hour design storm to the pump station. The following items are included in Alternative 2:

- CSS upgrades.
- New automatic bar screen and by-pass channel with static screen.
- New headworks building.
- New raw sewage pump station and controls.

- Average flow pumps and storm pumps.
 - New raw sewage pump station piping and valve vault.
 - New pump flow meter.
 - Site gravity and force main piping.
 - Force main piping to the MACM WWTP.
 - Force main piping to storage facility.
 - New storage facility and land acquisition.
3. Alternative 3 – Continue operation of existing processes and construct new peak flow storage facilities. This alternative utilizes the existing WWTP up to peak flows of 2.5 MGD. Peak flows above 2.5 MGD will be pumped by separate storm pumps and stored in a newly constructed storage facility. This alternative also includes construction of new headworks facilities, as well as the installation of new clarifier equipment to maximize efficiency. Additionally, this alternative includes CSS upgrades required to convey the 10-year, 24-hour design storm to the WWTP. The following items are included in Alternative 3:
- CSS upgrades.
 - New automatic bar screen and by-pass channel with static screen.
 - New headworks building.
 - New raw sewage pump station and controls.
 - Average flow pumps and storm pumps.
 - New raw sewage pump station piping and valve vault.
 - New pump flow meter.
 - Site gravity and force main piping.
 - Force main piping to storage facility.
 - New storage facility and land acquisition.

Evaluation of Alternatives

The following sections summarize design considerations associated with each alternative. Both Alternatives 1 and 3 will meet the current permit requirements and will not require a design capacity re-rate. Alternative 2 may require new facilities and/or a design capacity re-rate at the MACM WWTP, but those issues will only be investigated if Alternative 2 proves to be the preferred alternative for the City of Duquesne. Table 2 lists the advantages and disadvantages associated with each alternative.

Table 2: City of Duquesne Alternatives Comparison

Alternative No.	Alternative	Advantages	Disadvantages
1	CSO Bypass Treatment	<ol style="list-style-type: none"> 1. Maintain existing WWTP processes with minor upgrades 2. Bypass protects WWTP biology during peak flow events 3. Provides screening, primary treatment and disinfection in small footprint 4. Able to handle peak flows much higher than the WWTP design capacity 5. Low power requirement and no moving parts 	<ol style="list-style-type: none"> 1. No biological treatment for bypass 2. Additional O&M costs for influent pump station
2	Pump Station To MACM WWTP	<ol style="list-style-type: none"> 1. Operation and maintenance of WWTP eliminated. 2. Lower manpower requirement. 	<ol style="list-style-type: none"> 1. Flow storage facilities still required 2. MACM WWTP capacity restrictions may require upgrades and a re-rate 3. Large pump station will require various sized pumps
3	Flow Storage Facilities	<ol style="list-style-type: none"> 1. Maintain existing WWTP processes with minor upgrades 2. Protects WWTP biology during peak flow events 3. Biological treatment of all flow 	<ol style="list-style-type: none"> 1. Site restrictions require additional land acquisition 2. Pump station and force main required to convey flow to storage tank 3. Large pump station will require various sized pumps 4. Additional O&M costs for pump station

For further detail on the City of Duquesne alternative analysis, reference the LTCP in Appendix C.

Borough of Dravosburg

Alternatives were developed for evaluation with the primary focus of providing treatment to 85 percent of CSS flow captured during rain events on an annual average basis. In order to meet the 85 percent criteria, a hydraulic re-rate will be required. During the development of each alternative, it was high priority to maintain as much of the existing processes as possible. Three (3) alternatives were initially considered, but only two (2) were developed for detailed evaluation. The third alternative, to pump Dravosburg flow to the Duquesne WWTP, was discounted due to limited capacity at the Duquesne WWTP.

1. Alternative 1 – Convert existing process to a Sequencing Batch Reactor (SBR) process. Modification of existing process to handle all average and peak flow. This alternative includes construction of a new headworks and influent pump station, as well as modifications to the existing process using existing tanks. Additionally, this

alternative includes upgrading the existing process to meet re-rate requirements. The following items are included in Alternative 1:

- New automatic bar screen and by-pass channel with static screen.
 - New headworks building.
 - New raw sewage pump station and controls.
 - New raw sewage pump station piping and valve vault.
 - New pump flow meter.
 - Site gravity and force main piping.
 - New grit removal system.
 - Retrofit existing aeration basins to serve as SBRs.
 - All SBR equipment and piping.
 - Retrofit existing final clarifiers to serve as sludge holding tanks.
 - Retrofit existing chlorine contact tanks to serve as UV disinfection.
2. Alternative 2 – Pump to McKeesport WWTP and convert existing WWTP to peak flow storage. This alternative includes construction of a new raw sewage pump station to convey all flow up to 1.0 MGD to the McKeesport WWTP. All flow above 1.0 MGD will be pumped by separate storm pumps and stored in the existing Dravosburg WWTP aeration basins. The following items are included in Alternative 2:
- New automatic bar screen and by-pass channel with static screen.
 - New headworks building.
 - New raw sewage pump station and controls.
 - Average flow pumps and storm pumps.
 - New raw sewage pump station piping and valve vault.
 - New pump flow meter.
 - Site gravity and force main piping.
 - Force main piping to the MACM WWTP.
 - Retrofit existing aeration basins to serve as peak flow storage.
 - New diffusers in the peak flow storage basins.

Evaluation of Alternatives

The following sections summarize design considerations associated with each alternative. Both Alternatives 1 and 2 will meet the current permit requirements and will allow for treatment of design flows. Table 3 lists the advantages and disadvantages associated with each alternative.

Table 3: Borough of Dravosburg Alternatives Comparison

Alternative No.	Alternative	Advantages	Disadvantages
1	SBR	1. Process is very flexible and easy to operate. 2. Low manpower requirement. 3. Large biomass volume provides process protection against shock mass loadings. 4. Produces a well stabilized sludge. 5. Lower sludge production. 6. Proven technology. 7. DEP is comfortable with SBR process.	1. Effluent quality depends on decanter reliability. 2. Process control is dependent on PLC operation.
2	Pump Station To MACM WWTP	1. Operation and maintenance of WWTP eliminated. 2. Lower manpower requirement.	1. Large pump station will require various sized pumps

For further detail on the Borough of Dravosburg alternative analysis, reference the LTCP in Appendix D.

III.A.5 Operation & Maintenance Requirements for Small Flow Treatment Facility Systems

There are no small flow sewage treatment facilities (SFSTF) affected by this regional Plan.

III.A.6 Disposal Areas

Both of the existing WWTPs discharge treated effluent to the Monongahela River.

III.B. ON-LOT SEWAGE DISPOSAL SYSTEMS IN THE PLANNING AREA

On-lot sewage disposal systems in the planning areas are not considered, as the purpose of this Plan is to address the proposed upgrades to increase the capacity of the existing conveyance and treatment facilities.

III.C. WASTEWATER SLUDGE AND SEPTAGE GENERATION, TRANSPORT AND DISPOSAL METHODS

III.C.1 Location of Sources of Wastewater Sludge or Septage

City of Duquesne

The WWTP contains four (4) aerobic digesters in series and two (2) sludge thickening tanks. Thickened sludge is then conveyed to a 1.0-m belt filter press. Please reference the LTCP for more information on solids handling.

Borough of Dravosburg

The Dravosburg WWTP contains a sludge holding tank, which is periodically pumped and hauled to the MACM WWTP under Permit No. PA0026913. Please reference the LTCP for more information on solids handling.

III.C.2 Quantities of the Types of Sludges or Septage Generated

City of Duquesne

During 2013, the Duquesne WWTP processed 98.8 tons of dewatered sludge having an average of 20.17% solids yielding 19.9 dry tons of hauled sludge.

Borough of Dravosburg

During 2013, the Dravosburg WWTP disposed of 22,000 gallons of liquid sludge having a solids concentration of 1.53% for a total of 1.40 dry tons.

III.C.3 Present Disposal Methods, Locations, Capacities and Transportation Methods

City of Duquesne

Dewatered sludge from the Duquesne WWTP is hauled to the USA Waste site under Permit No. 100590.

Borough of Dravosburg

Liquid sludge from the Dravosburg WWTP is hauled to the MACM WWTP under Permit No. PA0026913.

IV. FUTURE GROWTH AND LAND DEVELOPMENT

IV.A. MUNICIPAL AND COUNTY PLANNING DOCUMENTS ADOPTED PURSUANT TO THE PENNSYLVANIA MUNICIPALITIES PLANNING CODE (ACT 247)

The Allegheny County Comprehensive Plan, *Allegheny Places*, contains all of the governing land use planning regulations which are used to establish guidelines for the urbanization of Allegheny County. All construction work which may be undergone through the implementation of the proposed wastewater treatment alternatives will be at the WWTP sites and along existing roadways.

IV.A.1 Land Use Plans and Zoning Maps

Exhibit 7 of Appendix I is a map, obtained from the *Allegheny Places Map Viewer*, which depicts the designated land uses at the proposed upgrade sites. It identifies residential, commercial, industrial, agricultural, recreational and open space areas. All construction work which may be undergone through the implementation of the proposed wastewater treatment alternatives, will be at the WWTP sites and along existing roadways.

IV.A.2 Zoning & Subdivision Regulations

Allegheny County currently utilizes the *Allegheny County Subdivision and Land Development Ordinance of 1998* for the purpose of protecting and promoting public health, safety and welfare through the establishment of standards and procedures for the review and approval of subdivisions and land development in Allegheny County. Subdivision and land development shall be designed to minimize damage to the environment, avoid hazardous development, respect the natural resources of the site, consider the character of the surrounding area, be suitable for intended uses, improve community appearance and contribute to the environmental quality and livability of new development areas. All land development proposed as part of this Plan shall follow the guidelines of the *Allegheny County Subdivision and Land Development Ordinance of 1998*.

IV.A.3 Limitations Related and Plans Related to Floodplain and Stormwater Management

Certain regulations exist in regards to floodplain and stormwater management for the protection of citizen health, safety and welfare, such as elevating the first floor level above the 100-year floodplain and obtaining necessary state and federal permits for construction within these areas. Floodplain resources are of significant importance and are vital for maintaining the floodplain ecosystem. The primary environmental policy, in regards to floodplains, is the protection of floodplain resource values. Both WWTPs are located in a floodplain area, as shown on the FEMA Floodplain Map in Exhibit 6 of Appendix I. The MACM will ensure that, during design, all regulations for facilities with a 100-year floodplain are met. In addition, all

attempts shall be made to minimize the impact on any ecologically sensitive areas during any construction activities that may occur through the implementation of the upgrades.

Many stormwater management limitations and requirements exist to protect the surface waters of the Commonwealth. All attempts shall be made to minimize the surface areas of impervious surfaces when designing and constructing the upgrades through credits and planning. These surfaces often collect oil, antifreeze, and other unnatural substances which have the potential to degrade the water quality in rivers and streams through runoff during wet weather events. In addition, an area must also be constructed to hold the water produced during the 2-year storm and allow this water to dissipate prior to the repetition of such an event.

The Pennsylvania Code, Title 25, Chapter 93 sets forth water quality standards for surface waters of the Commonwealth. These standards, set by the PADEP to establish the level of water quality each stream system should maintain, are based upon designated water uses which are protected under the Pennsylvania Clean Streams Law. A review of Chapter 93 reveals that Monongahela River is classified as a warm water fishery (WWF). The PADEP sets preliminary effluent limits to maintain water quality within a stream with those parameters in mind. The design effluent limits for WWTP upgrade alternatives are included in the LTCPs.

IV.B. LAND USE AND FUTURE GROWTH

IV.B.1 Existing Development

The existing development within the planning areas can be found in the LTCPs.

IV.B.2 Land Use Designations Established Under the Pennsylvania Municipalities Planning Code

The land use designations established under the Pennsylvania Municipalities Planning Code are shown on the land use map in Exhibit 7 of Appendix I. The purpose of this Plan is to address the proposed upgrades to increase the capacity of the conveyance systems and treatment facilities. All construction work which may be undergone through the implementation of the proposed wastewater treatment alternatives, will be at the WWTP sites and along existing roadways as shown in the LTCPs.

IV.B.3 Future Growth Areas and Population Projections

No significant growth is expected in either of the planning areas.

IV.B.4 Limitations for Use of Land and Water Resources

Zoning and subdivision regulations are outlined in the *Allegheny County Subdivision and Land Development Ordinance of 1998* and the *Allegheny County Comprehensive Plan, Allegheny Places*.

Important information regarding protection of land and water resources (i.e., ground/surface water supplies, recreational water use areas, groundwater recharge areas, industrial water use, wetlands, etc.) is outlined in the ordinance and in the comprehensive plan. The regulations do not affect the upgrades in this Plan.

IV.B.5 Sewage Planning for Future Growth

This Plan was prepared to outline upgrades to the existing facilities. No significant growth is expected in either of the planning areas.

V. IDENTIFICATION OF ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

V.A. CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT AND DISCHARGE ALTERNATIVES

V.A.1 Potential for Regional Wastewater Treatment

As a part of the LTCPs, consideration was given to sending all flow from both treatment facilities to the McKeesport WWTP.

V.A.2 Potential for Extension of Existing Sewage Facilities

The extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities is not addressed in this Plan. This Plan was prepared to outline the upgrade of the existing conveyance systems and treatment facilities.

V.A.3 Potential for Continued Use of Existing Facilities

City of Duquesne

The collection and conveyance system will continue to be utilized. As a part of the alternatives analysis, consideration is given to the continued use of the existing treatment facilities. In addition, the planning for upgraded facilities incorporates much of the existing infrastructure and equipment.

Borough of Dravosburg

The collection and conveyance system will continue to be used. No consideration is given to using the existing treatment processes, as there is inadequate capacity to handle wet weather flows. However, the planning for upgraded facilities incorporates much of the existing infrastructure and equipment.

V.A.4 Repair or Replacement of Existing Collection and Conveyance System Components

Repair or replacement of the existing collection and conveyance system was not considered as a part of this Plan. As a part of the Duquesne LTCP, two (2) new relief sewers are proposed to alleviate capacity issues. Also, consideration is given to upgrading the existing treatment facilities, incorporating much of the existing infrastructure and equipment.

V.A.5 Need for Construction of New Community Sewage Systems

There exists a need for construction of new community sewage treatment systems in both planning areas. The new facilities are outlined in detail in each planning area's respective LTCP. It is the practice of the PADEP to promote regional facilities and the basis of the Act 537 planning process is to provide the most environmentally sound solution for the region. As such, consideration was given to conveying all flow from both planning areas to the McKeesport WWTP. In the case of the Borough of Dravosburg, this is the leading alternative. In the City of Duquesne, however, it is not economically feasible to send flow to the McKeesport WWTP.

V.A.6 Use of Innovative or Alternative Methods of Collection and Conveyance

The use of innovative or alternative collection and conveyance system components is not addressed in this Plan. This Plan was prepared to outline the upgrade of the existing conveyance systems and treatment facilities.

V.B. USE OF INDIVIDUAL SEWAGE DISPOSAL SYSTEMS

The purpose of this Plan is to address the proposed upgrades to the conveyance systems and treatment facilities. As such, the use of individual sewage disposal systems is not considered in this plan.

V.C. USE OF SMALL FLOW SEWAGE TREATMENT FACILITIES

The purpose of this Plan is to address the proposed upgrades to the conveyance systems and treatment facilities. As such, the use of small flow sewage treatment facilities is not considered in this Plan.

V.D. USE OF COMMUNITY LAND DISPOSAL ALTERNATIVES

The purpose of this Plan is to address the proposed upgrades to the conveyance systems and treatment facilities. As such, the use of community land disposal alternatives is not considered in this Plan.

V.E. USE OF RETAINING TANK ALTERNATIVES

City of Duquesne

As a part of the alternatives analysis, consideration is given to adding flow storage facilities, while either treating dry weather flow at the existing WWTP, or conveying it to the MACM WWTP. Please reference the alternatives analysis.

Borough of Dravosburg

As a part of this Plan, consideration is given to converting the existing facilities into wet weather storage facilities while conveying dry weather flow to the MACM WWWT.

V.F. SEWAGE MANAGEMENT PROGRAMS

The purpose of this Plan is to address the proposed upgrades to the conveyance systems and treatment facilities. As such, the implementation of a sewage management program is not considered plausible.

V.G. NON-STRUCTURAL COMPREHENSIVE PLANNING ALTERNATIVES

The purpose of this Plan is to address the proposed upgrades to the conveyance systems and treatment facilities. As such, the use of non-structural comprehensive planning alternatives is not considered in this Plan.

V.H. NO ACTION ALTERNATIVE

It can be assumed that the likelihood of water contamination and the associated public health risks will increase if a no action alternative is undertaken. Prevention of such scenarios is essential.

The lack of conveyance capacity in the conveyance systems and treatment capacity at the treatment facilities must be addressed to protect the health, safety, and welfare of the citizens living in a municipality, to prevent future sewage disposal problems from occurring, and to provide protection for the groundwater and surface waters of the Commonwealth. A no action alternative is not an option at this time and is not considered in this Plan.

VI. EVALUATION OF ALTERNATIVES

VI.A. CONSISTENCY DETERMINATION

According to Act 537, all technically feasible sewage facility alternatives must be evaluated for consistency with certain acts, programs and policies. The upgrades to the existing treatment processes include both SBR and CSO bypass treatment technologies. The consistency areas are assessed and summarized for the proposed upgrades.

1. Consistency with Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act

The primary purpose of the Clean Streams Law is, "to preserve and improve the purity of the waters of the Commonwealth for the protection of public health, animal and aquatic life, and for industrial consumption and recreation." Section 4 essentially states that clean, unpolluted streams are essential to attract new manufacturing industries and to develop the tourist industry. Clean streams support and protect recreational facilities or activities. Section 4 states, "It is the objective of the Clean Streams Law not only to prevent further pollution of the waters of the Commonwealth, but also to reclaim and restore to a clean, unpolluted condition every stream in Pennsylvania that is presently polluted." The prevention and elimination of water pollution can have a huge impact on the economic future of the Commonwealth.

Section 5 defines the duties of the PADEP which provide it with the power to enforce the policies of the Clean Streams Law and states that the following are critical considerations to carry out the objectives of Section 4:

- Water quality management and pollution control in the watershed as a whole.
- The present and possible future uses of particular waters.
- The feasibility of combined or joint treatment facilities.
- The state of scientific and technological knowledge.
- The immediate and long-range economic impact upon the Commonwealth and its citizens.

By implementation of this Plan, the objectives of the Clean Streams Law and the Clean Water Act will be achieved. Pollution of the waters of the Commonwealth will be diminished by implementing the recommended alternative as presented in this Plan.

2. Consistency with Municipal Wasteload Management Corrective Action Plans or Annual Reports Under PA Code, Title 25, Chapter 94

Borough of Dravosburg

A review of the 2013 Chapter 94 Wasteload Management Report for the Dravosburg WWTP indicates that the WWTP was not hydraulically overloaded in the operating year 2013, and is not projected to be hydraulically overloaded within the next five years. The WWTP was not organically overloaded in the operating year 2013, and is not projected to be organically overloaded within the next five years.

The upgrades proposed herein are directed toward alleviating excessive combined sewer overflows (CSO) within the conveyance system in accordance with LTCP guidelines. Please reference the CSS LTCP for further information on this topic.

City of Duquesne

A review of the 2013 Chapter 94 Wasteload Management Report for the Duquesne WWTP indicates that the WWTP was not hydraulically overloaded in the operating year 2013, and is not projected to be hydraulically overloaded within the next five years. The WWTP was not organically overloaded in the operating year 2013, and is not projected to be organically overloaded within the next five years.

The upgrades proposed herein are directed toward alleviating excessive CSOs within the conveyance system in accordance with LTCP guidelines. Please reference the CSS LTCP for further information on this topic.

3. Consistency with Title II of the Clean Water Act or Titles II and VI of the Water Quality Act of 1987

Implementation of the recommended alternatives discussed in this Plan will improve water quality and significantly reduce the quantity of CSOs in the two (2) systems during wet weather events. Proposed treatment technologies evaluated herein were developed on the basis of meeting probable effluent limits, formally to be established during the PADEP Part I permitting process. Therefore, the alternatives proposed in this Plan are consistent with the objectives of the Clean Water Act and the Water Quality Act.

4. Consistency with Comprehensive Plans Developed Under the Pennsylvania Municipalities Planning Code

This Plan is consistent with the objectives of each municipality in regards to providing adequate public facilities for sewage treatment and ensuring that all MACM owned facilities meet the requirements of each municipality.

5. Consistency with Antidegradation Requirements as Contained in PA Code, Title 25, Chapters 93, 95 and 102

All of the alternatives identified within this Plan are consistent with the anti-degradation requirements set forth in Chapter 93 (Water Quality Standards), Chapter 95 (Wastewater Treatment Requirements), and in Chapter 102 (Soil Erosion and Sedimentation Control). The receiving waters of the Commonwealth will be protected by the recommended alternative. Furthermore, erosion and sedimentation pollution control measures will be rendered in accordance with and approved by the Allegheny County Conservation District prior to any construction activity.

Compliance with Chapter 102 is required during the design phase as a prerequisite of submittal of a Part II WQM Permit in accordance with Chapter 95. The requirements of Chapter 93 will be met through the submission of a Part I Permit application, which will determine the effluent discharge limits for a discharge to Peters Creek. As part of the Part II WQM Permit process, a Design Engineers Report will be developed to verify that the proposed treatment facilities will meet the effluent requirements set forth in the Part I Permit.

6. Consistency with State Water Plans Developed Under the Water Resources Planning Act

The goal of the State Water Plan is to enhance and protect the waters of the Commonwealth of Pennsylvania. The planning area for this Plan lies within the Monongahela River Basin, a sub-basin of the Ohio River Watershed. No different than any other watershed in Pennsylvania, water quality is an important issue in the Monongahela River Basin. Implementation of this Plan will improve the water qualities of the Commonwealth by protecting the quality of the Monongahela River. Thus, this Plan is consistent with the State Water Plan.

7. Consistency with the Pennsylvania Prime Agricultural Land Policy

Pennsylvania's Prime Agricultural Land Policy orders and directs the prevention of irreversible conversion of prime agricultural land to uses that result in its loss as an environmental or essential food production resource. Prime farmlands are important to examine for scenarios in which development is expected to occur because of the protective measures in existence to preserve this important resource. Exhibit 3 of Appendix I of this Plan includes mapping which shows that there are no prime agricultural lands at any of the proposed construction sites. Prime agricultural lands will not be affected by any construction activities that will occur at the sites as proposed through implementation of this Plan. Thus, this Plan is consistent with the Pennsylvania Prime Agricultural Land Policy.

8. Consistency with County Stormwater Management Plans Approved by the PADEP Under the Stormwater Management Act

The Stormwater Management Act of 1978, Act 167, as amended, encourages planning and management of stormwater runoff in each watershed which is consistent with sound water and land use practices. Act 167 contains guidelines for the development of Stormwater Management Plans for designated watersheds throughout the Commonwealth. As stated in the Allegheny County Comprehensive Plan, *Allegheny Places*, stormwater management has been traditionally defined as measures used by property owners and local governments to limit the amount of stormwater runoff from urban development and to control the path of runoff through space and time. Stormwater management has also recently included water quality considerations. Concerns of flooding and accelerated erosion are introduced through land development from a permeable, vegetated condition to an impervious, paved condition. The major goal of stormwater management is to protect health, safety and other property from damage.

All construction work included as part of the Plan will have to adhere to all existing stormwater regulations outlined in *Allegheny Places*. Activities related to the construction of sewage facilities will comply with erosion and sedimentation control requirements through the issuance of an NPDES permit. In addition, the footprint of all impervious surfaces (i.e., parking lots, driveways, roads, etc.) which may be constructed as part of the Plan upgrade will be minimized as much as possible in order to decrease runoff potential. This Plan is consistent with stormwater management plans.

9. Consistency with Wetlands Protection

Wetland areas are considered to be a valuable public water resource and are subjected to strict conservative practices. They provide an environment for valuable fish, waterfowl and wildlife habitat. Many endangered plant species are thought to exist in wetlands, and wetlands are essential for the maintenance of surface water quality and quantity. There are no wetland areas within the project site boundaries.

Although there are no wetland areas within the vicinity of the Plan upgrades where all construction activities will occur, all attempts shall still be made to minimize the impact on any ecologically sensitive areas during construction activities associated with the upgrades. This Plan is consistent with wetlands protection regulations.

10. Consistency with Protection of Rare, Endangered or Threatened Plant and Animal Species as Identified by the Pennsylvania Natural Diversity Inventory (PNDI)

As per the Pennsylvania Natural Heritage Program, there is only one (1) potential conflict of concern with the implementation of any of the alternatives described herein. This potential conflict is at the Duquesne WWTP site through the PA Fish and Boat Commission. Further correspondence will be included with the final submission of the Plan. The PNDI results for the proposed upgrade projects are included as Appendix J. It is anticipated that this Plan is consistent with the protection of rare, endangered or threatened plant and animal species.

11. Consistency with Historical and Archaeological Resource Protection in Conjunction with the Pennsylvania Historical and Museum Commission (PHMC)

It is anticipated that this Plan is consistent with historical and archaeological resource protection. No response has been received from the PHMC at the time of this Draft submission. General correspondence with PHMC is included in Appendix K.

VI.B. RESOLUTION OF INCONSISTENCIES

The alternative sewage treatment technologies identified herein are consistent with the following acts, programs and policies, and do not require resolution during this planning phase of the MACM upgrade projects:

- Sections 4 and 5 of the Clean Streams Law.
- Section 208 of the Clean Water Act.
- Municipal Wasteload Management Plan Under PA Code, Title 25, Chapter 94.
- Title II of the Clean Water Act.
- Titles II and VI of the Water Quality Act of 1987.
- Allegheny County Comprehensive Plan.
- Anti-degradation requirements as contained in PA Code, Title 25, Chapters 93, 95 and 102.
- State Water Plan developed under the Water Resources Planning Act.
- Pennsylvania Prime Agricultural Land Policy.
- Stormwater management requirements.
- Wetlands Protection under Chapter 105.
- Protection of rare, endangered or threatened plant and animal species as identified by the Pennsylvania Natural Diversity Inventory (PNDI).
- Historical and archaeological resource protection.

Additional action may be required to demonstrate consistency with the above named acts, programs and policies. This will occur during the design and permitting phases upon

implementation of the selected sewage facilities alternative. The following actions may be required:

- Preparation of Erosion and Sedimentation (E&S) Control Plans for the construction of the new facilities. These plans will be reviewed by the Allegheny County Conservation District. The construction may require up to 12 or more acres of earth disturbance, so the issuance of a General NPDES Permit will be required. Additional permits will be required, including a Part II Water Quality Management Permit. E&S plans will be required to incorporate Best Management Practices to demonstrate compliance with Chapter 102.
- A Part I Permit application may need submitted during the design phase of the selected alternatives for compliance with Chapter 93 (Water Quality Standards).
- The submission of the Part II Permit will require the preparation of a Design Engineer's Report documenting compliance with applicable PADEP design standards.
- A detailed wetlands evaluation may be required. Appropriate PADEP or Army Corps of Engineers (ACOE) permitting will be performed. However, this may not be required if it is determined that there are no wetlands within the vicinity of the planned upgrades, as was determined during the preliminary investigation within this Plan.

