PENNSYLVANIA AMERICAN WATER

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VIA eFiling

August 10, 2023

Rosemary Chiavetta, Secretary
Commonwealth of Pennsylvania
Pennsylvania Public Utility Commission
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120

In re: **Application of Pennsylvania-American Water Company under Sections 1102(a) and 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. §§ 1102(a) and 1329, for approval of (1) the transfer, by sale, to Pennsylvania-American Water Company, of substantially all of the assets, properties and rights related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority, and (2) the rights of Pennsylvania-American Water Company to begin to offer or furnish wastewater service to the public in the Township of Towamencin and portions of the Townships of Franconia, Lower Salford and Worcester and the Borough of Lansdale, all in Montgomery County, Pennsylvania**

Docket No: A-2023-3039900

Pennsylvania-American Water Company Responses to the Bureau of Technical Utility Services Deficiencies Set 2 – July 27, 2023

Dear Secretary Chiavetta:

Enclosed for filing with the Commission are Responses to Set 2 of Pennsylvania-American Water Company (the "Company") to the **66 Pa. C.S. Section 1329 Application Completeness Review Pennsylvania-American Water Company – Wastewater Division Acquisition of Township of Towamencin Wastewater System Assets at Docket No. A-2023-3039900**.

Copies are being served upon the advocates in accordance with the attached Certificate of Service and in accordance with the Commission's Final Supplemental Implementation Order entered February 28, 2019 at Docket No. M-2016-2543193.

With this filing, the Company believes its Application is complete and hopes the Commission will conditionally accept its Application. In addition, the Company respectfully requests that the Secretarial Letter conditionally accepting the Application for filing provide a due date for protests and notices of intervention, which is required on the form of notice approved by the Commission in *Application of Pennsylvania-American Water Company Pursuant to Sections 1102 and 1329 of the Public Utility Code for Approval of its Acquisition of the Water System Assets of the Steelton Borough Authority,* Docket No. A-2019-3006880 (Opinion and Order entered Oct. 3, 2019) and found at Application Appendix A-18-d.

Thank you for your attention to this matter. If you have any questions, please do not hesitate to contact me.

Sincerely,

Teresa K. Harrold

Enclosures

cc: Certificate of Service
Sean Donnelly, Bureau of Technical Utility Services

26. Checklist Item No. 12 – Application Completeness Review No. 1 requested that PAWC-WD amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition, including provisions to allow for the continued use of Deduct Meters for customers whose bills are determined based on water usage. PAWC-WD's response indicated that additional changes to the pro forma tariff to permit the continued use of deduct meters are unnecessary because the pro forma tariff includes the language, "Based on Water Usage or Sewage Flows, determined at PAWC's discretion." However, Section 53.25 of the Pennsylvania Code, 52 Pa. Code § 53.25, indicates, "A utility shall set forth all rules and regulations which apply generally to all classes of service covered by the tariff, and definitions of technical terms and abbreviations used in the tariff, the meanings of which are not common knowledge and cannot be gathered exactly from the context in which used." The option to use a deduct meter cannot exactly be gathered from the proposed language identified and the language included in Section 127-35 of Towamencin's rates, rules, and regulations does not leave the option to install Deduct Meters to the Towamencin's discretion. Please amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition, including provisions to allow for the continued use of Deduct Meters for customers whose bills are determined based on water usage.

Response: Rules and regulations around metering are not "rates." No customers in Towamencin utilize deduct meters and thus there will be no "continued use of Deduct Meters" upon acquisition. The proposed tariff contains Towamencin's existing rates, as required by Section 1329.