VI.C. WATER QUALITY STANDARDS, EFFLUENT LIMITATIONS OR OTHER TECHNICAL, LEGISLATIVE OR LEGAL REQUIREMENTS

The alternatives presented within this Plan were developed on the basis of achieving compliance with all applicable water quality standards, effluent limitations or other technical, legislative or legal requirements.

VI.D. COST ESTIMATES AND PRESENT WORTH ANALYSIS

The cost analysis for all alternatives was conducted in each planning area's respective LTCP. Refer to Appendix C and Appendix D of this plan for each respective LTCP. Estimated total construction costs and project costs for the implementation of the recommended alternatives utilized in this Plan are shown in Table 4.

Table 4: Recommended Alternative Costs

<u>Community Alternative</u>	<u>Construction Cost</u>	<u>Project Cost</u>
<u>City of Duquesne</u> CSO Bypass Treatment	\$5,939,000	\$7,424,000
<u>Borough of Dravosburg</u> Pump to McKeesport WWTP	\$4,401,000	\$5,503,000
Total	\$10,340,000	\$12,927,000

An analysis of projected user rates is included in Appendix L. A summary of the projected monthly and yearly debt service for each community is included in Table 5.

Table 5: MACM Projected Monthly Sewage Charges

<u>Community</u>	<u>Monthly Debt Service</u>	<u>Yearly Debt Service</u>
City of McKeesport	\$511,192	\$6,134,300
Tributary Communities	\$443,693	\$5,324,314
Duquesne	\$131,050	\$1,572,602
Dravosburg	\$41,665	\$499,985
Elizabeth Township Surcharge	\$116,667	\$1,400,000
Total	\$1,244,267	\$14,931,201

VI.E. ANALYSIS OF FUNDING METHODS

Pennsylvania Infrastructure Investment Authority (PENNVEST)

The first step in the PENNVEST application process is to participate in a planning consultation meeting. At the meeting, the financial status of the client will be evaluated to determine if any grant funding may be issued in the funding package available for the potential client. A grant will be considered only when the PENNVEST Board determines that the applicant's financial condition indicates that the loan repayment is unlikely. If no grant funding can be issued, the potential funding package will be given based upon certain information provided at the meeting. Total project funding is capped at \$11M per project, rising to \$20M if more than one municipality is served.

The typical life of a PENNVEST loan is 20 years and the interest rate of the loan currently ranges from 1.654% to 2.132% in Allegheny County. However, in some cases, the term of the loan may be extended beyond 20 years to as long as 30 years if needed to keep the user fees in line with other similar system user rates. The construction period is

added to this term in order to allow for an interest only period. Principal and interest repayments begin after final inspection.

PENNVEST funding is available for financing costs associated with capital projects, engineering fees, legal fees and right-of-way acquisitions. However, prior to receiving any loan or grant money, all permits necessary for construction activities must be approved by the associated regulatory agency. All fees associated with the permitting and design phase must be financed upfront by the municipality.

Bond Issuance

Bond financing is a form of borrowing that involves an interest-bearing certificate for sale to prospective investors. System owners with taxing power, for example, are authorized to issue general obligation bonds to fund their projects. Secured by the capacity to raise taxes or user fees to meet payment obligation, this class of bonds is capable of attracting investors at lower costs to the borrower. The appeal of a general obligation bond as a financing instrument is offset, to some degree, by stipulations governing their use. Their issuance may require voter and/or legislative approval and, given the existence of state-established debt limits for most governmental units, the issuance of bonds for other purpose projects may be substantially reduced.

All tax exempt bond issuers, as in the case of an Authority, are encouraged to consider loans from bond pools as a source of funding for capital projects for amounts greater than \$2M. Bond pools that contain funds created from tax-exempt revenue bonds are issued for the purpose of third-party borrowing. Advantages of pool loans are that the application consists of standardized forms, there are moderate up-front financing costs, they offer lower interest rates with flexible terms, they allow a finance term length of 10 to 30 years and they permit projects to progress more rapidly by providing variable rate start-up financing that may be converted to a fixed permanent rate. Pool loans generally require the credit enhancement of bond issuance or a letter of credit from a qualified bank.

VI.F. ANALYSIS OF NEED FOR IMMEDIATE OR PHASED IMPLEMENTATION OF ALTERNATIVES

There is no current plan to phase the upgrade alternatives in this Plan. Implementation and timing of the construction projects will depend heavily on project financing.

VI.G. ADMINISTRATIVE ORGANIZATIONS AND LEGAL AUTHORITY

The MACM has the legal authority to implement the wastewater treatment facility upgrades proposed herein.

VII. INSTITUTIONAL EVALUATION

VII.A. ANALYSIS OF EXISTING WASTEWATER TREATMENT AUTHORITIES

VII.A.1 Financial and Debt Status

A summary of the operating revenue and expenditures, as taken from the MACM's Year 2014 budget, is provided in Table 6. Operating revenues are generated through customer charges. Non-operating revenue generally consists of delinquency fees, investments, refunds and reimbursements. Operating expenses include personnel salaries and wages, professional service fees, maintenance fees, supplies, utilities, insurance and other administrative expenses. The non-operating expenses include the interest payment on bonds or loans. The difference between the total revenue and total expenses is defined as the net income.

Table 6: MACM Revenue and Expenditures

	2013 PROJECTIONS	2014 BUDGET
OPERATING REVENUES		
City of McKeesport	\$ 5,357,600	\$ 6,134,300
Elizabeth Township	477,000	541,800
Elizabeth Township (Buena Vista Surcharge)	N/A	1,400,000
Liberty (Includes Glassport & Lincoln)	437,600	505,600
North Versailles Township	1,182,000	1,358,400
Port Vue Borough	577,500	668,900
Versailles Borough	259,100	300,100
White Oak Borough	1,293,400	1,501,800
East McKeesport Borough	91,000	103,200
Duquesne	618,800	1,104,200
Dravosburg	308,600	386,700
Subtotal Operating Revenues	\$ 10,602,600	\$ 14,005,000
NON-OPERATING REVENUES		
Billing Delinquency Fees	\$ 106,300	\$ 199,100
Income from Investments	3,200	3,200
Capitalized Bond Interest	725,000	560,000
Miscellaneous	165,500	135,000
Transfer of Funds	722,100	0
Subtotal Non-Operating Revenues	\$ 1,712,100	\$ 897,300
GROSS REVENUES	\$ 12,314,700	\$ 14,902,300
OPERATING EXPENSES		
MACM Operations	3,625,800	5,267,300
Administration	2,429,600	1,492,900
TOTAL OPERATING EXPENSES	\$ 6,055,400	\$ 6,760,200
NET REVENUES	\$ 6,259,300	\$ 8,142,100
DEBT SERVICE REQUIREMENTS		
Penn Vest Loans	\$ 755,550	\$ 977,423
2008 Series Bond	301,535	301,535
2009 Series Bond	703,809	703,859
2010 Series Bond	668,161	668,161
2011 Series Bond	1,406,531	2,006,131
2012 Series Bond	377,464	375,614
2012-B Series Bond	161,498	161,448
2013 Series Bond	501,359	548,600
Bond Fund Management Fees	25,000	25,000
Total Debt Service Requirement	\$ 4,990,907	\$ 5,767,771
SURPLUS(DEFICIT)	\$ 1,268,393	\$ 2,374,329
Intergovernmental Agreement Fee	\$ 1,010,000	\$ 1,020,100
SURPLUS(DEFICIT)	\$ 258,393	\$ 1,354,229

VII.A.2 Available Staff and Administrative Resources

The MACM is adequately staffed to ensure efficient operation of all existing facilities. No further employment is planned as part of the proposed upgrades.

VII.A.3 Existing Legal Authority

The MACM has the legal authority to implement the wastewater planning recommendations proposed herein. Being the owner of the WWTPs, the MACM is responsible for handling O&M of both WWTPs, as well as setting user fees and billing each community for its respective share. The MACM is responsible for the O&M of both collection and conveyance systems as well.

VII.B. ANALYSIS OF INSTITUTIONAL ALTERNATIVES NECESSARY FOR IMPLEMENTATION

VII.B.1 Need for New Municipal Departments or Municipal Authorities

There is no need for the development of new municipal departments or authorities. The MACM is fully capable of undertaking the WWTP upgrades proposed within this Plan and operating the plant effectively and efficiently upon completion.

VII.B.2 Functions of Existing Organizations

The function of the MACM will not change as a result of this Plan.

VII.B.3 Cost of Administration, Implementability and the Capability to React to Future Needs

The alternatives developed within this Plan were done to incorporate the capacity to serve the needs of each municipality. Upon implementation of this Plan, the MACM will have the capability to ensure adequate treatment.

VII.C. ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY FOR IMPLEMENTATION

VII.C.1 Incorporation of Authorities or Agencies

There are no activities requiring the incorporation of authorities or agencies as part of this Plan.

VII.C.2 Development of Ordinances, Regulations, Standards and Inter-municipal Agreements

There are no ordinances, regulations, standards, or inter-municipal agreements required as a part of this Plan.

VII.C.3 Activities Required to Provide Rights-of-way, Easements and Land Transfers

The implementation of this Plan may require the acquisition of right-of-ways or easements along new relief sewers and force mains. These activities will be investigated further at the time of design.

VII.C.4 Adoption of Other Municipal Sewage Facilities Plans

In order for this Plan to be implemented, the City of McKeesport, the City of Duquesne, and the Borough of Dravosburg will be required to adopt this Act 537 Sewage Facilities Plan.

VII.C.5 Other Legal Documents

There are no other legal documents required for implementation of this Plan.

VII.C.6 Timeframes for Implementation of Institutional Alternatives

The MACM owns and operates all conveyance systems and treatment facilities outlined in this Plan. No other institutional alternatives were considered as a part of this Plan.

VII.C.7 Proposed Institutional Alternative

The MACM owns and operates all conveyance systems and treatment facilities outlined in this Plan. No other institutional alternatives were considered as a part of this Plan.

VIII. IMPLEMENTATION SCHEDULE AND JUSTIFICATION FOR SELECTED TECHNICAL & INSTITUTIONAL ALTERNATIVES

VIII.A. BEST TECHNICAL ALTERNATIVE

City of Duquesne

A detailed evaluation of the proposed alternatives led to the recommendation of Alternative 1 for the City's upgrades. The total estimated project cost is \$7,424,000. This alternative is recommended for the following reasons:

- Alternative 2 project cost is \$8,087,000 more than the recommended Alternative 1, while Alternative 3 project cost is \$5,483,000 more.
- The existing WWTP is in good operating condition for average flows, and Alternative 1 allows the WWTP to continue operation under these conditions.

Alternative 1 is recommended. However, given the "High Burden" classification associated with this work, completion of the proposed upgrades on a typical project timeline is not feasible. Project financing will drive the schedule for implementing Alternative 1 upgrades.

Borough of Dravosburg

Detailed evaluation of the proposed alternatives led to the recommendation of Alternative 2 for the Borough's upgrades. The total estimated project cost is \$5,503,000. This alternative is recommended for the following reasons:

- Alternative 1 project cost is \$3,371,000 more than the recommended Alternative 2.
- Alternative 2 eliminates operation and maintenance requirements of a WWTP.

Alternative 2 is recommended. However, given the "High Burden" classification associated with this work, completion of the proposed upgrades on a typical project timeline may not be feasible. Project financing will drive the schedule for implementing Alternative 2 upgrades.

VIII.B. CAPITAL FINANCING PLAN CHOSEN FOR IMPLEMENTATION

For implementation of this Plan, the MACM intends to explore PENNVEST funding options. If PENNVEST funding cannot be obtained, the MACM will then pursue municipal bonds.

VIII.C. IMPLEMENTATION SCHEDULE

The anticipated schedule of implementation of this Plan update is provided in Table 7.

Table 7: Schedule of Implementation

Task	Completion Date
Submit the Final Plan Update to the PADEP	November 1, 2015
Receive the Approval of the PADEP	January 1, 2016
Obtain funding for design related services	January 1, 2017
Begin design of upgrades	January 1, 2017
Apply for MACM WWTP re-rate	July 1, 2017
Apply for Part II Permits	July 1, 2018
Receive Part II Permits	January 1, 2019
Obtain funding for construction	January 1, 2021
Begin construction for upgrades	March 1, 2021
Complete construction	March 1, 2023

IX. ENVIRONMENTAL REPORT GENERATED FROM THE UNIFORM ENVIRONMENTAL REVIEW (UER) PROCESS

The Uniform Environmental Report (UER) for this Act 537 Plan Update is included in Appendix A.

APPENDIX A

Uniform Environmental Review (UER)

**MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
CITY OF DUQUESNE AND BOROUGH OF DRAVOSBURG**

Uniform Environmental Review
August 2014

KLH

ENGINEERS, INC.
5173 CAMPBELLS RUN ROAD
PITTSBURGH, PA 15205-9733

**Municipal Authority of the City of McKeesport
 Uniform Environmental Review
 City of Duquesne and Borough of Dravosburg**

Table of Contents

1.0 PROJECT DESCRIPTION AND NEED.....1

 1.1 Purpose of and Need for Project1

 1.2 Project Description1

2.0 SUMMARY OF REASONABLE ALTERNATIVES CONSIDERED3

 2.1 Alternatives Considered.....3

 2.2 Comparison Alternatives3

3.0 ENVIRONMENTAL CONSEQUENCES OF THE SELECTED ALTERNATIVE.....5

 3.1 Land Use/Important Farmland5

 3.2 Floodplains.....6

 3.3 Wetlands.....6

 3.4 Historic Resources.....7

 3.5 Biological Resources.....7

 3.6 Water Quality Issues.....8

 3.7 Coastal Resources.....8

 3.8 Socio-Economic Issues8

 3.9 Air Quality8

 3.10 Transportation9

 3.11 Noise Abatement and Control.....9

 3.12 Wild and Scenic Rivers.....9

 3.13 Miscellaneous Environmental Considerations9

4.0 SUMMARY OF MITIGATION10

5.0 PUBLIC PARTICIPATION10

6.0 EXHIBITS/ATTACHMENTS24

TABLES:

- Table 1 – City of Duquesne Alternatives Comparison
- Table 2 – Borough of Dravosburg Alternatives Comparison

MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
ACT 537 SEWAGE FACILITIES PLAN UPDATE
UNIFORM ENVIRONMENTAL REVIEW
CITY OF DUQUESNE AND BOROUGH OF DRAVOSBURG

1.0 PROJECT DESCRIPTION AND NEED

1.1 Purpose of and Need for Project

An Act 537 Sewage Facilities Plan Update was prepared to evaluate proposed wastewater treatment plant (WWTP) and combined sewer system (CSS) upgrades in the City of Duquesne and the Borough of Dravosburg, whose conveyance systems and treatment facilities are now owned by the Municipal Authority of the City of McKeesport (MACM).

In the City of Duquesne system, two (2) sections of the CSS in the planning area lack capacity to convey the 10-year, 24-hour design storm, causing manhole overflows. In addition, the WWTP lacks treatment capacity to process peak wet weather flows. It was determined that CSS upgrades are required to convey the 10-year, 24-hour design storm flow (without manhole overflows) while maintaining greater than 85% capture of all combined flow during a typical year.

In the Borough of Dravosburg system, it was determined that no CSS upgrades are required to convey the 10-year, 24-hour design storm flow while maintaining greater than 85% capture of all combined flow during a typical year, given a free discharge at the WWTP pump station. The Borough of Dravosburg WWTP, however, does not have capacity to process peak wet weather flows.

1.2 Project Description

The locations of the MACM, Duquesne and Dravosburg WWTPs are shown on mapping included in Attachment A. The recommended projects for the City of Duquesne and the Borough of Dravosburg are described as follows:

City of Duquesne

Detailed evaluation of the proposed alternatives led to the recommendation of continued operation of existing processes and construction of new combined sewer overflow (CSO) bypass treatment facilities. The existing WWTP is in good operating condition with adequate capacity for dry weather flows. This alternative utilizes the existing WWTP up to peak flows of 2.5 MGD. Peak flows above 2.5 MGD will receive CSO bypass treatment. This alternative includes construction of new headworks facilities, influent pump station, and CSO bypass treatment facilities, as well as the installation of new clarifier equipment to maximize efficiency.

Additionally, this alternative includes CSS upgrades required to convey the 10-year, 24-hour design storm to the WWTP including two gravity relief sewers totaling 1,025 lineal feet.

The following items are included in the project proposed for the City of Duquesne:

- CSS upgrades.
- New automatic bar screen and by-pass channel with static screen.
- New headworks building.
- New raw sewage pump station and controls.
- New raw sewage pump station piping and valve vault.
- New pump flow meter.
- Site gravity and force main piping.
- New CSO bypass treatment.
- Upgrade final clarifier equipment to maximize efficiency.

The total estimated project costs for the City of Duquesne project is \$7,424,000. Project layouts for the recommended alternatives are included in Attachment B.

Borough of Dravosburg

Detailed evaluation of the proposed alternatives led to the recommendation to pump flow to the McKeesport WWTP and convert the existing Dravosburg WWTP to peak flow storage. This alternative includes construction of a new raw sewage pump station to convey all flow up to 1.0 MGD to the McKeesport WWTP. All flow above 1.0 MGD will be pumped by separate storm pumps and stored in the existing Dravosburg WWTP aeration basins. The following items are included in the project proposed for the Borough of Dravosburg:

- New automatic bar screen and by-pass channel with static screen.
- New headworks building.
- New raw sewage pump station and controls.
- Average flow pumps and storm pumps.
- New raw sewage pump station piping and valve vault.
- New pump flow meter.
- Site gravity and force main piping.
- Force main piping to the MACM WWTP.
- Retrofit existing aeration basins to serve as peak flow storage.
- New diffusers in the peak flow storage basins.

The total estimated project costs for the Borough of Dravosburg project is \$5,503,000. Project layouts for the recommended alternatives are included in Attachment B.

The combined estimated project cost is \$12,927,000. This debt will be distributed among the MACM's customers. The MACM intends to explore PENNVEST funding options. If PENNVEST funding cannot be obtained, the MACM will then pursue municipal bonds.

2.0 SUMMARY OF REASONABLE ALTERNATIVES CONSIDERED

2.1 Alternatives Considered

In the City of Duquesne system, detailed planning evaluations were completed for three (3) alternatives as follows:

- Alternative 1 – Existing WWTP + new pump station + CSO bypass treatment.
- Alternative 2 – New pump station to MACM WWTP + flow storage.
- Alternative 3 – Existing WWTP + new pump station + flow storage.

In the Borough of Dravosburg system, detailed planning evaluations were completed for two (2) alternatives as follows:

- Alternative 1 – Modify existing WWTP to Sequencing Batch Reactor (SBR).
- Alternative 2 – Pump Station to MACM WWTP + existing tanks as flow storage.

2.2 Comparison of Alternatives

The following is a comparison of the alternatives considered for the City of Duquesne and Borough of Dravosburg systems:

City of Duquesne

Both Alternatives 1 and 3 will meet the current permit requirements and will not require a design capacity re-rate. Alternative 2 may require new facilities and/or a design capacity re-rate at the MACM WWTP, but those issues will only be investigated if Alternative 2 proves to be the preferred alternative for the City of Duquesne. Table 1 lists the advantages and disadvantages associated with each alternative considered for the City of Duquesne.

Table 1: City of Duquesne Alternatives Comparison

Alternative No.	Alternative	Advantages	Disadvantages
1	CSO Bypass Treatment	<ol style="list-style-type: none"> 1. Maintain existing WWTP processes with minor upgrades 2. Bypass protects WWTP biology during peak flow events 3. Provides screening, primary treatment and disinfection in small footprint 4. Able to handle peak flows much higher than the WWTP design capacity 5. Low power requirement and no moving parts 	<ol style="list-style-type: none"> 1. No biological treatment for bypass 2. Additional O&M costs for influent pump station
2	Pump Station To MACM WWTP	<ol style="list-style-type: none"> 1. Operation and maintenance of WWTP eliminated. 2. Lower manpower requirement. 	<ol style="list-style-type: none"> 1. Flow storage facilities still required 2. MACM WWTP capacity restrictions may require upgrades and a re-rate 3. Large pump station will require various sized pumps
3	Flow Storage Facilities	<ol style="list-style-type: none"> 1. Maintain existing WWTP processes with minor upgrades 2. Protects WWTP biology during peak flow events 3. Biological treatment of all flow 	<ol style="list-style-type: none"> 1. Site restrictions require additional land acquisition 2. Pump station and force main required to convey flow to storage tank 3. Large pump station will require various sized pumps 4. Additional O&M costs for pump station

Borough of Dravosburg

Both Alternatives 1 and 2 will meet the current permit requirements and will allow for treatment of design flows. Table 2 lists the advantages and disadvantages associated with each alternative considered for the Borough of Dravosburg.

Table 2: Borough of Dravosburg Alternatives Comparison

Alternative No.	Alternative	Advantages	Disadvantages
1	SBR	<ol style="list-style-type: none"> 1. Process is very flexible and easy to operate. 2. Low manpower requirement. 3. Large biomass volume provides process protection against shock mass loadings. 4. Produces a well stabilized sludge. 5. Lower sludge production. 6. Proven technology. 7. DEP is comfortable with SBR process. 	<ol style="list-style-type: none"> 1. Effluent quality depends on decanter reliability. 2. Process control is dependent on PLC operation.
2	Pump Station To MACM WWTP	<ol style="list-style-type: none"> 1. Operation and maintenance of WWTP eliminated. 2. Lower manpower requirement. 	<ol style="list-style-type: none"> 1. Large pump station will require various sized pumps

3.0 ENVIRONMENTAL CONSEQUENCES OF THE SELECTED ALTERNATIVE

The following sections analyze the impacts of the projects on various environmental resources of the planning area.

3.1 Land Use/Important Farmland

The proposed project is consistent with local land use planning and agricultural preservation interests.

Land Use

All construction work which may be undergone through the implementation of the proposed wastewater treatment alternatives will be at the WWTP sites and along existing roadways. There are no expected changes to the current land use through the implementation of the project.

Prime Agricultural Land

Agricultural areas, as defined by the Pennsylvania Code, are areas used primarily for the production of crops and where the soil is without vegetative cover during certain periods of the

year. Prime farmland is land that has the best physical and chemical soil properties for the production of food, feed and forage, fiber, and oil seed crops. Pennsylvania's Prime Agricultural Land Policy order and directs the prevention of irreversible conversion of prime agricultural land to uses that result in its loss as an environmental or essential food production resource. Prime farmlands are important to examine for scenarios in which future development is expected to occur because of the protective measures in existence to preserve this important resource.

Attachment A includes mapping which shows that there are no prime agricultural lands at any of the proposed construction sites. Prime agricultural lands will not be affected by any construction activities that will occur at the sites as proposed.

3.2 Floodplains

Floodplain regulations such as elevating the first floor level above the 100-year floodplain and obtaining necessary state and federal permits for construction in these areas exist for the preservation of citizen well being. In addition, floodplain resources are of significant importance and are vital for maintaining the floodplain ecosystem. The primary environmental policy in regards to floodplains is the protection of floodplain resource values.

Both WWTPs are located in a floodplain area, as shown on the floodplain mapping in Attachment A. The MACM will ensure that, during design, all regulations for facilities with a 100-year floodplain are met. In addition, all attempts shall be made to minimize the impact on any ecologically sensitive areas during any construction activities that may occur through the implementation of the upgrades.

Direct, Indirect, and Cumulative Effects

The cumulative effect of implementation of the project is that the 10-year, 24-hour design storm flow (without manhole overflows) will be conveyed for treatment while maintaining greater than 85% capture of all combined flow during a typical year. CSO events and the resulting sewage pollution throughout the planning area will be eliminated, improving the water qualities of the drainage basin and the overall environment.

3.3 Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adopted for life in saturated soil conditions including swamps, marshes, bogs and similar areas. Wetland areas are considered to be a valuable public water resource and are subject to strict conservative regulations. They provide an environment and habitat for aquatic life including fish, amphibians, and waterfowl; additionally many endangered plant species are thought to exist in wetlands, and wetlands are essential for the maintenance of surface water quality and quantity.

Hydric soils are formed in conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils contain the characteristics necessary for potential wetland existence and may indicate the presence of wetlands.

Mapping displaying the known presence of wetlands and the hydric soils within the planning areas is included in Attachment A. The only wetland areas in the planning area are located along the Monongahela River and are classified as riverine. Furthermore, there are soils in the planning areas classified as partially hydric.

The MACM will make all attempts to minimize the impact on ecologically sensitive areas during any construction activities. All construction work associated with the chosen alternative will be consistent with all applicable state and federal regulations regarding wetlands. A detailed wetlands delineation analysis to determine the extent of jurisdictional wetlands would be required should any proposed construction encroach on areas conducive to the presence of wetlands. Implementation of this Plan update is not expected to affect wetlands in any way and the selected alternative will be consistent with wetland protection practices and legislation.

Direct, Indirect, and Cumulative Effects

The project is expected to have no impacts on wetlands.

3.4 Historic Resources

It is anticipated that the projects are consistent with historical and archaeological resource protection. No response has been received from the PHMC to date, but will be included in the final submission. General correspondence with PHMC is included as Attachment C.

Direct, Indirect, and Cumulative Effects

This project is expected to have no impacts on any historic resources.

3.5 Biological Resources

As per the Pennsylvania Natural Heritage Program, a partnership amongst the Western Pennsylvania Conservancy, the Department of Conservation and Natural Resources (DCNR), and the Nature Conservancy, a review by applicable environmental agencies is necessary to identify and protect environmental values within the project area. The Pennsylvania Natural Diversity Inventory (PNDI) results for the proposed projects are included as Attachment D. The PA Fish and Boat commission identified a potential conflict at the site of the Duquesne WWTP. Further correspondence with the PA Fish and Boat Commission is included in Attachment D. No response has been received to date, but will be included in the final submission.

Direct, Indirect, and Cumulative Effects

This project is expected to have no impacts on any sensitive biological resources.

3.6 Water Quality Issues

The Pennsylvania Code, Title 25, Chapter 93 contains water quality standards for the surface waters of the Commonwealth. These standards, set by the PADEP to establish the water quality standards for each stream, are based upon designated water uses which are protected under the Pennsylvania Clean Streams Law. A review of Chapter 93 reveals that the Monongahela River is classified as a warm water fishery (WWF). The PADEP sets preliminary effluent limits to maintain water quality within a stream with those parameters in mind. The requirements of Chapter 93 will be met through the submission of a Part I Permit application, which will determine the effluent discharge limits.

Direct, Indirect, and Cumulative Effects

The project will directly improve the water quality of the Monongahela River drainage basin, and thereby have a cumulative effect of improving the waters of the Commonwealth.

3.7 Coastal Resources

The project is not located in a coastal zone management area. Therefore, it will have no impact on coastal resources.

Direct, Indirect, and Cumulative Effects

This project will not impact coastal resources.

3.8 Socio-Economic Issues

The project will not impose any disproportionate adverse effects on minority and/or disadvantaged populations. It is the MACM's policy to treat all of its customers equally and to evaluate wastewater service with no regards to socio-economic status.

Direct, Indirect, and Cumulative Effects

This project will not disproportionately impact minority and/or disadvantaged populations.

3.9 Air Quality

The only potential for impacts on air quality resulting from this project may be emissions from construction equipment during construction and fugitive dust from construction activities. The

contract documents for the project will include provisions requiring the contractors to control dust and mud as required by local ordinances and best management practices.

Direct, Indirect, and Cumulative Effects

This project will not negatively impact air quality.

3.10 Transportation

There will be minimal increase in traffic from construction vehicles in the project area during the construction period. It is not anticipated that this additional traffic will have any adverse impacts on the project area. After construction is completed, there will be no additional traffic as a result of this project.

Direct, Indirect, and Cumulative Effects

As a result of the construction there will be minimal impact on nearby residents.

3.11 Noise Abatement and Control

There will be additional noise from construction activities during the construction period. The contract documents will contain provisions limiting the construction activities to approved hours as established by local ordinance. Some equipment will be housed inside of a building which will contain noise.

Direct, Indirect, and Cumulative Effects

This project will not impact noise levels other than temporary increase during construction activities.

3.12 Wild and Scenic Rivers

The project will not affect any wild or scenic rivers. Implementation of the project will eliminate CSO events and the associated sewage pollution. Therefore, the water quality of the Monongahela River drainage basin will be improved.

Direct, Indirect, and Cumulative Effects

This project will not impact any wild or scenic rivers.

3.13 Miscellaneous Environmental Considerations

This project is not anticipated to have any additional miscellaneous environmental impacts.

4.0 SUMMARY OF MITIGATION

No mitigation is required for this project other than what would be considered routine as part of a project of this nature. For instance, implementation of erosion and sedimentation (E&S) pollution control plans, stormwater management plans, and implementing procedures to ensure compliance with all permits during construction.

5.0 PUBLIC PARTICIPATION

A public notice describing the project and announcing the Act 537 Plan Special Study will be available for review and comment during a 30-day public comment period will be advertised in the local paper.

6.0 EXHIBITS/ATTACHMENTS

The Exhibits and Attachments included within this Uniform Environmental Review (UER) include the following:

- Attachment A: Exhibits
 - USGS Location Map
 - Aerial Location Map
 - Soils and Farmland Classifications Map
 - Floodplains Map
 - Wetlands and Hydric Soil Conditions Map
- Attachment B: Project Layouts
- Attachment C: Pennsylvania Historical and Museum Commission Correspondence
- Attachment D: Pennsylvania Natural Diversity Inventory Results

ATTACHMENT A

Exhibits

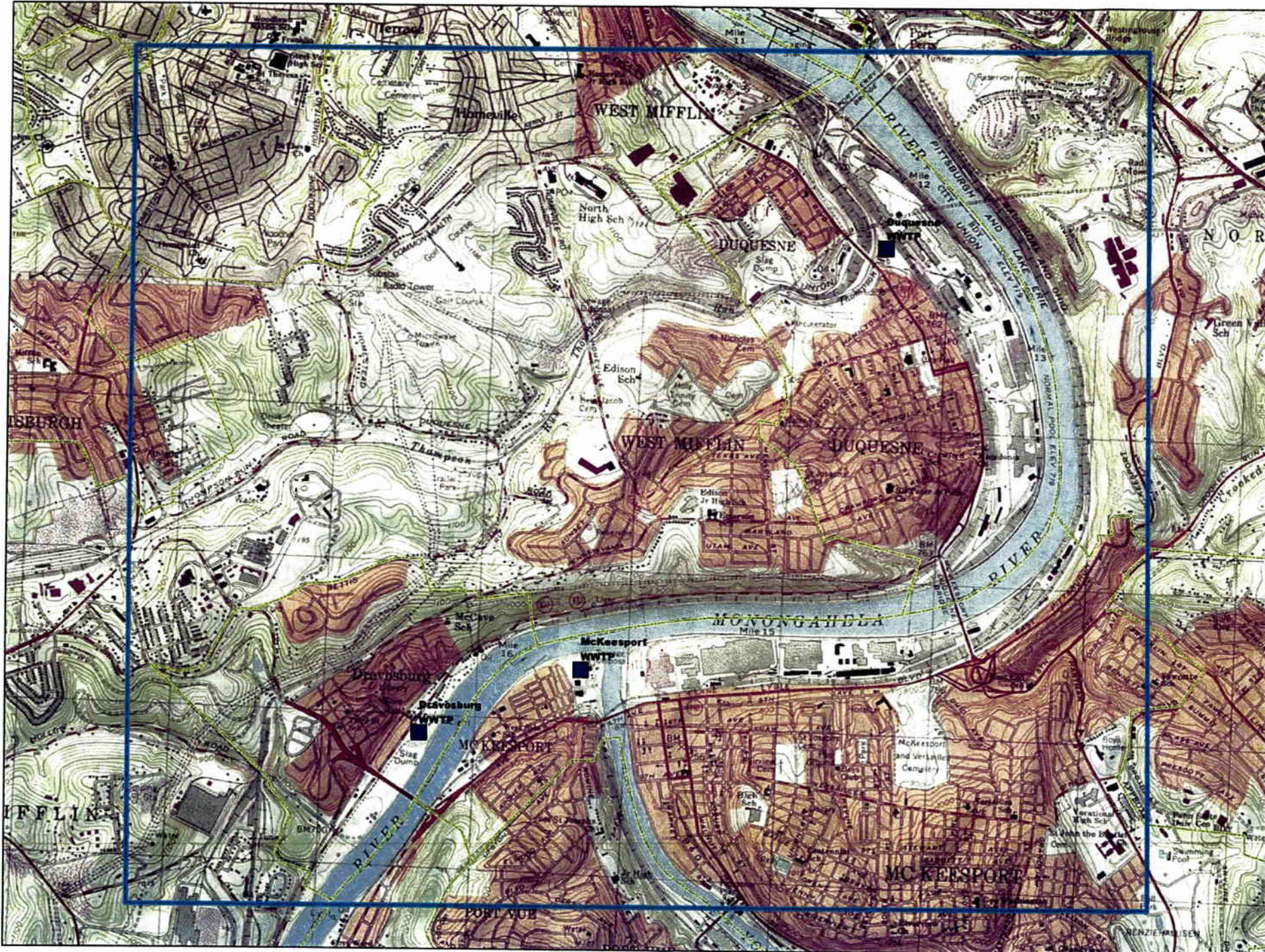
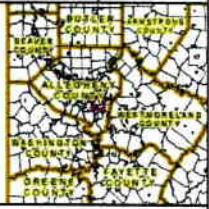


EXHIBIT 1

220-53



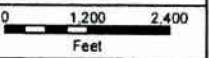
K I H

5173 Campbell Run Road
Pittsburgh, PA 15205
Phone: 412-454-0510
Fax: 412-484-0426
www.kihengineers.com

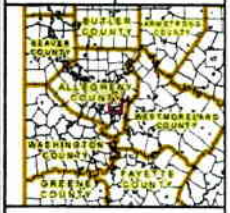
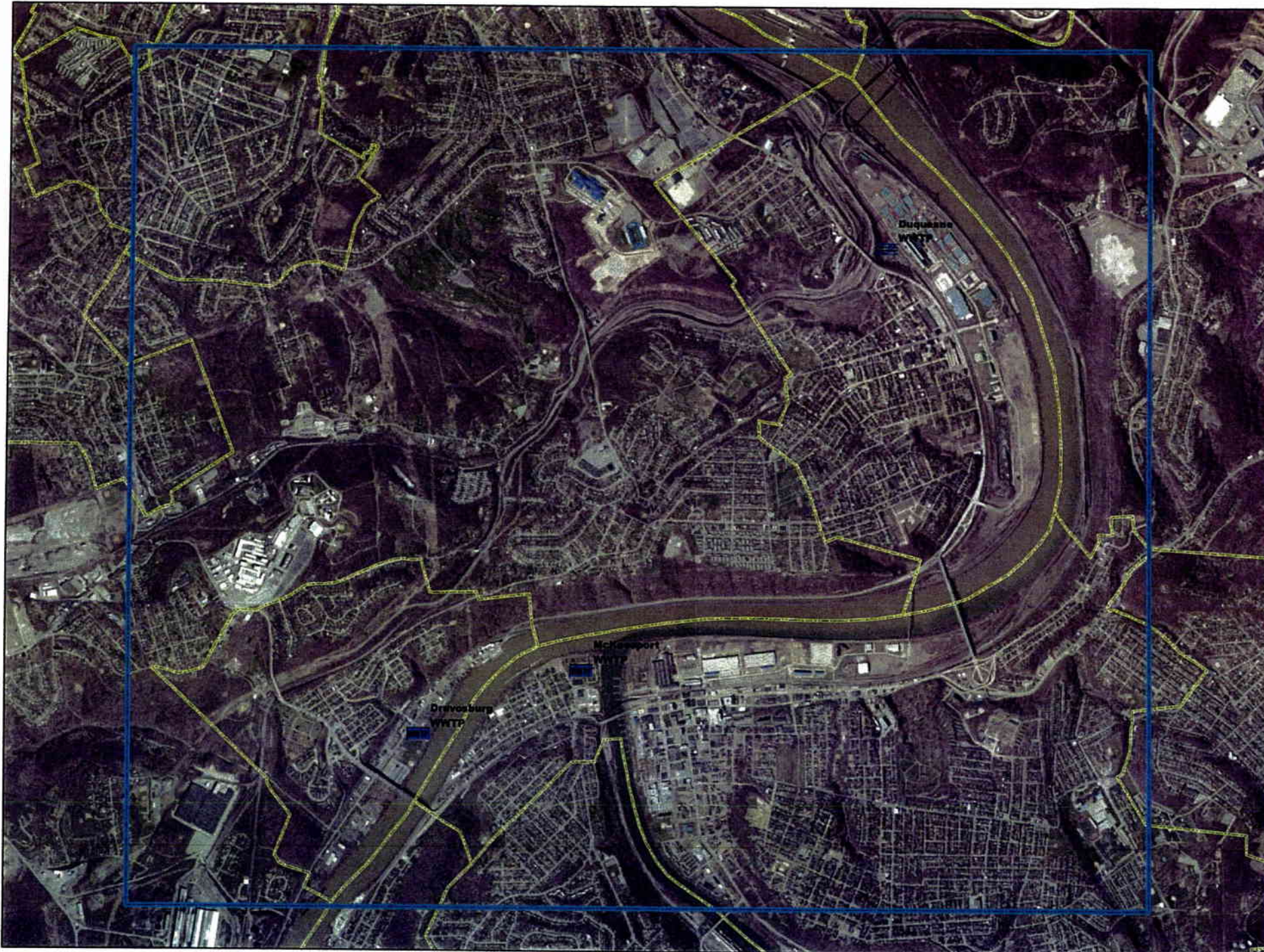
Legend

- WWTP Locations
- Boundary
- Municipal Boundaries
- County Boundaries

**CITY OF
MCKEESPORT
ALLEGHENY COUNTY
PENNSYLVANIA
LOCATION**



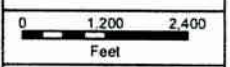
Author: Ross Volkman
Date: 8/21/2014
NAD 1983 StatePlane Pennsylvania South 1198 3702 Feet
Projection: Lambert Conformal Conic



KIH
5173 Campbells Run Road
Pittsburgh, PA 15208
Phone: 412-494-0510
Fax: 412-494-0426
www.kihengineers.com

- Legend**
- WWTP Locations
 - Boundary
 - Municipal Boundaries
 - County Boundaries

**CITY OF
MCKEESPORT
ALLEGHENY COUNTY
PENNSYLVANIA
LOCATION**



KIH® Ross Williams
Date: 8/21/2014
NAD 1983 StatePlane Pennsylvania North FIPS 2001 Feet
Projection: Lambert Conformal Conic

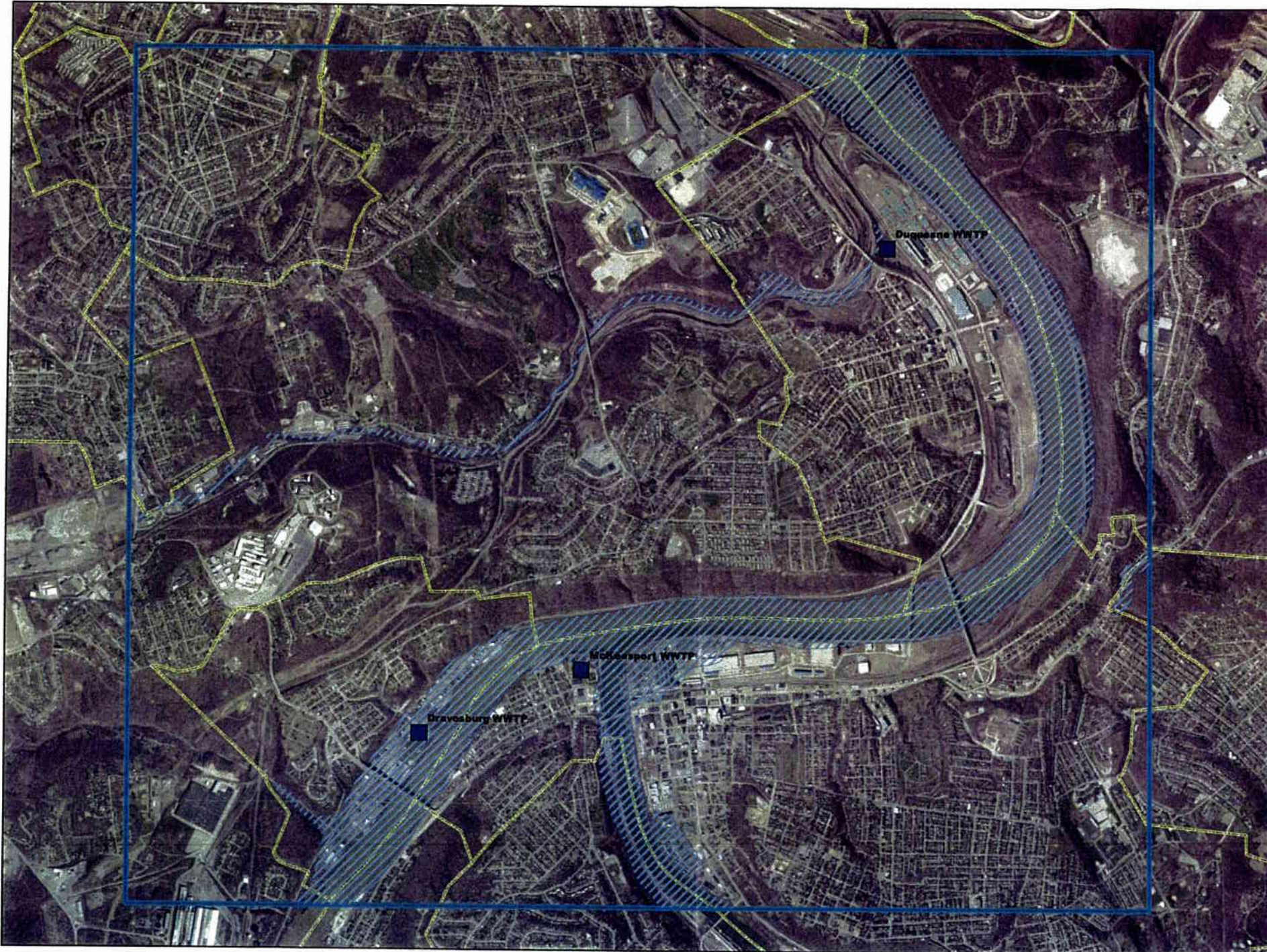


EXHIBIT 6

220-53



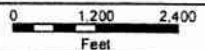
K I H

5173 Campells Run Road
Pittsburgh, PA 15205
Phone: 412-494-0510
Fax: 412-494-0425
www.kihengineers.com

Legend

- WWTP Locations
- Floodplains
- Boundary
- Municipal Boundaries
- County Boundaries

**CITY OF
MCKEESPORT
ALLEGHENY COUNTY
PENNSYLVANIA
FLOODPLAINS**



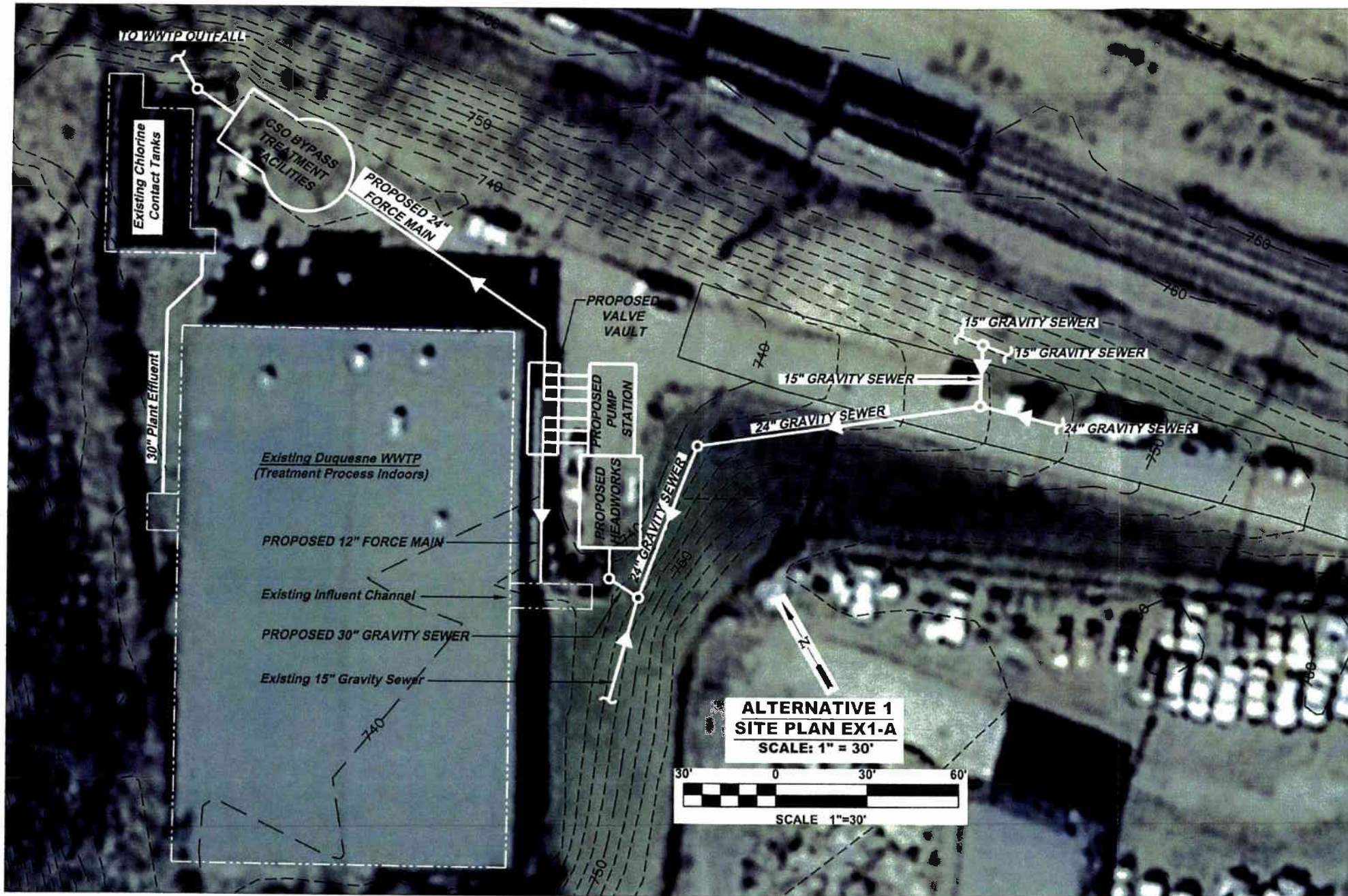
Author: Ross Volkman
Date: 8/21/2014
NAD: 1983 StatePlane Pennsylvania South 1495 1100 Feet
Projection: Lambert Conformal Conic

13

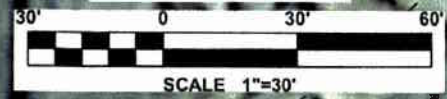
ATTACHMENT B
PROJECT LAYOUTS

C

C



**ALTERNATIVE 1
SITE PLAN EX1-A**
SCALE: 1" = 30'



Scale: As Shown Date: August 2014 Drawn By: BHD Checked By: BMC Approved By: SHG		Order No. 220-53 Drawing No. EX1 Sheet No. 1 of 1	
BOROUGH OF DUQUESNE ALLEGHENY COUNTY, PENNSYLVANIA WASTEWATER TREATMENT PLANT ALTERNATIVE 1 SITE PLAN			
		5173 Campbell Run Road Pittsburgh, PA 15205 Phone: 412-484-9510 Fax: 412-484-9511 info@klinghoffer.com	
Date	Revisions	Date	Revisions

© 2014 Klinghoffer Engineering, Inc. All rights reserved. This drawing is the property of Klinghoffer Engineering, Inc. and is not to be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Klinghoffer Engineering, Inc.



220-53
EXHIBIT

0 200 400
 Feet

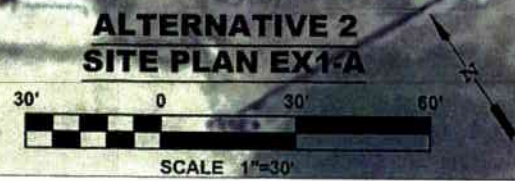
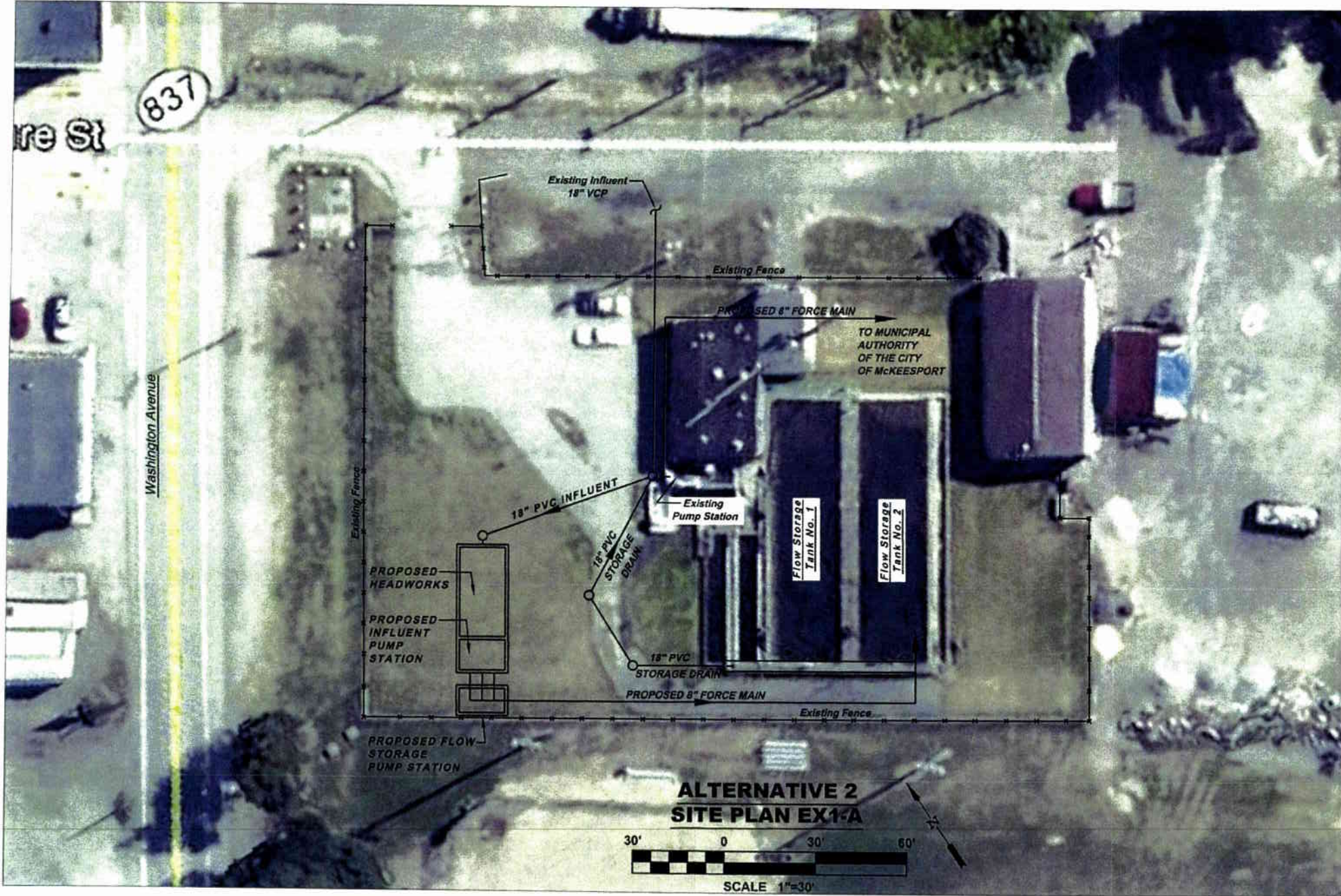
Author: Robert Whelan
 Date: 11/20/14
 HAD: 1443 Capital Plan Implementation Study EIP5 1702 East
 Duquesne, Lehigh Professional Center

CITY OF DUQUESNE
ALLEGHENY COUNTY, PENNSYLVANIA
RELIEF SEWER LOCATIONS

KLH

KLH CONSULTANTS, INC.
 1000 W. 10th Street
 Erie, PA 16590
 Tel: 814.833.8800
 Fax: 814.833.8801
 www.klh.com





Scale: As Shown
 Date: July 2014
 Drawn By: EHD
 Checked By: BHC
 Approved By: SHG

Order No.
220-53

Drawing No.
EX1

Sheet No.
1 of 1

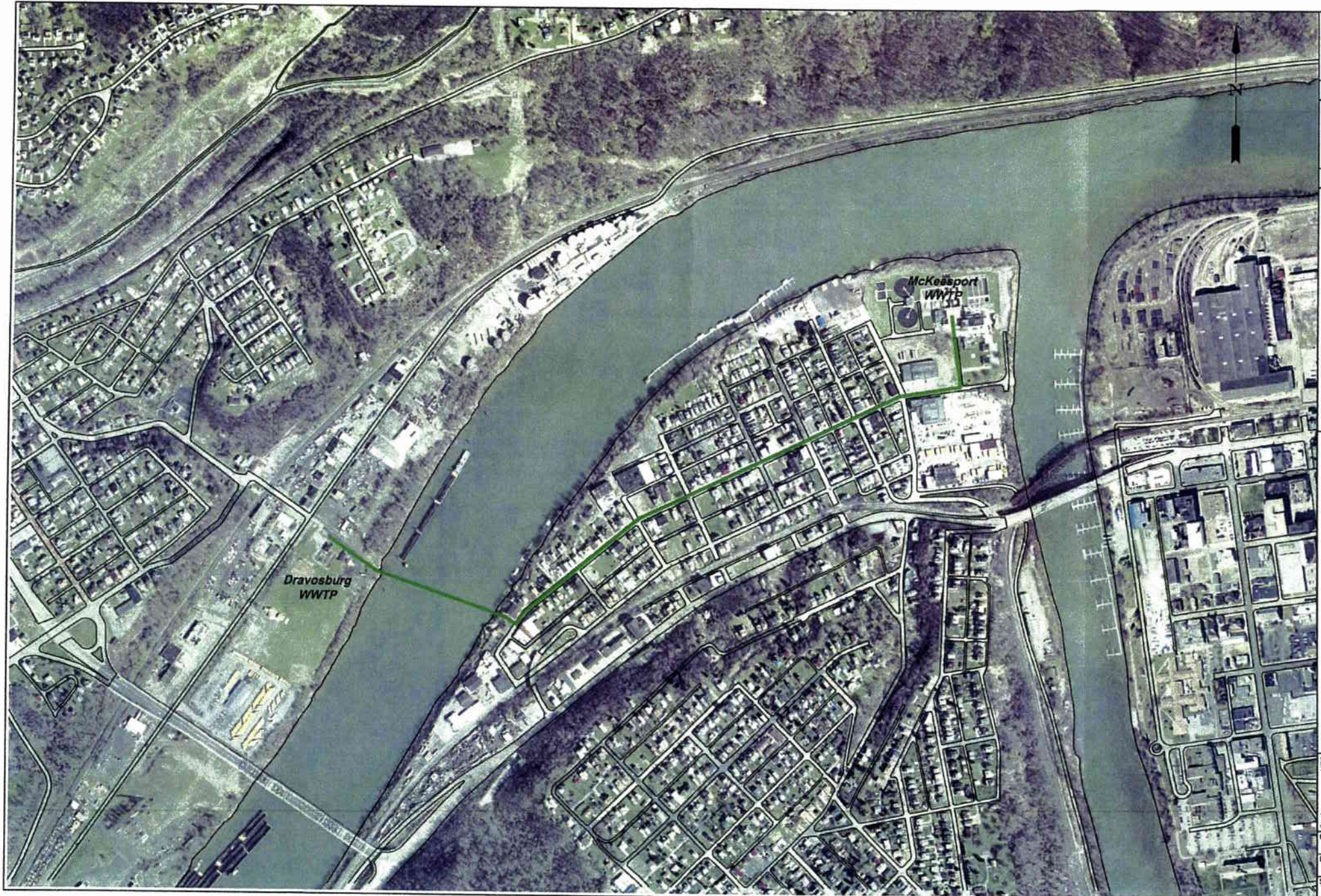
BOROUGH OF DRAYOSBURG
ALLEGHENY COUNTY, PENNSYLVANIA
LONG TERM CONTROL PLAN
ALTERNATIVE 2 SITE PLAN




8173 Campbell Run Road
 Pittsburgh, PA 15205
 Phone: 412-261-0100
 Fax: 412-261-0101
 info@kliengineers.com

Date	Revisions	Date	Revisions

This drawing is the property of KLI ENGINEERS INC. and is not to be reproduced, copied, or used in any way without the written consent of KLI ENGINEERS INC.