27. Checklist Items Nos. 12 and 18.a. – Application Completeness Review No. 4 requested that PAWC-WD amend either the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts for Clemens Food Group's rate, as identified in the pro forma tariff, or the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition that does not contain the noted special rate. PAWC-WD's response included a copy of a confidential agreement (September 1988 Amended Agreement) executed on September 22, 1988, between Towamencin Township, Upper Gwynedd-Towamencin Municipal Authority, and Clemens Food Group's predecessor, as amended. Additionally, the Amended Appendix A-18-a.4 included a copy of confidential agreement (October 2015 Agreement) executed on October 27, 2015, between Towamencin Township, Towamencin Municipal Authority and Clemens Food Group. Neither the September 1988 Amended Agreement nor the October 2015 Agreement identified a special rate charge for Clemens Food Group of $0.7409 per 100 gallons. PAWC-WD's response to Application Completeness Review Item No. 3 included a revised pro forma tariff (Amended Pro Forma Tariff) in the Amended Appendix A-12. If the Amended Pro Forma Tariff is equal to the seller's rate for Clemens Food Group at the time of acquisition, amend the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts for Clemens Food Group's rate. Otherwise, amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition that does not contain the noted special rate.

Response: After discussion with Towamencin regarding this question, Towamencin discovered a billing error related to its bills to Clemens Food Group. Prior to the execution of the October 2015 Agreement, the usage charge rate charged to Clemens was a blended rate of 2/3 Towamencin's EDU rate and 1/3 Upper Gwynedd's EDU rate (see Schedule A of the 2010 Agreement between Towamencin and Hatfield Quality Meats, which is marked as **Second Amended Appendix A-18-a.4 CONFIDENTIAL**). The October 2015 Agreement changed the usage rate language to the following:

"Usage charges shall be approximately equal to the annual sewer rental fees charged by Towamencin Township to similar commercial/industrial customers, currently equal to the residential customer charges. The current formula for sewer usage charge is as follows:

2015 Usage Charge per gallon= $0.00511/gallon of metered discharge

Towamencin Township shall have the right on an annual basis to revise this Usage Charge to be consistent with the other industrial and residential rates set within the Township."

The Township did not change its EDU rate for commercial/industrial customers between 2015 and 2022, which meant it charged a usage charge during this period consistent with Schedule A of the October 2015 Agreement ($0.00511/gallon of metered usage) (**See Second Amended Appendix A-18-a.4 CONFIDENTIAL**).

After Towamencin's EDU rate increase starting in 2022, the usage rate charged to Clemens was approximately 6% less than Township's EDU Rate, which the Township just discovered. Specifically, Clemens was charged $0.00580/gallon when the correct charge under the October 2015 Agreement should have been $0.00616/gallon, which represents the current commercial/industrial $450 EDU rate converted to a gallon consumption charge.

As a result of discovering this billing error, the Township will immediately adjust the next quarterly Clemens bill and is evaluating methods of potential recoupment of the recently underbilled invoices.

Accordingly, PAWC's Pro Forma Tariff marked as **Third Amended Appendix A-12** has been revised to eliminate the special rate charge for Clemens.

28. Checklist Item No. 12 – Application Completeness Review No. 6 requested that PAWC-WD amend the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition including the Typical Domestic Pollutant Concentrations for each existing permit or agreement. PAWC-WD's response identified certain Typical Domestic Pollutant Concentrations, except for copper and zinc. However, PAWC-WD also provided an invoice in confidential Attachment 14-A, which identified on Page 5, a Typical Domestic Pollutant Concentration of 20 mg/l NH3-N to determine a customer's strength surcharge for a customer. This daily maximum limit of 20 mg/l NH3-N does not match the Typical Domestic Pollutant Concentration of 18 mg/l NH3-N identified in the Amended Pro Forma Tariff, provided as the Application's Amended Appendix A-12. Please provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition including Typical Domestic Pollutant Concentrations for each existing permit or agreement that defines different Typical Domestic Pollutant Concentrations.

Response: After discussion with Towamencin, PAWC confirmed that Towamencin's invoice including a daily maximum limit of 20 mg/l NH3-N was a billing error. Towamencin confirmed that 18 mg/l NH3-N is the correct typical domestic pollutant concentration consistent with its Section 127-63(B) of Towamencin's ordinance (**see Appendix A-18-b**). Accordingly, no changes to PAWC's Pro Forma Tariff are required because it includes the correct typical domestic pollutant concentration amount of 18 mg/l NH3-N.