Scale: NTS	Date: May 2014	Drawn By: VLS	Checked By: BMC	Approved By: SHG
Order No. 220-53	Drawing No. FM-EX2			
Sheet No. 1 of 1				
MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT ALLEGHENY COUNTY, PENNSYLVANIA DRAVOSBURG-DUQUESNE AREA ACT 537 & LONG TERM CONTROL PLAN FORCE MAIN EXHIBIT				
 ENGINEERS, INC. info@kllengineers.com				
5173 Campella Run Road Pittsburgh, PA 15206 Phone: 412.484.0800 Fax: 412.484.0326				
Date	Revisions	Date	Revisions	

ATTACHMENT C

PENNSYLVANIA HISTORICAL AND
MUSEUM COMMISSION CORRESPONDENCE

No response has been received from the PHMC to date. The PHMC response will be included in the final submission of the Act 537 Plan.

KLH

ENGINEERS, INC

August 28, 2014
Ref. No. 220-53

Pennsylvania Historical and Museum Commission
State Historic Preservation Office
400 North Street
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120-0093

CERTIFIED RETURN RECEIPT

To Whom It May Concern:

**Municipal Authority of the City of McKeesport
Allegheny County, Pennsylvania
Act 537 Sewage Facilities Plan Update – City of Duquesne and Borough of Dravosburg**

On behalf of the Municipal Authority of the City of McKeesport (MACM), KLH Engineers, Inc. is providing this correspondence to fulfill the requirements of historical and archaeological resource protection under P.C.S. 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission (PHMC). This is being done in an effort to complete the planning required as part of the Act 537 Sewage Facilities Plan Update to evaluate proposed wastewater treatment plant (WWTP) and combined sewer system (CSS) upgrades in the City of Duquesne and the Borough of Dravosburg. The Plan Update was developed to serve as the governing Act 537 Sewage Facilities Plan for the City of Duquesne and Borough of Dravosburg, whose conveyance systems and treatment facilities are now owned and operated by the MACM.

The following alternatives were recommended for the City of Duquesne and the Borough of Dravosburg:

City of Duquesne

In the Duquesne system, two sections of the CSS in the planning area lack capacity to convey the 10-year, 24-hour design storm, causing manhole overflows. In addition, the WWTP lacks treatment capacity to process peak wet weather flows. It was determined that CSS upgrades are required to convey the 10-year, 24-hour design storm flow (without manhole overflows) while maintaining greater than 85% capture of all combined flow during a typical year.

Detailed evaluation of the proposed alternatives led to the recommendation of continued operation of existing processes and construction of new combined sewer overflow (CSO) bypass treatment facilities. The existing WWTP is in good operating condition with adequate capacity for dry weather flows. This alternative utilizes the existing WWTP up to peak flows of 2.5 MGD. Peak flows above 2.5 MGD will receive CSO bypass treatment. This alternative includes construction of new headworks facilities, influent pump station, and CSO bypass treatment facilities, as well as the installation of new clarifier equipment to maximize efficiency. Additionally, this alternative includes CSS upgrades required to convey the 10-year, 24-hour design storm to the WWTP including two gravity relief sewers totaling 1,025 lineal feet.

The following items are included in the project proposed for the City of Duquesne:

- CSS upgrades
- New automatic bar screen and by-pass channel with static screen
- New headworks building
- New raw sewage pump station and controls
- New raw sewage pump station piping and valve vault
- New pump flow meter
- Site gravity and force main piping
- New CSO bypass treatment
- Upgrade final clarifier equipment to maximize efficiency

Borough of Dravosburg

In Dravosburg, it was determined that no CSS upgrades are required to convey the 10-year, 24-hour design storm flow while maintaining greater than 85% capture of all combined flow during a typical year, given a free discharge at the WWTP pump station. The Borough of Dravosburg WWTP, however, does not have capacity to process peak wet weather flows. Detailed evaluation of the proposed alternatives led to the recommendation to pump flow to the McKeesport WWTP and convert the existing Dravosburg WWTP to peak flow storage. This alternative includes construction of a new raw sewage pump station to convey all flow up to 1.0 MGD to the McKeesport WWTP. All flow above 1.0 MGD will be pumped by separate storm pumps and stored in the existing Dravosburg WWTP aeration basins. The following items are included in the project proposed for the Borough of Dravosburg:

- New automatic bar screen and by-pass channel with static screen
- New headworks building
- New raw sewage pump station and controls
- Average flow pumps and storm pumps
- New raw sewage pump station piping and valve vault
- New pump flow meter
- Site gravity and force main piping
- Force main piping to the MACM WWTP
- Retrofit existing aeration basins to serve as peak flow storage
- New diffusers in the peak flow storage basins

Attached to this correspondence are the following documents:

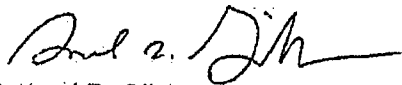
- PHMC Project Review Form
- USGS 7.5-minute Quadrangle Map showing planning area delineation
- Preliminary, conceptual layout of the proposed projects

Pennsylvania Historical and Museum Commission
State Historic Preservation Office
August 28, 2014
-page three-

All appropriate permits will be obtained before any construction activities, and the project will meet all local, county, state and federal regulations regarding wetlands, prime agricultural areas, erosion and sedimentation pollution control, stormwater management and all other applicable requirements. No impacts on historical and archaeological resources are expected as a result of these projects. Please feel free to contact our office if you have any questions or concerns.

Sincerely,

KLH ENGINEERS, INC.



Samuel R. Gibson, E.I.T.

Enclosure



PROJECT REVIEW FORM

Request to Initiate SHPO Consultation on
State and Federal Undertakings

SHPO USE ONLY	
DATE RECEIVED:	
ER NUMBER:	

REV: 5/2012

SECTION A: GENERAL PROJECT INFORMATION

Is this a new submittal? YES NO OR This is additional information for ER Number:

Project Name: Act 537 Sewage Facilities Plan Update County: Allegheny

Project Address:

City/State/Zip: McKeesport PA Municipality: Dravosburg and Duquesne

SECTION B: PRIMARY CONTACT INFORMATION

Name: Bryan M. Churilla, P.E. Phone: (412) 494-0510

Company: KLH Engineers, Inc. Fax: (412) 494-0426

Street/P.O. Box: 5173 Campbells Run Road Email: bchurilla@klhengineers.com

City/State/Zip: Pittsburgh PA 15205

SECTION C: PROJECT DESCRIPTION

This project is located on: (check all that apply)

Federal property State property Municipal property Private property

List all Federal and State agencies and programs (funding, permits, licenses) involved in this project	Agency Type	Agency/Program/Permit Name	Project/Permit/Tracking Number (if applicable)

Proposed Work - Attach project description, scope of work, site plans, and/or drawings

Project Includes (check all that apply): Construction Demolition Rehabilitation Disposition

Total acres of project area: _____ Total acres of earth disturbance: 1.34

Are there any buildings or structures within the project area? Yes No Approximate age: _____

This project involves properties listed in or eligible for listing in the National Register of Historic Places, or designated as historic by a local government	Yes	No	Unsure	Name of historic property or historic districts
	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	

<p>Please print and mail completed form and all attachments to:</p> <p>PHMC State Historic Preservation Office 400 North St. Commonwealth Keystone Building, 2nd Floor Harrisburg, PA 17120-0093</p>	<p>Attachments - Please include the following information with this form</p> <p><input checked="" type="checkbox"/> Map - 7.5' USGS quad showing project boundary and Area of Potential Effect</p> <p><input checked="" type="checkbox"/> Description/Scope - Describe the project, including any ground disturbance and previous land use</p> <p><input checked="" type="checkbox"/> Site Plans/Drawings - Indicate the location and age, if known, of all buildings in the project area</p> <p><input type="checkbox"/> Photographs - Attach prints or digital photographs showing the project site, including images of all buildings and structures keyed to a site plan</p>
---	---

SHPO DETERMINATION (SHPO USE ONLY) SHPO REVIEWER:

<input type="checkbox"/> There are NO HISTORIC PROPERTIES in the Area of Potential Effect. <input type="checkbox"/> The project will have NO EFFECT on historic properties. <input type="checkbox"/> The project will have NO ADVERSE EFFECTS on historic properties.	<input type="checkbox"/> The project will have NO ADVERSE EFFECTS WITH CONDITIONS (see attached). <input type="checkbox"/> SHPO REQUESTS ADDITIONAL INFORMATION (see attached).
---	--

ATTACHMENT D

PENNSYLVANIA NATURAL DIVERSITY
INVENTORY RESULTS

No response has been received from the PA Fish and Boat Commission to date. The response will be included in the final submission of the Act 537 Plan.

KLH

ENGINEERS, INC

September 2, 2014

Ref. No.: 220-53

CERTIFIED RETURN RECEIPT
7010-0290-0000-3358-9159

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane
Bellefonte, PA 16823-7437

To Whom It May Concern:

Municipal Authority of the City of McKeesport
Allegheny County, Pennsylvania
Act 537 Sewage Facilities Plan Update – City of Duquesne and Borough of Dravosburg

On behalf of the Municipal Authority of the City of McKeesport (MACM), KLH Engineers, Inc. is providing this correspondence to fulfill the requirements of the Pennsylvania Natural Diversity Inventory (PNDI) review process. This is being done in an effort to complete the planning required as part of the Act 537 Sewage Facilities Plan Update to evaluate proposed wastewater treatment plant (WWTP) and combined sewer system (CSS) upgrades in the City of Duquesne and the Borough of Dravosburg. The Plan Update was developed to serve as the governing Act 537 Sewage Facilities Plan for the City of Duquesne and the Borough of Dravosburg, whose conveyance and treatment facilities are now owned and operated by the MACM.

The PNDI search was conducted for the alternatives proposed within the Plan Update resulting in a potential impact identified by the PA Fish and Boat Commission at the site of the Duquesne WWTP. The location of the Duquesne WWTP is shown on the enclosed USGS 7.5-minute Quadrangle Map.

Detailed evaluation led to the recommendation of continued operation of existing processes at the Duquesne WWTP and construction of new combined sewer overflow (CSO) bypass treatment facilities. The existing WWTP is in good operating condition with adequate capacity for dry weather flows. This alternative utilizes the existing WWTP up to peak flows of 2.5 MGD. Peak flows above 2.5 MGD will receive CSO bypass treatment. The project, which will be constructed at the existing WWTP site that is roughly one third of an acre in size, includes construction of new headworks facilities, influent pump station, and CSO bypass treatment facilities, as well as the installation of new clarifier equipment to maximize efficiency. The proposed site plan is shown on an enclosed exhibit.

The following items are included in the project proposed for the Duquesne WWTP:

- New automatic bar screen and by-pass channel with static screen.
- New headworks building.
- New raw sewage pump station and controls.
- New raw sewage pump station piping and valve vault.
- New pump flow meter.

220-53_PNDI to PA Fish & Boat Commission_SRG_09.02.14

5173 Campbells Run Road Pittsburgh, PA 15205 Phone: 412.494.0510 Fax: 412.494.0426 info@klhengineers.com

www.klhengineers.com

PA Fish and Boat Commission
September 2, 2014
-Page Two-

- Site gravity and force main piping.
- New CSO bypass treatment.
- Upgrade final clarifier equipment to maximize efficiency.

As part of the Act 537 planning process, a preliminary evaluation of the presence of wetlands and hydric soil conditions was conducted. The results of these studies are shown on the enclosed hydric soil and wetlands mapping. The only wetland areas in the planning area are located along the Monongahela River and are classified as riverine. Furthermore, there are soils in the planning areas classified as partially hydric.

The MACM will make all attempts to minimize the impact on ecologically sensitive areas during any construction activities. All construction work associated with the chosen alternative will be consistent with all applicable state and federal regulations regarding wetlands. A detailed wetlands delineation analysis to determine the extent of jurisdictional wetlands will be completed should any proposed construction encroach on areas conducive to the presence of wetlands. Implementation of this Plan Update is not expected to affect wetlands in any way and the selected alternative will be consistent with wetland protection practices and legislation.

Enclosed with this correspondence are the following documents:

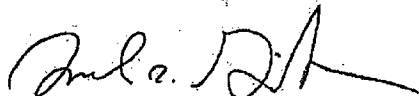
- Signed copy of the Project Environmental Review Receipt.
- USGS 7.5-minute Quadrangle Map showing the location of the Duquesne WWTP.
- Hydric Soils and Wetlands Mapping.
- Proposed WWTP site plan.

All appropriate permits will be obtained before any construction activities, and the project will meet all local, county, state and federal regulations regarding wetlands, prime agricultural areas, erosion and sedimentation pollution control, stormwater management, and all other applicable requirements. No environmental impacts are expected as a result of these projects.

Please feel free to contact our office if you have any questions or concerns.

Sincerely,

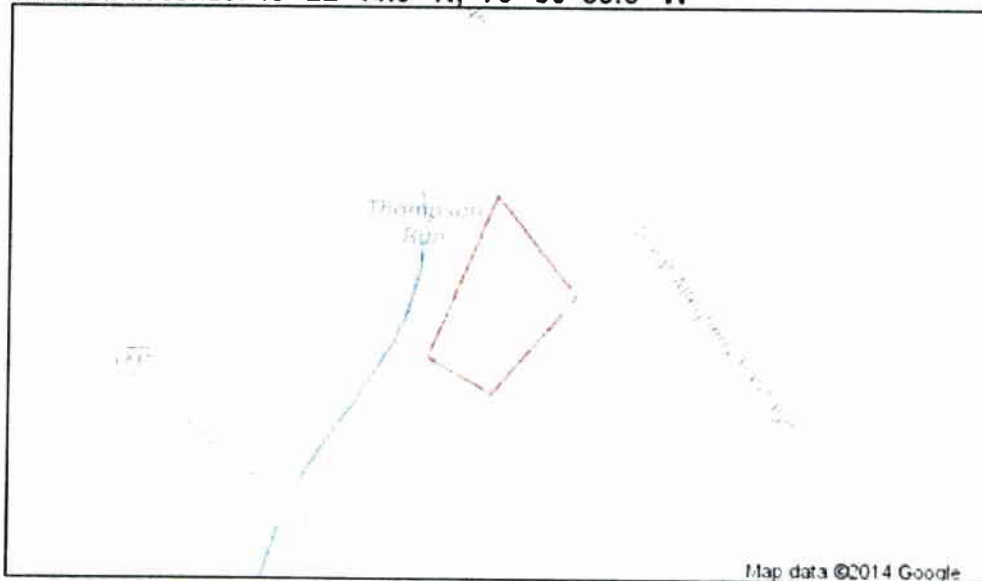
KLH ENGINEERS, INC.


Samuel R. Gibson, E.I.T.

Enclosures

1. PROJECT INFORMATION

Project Name: **Duquesne WWTP**
 Date of review: **8/5/2014 1:53:04 PM**
 Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant (construction, expansion or modification)**
 Project Area: **0.8 acres**
 County: **Allegheny Township/Municipality: Duquesne**
 Quadrangle Name: **BRADDOCK ~ ZIP Code: 15110**
 Decimal Degrees: **40.379129 N, -79.849883 W**
 Degrees Minutes Seconds: **40° 22' 44.9" N, -79° 50' 59.6" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies strongly advise against conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name: *Chaenobryttus gulosus*

Common Name: Warmouth

Current Status: Endangered

Scientific Name: *Toxolasma parvus*

Common Name: Lilliput

Current Status: Special Concern Species*

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other.

authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.

** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

- SIGNED copy of this Project Environmental Review Receipt
- Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- Project location information (name of USGS Quadrangle, Township/Municipality, and County)
- USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

- A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
 Bureau of Forestry, Ecological Services Section
 400 Market Street, PO Box 8552, Harrisburg, PA.
 17105-8552
 Fax: (717) 772-0271

U.S. Fish and Wildlife Service
 Endangered Species Section
 315 South Allen Street, Suite 322, State College, PA.
 16801-4851
 NO Faxes Please.

PA Fish and Boat Commission
 Division of Environmental Services
 450 Robinson Lane, Bellefonte, PA. 16823-7437
 NO Faxes Please

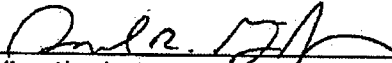
PA Game Commission
 Bureau of Wildlife Habitat Management
 Division of Environmental Planning and Habitat Protection
 2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
 Fax: (717) 787-8957

7. PROJECT CONTACT INFORMATION

Name: Samuel R. Gibson
 Company/Business Name: KHENGINEERS, INC.
 Address: 5773 CAMPBELL RUN RD.
 City, State, Zip: PITTSBURGH, PA 15205
 Phone: (412) 494-0510 Fax: (412) 494-0426
 Email: sgibson@khengineers.com

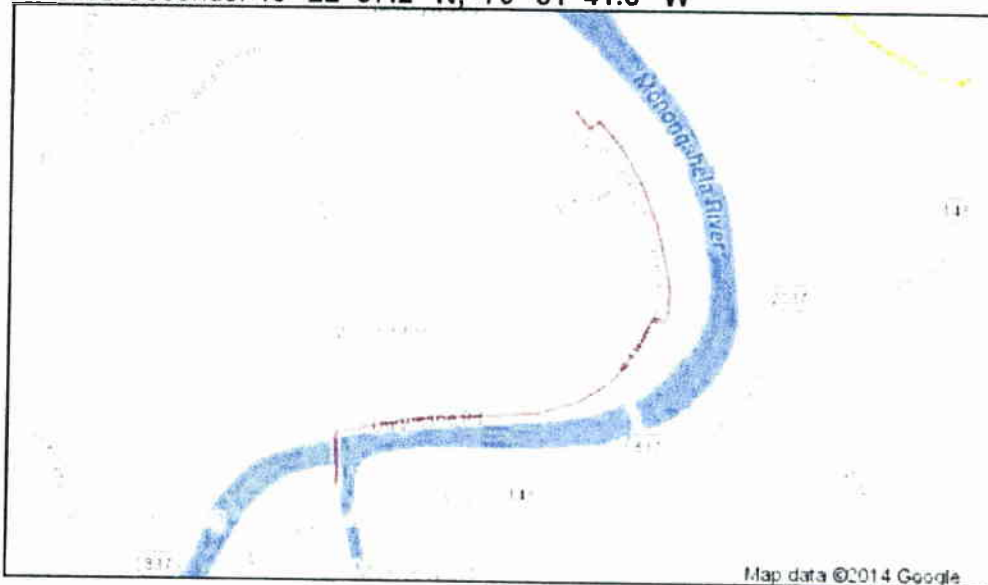
8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

 9/2/14
 applicant/project proponent signature date

1. PROJECT INFORMATION

Project Name: **Duquesne WWTP Force Main**
 Date of review: **8/5/2014 1:04:51 PM**
 Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewer line (new - construction in new location)**
 Project Length: **17324.4 feet**
 County: **Allegheny Township/Municipality: Duquesne, West Mifflin, McKeesport**
 Quadrangle Name: **BRADDOCK ~ ZIP Code: 15122, 15132, 15110, 15034**
 Decimal Degrees: **40.377006 N, -79.861623 W**
 Degrees Minutes Seconds: **40° 22' 37.2" N, -79° 51' 41.8" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies strongly advise against conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.

1. PROJECT INFORMATION

Project Name: **Dravosburg WWTP**
 Date of review: **8/5/2014 2:09:21 PM**
 Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant (construction, expansion or modification)**
 Project Area: **1.2 acres**
 County: **Allegheny Township/Municipality: Dravosburg**
 Quadrangle Name: **GLASSPORT ~ ZIP Code: 15034**
 Decimal Degrees: **40.349375 N, -79.885361 W**
 Degrees Minutes Seconds: **40° 20' 57.8" N, -79° 53' 7.3" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA.
17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Endangered Species Section
315 South Allen Street, Suite 322, State College, PA.
16801-4851
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

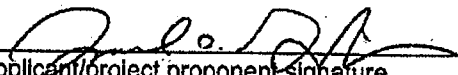
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: SAMUEL R. GIBSON
Company/Business Name: KLH ENGINEERS, INC.
Address: 5173 CAMDBELLS RUN. RD.
City, State, Zip: PITTSBURGH, PA 15205
Phone: (412) 494-0570 Fax: (412) 494-0426
Email: sgibson@klhengineers.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.


applicant/project proponent signature

7/2/14
date

1. PROJECT INFORMATION

Project Name: **Dravosburg WWTP Force Main**

Date of review: **8/5/2014 2:07:18 PM**

Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewer line (new - construction in new location)**

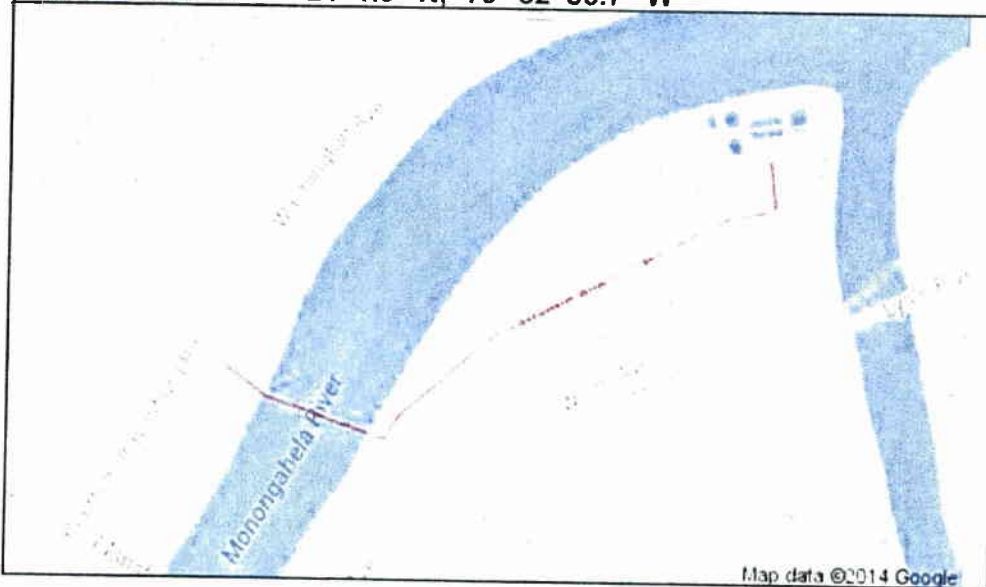
Project Length: **4424.7 feet**

County: **Allegheny Township/Municipality: Dravosburg, Mckeesport**

Quadrangle Name: **MC KEESPORT ~ ZIP Code: 15132, 15034**

Decimal Degrees: **40.350534 N, -79.882403 W**

Degrees Minutes Seconds: **40° 21' 1.9" N, -79° 52' 56.7" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies strongly advise against conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA.
17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service
Endangered Species Section
315 South Allen Street, Suite 322, State College, PA.
16801-4851
NO Faxes Please.

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

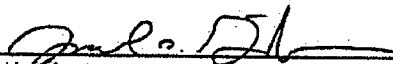
PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: SAMUEL R. CRIBSON
Company/Business Name: KLEINGARDNER INC
Address: 5173 CAMPOALS RUN RD.
City, State, Zip: PITTSBURGH, PA 15265
Phone: (412) 494-0510 Fax: (412) 494-0426
Email: scrisson@kleingardner.com

8. CERTIFICATION

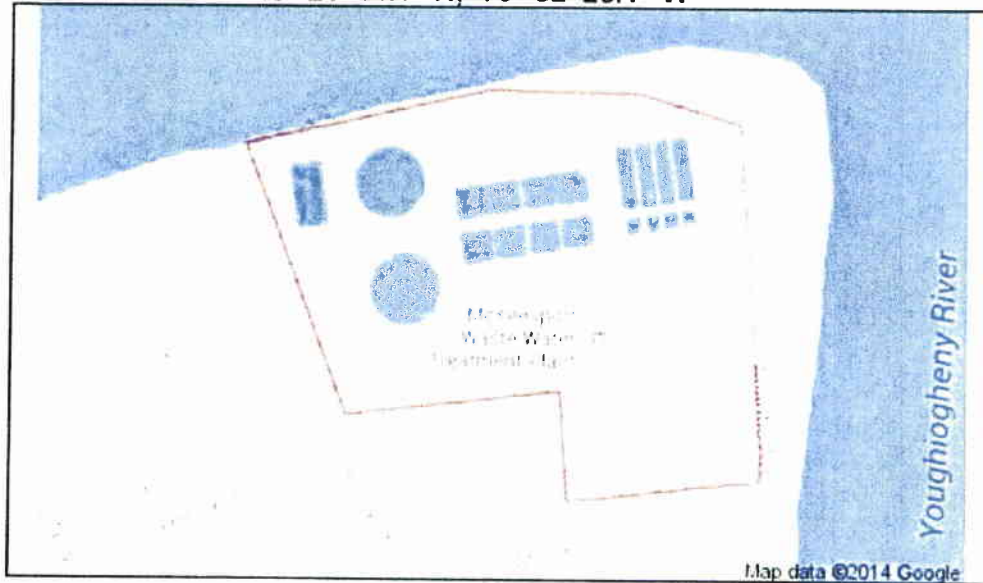
I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.


applicant/project proponent signature

9/2/14
date

1. PROJECT INFORMATION

Project Name: **McKeesport WWTP**
 Date of review: **8/5/2014 1:45:21 PM**
 Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant (construction, expansion or modification)**
 Project Area: **8.8 acres**
 County: **Allegheny Township/Municipality: McKeesport**
 Quadrangle Name: **MC KEESPORT ~ ZIP Code: 15132**
 Decimal Degrees: **40.353911 N, -79.873916 W**
 Degrees Minutes Seconds: **40° 21' 14.1" N, -79° 52' 26.1" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are valid for two years (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies strongly advise against conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE: No impacts to federally listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA.
17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Endangered Species Section
315 South Allen Street, Suite 322, State College, PA.
16801-4851
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

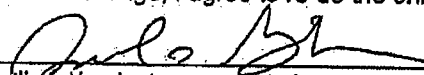
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: SAMUEL R. GIBSON
Company/Business Name: KLEINENBERGERS INC.
Address: 5173 CAMPBELL'S RUN RD.
City, State, Zip: PITTSBURGH PA 15205
Phone: (412) 494-0510 Fax: (412) 494-0426
Email: sg.gibson@kleinenbergers.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

 9/2/14
applicant/project proponent signature date

APPENDIX B

ACT 537 PLAN CONTENT AND
ENVIRONMENTAL ASSESSMENT CHECKLIST



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

Instructions for Completing Act 537 Plan Content and Environmental Assessment Checklist

Remove and recycle these instructions prior to submission

CHECKLIST INSTRUCTIONS

These instructions are designed to assist the applicant in completing the Act 537 Plan Content and Environmental Assessment Checklist.

This checklist is composed of three parts: one for "General Information," one for "Administrative Completeness," and one for "General Plan Content". A plan must be "administratively complete" in order to be formally reviewed by DEP. The General Plan Content portion of the checklist identifies each of the issues that must be addressed in your Act 537 Plan Update based on the pre-planning meeting between you and/or your consultant and DEP.

Use the right-hand column blanks in the checklist to identify the page in the plan on which each planning issue is found or to reference a previously approved update or special study (title and page number).

If you determine a planning issue is not applicable even though it was previously thought to be needed, please explain your decision within the text of the plan (or as a footnote) and indicate the page number where this documentation is found.

When information required as part of an official plan update revision has been developed separately or in a previous update revision, incorporate the information by reference to the planning document and page.

For specific details covering the Act 537 planning requirements, refer to Chapters 71 and 73 of DEP's regulations.

Wastewater projects proposing funding through the following sources must prepare an "Environmental Report" as described in the Uniform Environmental Review Process (UER) and include it with the plan submission designated as "Plan-Appendix A". The following funding programs use the UER process.

- The Clean Water State Revolving Loan Fund (PENNVEST, DEP, EPA)
- The RUS Water and Waste Disposal Grant and Loan Program (USDA-RD)
- The Community Development Block Grant Program (DCED, HUG)
- Other Federal Funding Efforts (EPA)

The checklist items or portions of checklist items required in the Act 537 Plan Update revision and that are also included in the UER process are indicated by shading. Most of the "Environmental Report" document may be constructed from the Act 537 Official Plan Update revision by using "copy & paste" techniques. The technical guidance document *Uniform Environmental Review Process* (UER) (DEP ID. 381-5511-111) is available electronically on DEP's website at www.dep.state.pa.us.

After Municipal Adoption by Resolution, submit three copies of the plan, any attachments or addenda and this checklist to DEP.

A copy of this completed checklist must be included with your Act 537 plan. DEP will use the "DEP USE ONLY" column during the completeness evaluation of the plan. This column may also be used by DEP during the pre-planning meeting with the municipality to identify planning elements that are not required to be included in the plan.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

Act 537 Plan Content and Environmental Assessment Checklist

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name Municipal Authority of the City of McKeesport Act 537 Sewage Facilities Plan Update - City of Duquesne and Borough of Dravosburg

2. Brief Project Description The Act 537 Plan was prepared to assess the upgrades required to convey and treat wet weather flows in each planning area. The Plan evaluates upgraded treatment facilities, storage options, and regionalization options.

B. Client (Municipality) Information

Municipality Name	County	City	Boro	Twp
City of McKeesport	Allegheny	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Schultz	Chuck			Superintendent
Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
100 Atlantic Avenue	
Address Last Line -- City	State ZIP+4
McKeesport	PA 15132
Phone + Ext.	FAX (optional) Email (optional)
(412) 673-9701	(412) 673-4283

C. Site Information

Site (or Project) Name	(Municipal Name) Act 537 Plan
Duquesne WWTP & CSS Upgrades / Dravosburg CSS Upgrades	
Site Location Line 1	Site Location Line 2
Duquesne WWTP	Dravosburg WWTP to McKeesport WWTP

D. Project Consultant Information

Last Name	First Name	MI	Suffix
Churilla	Bryan		M
Title	Consulting Firm Name		
Project Manager	KLH Engineers, Inc.		
Mailing Address Line 1	Mailing Address Line 2		
5173 Campbells Run Road			
Address Last Line -- City	State	ZIP+4	Country
Pittsburgh	PA	15205	USA
Email	Phone + Ext.	FAX	
bchurilla@klhengineers.com	(412) 494 - 0510 x 126	(412) 494 - 0426	

PART 2 ADMINISTRATIVE COMPLETENESS CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan	In addition to the main body of the plan, the plan must include items one through eight listed below to be accepted for formal review by the department. Incomplete Plans will be returned unless the municipality is clearly requesting an advisory review.
_____	i	1. Table of Contents 2. Plan Summary
_____	1	A. Identify the proposed service areas and major problems evaluated in the plan. (Reference - Title 25, §71.21.a.7.i).
_____	2	B. Identify the alternative(s) chosen to solve the problems and serve the areas of need identified in the plan. Also, include any institutional arrangements necessary to implement the chosen alternative(s). (Reference Title 25 §71.21.a.7.ii).
_____	3	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference Title 25, §71.21.a.7.ii).
_____	3	D. Identify the municipal commitments necessary to implement the Plan. (Reference Title 25, §71.21.a.7.iii).
_____	4	E. Provide a schedule of implementation for the project that identifies the MAJOR milestones with dates necessary to accomplish the project to the point of operational status. (Reference Title 25, §71.21.a.7.iv).
_____	3	3. Municipal Adoption: Original, signed and sealed Resolution of Adoption by the municipality which contains, at a minimum, alternatives chosen and a commitment to implement the Plan in accordance with the implementation schedule. (Reference Title 25, §71.31.f) Section V.F. of the Planning Guide.
_____	3	4. Planning Commission / County Health Department Comments: Evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the municipality, planning agencies of the county, planning agencies with area wide jurisdiction (where applicable), and any existing county or joint county departments of health. (Reference-Title 25, §71.31.b) Section V.E.1 of the Planning Guide.
_____	3	5. Publication: Proof of Public Notice which documents the proposed plan adoption, plan summary, and the establishment and conduct of a 30 day comment period. (Reference-Title 25, §71.31.c) Section V.E.2 of the Planning Guide.
_____	3	6. Comments and Responses: Copies of ALL written comments received and municipal response to EACH comment in relation to the proposed plan. (Reference-Title 25, §71.31.c) Section V.E.2 of the Planning Guide.
_____	4	7. Implementation Schedule: A complete project implementation schedule with milestone dates specific for each existing and future area of need. Other activities in the project implementation schedule should be indicated as occurring a finite number of days from a major milestone. (Reference-Title 25, §71.31.d) Section V.F. of the Planning Guide. Include dates for the future initiation of feasibility evaluations in the project's implementation schedule for areas proposing completion of sewage facilities for planning periods in excess of five years. (Reference Title 25, §71.21.c).
_____	4	8. Consistency Documentation: Documentation indicating that the appropriate agencies have received, reviewed and concurred with the method proposed to resolve identified inconsistencies within the proposed alternative and consistency requirements in 71.21.(a)(5)(i-iii). (Reference-Title 25, §71.31.e). Appendix B of the Planning Guide.

PART 3 GENERAL PLAN CONTENT CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan	Item Required
_____	<u>6</u>	I. Previous Wastewater Planning A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
_____	<u>N/A</u>	1. Previously undertaken under the Sewage Facilities Act (Act 537). (Reference-Act 537, Section 5 §d.1).
_____	<u>N/A</u>	2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference-Title 25, §71.21.a.5.i.A-D). Section V.F of the Planning Guide.
_____	<u>N/A</u>	3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference-Title 25, §71.21.a.5.i.A&B). Section V.D. of the Planning Guide.
_____	<u>N/A</u>	4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference-Title 25, §71.21.a.5.i.A).
_____	<u>7</u>	II. Physical and Demographic Analysis utilizing written description and mapping (All items listed below require maps, and all maps should show all current lots and structures and be of appropriate scale to clearly show significant information).
_____	<u>7</u>	A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference-Title 25, §71.21.a.1.i).
_____	<u>7</u>	B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference-Title 25, §71.21.a.1.ii).
_____	<u>7</u>	C. Soils - Analysis with description by soil type and soils mapping for areas not presently served by sanitary sewer service. Show areas suitable for in-ground onlot systems, elevated sand mounds, individual residential spray irrigation systems, and areas unsuitable for soil dependent systems. (Reference-Title 25, §71.21.a.1.iii). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference-Title 25, §71.21.a.1.iii).
_____	<u>9</u>	D. Geologic Features - (1) Identification through analysis, (2) mapping and (3) their relation to existing or potential nitrate-nitrogen pollution and drinking water sources. Include areas where existing nitrate-nitrogen levels are in excess of 5 mg/L. (Reference-Title 25, §71.21.a.1.iii).
_____	<u>9</u>	E. Topography - Depict areas with slopes that are suitable for conventional systems; slopes that are suitable for elevated sand mounds and slopes that are unsuitable for onlot systems. (Reference-Title 25, §71.21.a.1.ii).
_____	<u>9</u>	F. Potable Water Supplies - Identification through mapping, description and analysis. Include public water supply service areas and available public water supply capacity and aquifer yield for groundwater supplies. (Reference-Title 25 §71.21.a.1.vi). Section V.C. of the Planning Guide.
_____	<u>10</u>	G. Wetlands-Identify wetlands as defined in Title 25, Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per USDA, SCS mapped hydric soils. Proposed collection, conveyance and treatment facilities and lines must be located and labeled, along with the identified wetlands, on the map. (Reference-Title 25, §71.21.a.1.v). Appendix B, Section II.I of the Planning Guide.

_____	<u>11</u>	III. Existing Sewage Facilities in the Planning Area - Identifying the Existing Needs
_____		A. Identify, map and describe municipal and non-municipal, individual and community sewerage systems in the planning area including:
_____	<u>11</u>	1. Location, size and ownership of treatment facilities, main intercepting lines, pumping stations and force mains including their size, capacity, point of discharge. Also include the name of the receiving stream, drainage basin, and the facility's effluent discharge requirements. (Reference-Title 25, §71.21a.2.i.A).
_____	<u>11</u>	2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's NPDES permitted capacity, and the Clean Streams Law permit number. (Reference-Title 25, §71.21.a.2.i.A).
_____	<u>11</u>	3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under Title 25, Chapter 94 (relating to municipal wasteload management) or violations of the NPDES permit, Clean Streams Law permit, or other permit, rule or regulation of DEP. (Reference-Title 25, §71.21.a.2.i.B).
_____	<u>12</u>	4. Details of scheduled or in-progress upgrading or expansion of treatment facilities and the anticipated completion date of the improvements. Discuss any remaining reserve capacity and the policy concerning the allocation of reserve capacity. Also discuss the compatibility of the rate of growth to existing and proposed wastewater treatment facilities. (Reference-Title 25, §71.21.a.4.i & ii).
_____	<u>16</u>	5. A detailed description of the municipality's operation and maintenance requirements for small flow treatment facility systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, §71.21.a.2.i.C).
_____	<u>16</u>	6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference-Title 25, §71.21.a.4.i & ii).
_____	<u>16</u>	B. Using DEP's publication titled <i>Sewage Disposal Needs Identification</i>, identify, map and describe areas that utilize individual and community onlot sewage disposal and, unpermitted collection and disposal systems ("wildcat" sewers, borehole disposal, etc.) and retaining tank systems in the planning area including:
_____	<u>N/A</u>	1. The types of onlot systems in use. (Reference-Title 25, §71.21.a.2.ii.A).
_____	<u>N/A</u>	2. A sanitary survey complete with description, map and tabulation of documented and potential public health, pollution, and operational problems (including malfunctioning systems) with the systems, including violations of local ordinances, the Sewage Facilities Act, the Clean Stream Law or regulations promulgated thereunder. (Reference-Title 25, §71.21.a.2.ii.B).
_____	<u>N/A</u>	3. A comparison of the types of onlot sewage systems installed in an area with the types of systems which are appropriate for the area according to soil, geologic conditions, topographic limitations sewage flows, and Title 25 Chapter 73 (relating to standards for sewage disposal facilities). (Reference-Title 25, §71.21.a.2.ii.C).
_____	<u>N/A</u>	4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's <i>Sewage Disposal Needs Identification</i> publication. (Reference-Title 25 §71.21.a.2.ii.B).
_____	<u>N/A</u>	5. Detailed description of operation and maintenance requirements of the municipality for individual and small volume community onlot systems, including the status of past and present compliance with these requirements and any other requirements relating to sewage management programs. (Reference-Title 25, §71.21.a.2.i.C).

- _____ 16 C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:
- _____ 16 1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference-Title 25 §71.71).
- _____ 17 2. Quantities of the types of sludges or septage generated. (Reference-Title 25 §71.71).
- _____ 17 3. Present disposal methods, locations, capacities and transportation methods. (Reference-Title 25 §71.71).

- _____ 18 **IV. Future Growth and Land Development**
- _____ 18 A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:
- _____ 18 1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference-Title 25, §71.21.a.3.iv).
- _____ 18 2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – Title 25§71.21.a.3.iv).
- _____ 18 3. All limitations and plans related to floodplain and stormwater management and special protection (Ch. 93) areas. (Reference-Title 25 §71.21.a.3.iv) Appendix B, Section II.F of the Planning Guide.
- _____ 19 B. Delineate and describe the following through map, text and analysis.
- _____ 19 1. Areas with existing development or plotted subdivisions. Include the name, location, description, total number of EDU's in development, total number of EDU's currently developed and total number of EDU's remaining to be developed (include time schedule for EDU's remaining to be developed). (Reference-Title 25, §71.21.a.3.i).
- _____ 19 2. Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas. (Reference-Title 25,§71.21.a.3.ii). Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning. (Reference-Title 25, §71.21.a.3.iv).
- _____ 19 3. Future growth areas with population and EDU projections for these areas using historical, current and future population figures and projections of the municipality. Discuss and evaluate discrepancies between local, county, state and federal projections as they relate to sewage facilities. (Reference-Title 25, §71.21.a.1.iv). (Reference-Title 25, §71.21.a.3.iii).
- _____ 19 4. Zoning, and/or subdivision regulations; local, county or regional comprehensive plans; and existing plans of any other agency relating to the development, use and protection of land and water resources with special attention to: (Reference-Title 25, §71.21.a.3.iv).
 - public ground/surface water supplies
 - recreational water use areas
 - groundwater recharge areas
 - industrial water use
 - wetlands
- _____ 20 5. Sewage planning necessary to provide adequate wastewater treatment for five and ten year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference-Title 25, §71.21.a.3.v).

- _____ N/A 3. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.64.c.2).
- _____ N/A 4. Municipal, Local, Agency or other controls over operation and maintenance requirements through a Sewage Management Program. (Reference-Title 25, §71.64.d). See Part "F" below.
- _____ 22 D. The use of community land disposal alternatives including:
- _____ N/A 1. Soil and site suitability. (Reference-Title 25, §71.21.a.2.ii.C).
- _____ N/A 2. Preliminary hydrogeologic evaluation. (Reference-Title 25, §71.21.a.2.ii.C).
- _____ N/A 3. Municipality, Local Agency or Other Controls over operation and maintenance requirements through a Sewage Management Program (Reference-Title 25, §71.21.a.2.ii.C). See Part "F" below.
- _____ N/A 4. The rehabilitation or replacement of existing malfunctioning community land disposal systems. (See Part "V", B, 4, a, b, c above). See also Part "F" below.
- _____ 22 E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference- Title 25, §71.21.a.4).
- _____ N/A 1. Commercial, residential and industrial use. (Reference-Title 25, §71.63.e).
- _____ N/A 2. Designated conveyance facilities (pumper trucks). (Reference-Title 25, §71.63.b.2).
- _____ N/A 3. Designated treatment facilities or disposal site. (Reference-Title 25, §71.63.b.2).
- _____ N/A 4. Implementation of a retaining tank ordinance by the municipality. (Reference-Title 25, §71.63.c.3). See Part "F" below.
- _____ N/A 5. Financial guarantees when retaining tanks are used as an interim sewage disposal measure. (Reference-Title 25, §71.63.c.2).
- _____ 23 F. Sewage Management Programs to assure the future operation and maintenance of existing and proposed sewage facilities through:
- _____ N/A 1. Municipal ownership or control over the operation and maintenance of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference-Title 25, §71.21.a.4.iv).
- _____ N/A 2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference-Title 25, §71.73.b.1.).
- _____ N/A 3. Required maintenance of sewage disposal systems including septic and aerobic treatment tanks and other system components on a schedule established by the municipality. (Reference-Title 25, §71.73.b.2).
- _____ N/A 4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference-Title 25, §71.21.a.4.iv) and §71.73.b.5 through:
- _____ N/A a. Aggressive pro-active enforcement of ordinances that require operation and maintenance and prohibit malfunctioning systems. (Reference-Title 25, §71.73.b.5).
- _____ N/A b. Public education programs to encourage proper operation and maintenance and repair of sewage disposal systems.
- _____ N/A 5. Establishment of joint municipal sewage management programs. (Reference-Title 25, §71.73.b.8).
- _____ N/A 6. Requirements for bonding, escrow accounts, management agencies or associations to assure operation and maintenance for non-municipal facilities. (Reference-Title 25, §71.71).

- _____ 23 G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference-Title 25, §71.21.a.4).
 - _____ N/A 1. Modification of existing comprehensive plans involving:
 - _____ N/A a. Land use designations. (Reference-Title 25, §71.21.a.4).
 - _____ N/A b. Densities. (Reference-Title 25, §71.21.a.4).
 - _____ N/A c. Municipal ordinances and regulations. (Reference-Title 25, §71.21.a.4).
 - _____ N/A d. Improved enforcement. (Reference-Title 25, §71.21.a.4).
 - _____ N/A e. Protection of drinking water sources. (Reference-Title 25, §71.21.a.4).
 - _____ 23 2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference-Title 25, §71.21.a.4).
 - _____ N/A 3. Alternatives for creating or changing municipal subdivision regulations to assure long-term use of on-site sewage disposal that consider lot sizes and protection of replacement areas. (Reference-Title 25, §71.21.a.4).
 - _____ N/A 4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference-Title 25, §71.21.a.4).
- _____ 23 H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference-Title 25, §71.21.a.4).
 - _____ 23 1. Water Quality/Public Health. (Reference-Title 25, §71.21.a.4).
 - _____ 23 2. Growth potential (residential, commercial, industrial). (Reference-Title 25, §71.21.a.4).
 - _____ 23 3. Community economic conditions. (Reference-Title 25, §71.21.a.4).
 - _____ 23 4. Recreational opportunities. (Reference-Title 25, §71.21.a.4).
 - _____ 23 5. Drinking water sources. (Reference-Title 25, §71.21.a.4).
 - _____ 23 6. Other environmental concerns. (Reference-Title 25, §71.21.a.4).
- _____ 24 VI. Evaluation of Alternatives
 - _____ 24 A. Technically feasible alternatives identified in Section V of this check-list must be evaluated for consistency with respect to the following: (Reference-Title 25, §71.21.a.5.i.).
 - _____ 24 1. Applicable plans developed and approved under **Sections 4 and 5 of the Clean Streams Law or Section 208 of the Clean Water Act** (33 U.S.C.A. 1288). (Reference-Title 25, §71.21.a.5.i.A). Appendix B, Section II.A of the Planning Guide.
 - _____ 25 2. Municipal wasteload management **Corrective Action Plans or Annual Reports** developed under PA Code, Title 25, Chapter 94. (Reference-Title 25, §71.21.a.5.i.B). The municipality's recent Wasteload Management (Chapter 94) Reports should be examined to determine if the proposed alternative is consistent with the recommendations and findings of the report. Appendix B, Section II.B of the Planning Guide.
 - _____ 25 3. Plans developed under **Title II of the Clean Water Act** (33 U.S.C.A. 1281-1299) or **Titles II and VI of the Water Quality Act of 1987** (33 U.S.C.A. 1251-1376). (Reference-Title 25, §71.21.a.5.i.C). Appendix B, Section II.E of the Planning Guide.

- _____ 25 4. **Comprehensive plans** developed under the Pennsylvania Municipalities Planning Code. (Reference-Title 25, §71.21.a.5.i.D). The municipality's comprehensive plan must be examined to assure that the proposed wastewater disposal alternative is consistent with land use and all other requirements stated in the comprehensive plan. Appendix B, Section II.D of the Planning Guide.
- _____ 26 5. **Antidegradation requirements** as contained in PA Code, Title 25, Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference-Title 25, §71.21.a.5.i.E). Appendix B, Section II.F of the Planning Guide.
- _____ 26 6. **State Water Plans** developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference-Title 25, §71.21.a.5.i.F). Appendix B, Section II.C of the Planning Guide.
- _____ 26 7. **Pennsylvania Prime Agricultural Land Policy** contained in Title 4 of the Pennsylvania Code, Chapter 7, Subchapter W. Provide narrative on local municipal policy and an overlay map on prime agricultural soils. (Reference-Title 25, §71.21.a.5.i.G). Appendix B, Section II.G of the Planning Guide.
- _____ 27 8. **County Stormwater Management Plans** approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference-Title 25, §71.21.a.5.i.H). Conflicts created by the implementation of the proposed wastewater alternative and the existing recommendations for the management of stormwater in the county Stormwater Management Plan must be evaluated and mitigated. If no plan exists, no conflict exists. Appendix B, Section II.H of the Planning Guide.
- _____ 27 9. **Wetland Protection.** Using wetland mapping developed under Checklist Section II.G, identify and discuss mitigative measures including the need to obtain permits for any encroachments on wetlands from the construction or operation of any proposed wastewater facilities. (Reference-Title 25, §71.21.a.5.i.I) Appendix B, Section II.I of the Planning Guide.
- _____ 28 10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference-Title 25, §71.21.a.5.i.J). Provide DEP with a copy of the completed Request For PNDI Search document. Also provide a copy of the response letter from the Department of Conservation and Natural Resources' Bureau of Forestry regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.
- _____ 28 11. **Historical and archaeological resource protection** under P.C.S. Title 37, Section 507 relating to cooperation by public officials with the Pennsylvania Historical and Museum Commission. (Reference-Title 25, §71.21.a.5.i.K). Provide the department with a completed copy of a Cultural Resource Notice request of the Bureau of Historic Preservation (BHP) to provide a listing of known historical sites and potential impacts on known archaeological and historical sites. Also provide a copy of the response letter from the BHP. Appendix B, Section II.K of the Planning Guide.
- _____ 28 B. Provide for the resolution of any inconsistencies in any of the points identified in Section VI.A. of this checklist by submitting a letter from the appropriate agency stating that the agency has received, reviewed and concurred with the resolution of identified inconsistencies. (Reference-Title 25, §71.21.a.5.ii). Appendix B of the Planning Guide.
- _____ 29 C. Evaluate alternatives identified in Section V of this checklist with respect to applicable water quality standards, effluent limitations or other technical, legislative or legal requirements. (Reference-Title 25, §71.21.a.5.iii).

- _____ 29 D. Provide cost estimates using present worth analysis for construction, financing, on going administration, operation and maintenance and user fees for alternatives identified in Section V of this checklist. Estimates shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of plan submission. (Reference-Title 25, §71.21.a.5.iv).
- _____ 30 E. Provide an analysis of the funding methods available to finance the proposed alternatives evaluated in Section V of this checklist. Also provide documentation to demonstrate which alternative and financing scheme combination is the most cost-effective; and a contingency financial plan to be used if the preferred method of financing cannot be implemented. The funding analysis shall be limited to areas identified in the plan as needing improved sewage facilities within five years from the date of the plan submission. (Reference-Title 25, §71.21.a.5.v).
- _____ 31 F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference-Title 25, §71.21.a.5.vi).
- _____ N/A 1. A description of any activities necessary to abate critical public health hazards pending completion of sewage facilities or implementation of sewage management programs. (Reference-Title 25, §71.21.a.5.vi.A).
- _____ N/A 2. A description of the advantages, if any, in phasing construction of the facilities or implementation of a sewage management program justifying time schedules for each phase. (Reference-Title 25, §71.21.a.5.vi.B).
- _____ 31 G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - Title 25, §71.21.a.5.vi.D).
- _____ 32 VII. Institutional Evaluation
- _____ 32 A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:
- _____ 33 1. Financial and debt status. (Reference-Title 25, §71.61.d.2).
- _____ 33 2. Available staff and administrative resources. (Reference-Title 25, §71.61.d.2)
- _____ 33 3. Existing legal authority to:
- _____ 33 a. Implement wastewater planning recommendations. (Reference-Title 25, §71.61.d.2).
- _____ 33 b. Implement system-wide operation and maintenance activities. (Reference-Title 25, §71.61.d.2).
- _____ 33 c. Set user fees and take purchasing actions. (Reference-Title 25, §71.61.d.2).
- _____ 33 d. Take enforcement actions against ordinance violators. (Reference-Title 25, §71.61.d.2).
- _____ 33 e. Negotiate agreements with other parties. (Reference-Title 25, §71.61.d.2).
- _____ 33 f. Raise capital for construction and operation and maintenance of facilities. (Reference-Title 25, §71.61.d.2).
- _____ 33 B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:
- _____ 33 1. Need for new municipal departments or municipal authorities. (Reference-Title 25, §71.61.d.2).
- _____ 33 2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference-Title 25, §71.61.d.2).
- _____ 33 3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference-Title 25, §71.61.d.2).