29. Checklist Item No. 12 – Application Completeness Review No. 8 requested that PAWC-WD amend the Application's Appendix A-12 to provide a proposed tariff supplement containing a rate equal to the existing rates of the seller at the time of acquisition including Typical Domestic Pollutant Concentration values that match Towamencin's existing pollutant concentration and "surcharge limit" values identified in Towamencin's Rates, Sections 127- 63. B. and C. PAWC-WD's response did not include Typical Domestic Pollutant Concentration values for copper and zinc. Additionally, the Amended Pro Forma Tariff indicated the Typical Domestic Pollutant Concentration values for copper and zinc are based on the mass limit in the industrial waste discharge permit. Please provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition, including Typical Domestic Pollutant Concentrations for copper and zinc for each existing permit or an agreement that define values for copper and zinc that differ from standard Typical Domestic Pollutant Concentrations.

Response: The customers' industrial waste discharge permits define the values for copper and zinc. All permits are attached hereto and marked as **Attachment 29-A CONFIDENTIAL**.

30. Checklist Item Nos. 12 and 18.a. – Application Completeness Review Item No. 9 requested that PAWC-WD amend either the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts to modify rates to begin billing customers identified in SDR Item No. 6 prior to closing, or the Application's Appendix A-12 to provide a proposed tariff or tariff supplement containing a rate equal to the existing rates of the seller at the time of acquisition. PAWC-WD's response did not include an amendment to either appendix, as applicable. Please amend either the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts to modify rates to begin billing customers identified in SDR Item No. 6 prior to closing, or the Application's Appendix A-12 to provide a proposed tariff containing a rate equal to the existing rates of the seller at the time of acquisition.

Response: After discussion with Towamencin, Towamencin determined that because there is no ordinance in place allowing for free service to the service locations identified in SDR Item No. 6, Towamencin will begin billing each of those service locations for wastewater service between now and closing. Accordingly, no change to PAWC's Pro Forma Tariff related to these service locations is required.

31. Checklist Item No. 12 – Application Completeness Review Item No. 13 requested that PAWC-WD amend the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing the clean water discount rate. PAWC-WD's response indicated the October 2015 Agreement was the agreement that established the clean water discount rate. However, the Pro Forma Tariff does not include a clean water discount rate formula that matches the clean water discount rate formula under the October 2015 Agreement. Please amend the Application's Appendix A-12 to provide a proposed tariff or tariff supplement containing a rate equal to the existing rates of the seller at the time of acquisition, including either a clean water discount rate formula that matches the October 2015 Agreement or a similar provision indicating that the clean water discount rate shall be calculated in accordance with the clean water discount rate under the October 2015 Agreement filed with the Commission on July 18, 2023 at Docket A-2023-3039900.

Response: PAWC revised its Pro Forma Tariff marked as **Third Amended Appendix A-12** to clarify that "the clean water discount rate under the October 2015 Agreement filed with the Commission on July 18, 2023 at Docket A-2023-3039900."

32. Checklist Item No. 18.a. – Application Completeness Review Item No. 14 requested that PAWC-WD amend the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing strength surcharge rates. PAWC-WD's response did not include a responsive amendment to Appendix A-18-a. Please amend the Application's Appendix A-18-a to include copies of Towamencin's effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing Typical Domestic Pollutant Concentrations that are used to determine strength surcharges, including for copper and zinc.

Response: The permits that establish the typical domestic pollutant concentrations that are used to determine strength surcharges are attached hereto as **Attachment 29-A CONFIDENTIAL**.

33. Checklist Item No. 18.a. – Application Completeness Review Item No. 15 requested that PAWC-WD amend the Application's Appendix A-18-a to include copies of the effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing flow surcharge rates. PAWC-WD's response did not include a responsive amendment to Appendix A-18-a. Please provide copies of the effective ordinances, resolutions, tariffs, agreements, permits, and/or contracts establishing flow surcharge rates.