- _____ 33 C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:
- _____ 33 1. Incorporation of authorities or agencies. (Reference-Title 25, §71.61.d.2).
- _____ 33 2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference-Title 25, §71.61.d.2).
- _____ 34 3. Description of activities to provide rights-of-way, easements and land transfers. (Reference-Title 25, §71.61.d.2).
- _____ 34 4. Adoption of other municipal sewage facilities plans. (Reference-Title 25, §71.61.d.2).
- _____ 34 5. Any other legal documents. (Reference-Title 25, §71.61.d.2).
- _____ 34 6. Dates or timeframes for items 1-5 above on the project's implementation schedule.
- _____ 34 D. Identify the proposed institutional alternative for implementing the chosen technical wastewater disposal alternative. Provide justification for choosing the specific institutional alternative considering administrative issues, organizational needs and enabling legal authority. (Reference-Title 25, §71.61.d.2).

_____ 35 **VIII. Implementation Schedule and Justification for Selected Technical & Institutional Alternatives**

- A. Identify the technical wastewater disposal alternative which best meets the wastewater treatment needs of each study area of the municipality. Justify the choice by providing documentation which shows that it is the best alternative based on:
 - _____ 35 1. Existing wastewater disposal needs. (Reference-Title 25, §71.21.a.6).
 - _____ 35 2. Future wastewater disposal needs. (five and ten years growth areas). (Reference-Title 25, §71.21.a.6).
 - _____ 35 3. Operation and maintenance considerations. (Reference-Title 25, §71.21.a.6).
 - _____ 35 4. Cost-effectiveness. (Reference-Title 25, §71.21.a.6).
 - _____ 35 5. Available management and administrative systems. (Reference-Title 25, §71.21.a.6).
 - _____ 35 6. Available financing methods. (Reference-Title 25, §71.21.a.6).
 - _____ 35 7. Environmental soundness and compliance with natural resource planning and preservation programs. (Reference-Title 25, §71.21.a.6).
- _____ 35 B. Designate and describe the capital financing plan chosen to implement the selected alternative(s). Designate and describe the chosen back-up financing plan. (Reference-Title 25, §71.21.a.6)
- _____ 36 C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a Sewage Management Program. (Reference - Title 25 §71.31d)

_____ 37 **IX. Environmental Report (ER) generated from the Uniform Environmental Review Process (UER)**

- _____ 37 A. Complete an ER as required by the UER process and as described in the DEP Technical Guidance 381-5511-111. Include this document as "Appendix A" to the Act 537 Plan Update Revision. Note: *An ER is required only for Wastewater projects proposing funding through any of the funding sources identified in the UER.*

ADDITIONAL REQUIREMENTS FOR PENNVEST PROJECTS

Municipalities that propose to implement their official sewage facilities plan updates with PENNVEST funds must meet six additional requirements to be eligible for such funds. See A Guide for Preparing Act 537 Update Revisions (362-0300-003), Appendix N for greater detail or contact the DEP regional office serving your county listed in Appendix J of the same publication.

DEP Use Only	Indicate Page #(s) in Plan	Item Required
_____	<u>37</u>	1. Environmental Impact Assessment. (Planning Phase) The Uniform Environment Review (UER) replaces the Environmental Impact Assessment that was a previous requirement for PENNVEST projects.
_____	<u>29</u>	2. Cost Effectiveness (Planning Phase) The cost-effectiveness analysis should be a present-worth (or equivalent uniform annual) cost evaluation of the principle alternatives using the interest rate that is published annually by the Water Resources Council. Normally, for PENNVEST projects the applicant should select the most cost-effective alternative based upon the above analysis. Once the alternative has been selected the user fee estimates should be developed based upon interest rates and loan terms of the selected funding method.
_____		3. Second Opinion Project Review. (Design Phase)
_____		4. Minority Business Enterprise/Women's Business Enterprise (Construction Phase)
_____		5. Civil Rights. (Construction Phase)
_____		6. Initiation of Operation/Performance Certification. (Post-construction Phase)

I/A TECHNOLOGIES

PARTIAL LISTING OF INNOVATIVE AND ALTERNATIVE TECHNOLOGIES

TREATMENT TECHNOLOGIES

Aquaculture
Aquifer Recharge
Biological Aerated Filters
Constructed Wetlands
Direct Reuse (NON-POTABLE)
Horticulture
Overland Flow
Rapid Infiltration
Silviculture
Microscreens
Controlled Release Lagoons
Swirl Concentrator

SLUDGE TREATMENT TECHNOLOGIES

Aerated Static Pile Composting
Enclosed Mechanical Composting (In vessel)
Revegetation of Disturbed Land
Aerated Windrow Composting

ENERGY RECOVERY TECHNOLOGIES

Anaerobic Digestion with more than 90 percent
Methane Recovery
Cogeneration of Electricity
Self-Sustaining Incineration

**INDIVIDUAL & SYSTEM-WIDE
COLLECTION TECHNOLOGIES**

Cluster Systems
Septage Treatment
Small Diameter Gravity Sewers
Step Pressure Sewers
Vacuum Sewers
Variable Grade Sewers
Septic Tank Effluent Pump with
Pressure Sewers

APPENDIX C

CITY OF DUQUESNE
COMBINED SEWER SYSTEM
LONG TERM CONTROL PLAN

**MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
CITY OF DUQUESNE**

**Combined Sewer System
Long Term Control Plan
August 2014**

KLH

A blue wavy line graphic that starts under the 'K' and ends under the 'H', curving upwards at both ends.

**KLH ENGINEERING, INC.
5173 CAMPBELLS RUN ROAD
PITTSBURGH, PA 15205-9733**

MUNICIPAL AUTHORITY OF THE CITY OF MCKEESPORT
CITY OF DUQUESNE
COMBINED SEWER SYSTEM LONG TERM CONTROL PLAN
TABLE OF CONTENTS

1.0	Executive Summary	1
2.0	Introduction	3
2.1	Background	3
2.2	Document Intention	4
3.0	System Characterization.....	5
3.1	Service Area	5
3.2	Diversion Chambers	5
3.3	Pump Stations.....	5
3.4	CSS Upgrades Required	6
4.0	Flow Monitoring Study	12
4.1	Site Selection	12
4.2	Equipment Description	13
4.3	Field Quality Control.....	13
4.4	Office Quality Assurance	13
4.5	Rain Event Summary	13
5.0	Combined Sewer System Modeling.....	15
5.1	Methodology.....	15
5.2	Model Development	19
5.3	Validation	20
5.4	Historical Rainfall Analysis	25
5.5	Long-Term Continuous Simulation Results	26
6.0	Existing Facility	27
6.1	Existing NPDES Permit Requirements.....	27
6.2	Existing Hydraulic Loadings.....	27
6.3	Existing Mass Loadings.....	28
6.4	Existing Process	29
7.0	Treatment Plant Upgrades	33
7.1	Design Hydraulic Loadings.....	33
7.2	Design Mass Loadings.....	35
7.3	Design Effluent Limits.....	35
7.4	Alternatives Evaluation.....	35
8.0	Project Planning	44
9.0	Summary and Conclusions	45

TABLES

Table 3.1	Duquesne CSO's	5
Table 4.1	Duquesne Flow Monitoring Sites	12
Table 4.2	Significant Rain Events	14
Table 5.1	Ranges of Values for Unit Hydrograph Parameters.....	18
Table 5.2	Number of Kept, Outlier, and Total Events by Site.....	23
Table 6.1	Existing Effluent Limits	27
Table 6.2	Existing Hydraulic Loadings	28
Table 6.3	Existing Influent Organic Loadings	28
Table 7.1	Design Hydraulic Loadings	33
Table 7.2	Design Mass Loadings	35
Table 7.3	Alternatives Comparison.....	38
Table 7.4	WWTP Upgrade Costs	42
Table 7.5	Project Affordability	43
Table 8.1	LTCP Schedule	44

PHOTOGRAPHS

Photograph 6.1	Influent Channel	29
Photograph 6.2	Grit Removal System.....	30
Photograph 6.3	Aeration Basis.....	30
Photograph 6.4	Final Clarifiers.....	31
Photograph 6.5	Chlorine Contact Tank	31
Photograph 6.6	Belt Filter Press.....	32
Photograph 7.1	Example Storm King	40

FIGURES

Figure 3.1	Parallel Relief Sewer 1	7
Figure 3.2	Hydraulic Profile for Existing Conditions	8
Figure 3.3	Hydraulic Profile for Proposed Relief Sewer 1.....	8
Figure 3.4	Parallel Relief Sewer 2.....	9
Figure 3.5	Hydraulic Profile – Existing Conditions.....	10
Figure 3.6	Hydraulic Profile – No Relief Sewer, Bolted Manholes	10
Figure 3.7	Hydraulic Profile – Proposed Relief Sewer 2.....	11
Figure 5.1	Hydrograph Decomposition of Total Monitored Flow	16
Figure 5.2	Typical Dry Weather Flow Pattern.....	16
Figure 5.3	Summation of Three Unit Hydrographs	17
Figure 5.4	Interceptor Profile Between Manhole DU3097M and Outfall WWTP-OF.....	19
Figure 5.5	Event Volume Regression Plot for All Sites in the Duquesne System	24
Figure 5.6	Event Peak Regression Plot for All Sites in the Duquesne System.....	25
Figure 7.1	Design Hydrograph.....	34
Figure 7.2	Storm King Internal Components	40
Figure 7.3	U.S. Steel Parcel 304-K-400	41

APPENDICES

- Appendix A System Map, CSO Location Map & Tributary Area Map
- Appendix B Duquesne Survey Field Book
- Appendix C Drnach Meter Site Inspection Forms
- Appendix D Drnach Scattergraphs
- Appendix E Duquesne Model System Map
- Appendix F Duquesne Model Physical Characteristics (List)
- Appendix G Monitored vs. Modeled Hydrographs
- Appendix H Monitored vs. Modeled Regression Plots
- Appendix I Typical Year Rain Hyetograph
- Appendix J InfoSWMM Typical Year Model Report
- Appendix K Existing Process Flow Diagram
- Appendix L Existing WWTP Plans
- Appendix M Existing Process Calculations
- Appendix N Existing Final Clarifier Plan and Proposed Upgrade Equipment
- Appendix O Alternative 1: Process Flow Diagram
- Appendix P Alternative 1: Site Plan
- Appendix Q Alternative 1: Process Calculations
- Appendix R Alternative 2: Process Flow Diagram
- Appendix S Alternative 2: Site Plan
- Appendix T Alternative 2: Force Main Alignment
- Appendix U Alternative 3: Process Flow Diagram
- Appendix V Alternative 3: Site Plan
- Appendix W Project Cost Estimates
- Appendix X Financial Capability Assessment – Alternative 1
- Appendix Y Financial Capability Assessment – Alternative 2
- Appendix Z Financial Capability Assessment – Alternative 3

ABBREVIATIONS

AAF	Annual Average Flow
BNR	Biological Nutrient Removal
BOD	Biological Oxygen Demand
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
DEP	Pennsylvania Department of Environmental Protection
EDU	Equivalent Dwelling Unit
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GPD	Gallons Per Day
GPM	Gallons Per Minute
LF	Linear Feet
LTCP	Long-Term Control Plan
lb/day	Pounds Per Day
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
/100ml	Colony Forming Units Per 100 Milliliter
MMF	Maximum Monthly Average Flow
NH ₃ -N	Ammonia Nitrogen
NO ₂	Nitrite
NO ₃	Nitrate
NPDES	National Pollutant Discharge Elimination System
PDF	Peak Daily Flow
PIF	Peak Instantaneous Flow
PHF	Peak Hourly Flow
PLC	Programmable Logic Controller
POTW	Publicly Owned Treatment Works
SBR	Sequencing Batch Reactor
SCS	United States Natural Resources Conservation Service
SOR	Surface Overflow Rate
SWMM	Storm Water Management Model
TF	Trickling Filter
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UV	Ultraviolet
VFD	Variable Frequency Drive
WWTP	Wastewater Treatment Plant

1.0 EXECUTIVE SUMMARY

The Long-Term Control Plan (LTCP) was completed in order to address wastewater treatment plant (WWTP) and combined sewer system (CSS) upgrades necessary to meet Federal and State regulatory requirements. The goal of the LTCP is to decrease volume of combined sewage overflows on an annual basis and subsequently, increase the volume that receives treatment at the WWTP.

The focus of this LTCP update was to:

1. Develop WWTP design loadings required in order to address combined sewer overflow (CSO) regulatory requirements.
2. Evaluate the capacity of the existing City of Duquesne WWTP processes relative to design loadings.
3. Complete evaluation of feasible alternatives developed to address WWTP process deficiencies relative to design loadings.
4. Summarize all CSS upgrades required in order to address CSO regulatory requirements.
5. Complete Financial Capability Assessment in order to evaluate economic feasibility of recommended alternative.

Detailed evaluation was completed for three (3) alternatives.

- Alternative 1 – Existing WWTP + new pump station + CSO bypass treatment.
- Alternative 2 – New pump station to MACM WWTP + flow storage.
- Alternative 3 – Existing WWTP + new pump station + flow storage.

All alternatives include two (2) gravity relief sewers totaling 1,025 lineal feet. It was determined that these CSS upgrades are required to convey the 10-year, 24-hour design storm flow (without manhole overflows) while maintaining greater than 85% capture of all combined flow during a typical year.

Detailed evaluation of the proposed alternatives led to the recommendation of Alternative 1 for City's LTCP upgrades. The total estimated project cost is \$7,424,000. This alternative is recommended for the following reasons:

- Alternative 2 project cost is \$8,087,000 more than the recommended Alternative 1, and Alternative 3 project cost is \$5,483,000 more.
- The existing WWTP is in good operating condition with adequate capacity for dry weather flows, and Alternative 1 allows the WWTP to continue operation under these conditions.

The following LTCP schedule is proposed.

Milestone	Date
Submit draft LTCP	September 1, 2014
Submit final LTCP with MACM ACT 537	November 1, 2015
DEP approval of LTCP and ACT 537	January 1, 2016
Obtain funding for design related services	January 1, 2017
Begin design of upgrades	January 1, 2017
Apply for MACM WWTP re-rate	July 1, 2017
Apply for Part II Permit for pump station	July 1, 2018
Receive Part II Permit for pump station	January 1, 2019
Obtain funding for construction	January 1, 2021
Begin construction for CSS upgrades	March 1, 2021
Complete construction	March 1, 2023
Submit post construction compliance monitoring plan	September 1, 2023

*DEP LTCP approval and Part II Permit dates are beyond the control of the City and KLH, therefore schedule dates will be adjusted based on actual DEP milestone completion dates.

2.0 INTRODUCTION

2.1 BACKGROUND

The City of Duquesne is located in Allegheny County, Pennsylvania; it is situated along the Monongahela River. The population was 5,565 at the 2010 Census. For all intents and purposes, 100% of the City is provided sewer service and the service area does not go beyond the corporate limits. The City's combined sewer system (CSS) presently serves 1,909 customers. Utilizing the U.S. Census data for 2010, which indicates an average of 2.22 persons per household, it is estimated that the WWTP serves approximately 4,238 persons. The WWTP is located in the center of the City adjacent to Route 837 and discharges into Thompson Run, tributary to the Monongahela River. The plant is owned by the Municipal Authority of the City of McKeesport and operated under NPDES Permit No. PA0026981.

The City has selected to utilize the EPA CSO Control Policy "presumption" approach criteria ii through their Long Term Control Plan (LTCP) process. The criteria are as follows.

"The elimination or capture for treatment of no less than 85% by volume of combined sewage collected in the CSS during precipitation events on a system-wide annual average basis."

In order to assess the overflow volumes relative to total CSS conveyance on an annual average basis, the City completed a system characterization survey, a comprehensive flow monitoring study (from January 1, 2013 through June 1, 2013), and a computer modeling, utilizing SWMM, of CSS hydraulic and hydrologic characteristics. The results of the flow monitoring and modeling study are described through this report.

This report will summarize sewer system upgrades/modifications required in order to allow for the "presumption" approach criteria to be met.

The monitoring and modeling established peak flow instantaneous flow as 14.57 MGD, based on 1-year, 24-hour rain event with no manhole overflows. This peak flow value is far in excess of the existing WWTP's peak capacity, and minor CSS upgrades are required to convey all flow to the WWTP. Therefore, conveyance/storage and treatment of the design flows discussed in this report will be necessary to meet the EPA CSO Control Policy.

The focus of this Long-Term Control Plan is to:

1. Develop WWTP design loadings required in order to address CSO regulatory requirements.
2. Evaluate the capacity of the existing City of Duquesne WWTP processes relative to design loadings.

3. Complete evaluation of feasible alternatives developed to address WWTP process deficiencies relative to design loadings.
4. Summarize all CSS upgrades required in order to address CSO regulatory requirements.
5. Complete Financial Capability Assessment in order to evaluate economic feasibility of recommended alternative.

2.2 DOCUMENT INTENTION

This document is intended for planning purposes only. Evaluation of specific processes is limited to confirming feasibility and estimating planning level project costs. Once this LTCP update report is approved, the basis of design study can commence. This study will focus on the process modeling, detailed equipment evaluation, and development of process control logic for the recommended alternative. The Basis of Design Report will serve as the basis for all design phase work.

3.0 SYSTEM CHARACTERIZATION

3.1 SERVICE AREA

The City of Duquesne presently serves 1,909 customers. The City's sewage conveyance system is divided into five drainage areas. All of these areas have combined sewage flow and are controlled by a regulator.

AREA 1: Crawford Avenue area	(flows into area 2)
AREA 2: Wylie Avenue area	(Regulator 002)
AREA 3: Hamilton Avenue area	(Regulator 003)
AREA 4: Overland Avenue area	(Regulator 004)
AREA 5: Clark Street area	(Regulator 005)

3.2 DIVERSION CHAMBERS

The CSS includes four (4) CSO outfalls, in addition to the WWTP outfall. The CSO identification numbers and locations are listed in Table 3.1 below. The locations of these CSO's are shown on the drawing set included in Appendix A.

Duquesne CSO's
Table 3.1

CSO ID No.	Location
001	WWTP Outfall
002	Wylie Avenue
003	Hamilton Avenue
004	Overland Avenue
005	Clark Street

3.3 PUMP STATIONS

The City of Duquesne service area does not have any sewage pumping stations.

3.3.1 Interceptor Sewer

The following chart represents the approximate quantities of sewer line and related appurtenances, as published in the City of Duquesne's Chapter 94 Report.

Area	Flush Tanks		Manholes		EggShape Pipe		Total Pipe	
1	10	EA	79	EA	0	LF	15,760	LF
2	25	EA	188	EA	5,500	LF	27,500	LF
3	23	EA	146	EA	2,850	LF	30,820	LF
4	6	EA	58	EA	0	LF	63,150	LF
5	0	EA	86	EA	0	LF	20,650	LF
Total:	64	EA	557	EA	8350	LF	157880	LF

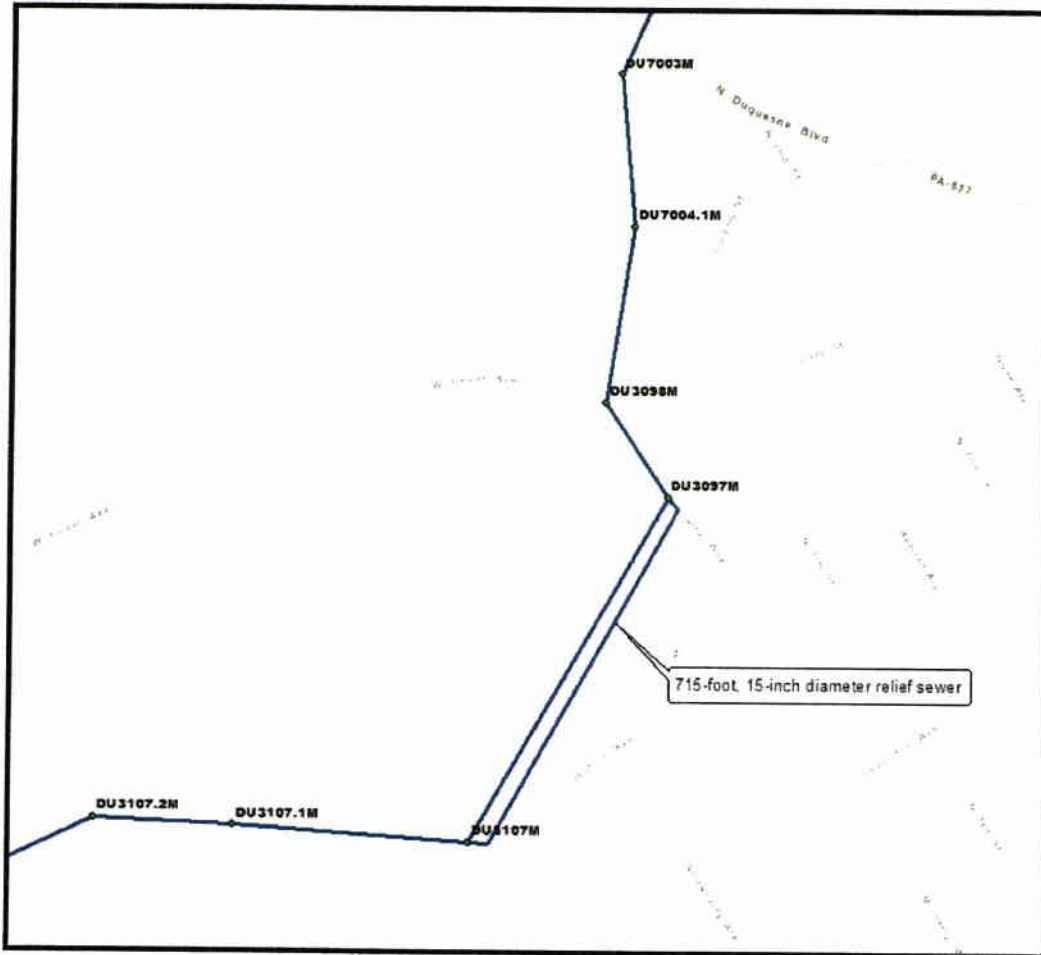
A copy of the City of Duquesne field survey data is included in Appendix B.

3.4 CSS UPGRADES REQUIRED

Flow monitoring and SWMM modeling was completed for the City's CSS. It was determined that two (2) sewer improvements are required within the system to allow for conveyance of the peak flow resulting from the 10-year, 24-hour rain event, given a free discharge at the WWTP.

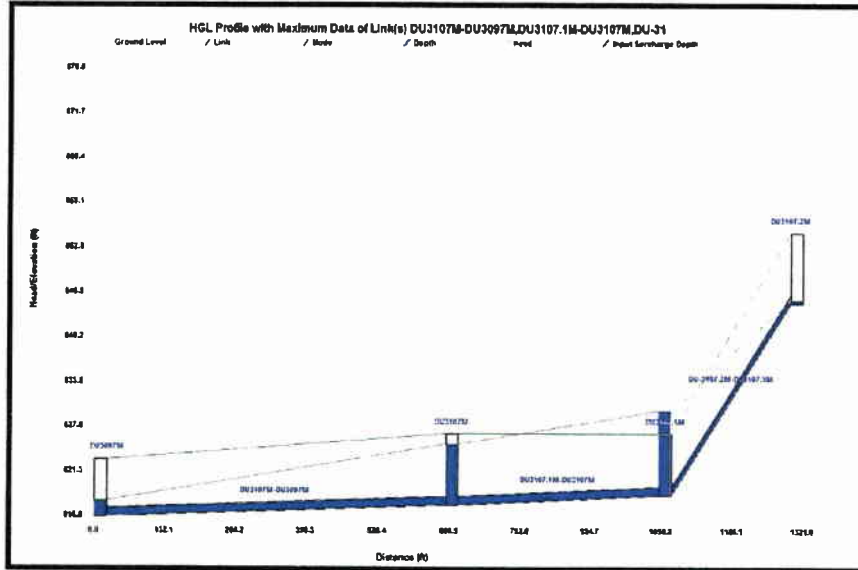
The first required conveyance system upgrade is a parallel relief sewer downstream of CSO 005 between William Avenue and Mulberry Way, from Manhole DU3107M to DU3097M. Figure 3.1 depicts the location of the relief sewer.

Parallel Relief Sewer 1
Figure 3.1

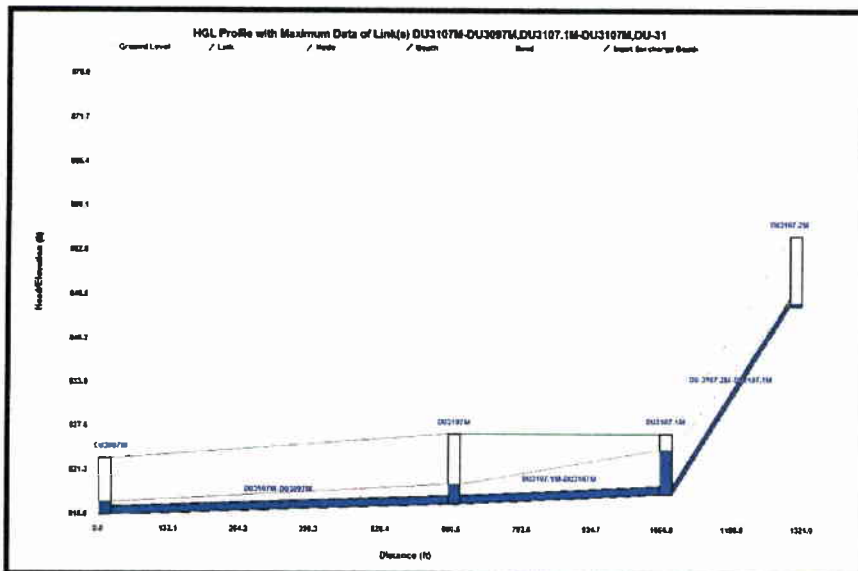


The relief sewer is estimated to be 715-foot length, and 15-inch diameter, to ensure no manhole overflows during the 10-year, 24-hour design rain event. Figure 3.2 shows the hydraulic profile in the sewer under existing conditions, while Figure 3.3 shows the profile after the relief sewer is constructed.

**Hydraulic Profile for Existing Conditions
10-Year, 24-hour Design Rain Event
Figure 3.2**

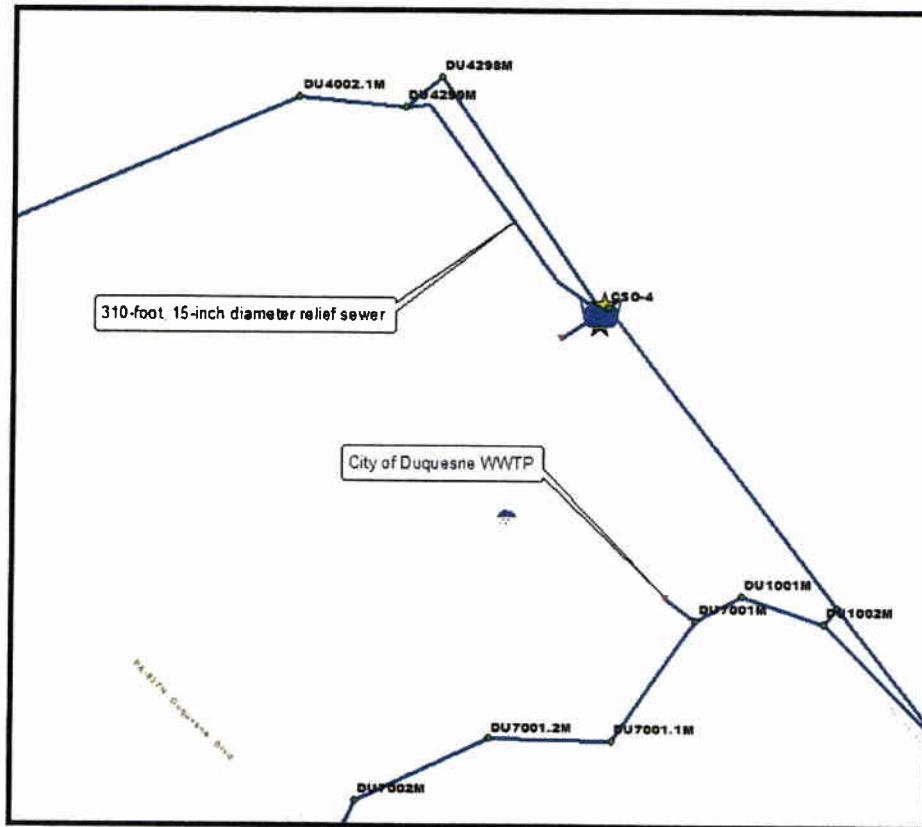


**Hydraulic Profile for Proposed Relief Sewer 1
10-Year, 24-hour Design Rain Event
Figure 3.3**



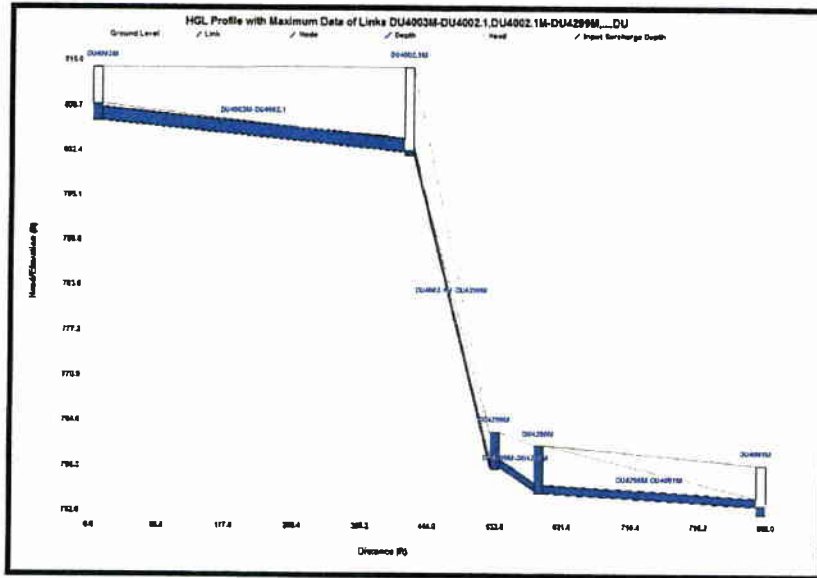
The second required conveyance system upgrade is a parallel relief sewer upstream of CSO 004 along the railroad, from Manhole DU4299M to CSO 004. In addition to the relief sewer, the lids on Manholes DU4299M and DU4298M will need bolted down to prevent flooding. Figure 3.4 depicts the location of the relief sewer.

Parallel Relief Sewer 2
Figure 3.4

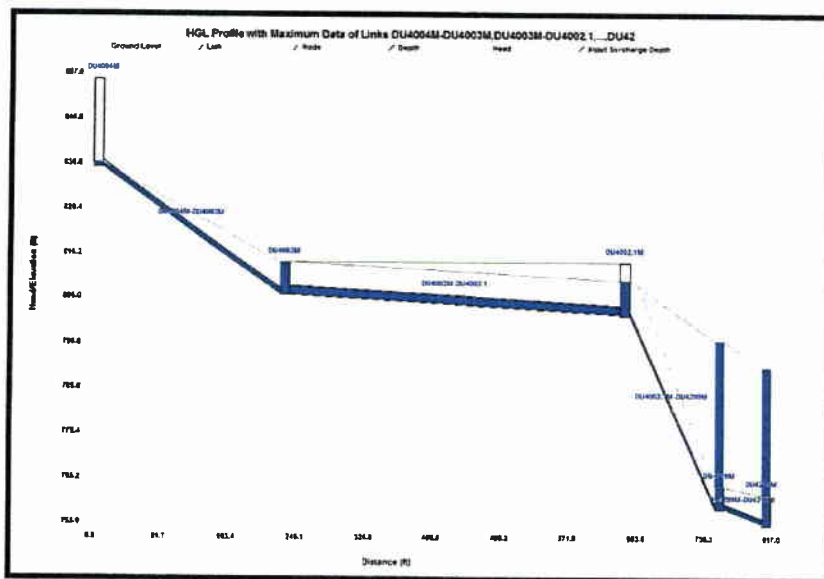


The relief sewer is estimated to be 310-feet length, and 24-inch diameter, to ensure no manhole overflows during the 10-year, 24-hour design rain event. Figure 3.5 shows the hydraulic profile in the sewer under existing conditions. As seen in Figure 3.6, bolted manhole lids without the relief sewer caused additional flooding upstream. Figure 3.7 shows the profile after the relief sewer is constructed.

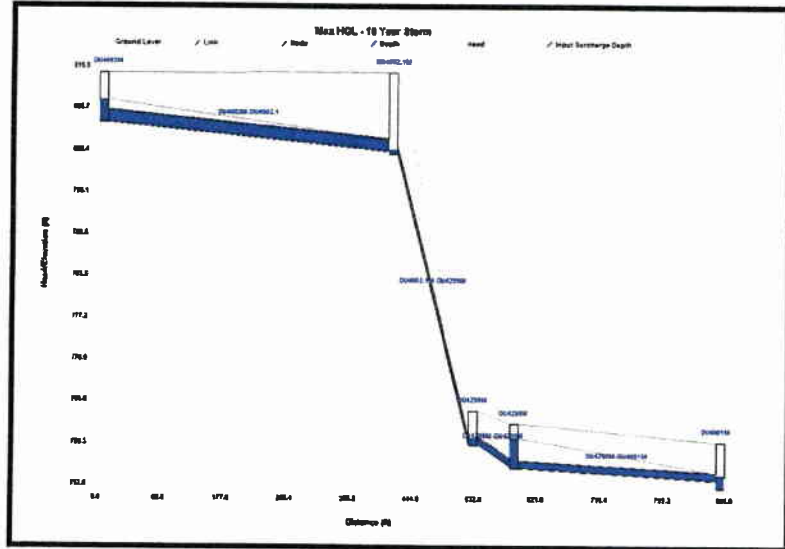
**Hydraulic Profile
Existing Conditions
10-Year, 24-hour Design Rain Event
Figure 3.5**



**Hydraulic Profile
No Relief Sewer, Bolted Manholes
10-Year, 24-hour Design Rain Event
Figure 3.6**



**Hydraulic Profile
Proposed Relief Sewer 2
10-Year, 24-hour Design Rain Event
Figure 3.7**



4.0 FLOW MONITORING STUDY

4.1 SITE SELECTION

Flow monitoring site locations were selected based on their importance in the collection system. Meters were installed and maintained by Drnach Environmental, Inc. (DE). Monitoring sites were selected to ensure all areas of the system were accounted for. In total, eight (8) meters were required to account for all flow. These areas are as follows:

- Tributary to Wylie Avenue CSO 002 (Meter M-1)
- West tributary of Hamilton Avenue CSO 003 (Meter M-3)
- North tributary of Hamilton Avenue CSO 003 (Meter M-5A8)
- East tributary of Hamilton Avenue CSO 003 (Meter M-5A18)
- Tributary to Overland Avenue CSO 004 (Meter M-6)
- Tributary to Overland Avenue CSO 004 (Meter M-6A)
- South tributary to Clark Avenue CSO 005 (Meter M-8)
- East downstream of Clark Avenue CSO 005 (Meter M-10)
- West downstream of Clark Avenue CSO 005 (Meter M-11)

DE Site Inspection Forms are included in Appendix C. Table 4.1 shows the flow monitoring sites and monitoring period.

Duquesne Flow Monitoring Sites
Table 4.1

Sites	Location	Monitoring Period
M-1	520 S Duquesne Ave	January 1 – June 1, 2013
M-3	130 Duquesne Blvd	January 1 – June 1, 2013
M-5A8	10 N Linden St	January 1 – June 1, 2013
M-5A18	10 N Linden St	January 1 – June 1, 2013
M-6	Overland CSO 004	January 1, 2013 – June 1, 2014
M-6A	Railroad (near CSO 004)	December 1, 2013 – June 1, 2014
M-8	Clark St & Parallel Way	January 1 – June 1, 2013
M-10	Clark St & Edith Ave	January 1 – June 1, 2013
M-11	125 Clark St	January 1 – June 1, 2013

A map illustrating the metered areas of Duquesne is included in Appendix A.

Additional flow monitoring for Sites M-6 and M-6A from December 1, 2013 through April 30, 2014 was completed to evaluate manhole overflows upstream of CSO 004.

4.2 EQUIPMENT DESCRIPTION

The meters installed, by DE, for the flow monitoring study were area-velocity (A-V) meters. The A-V meters are capable of measuring head and flow velocity over the full range of sewer flow, from free-flow to surcharged as well as reverse flow.

Rain gauges utilized were tipping-bucket type.

4.3 FIELD QUALITY CONTROL

The A-V meters were installed, maintained, and downloaded by DE. Each site was visited on a weekly basis in order to ensure that the equipment was functioning properly. This approach allowed for issues to be corrected without significant loss of data and time.

4.4 OFFICE QUALITY ASSURANCE

Flow data provided to Duquesne was reviewed by KLH Engineers, Inc. (KLH) in order to ensure that the data was reliable. Reliability of flow data was evaluated in terms of precision and accuracy.

Precision, repeatability of measurements, is best evaluated through use of scattergraphs. KLH reviewed scattergraphs provided by DE in order to confirm that the data being provided had a reasonable level of precision. Drnach scattergraphs for the meter sites are included in Appendix D.

Accuracy, how well meter values compare to actual values, was also evaluated. This evaluation is more difficult given that the actual flow or velocities at any given time are difficult to know for certain. However, accuracy was evaluated from a magnitude standpoint. Comparisons of total daily flows from the meter sites to the WWTP were made as well as individual site evaluations with respect to hydraulic evaluation tools such as Manning's Equation.

The data from all sites was determined by KLH to have reasonable levels of precision and accuracy, and therefore, the data was considered to be reliable for the purposes of this study.

4.5 RAIN EVENT SUMMARY

The major rainfall monitoring began on January 1, 2013 and ended on June 1, 2013. During this time period three (3) significant rain events occurred. These events are listed in Table 4.2 below. A significant rain event was defined as an event where rainfall depth was greater than or equal to one inch.

Significant Rain Events

Table 4.2

Event No.	Start Date	End Date	Duration [hrs]	Depth [in]
1	1/30/2013	1/31/2013	22.25	1.08
2	2/26/2013	2/27/2013	24.75	1.01
3	4/16/2013	4/17/2013	8.75	1.13

During this time period, the total rainfall depth was 13.08 inches. Annual average rainfall for the National Oceanic and Atmospheric Administration (NOAA) McKeesport, PA site (nearest rain gage site to Duquesne) is 37.05 inches. The rainfall recorded during the monitoring period is a slightly less than the annual average rain event.

$$(13.08 \text{ inches}) \times (12 \text{ months/year}) \div (5 \text{ months}) = 31.39 \text{ inches/year}$$

5.0 COMBINED SEWER SYSTEM MODELING

5.1 METHODOLOGY

The Duquesne CSS was modeled utilizing Innowyze InfoSWMM (SWMM). SWMM is a dynamic rainfall-runoff simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas. The runoff component of SWMM operates on a collection of sub-catchment areas that receive precipitation and generate runoff and pollutant loads. The routing portion of SWMM transports this runoff through a system of pipes, channels, storage/treatment devices, pumps, and regulators.

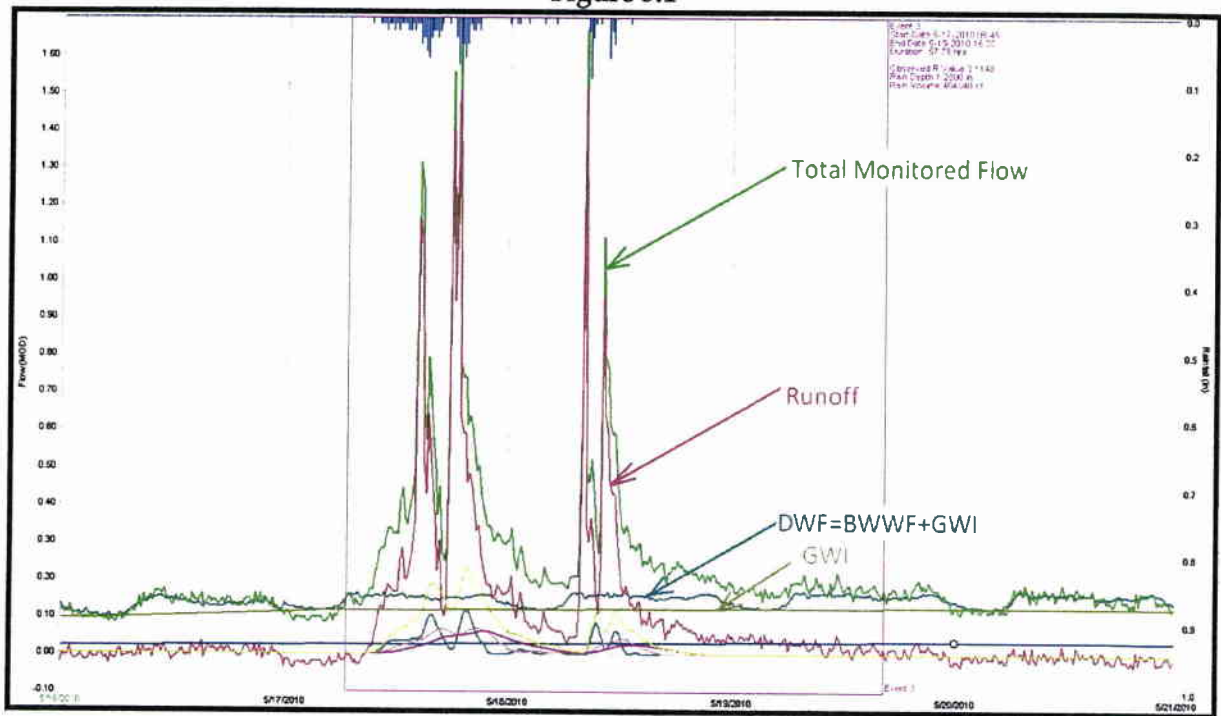
5.1.1 Model Hydrology

There are three (3) major components of the total sewer flow in combined sewer system. Dry weather flow (DWF) includes two components (groundwater infiltration and base wastewater flow). The third component is runoff. Groundwater infiltration (GWI) represents groundwater that enters the collection system through defective pipes, pipe joints, and leaking manhole walls during dry weather. Base wastewater flow (BWWF) is the residential, industrial and commercial flow discharged to the sewer system for collection and treatment. GWI and BWWF together comprise the base flow, or dry weather portion of sewer flow. Runoff represents the wet-weather contribution that enters a combined sewer system during and after a rainfall event.

Accurate dry weather flow plays an important role in hydrologic and hydraulic (H&H) modeling. Dry weather flow loadings were determined through analysis of flow monitoring data during dry weather days from each flow monitoring location as well as the total system flow monitored at the WWTP. Hydrograph decomposition is the process of analyzing a total monitored sewer flow hydrograph and estimating the three components of wastewater flow (Runoff, BWWF and GWI). Hydrograph decomposition was performed using EPA Sanitary Sewer Overflow Analysis and Planning (SSOAP) Toolbox. Although SSOAP Toolbox is mainly used in sanitary sewer overflow analysis, its capability of hydrograph decomposition can also be utilized in combined sewer overflow analysis. Figure 5.1 illustrates the hydrograph decomposition of monitored wastewater flow. The average base flow (BWWF and GWI) time series is projected through the monitored wet weather hydrograph. The area between the wet-weather hydrograph and the average base flow time series represents the Runoff volume.

Hydrograph Decomposition of Total Monitored Flow

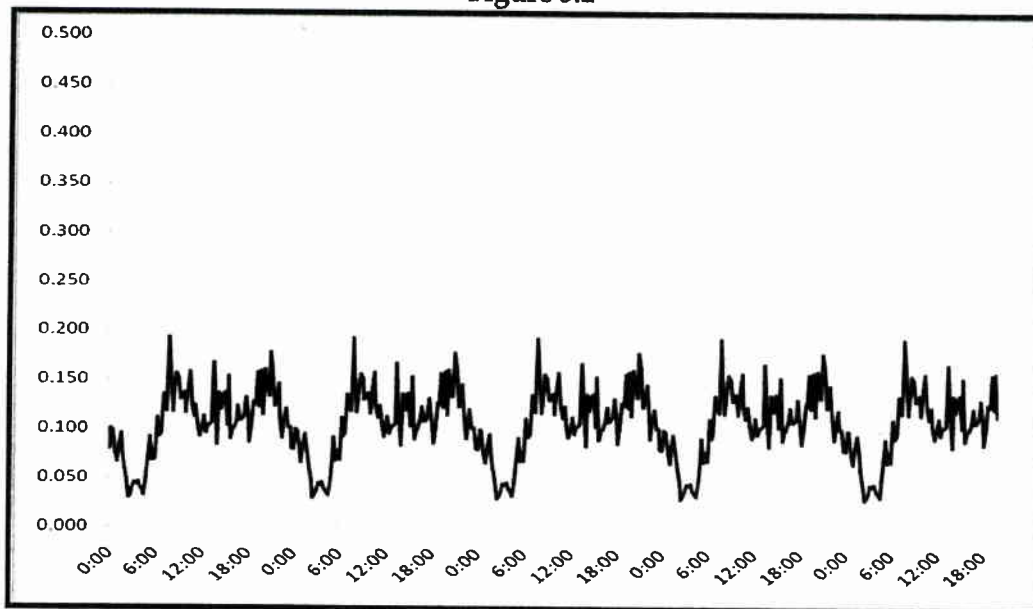
Figure 5.1



Generally, the dry weather flow varies with time in a day, with two peaks at about 7:00AM and 7:00PM, two bottoms at about 3:00AM and 3:00PM. The dry weather flows were loaded in corresponding upstream manholes. Figure 5.2 shows the typical dry weather flow pattern.

Typical Dry Weather Flow Pattern

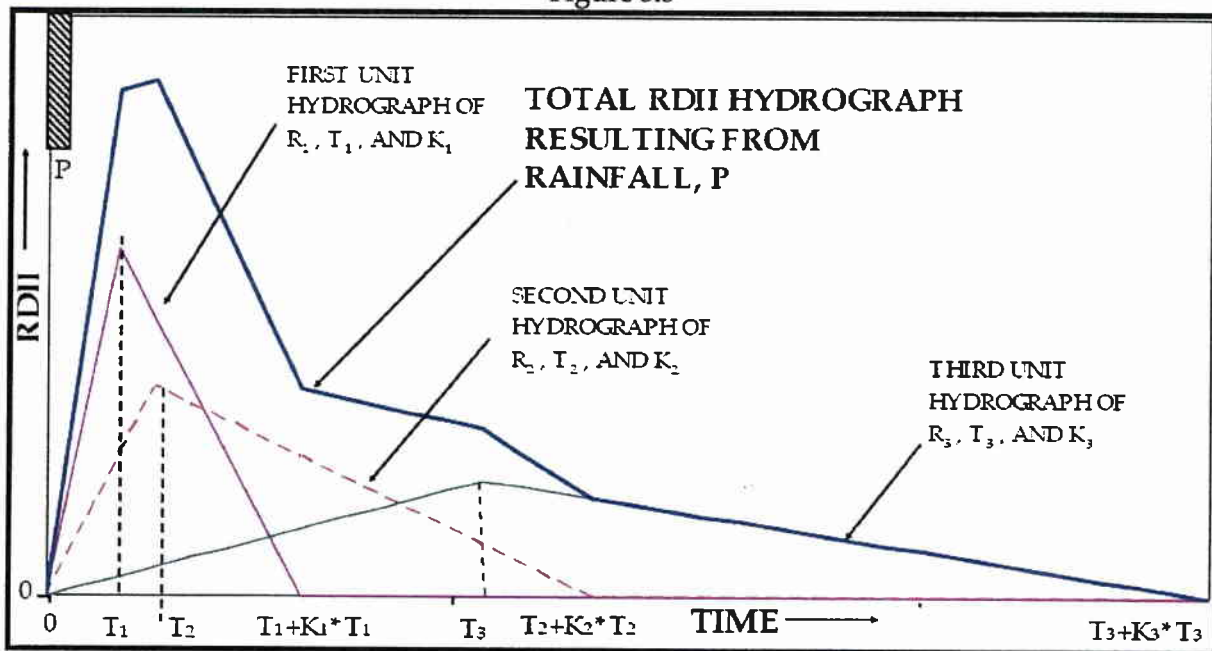
Figure 5.2



Wet weather flows were simulated using InfoSWMM by utilizing the RTK unit hydrograph method. Figure 5.3 illustrates how SWMM generates three unit hydrographs based on the RTK parameters for a given unit rainfall input. It also demonstrates that the total RDII unit hydrograph is the summation of three individual unit hydrographs. The three unit hydrographs can be related with fast (first unit hydrograph), medium (second unit hydrograph), and slow (third unit hydrograph) RDII responses typically observed in the sanitary sewer system. In some cases, only one or two unit hydrographs are required to adequately define observed RDII hydrographs.

Summation of Three Unit Hydrographs

Figure 5.3



The following general guidelines should be followed in selecting the RTK parameters to ensure that the calculated RDII hydrograph meets the goal of visual curve fittings:

- Total R value = $R_1 + R_2 + R_3$, if all three unit hydrographs used.
- The T and K parameters should be similar for rainfall events for a given sewershed tributary to the flow monitor since they depend on the geometry and sewer system layout.
- In all cases, $T_1 < T_2 < T_3$.
- In most cases, $K_1 < K_2 < K_3$.
- The necessity to change T and K significantly for a particular event to match the observed flows is often a sign that the rainfall data being used is not representative of the rainfall that fell over the basin for the event or the system experienced operational challenges resulting in an altered shape of the hydrograph.

- The event specific R-values will vary, generally being higher for wet antecedent moisture conditions and lower for dryer antecedent conditions. Similarly, R-values will typically be higher in a wet season.
- T and K for the three triangular unit hydrograph should generally be within the ranges shown in Table 5.1.

Ranges of Values for Unit Hydrograph Parameters

Table 5.1

Curve	T (Hours)	K
1	0.5 – 2	1 – 2
2	3 – 5	2 – 3
3	5 – 10	3 – 7

5.1.2 Model Hydraulics

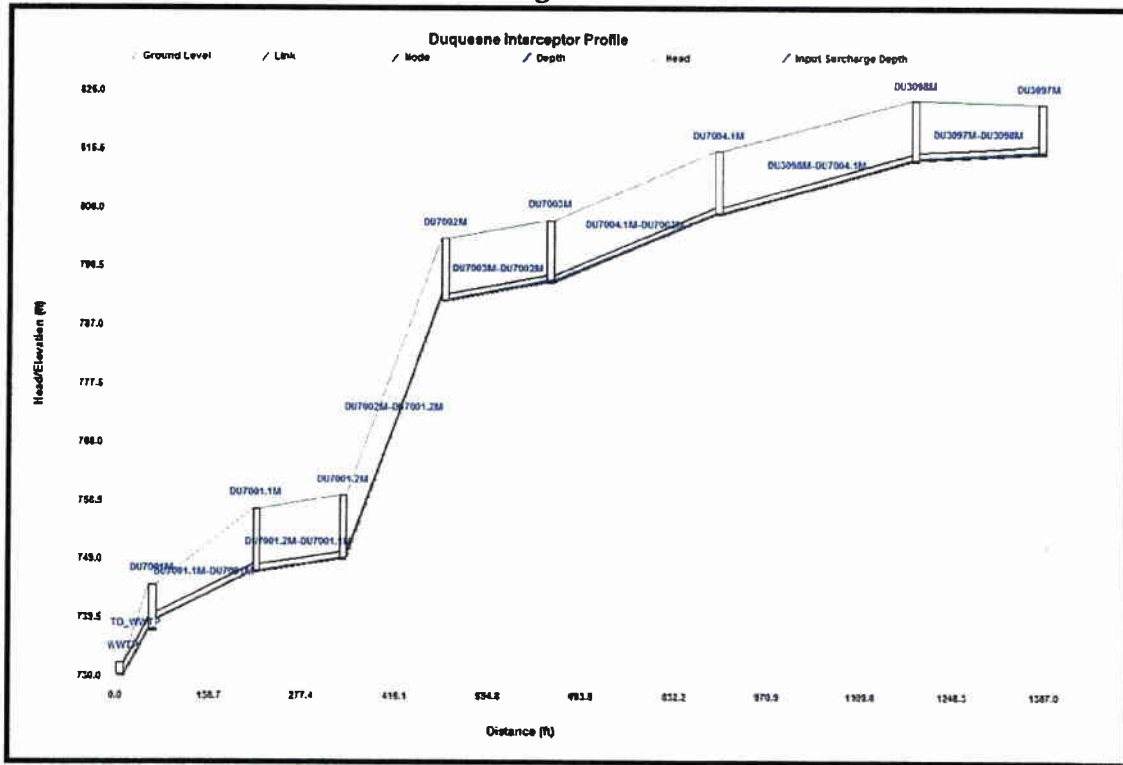
Flows in the collection system, which include dry-weather flows and the wet-weather flows, are routed through the hydraulic configuration of the model. The hydraulic configuration of a model is the representation of the various hydraulic elements of the system, which can broadly be classified as nodes and links. Nodes in the model are the manholes, diversion chambers, wet well, and outfalls, while the links are the conduits, orifices, diversion weirs, and pumps connecting the nodes.

The purpose of a diversion chamber is to intercept and convey all of the dry-weather flow, and a regulated fraction of wet-weather flow, to the wastewater treatment plant. The diverted dry- and wet-weather flow is conveyed by a connector pipe to the interceptor, while wet-weather flows in excess of the design capacity of the regulator are diverted through a diversion weir or overflow pipe to a receiving stream. Wet wells are drainage system nodes that provide storage volume. Physically they could represent storage facilities as small as a catch-basin or as large as a lake. The volumetric properties of a storage unit are described by a function or table of surface area versus height. Outfalls are terminal nodes of the drainage system used to define final downstream boundaries under Dynamic Wave flow routing or discharge overflow to the receiving stream.