Response: The permits that establish the typical domestic pollutant concentrations that are used to determine flow surcharges are attached hereto as **Attachment 29-A CONFIDENTIAL.**

34. Checklist Item No. 22.a. – Application Completeness Review Item No. 19.a. requested PAWC-WD provide a copy of the DEP-approved 2017 Act 537 Plan that amended the Towamencin wastewater service area along with copies of the approval resolutions from the affected municipalities. PAWC-WD's response included copies of the Act 537 Sewage Facilities Plan – Special Study (2017 Upper Gwynedd Act 537 Special Study) dated October 2016 for Upper Gwynedd Township and letter from DEP to Upper Gwynedd Township dated September 13, 2017, approving the 2017 Upper Gwynedd Act 537 Special Study provided as the Application's Attachment 19-A. However, the 2017 Upper Gwynedd Act 537 Special Study appears to be missing appendices A, B, D, E, F, G, H, L, M, N, and P. Please provide a complete copy the 2017 Upper Gwynedd Act 537 Special Study with all referenced appendices.

Response: See **Amended Attachment 19-A**.

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PLAN SUMMARY

INTRODUCTION

Upper Gwynedd Township (UGT or The Township) is currently served by two wastewater treatment plants (WWTP). These are the UGT WWTP and the Towamencin Municipal Authority (TMA) WWTP. The TMA WWTP was formerly known as the Upper Gwynedd Towamencin Municipal Authority (UGTMA) WWTP. UGT owns and operates the UGT WWTP. TMA owns and operates the TMA WWTP.

UGT has a sanitary sewer collection system that serves the entire Township. A ridge line runs mostly north south through UGT and divides the Township into two service areas. The ridge line starts just north of where Church Road intersects with Hancock Road and extends south to a point just west of the intersection of Broad Street and Morris Road. The UGT WWTP serves the portion of UGT that is east of this ridge line. The TMA WWTP serves the portion of UGT west of the ridge line. Reference is made to the map attached in Appendix A.

The UGT WWTP service area has two main interceptor sewer lines that collect flow. These are the Southwest Interceptor and the East Interceptor. The Kriebel Road Interceptor serves the portion of the UGT service area that flows to the TMA WWTP. Once again, reference is made to the map in Appendix A.

A. SERVICE AREA ISSUES

UGT feels that it will better serve the needs of its residents and other customers by treating all flow from the Township at the UGT WWTP. This consolidation of flow will lead to more efficiency for UGT and is in the best interests of its residents.

B. CORRECTIVE ALTERNATIVES

UGT will physically divert a significant majority of flow in the Township that currently goes to the TMA (formerly Upper Gwynedd Towamencin Municipal Authority (UGTMA)) WWTP, to the UGT WWTP. This will require modifications to the UGT collection system and the UGT WWTP. These modifications are described in Section V.

As will be documented in this Act 537 Plan-Special Study (Special Study or Act 537 Plan), an Agreement was negotiated and finalized between UGT and Towamencin Township (TT) to divert UGT flow that currently goes to the TMA WWTP, to the UGT WWTP. In this Agreement, TT agreed to support UGT's efforts to divert flow. This Agreement was the document which provided for UGT to leave the UGTMA. The Agreement is attached in Appendix B.

C. COST OF IMPLEMENTING CORRECTIVE ACTION ALTERNATIVES

Over the next approximately four years, it is estimated that diverting UGT's flow will cost $27,000,000 and require approximately fifteen million dollars in financing (reference is made to Section VI). However, there is significant, long term benefit that will accrue to UGT to help pay for this project.

Very significant expenditures will be required in the future to maintain and upgrade the TMA WWTP and the Kriebel Road Interceptor, and also to meet anticipated future, stricter Pennsylvania Department of Environmental Protection (PADEP) discharge limits. UGT's share of these costs would be significant. An independent study authorized by both UGT and TT was performed by a nationally recognized engineering consulting firm, Hazen & Sawyer. Based on this study, the UGT share of the cost is $33,800,000. Instead of spending money at the TMA WWTP and on the Kriebel Road Interceptor, UGT will invest in its own collection system and WWTP to better serve its customers.

In addition, UGT received $7,100,000 as part of the legal agreement included in Appendix B which will help pay for the Flow Diversion project.