An orifice diversion structure is a modification of the dam structure consisting of a fixed plate or gate. At the entrance to the connector pipe, the gate or plate is designed to place additional hydraulic restrictions beyond that of the connector pipe on flow diverted to the interceptor. Usually the incoming municipal pipe and the overflow pipe are the same size while the connector pipe to the interceptor is smaller. As higher flows increase the hydraulic grade line (HGL) or water level in the structure, wet-weather overflow in excess of the engineered conveyance capacity of the regulator device and connector pipe is diverted through an outfall pipe to a receiving stream. Pumps are links used to lift water to higher elevations. A pump curve describes the relation between a pump's flow rate and conditions at its inlet and outlet nodes.

An example profile of the interceptor is shown in Figure 5.4.

Interceptor Profile between Manhole DU3097M and Outfall WWTP-OF
Figure 5.4



Hydraulic routing of dry and wet weather flows was accomplished utilizing dynamic wave. Dynamic wave is the full solution of the Saint-Venant Equations, which describe one-dimensional unsteady flow through conservation of mass and momentum. The dynamic wave method is capable of estimating hydraulic parameters for free-flow, open channel with backwater effects, surcharged, full pipe, and reverse flow conditions. Although analysis utilizing this method is complex and time consuming, it is well suited to CSS which are subject to a variety of hydraulic conditions.

5.2 MODEL DEVELOPMENT

The major characteristics of interceptors in the model, which include conduit length, size, manhole invert, manhole depth, were developed using KLH survey data. Unlike sub-catchment hydrological parameters, the major characteristics of interceptors were deemed fixed and were not adjusted during model validation process, unless reliable investigation showed that there was an update for the manhole or conduit.

Additionally, field data collected by DE were used. Data collected by DE are manhole inspection with site photographs, precipitation data, and flow monitoring data.

Totally, the model contains eight (8) sub-catchments, 61 manhole structures, 66 conduits, five (5) outfall structures, and three (3) orifices. Appendix E shows the schematics of the Duquesne model. Appendix F shows the model components details in text format.

5.3 VALIDATION

Model validation is the process of adjusting both hydrologic (flow development) and hydraulic (flow routing) variables to best match actual measured flow data. The result is a hydrologic and hydraulic model of an existing collection system that best represents dry weather conditions and the flow responses to wet weather conditions and hydraulic grade lines (HGL) within the sewer system. A properly validated hydrologic and hydraulic model provides a valuable tool for many types of analyses including simple capacity analyses and CSO alternatives evaluation.

The Duquesne model will be used as a predictive tool to characterize the sewage collection system under existing and future conditions. Therefore, it is imperative that the model accurately represents wastewater flows in the collection systems. To calibrate the Duquesne model, extensive basin-wide flow monitoring was conducted to collect the required data. This data, once subjected to quality assurance procedures, was compared to the modeled response at the monitored locations. The model input parameters were then subject to validation to facilitate a closer correlation between the observed data and the simulated response.

5.3.1 Validation Criteria

The accuracy of the developed model during wet-weather events is essential when recommending appropriate wet-weather control facilities. To make sure that the model accurately represents the best available information, rigorous wet-weather validation criteria were applied to the Duquesne model using a large quantity of quality-assured monitoring data.

Hydrologic validation was conducted for all of the monitored sites to properly simulate the wet-weather response from the monitored sewershed. Hydrologic validation of a monitored sewershed was based on the maximum number of successfully monitored wet-weather events. The number of events used for validation depends on the monitoring period and flow monitoring quality.

Using time series plots, graphical comparisons were made of peak flow and volume for each wet-weather event occurring during the validation period. Statistical comparison plots were developed to illustrate the goodness-of-fit between the modeled response and the monitored data. For a large number of storm events monitored locations, the simulated storm volumes and peak flows vs. the corresponding monitored volumes and peak flows were plotted. Regression plots were also generated to make statistical comparisons of the simulated flows and the monitored flows. The statistics include a regression trendline of model results compared to the metering results, a calculation of the slope and intercept of the trendline. An R-square value calculation is performed to provide a measure of the model's accuracy to predict flow monitoring results. Storm events with missing, incomplete and/or errant flow monitoring data,

unreasonable responses in either the simulated flows or monitored flows or inaccurate or unreasonable precipitation data were identified and deemed “outliers.” These outlier storm events were deleted for the regression analysis, so they did not affect the results of the regression analysis. The iterative process of optimizing the runoff and RDII parameters was continued until the validation objectives were achieved.

While using any monitored flow data to validate a hydraulic model, the variability of the monitored data needs to be considered. This is to say that even under optimal conditions within a monitoring manhole, the accuracy of monitored data is typically +/-10 percent, and the variability can be higher in a hydraulically challenged site such as high velocities, surface turbulence and varying backwater interferences. Depending on the hydraulic conditions present at a monitoring site, there can be ample variation in the performance of a monitoring site in terms of flow monitoring data collected during dry- and wet-weather flow from that site. This variability was accounted for when using the observed flow monitoring data during the hydrologic validation of the sites.

The purpose of the validation process for monitored combined sewersheds is to determine the runoff parameters to achieve the following primary goals of model validation:

- On the statistical regression plots, a regression line with slope close to one (1) indicates that the modeled storm event volumes and peak flow rates are consistent with the monitored volumes and peak flow rates.
- On the statistical regression plots, an intercept of the regression line close to zero (0) indicates that the modeled event volumes and peak flow rates were not biased (i.e., consistently over-simulating or under-simulating) with respect to the monitored volumes and peak flow rates.
- On the statistical regression plots, an R-square value of the regression line close to one (1) indicates that the degree of scatter in the data points in the regression plot is low.
- On the time series plots, matching as closely as possible the ratio of the time to peak, shape and magnitude for the monitored and simulated events.

For small number of storm events monitored locations, the statistical method may not generate stable regression plots. In these cases, model validation was evaluated for individual storms and overall storms. The validation criteria are the percentage of model peak higher than meter peak (P_{per}) and the percentage of model volume higher than meter volume (V_{per}). These criteria were used in conjunction when determining whether or not a particular portion of the system was adequately validated. The iterative process of optimizing the runoff parameters was continued until the validation objectives were achieved. The definition of P_{per} and V_{per} were shown in Equation 2 and Equation 3.

$$P_{per} = \frac{P_o - P_m}{P_o} \times 100\% \quad \text{Equation 2}$$

$$V_{per} = \frac{V_o - V_m}{V_o} \times 100\% \quad \text{Equation 3}$$

where:

P_o = Observed (meter) hydrograph peak;

P_m = Modeled hydrograph peak;

V_o = Observed (meter) hydrograph total volume;

V_m = Modeled hydrograph total volume;

The purpose of the validation process for monitored combined and separate sub-catchments is to determine the runoff parameters to achieve the primary goals of model validation. Generally speaking, peaks and volumes within 15 percent are considered to be well validated.

It is important to emphasize that with the large number of storms used to validate the model, data scatter is expected and acceptable in the regression plots, especially for simulated vs. monitored storm peak flow rates. Because of the large number of storm events considered in the analyses, a higher degree of scatter in the data points (with a corresponding lower R-square value) needs to be allowed, as long as there is no overall bias demonstrated in these plots. With the long-term continuous simulation modeling approach, simulation of individual storms is not significant when compared with the accuracy of the overall model simulation over the course of the total model duration. The criterion is to make sure that there is no overall bias in the simulations, and that over-simulation and under-simulation of individual storms balance out over the course of the long-term simulation.

5.3.2 Model Validation QA/QC Procedures

QA/QC procedures were utilized during both the hydrologic and hydraulic validation processes to verify that the model yields meaningful, accurate, and reliable results consistent with the modeling goals and objectives. The following general QA/QC procedures were performed during the model validation processes:

- Checked for warnings and error messages in the model output file and resolved all major warnings and errors.
- Checked the model's run report for inconsistencies and/or unexpected results.
- Checked the model's overall continuity error and resolved items resulting in an overall continuity error greater than 2%.

- Checked individual continuity errors and resolved items resulting in individual continuity errors greater than 5%.
- Checked model stability using the following methods:
 - Visually checked the dynamic performance of the hydraulic grade line along profile views of sewers.
 - Visually checked the output hydrographs at key hydraulic locations across the simulated area.
 - Checked for dry pipes under both dry weather and wet weather flow conditions and resolved any improperly loaded conditions.
 - Checked the performance of system appurtenances such as pumps, weirs, orifices, and storage elements and verified that they are performing as expected.
 - Checked manholes where flows are lost from the system and verified that these losses are as expected.

5.3.3 Model Validation

For the validation process, all of the wet weather events where data were available were initially utilized at each monitoring location. During the QA/QC process, certain events were noted to have various data problems, including uncharacteristic responses, and these events were generally defined as outliers. Table 5.2 shows the kept events number, outlier events number and the total events number for each site.

Number of Kept, Outlier, and Total Events by Site

Table 5.2

	Kept	Outlier	Total
M-1	7	0	7
M-3	7	0	7
M-5A8	7	0	7
M-5A18	7	0	7
M-6A	7	0	7
M-8	7	0	7
M-10	7	0	7
M-11	7	0	7

Figure 5.5 and Figure 5.6 present the overall validation results for all the monitoring sites in the Duquesne system for event volume and event peak flow, respectively. The plots show all of the validation events and a trend line for the validation events. The data used to generate these figures is derived from the individual modeling and monitoring site.

Figure 5.5 shows the regression plot between the simulated event volume and monitored event volume for all the monitored sites in the Duquesne system. As the plot shows, the slope of the regression line is 0.9469, which suggests that there is good correlation between the simulated and monitored event volumes. The small value of 0.0189 for the intercept suggests that there is no relative bias in the simulation of the event volumes. The R-squared value of the regression plots is 0.9098 suggesting that there is a very small scatter in the data points around the regression. The source of the scatter is attributed to non-uniform hydrologic responses in the collection system and inaccuracies in flow monitoring and rainfall data collection.

Event Volume Regression Plot for All Sites in the Duquesne System

Figure 5.5

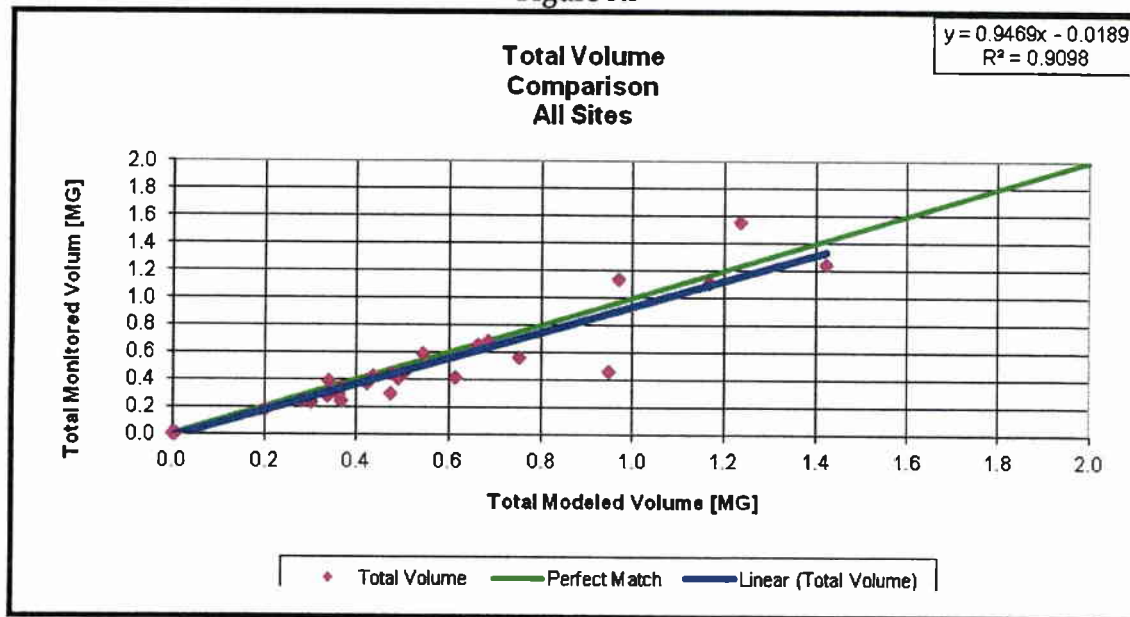
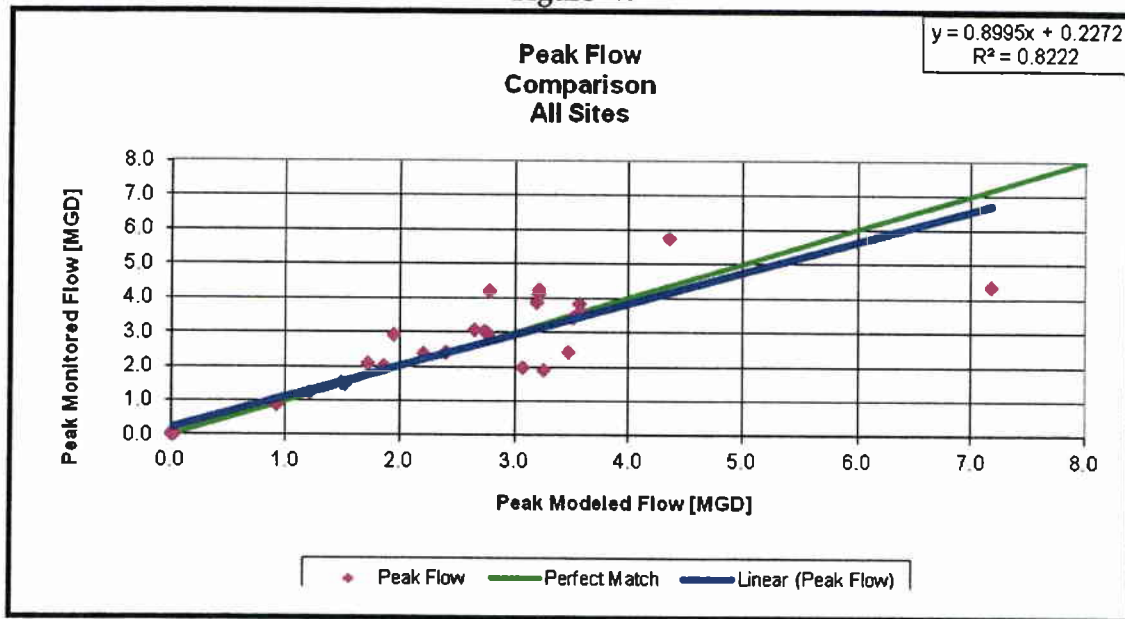


Figure 5.6 shows the regression plot between the simulated event peak flow and monitored peak flow for all the monitored locations in the Duquesne system. As the plot shows, the slope of the regression lines is 0.8995, which suggests that there is good correlation between the simulated and monitored event peak flows. The small value of 0.2272 for the intercept suggests that there is no relative bias in the simulation of the event peak flows. The R-squared value of the peak flow regression plot is 0.8222 suggesting that there is a small scatter in the data points. The source of the scatter is attributed to non-uniform hydrologic responses in the collection system and inaccuracies in flow monitoring and rainfall data collection.

Event Peak Regression Plot for All Sites in the Duquesne System

Figure 5.6



To illustrate modeling details, Appendix G shows the modeled and monitored volumes and peaks for each site and each event, as well as the monitored and modeled hydrographs. Appendix H shows the regression plots for each site. Because some sites have a small number of monitoring events, the statistical method may not generate stable regression plots. This does not mean the validation is poor, as long as the total volume and peak differences are in reasonable range.

Overall, the model is considered to be well validated and suitable for evaluating the system performance in various rain events.

5.4 HISTORICAL RAINFALL ANALYSIS

As previously stated, the "presumption" approach evaluates overflows on an annual average basis.

"The elimination or capture for treatment of no less than 85% by volume of combined sewage collected in the CSS during precipitation events on a system-wide annual average basis."

The ALCOSAN typical year 15-minute interval rainfall data was used for this analysis. This data was used because it is readily available to KLH and it is representative of the annual average conditions for the City of Duquesne. This data is included in Appendix I.

5.5 LONG-TERM CONTINUOUS SIMULATION RESULTS

In order to determine whether or not the Duquesne CSS can capture for treatment 85 percent of flow volume resulting from rain events, on an annual average basis, a year-long continuous model simulation was completed using the increased ALCOSAN Pixel Eight typical year rainfall.

Equation 4 was utilized for percent capture evaluation.

$$\% \text{ Capture} = [V_{\text{WWTP}} / (V_{\text{WWTP}} + V_{\text{CSO}})] \times 100\% \quad \text{Equation 4}$$

Where

V_{WWTP} - Total volume of CSS flow conveyed to the WWTP during wet weather,
 V_{CSO} = Total volume of overflow from the CSO's,

These volumes were determined based on the one year simulation.

$V_{\text{WWTP}} = 233.76 \text{ MG}$

$V_{\text{CSO}} = 28.97 \text{ MG}$

$\% \text{ Capture} = [233.76 / (233.76 + 28.97)] \times 100\% = 88.97\%$

Based on the continuous simulation modeling, the Duquesne CSS, on a system-wide annual average basis, does not meet the "presumption" approach criteria ii, after completion of the WWTP improvements described in the following sections. Maintaining a free discharge boundary condition at the proposed WWTP influent pump station, in addition to the proposed relief sewers, will allow for the "presumption" approach to be met. The SWMM model report is included in Appendix J.

6.0 EXISTING FACILITY

6.1 EXISTING NPDES PERMIT REQUIREMENTS

The existing WWTP provides screening, grit removal, contact stabilization, secondary treatment and disinfection prior to discharging treated effluent to Monongahela River. The operation and discharge is regulated under the terms of the current NPDES Permit Number PA0026981. The permit limits are listed in Table 6.1. The WWTP design flow is 2.0 MGD.

Existing Effluent Limits

Table 6.1

PARAMETER	LOADING (lbs)			CONCENTRATION (mg/L)				
	Average Monthly	Average Weekly	Units	Average Monthly	Average Weekly	Instant. Maximum	Units	
Flow	-	-	-	Monitor and Report				-
CBOD-5 Day	417	626	lb/day	25	37.5	50	mg/L	
Suspended Solids	500	751	lb/day	30	45	60	mg/L	
Total Residual Chlorine				1.0		3.3	mg/L	
Fecal Coliform								
May 1 to Sept 30				200			/ 100ml	
Oct. 1 to April 30				2,000			/ 100ml	
pH	Within Limits of 6.0 to 9.0 Standard Units At All Times.							

6.2 EXISTING HYDRAULIC LOADINGS

6.2.1 Average Flows

The facility has an average daily design capacity of 2.0 MGD. Analysis of flow data from the past five (5) years shows that monthly average flow has not exceeded 2.0 MGD for three (3) consecutive months, and therefore, the WWTP is technically not hydraulically overloaded. The monthly average flows have not exceeded 2.0 MGD over the past five (5) years. The maximum monthly average flow observed over the past five (5) years is 1.412 MGD.

Analysis of flow data from the past five (5) years shows that the annual average flow for the WWTP is 0.863 MGD. Table 6.2 summarizes average flows for the five (5) years.

Existing Hydraulic Loadings

Table 6.2

Year	Max. Mo. Ave. Flow (MGD)	Annual Ave. Flow (MGD)
2009	0.981	0.66
2010	1.080	0.90
2011	1.199	0.84
2012	1.280	0.94
2013	1.412	0.97

6.2.2 Peak Flows

The capacity of the CSS limits the flows that are received at the WWTP. Peak hourly flow should be limited to 2.77 MGD based on final clarifier surface overflow rate. Given the available footprint at the WWTP site, there is no space available for additional clarifiers.

6.3 EXISTING MASS LOADINGS

6.3.1 Historical Loadings

WWTP raw sewage organic loading data was evaluated for the past five (5) years. Organic loadings are summarized in Table 6.3 below.

Existing Influent Organic Loadings

Table 6.3

Year	Max. Month (lb. BOD/day)	Annual Ave. (lb. BOD/day)
2009	701	538
2010	1,241	620
2011	933	487
2012	806	592
2013	493	351

The WWTP's current rated organic capacity is 2,780 lb/day. Given the 5-year annual average BOD loading of 518 lb/day and the 5-year annual average flow of 0.863 MGD, the average BOD concentration is 72 mg/L. The City's wastewater would be classified as low strength which is not uncommon for old CSS's.

6.4 EXISTING PROCESS

A process flow diagram for the existing WWTP is included in Appendix K of this report. A site plan for the existing WWTP is included in Appendix L. Calculations associated with the existing processes are included in Appendix M.

6.4.1 Preliminary Treatment

Flow enters the WWTP through a parshall flume, which continuously records flow using an ultrasonic flow meter and seven-day chart recorder. Flow is then conveyed through a mechanically cleaned bar screen, or during times of maintenance, a manually cleaned bar screen.

Influent Channel
Photograph 6.1



6.4.2 Grit Removal

Wastewater flows via open channel from the parshall flume through an aerated grit chamber utilizing a mechanical grit removal system. The grit basin's peak capacity is 5.48 MGD based on a 3 minute minimum detention time. It is noted that the square configuration of this basin is not conducive to plug flow. Plug flow is desirable in an aerated grit basin in order to reduce potential for basin short-circuiting.

Grit Removal System

Photograph 6.2



6.4.3 Secondary Treatment

The Duquesne WWTP has four (4) aeration basins. Two (2) serve as contact tanks and two (2) are utilized as stabilization basins. Each basin is approximately 21-feet wide by 24-feet long, with an average flow water surface depth of 13.50-feet.

Aeration Basins

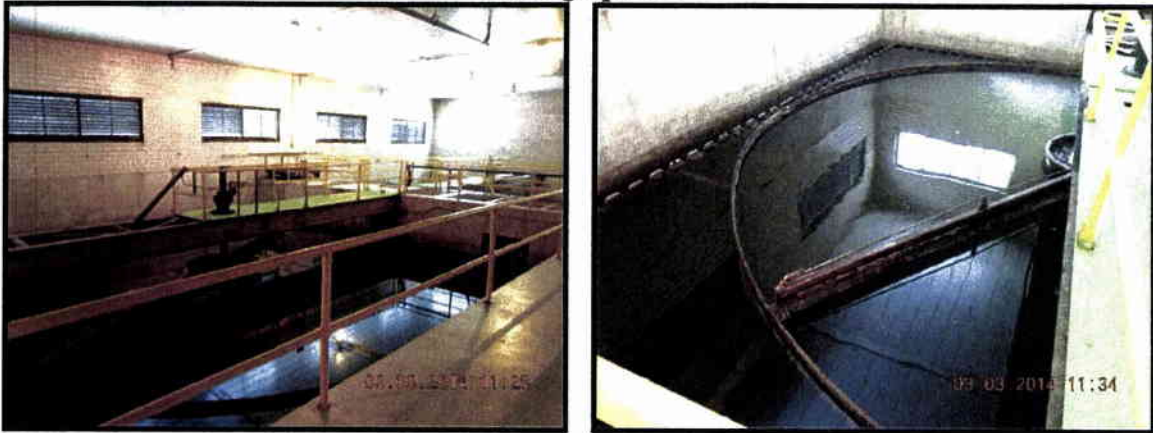
Photograph 6.3



Aeration basin effluent flows by gravity to two (2) square final settling tanks, each 34-feet x 34-feet. The settling tanks have a maximum monthly average flow capacity of 1.85 MGD based on surface overflow rate, and a peak hour flow capacity of 2.77 MGD, also based on surface overflow rate.

Final Clarifiers

Photograph 6.4



6.4.4 Disinfection

Final settling tank effluent flows by gravity into one (1) chlorine contact tank. The tank is 56-feet long by 31-feet wide with an average flow water depth of 9-feet. It is constructed with dividing walls, providing a serpentine pattern, totaling 190-linear feet of channels and 1,380 square feet of surface area. The maximum monthly average flow capacity is 3.02 MGD and the peak hour flow capacity is 6.88 MGD, both limited by total detention time.

Chlorine Contact Tank

Photograph 6.5

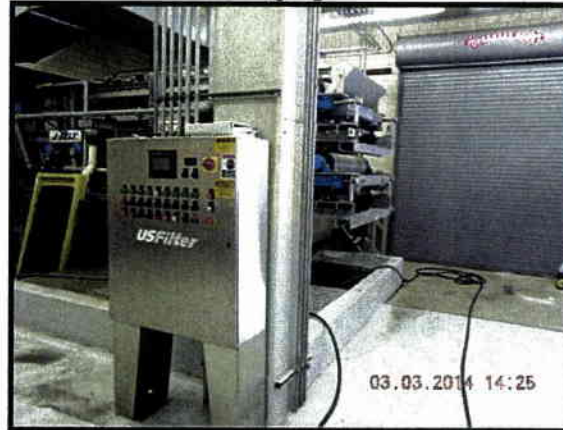


6.4.5 Solids Handling

At the Duquesne WWTP, return activated sludge is removed from the bottom of the final clarifiers and is transferred to the stabilization tanks by an air lift line. Waste activated sludge is then removed from the stabilization tanks and pumped to the aerobic digesters.

Adjacent to the contact stabilization tanks, the WWTP contains four (4) aerobic digesters in series and two (2) sludge thickening tanks. Each aerobic digester is approximately 21-foot wide by 26-feet long, with a total four (4) tank capacity of 282,422 gallons. Each sludge thickening tank is 20-feet in diameter, providing a total two (2) tank capacity of 45,823 gallons. Thickened sludge is then conveyed to a 1.0-m belt filter press.

Belt Filter Press
Photograph 6.6



7.0 TREATMENT PLANT UPGRADES

7.1 DESIGN HYDRAULIC LOADINGS

In order to meet the EPA CSO Control Policy, “presumption” approach as well as DEP design standards, three criteria were evaluated:

1. Percent capture – at least 85% of CSS volume (resulting from rain events), on an annual average basis, must be captured and conveyed to the WWTP for full biological treatment.
2. Design rain event – application of a design rain event is critical to ensure that upgrades completed to address percent capture will not result in manhole overflows.

Including the conveyance system upgrades previously outlined in this report, H&H modeling resulted in the 88.97% capture, which was described in the Flow Monitoring and System Modeling section of this report. Application of the typical year rainfall to the sewer system results in a modeled peak flow at the WWTP of 14.57 MGD. Design flows are summarized in Table 7.1 below.

Design Hydraulic Loadings
Table 7.1

Design Flow	WWTP (MGD)
Peak Instantaneous	14.57
Peak Hourly	12.60
Peak Daily	6.97
Max Monthly Ave	2.00
Annual Average	1.00

All design flows were based on 30-year population projection. No significant growth is anticipated within the City over the next 30 years. Consistent with past Chapter 94 reports, 2 EDUs/year over the next 30 years was included. Development of each design flow is further described below.

7.1.1 Peak Instantaneous Flow (PIF)

As discussed above, PIF is governed by the design rain event. The design hydrograph resulting from the SWMM modeling is shown in Figure 7.1 below.