D. MUNICIPAL COMMITMENT

As stated above, UGT has finalized a legal agreement with TT to provide for the flow diversion project. UGT is fully committed to this project. UGT is making a commitment to adopt annual budgets and secure the funding necessary to successfully implement the project. UGT plans on a bond issue to help finance the project.

E. IMPLEMENTATION SCHEDULE

The project schedule is attached as Appendix C. This schedule includes all significant milestones and incorporates all regulatory and other outside entity approval.

F. AGENCY AND PUBLIC COMMENT DOCUMENTATION

UGT will make sure that all required public and agency comments are solicited. This includes a 30 day public comment period, comments from the Montgomery County Planning Commission and Health Department, and the UGT and TT Planning Commissions. Evidence of soliciting comments will be provided including Proof of Publication for the public comment period. UGT will address all comments and will include both the comments and responses to comments prior to submission to the PADEP. After addressing comments, UGT and TT will adopt resolutions prior to sending the completed Special Study to the PADEP for review and approval.

G. REFERENCE TO APPENDICES OF SUPPORTING DOCUMENTATION

The following required supporting documentation has been included in Appendices to this Report:

- Appendix D - Montgomery County Planning Commission and Health Department notification
- Appendix E - UGT and TT Planning Commissions notification
- Appendix F - Proof of Publication of Public Notice
- Appendix G – Agency and Public Comments and the municipal response to comments
- Appendix H - Original signed and sealed Resolutions by UGT and TT
- Appendix I – PADEP Act 537 Plan Content Checklist

Please note that the documentation for Appendix G and Appendix H will not be available until after the comment periods.

I. PREVIOUS WASTEWATER PLANNING

I.A SEWAGE FACILITIES PLANNING

In order to establish wastewater facility planning objectives and needs, a review of previously completed wastewater planning information is necessary. In addition, existing and proposed wastewater treatment planning and projected growth for the service area must be considered.

Previous wastewater planning for Upper Gwynedd Township has included previous Act 537 Plans, two Act 537 Plan Special Studies, various Sewage Facilities Planning Modules for individual development projects, annual Chapter 94 Wasteload Management Reports, and a Corrective Action Plan (CAP).

The most recent Act 537 document on record is the Act 537 Plan - Special Study done as part of UGT's CAP. This Special Study was published for public comment in June 2016 and was submitted to PADEP in August 2016 for review and approval.

This Act 537 Plan - Special Study focuses on the Flow Diversion project which will divert flow from UGT that currently goes to the TMA WWTP, to the UGT WWTP.

II. PHYSICAL DESCRIPTION OF PLANNING AREA

II. A PLANNING AREA

Sewage collection in Upper Gwynedd Township is delineated into two service areas. (Refer to Appendix A). The service area east of the ridge line flows to the UGT WWTP. Flow to the west of the ridge line flows to the TMA WWTP.

A significant majority of the flow that currently goes to the TMA WWTP is proposed to be diverted to the UGT WWTP. The service area east of the ridge line will continue to flow to the UGT WWTP. Flow from the service area west of the ridge line is proposed to be diverted to the UGT WWTP.

II.B WETLANDS AND 100 YEAR FLOOD PLAIN

The diversion of flow that currently goes to the TMA WWTP, to the UGT WWTP will require two pump stations and two force mains. This will be described in greater detail in Section V. The proposed pump stations and force main routes are shown in Appendix A and Appendix J.

II.B.1 WETLANDS

Construction of the force main in the area adjacent to Musket Drive and in areas between North Wales Road and the UGT WWTP is expected to temporarily disturb existing wetlands. When the design is being prepared, a formal wetlands delineation for all disturbed areas will be performed. Any construction activity disturbing wetlands will be

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

The pump stations will be constructed outside the 100 year flood plain. Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

III. EVALUATION OF EXISTING WASTEWATER FACILITIES

III.A UPPER GWYNEDD TOWNSHIP WASTEWATER TREATMENT FACILITIES

Domestic and industrial wastewater generated within Upper Gwynedd Township is treated at the Upper Gwynedd Township Wastewater Treatment Plant and the Towamencin Municipal Authority Wastewater Treatment Plant.

The approximate dividing line for the two service areas within UGT is located on a ridge line shown in Appendix A. The flow east of the ridge line flows to the UGT WWTP and the flow to the west of the ridge line flows to the TMA WWTP. This Special Study includes a description of only the UGT WWTP. A flow schematic of the existing UGT WWTP is included in Appendix K.

The WWTP includes the following treatment unit operations:

- Headworks
- Flow Equalization
- Primary Clarification
- Activated sludge secondary treatment
- Tertiary phosphorus treatment
- Secondary clarification
- UV disinfection

The UGT WWTP has adequate capacity to handle the existing flow. Adequate capacity also exists for projected, future growth from new development. However, additional capacity will be needed for the Flow Diversion. This will be discussed further in Sections IV and V.

Using flow data from the UGT 2015 Chapter 94 report, the current, available capacity is 0.803 MGD and the projected five year future, available capacity is 0.643 MGD. The available capacity does not factor in capacity needed for the flow diversion.

There have been no operating problems with the UGT WWTP. There is no expansion or upgrade of treatment processes currently in progress. There will be treatment plant modifications that are needed to handle the flow being diverted. This will be discussed in Sections V and VI.

UGT WWTP

Location:	Township Line Road west of Swedesford Road Upper Gwynedd Township
NPDES Permit No.:	PA 0023256
Clean Streams Law Permit No.	WQM Permit #4691420
Receiving Stream & Classification:	Wissahickon Creek; TSF (Trout Stocking) MF (Migratory Fishes)
Hydraulic Design Capacity:	6.5 Million Gallons Per Day (MGD)

Annual Average Flow for Effluent

Limit Calculations: 5.7 MGD

A complete copy of the current NPDES permit for the Upper Gwynedd WWTP is included in Appendix L.

III.B UPPER GWYNEDD TOWNSHIP COLLECTION SYSTEM

The UGT collection system serves the entire Township. As stated earlier, UGT is currently served by two wastewater treatment plants. The portion of the UGT collection system that flows to the TMA WWTP is located west of the ridge line. The portion of the collection system that flows to the UGT WWTP is located east of the ridge line. The UGT collection system is located entirely within the Township and is owned by Upper Gwynedd. Reference is made to Appendix A which includes the UGT Collection System.

III.B.1 UGT WASTEWATER TREATMENT PLANT SERVICE AREA

The UGT WWTP service area is served by two main interceptors.

1. The Southwest Interceptor (known as the Northwest Interceptor north of Sumneytown Pike) service area includes the central and southwestern portions of the Township and includes flow from North Wales Borough and portions of Worcester, Whitpain, and Montgomery Townships. The Southwest Interceptor starts north of Sumneytown Pike as an

18” pipe. It changes to a 24” pipe once it crosses Sumneytown Pike and then gradually increases in size until it becomes a 42” sewer line before connecting to the UGT WWTP.

Most flow through the Southwest Interceptor is by gravity. There are also several pump stations which are used to get flow to this interceptor.

2. The East Interceptor service area serves the eastern portion of the Township and a small portion of Lower Gwynedd Township. Wastewater from a portion of the Foulkeways community in Lower Gwynedd Township is pumped via a force main to this interceptor. The East Interceptor starts out as a 10” sewer line, increases in size to a 15” line, and finally to an 18” sewer line. The East Interceptor flows to the Southwest Interceptor just upstream of where the Southwest Interceptor connects with the UGT WWTP.

III.B.2 TMA WASTEWATER TREATMENT PLANT SERVICE AREA IN UGT

The TMA service area in UGT is served by the Kriebel Road Interceptor (KRI). All flow from UGT to the TMA WWTP is by gravity.

The KRI starts in UGT, north of Sumneytown Pike and east of Route 363 (Valley Forge Road). The KRI starts as a 10” pipe and changes to a 15” pipe just before it crosses Sumneytown Pike. Once the KRI crosses Route 363, wastewater from Towamencin Township flows to the KRI. The pipe increases in size to 20” before ending at the TMA WWTP.

III.B.3 COLLECTION SYSTEM DIVERSION AREAS

There are four points where the flow from UGT crosses Valley Forge Road (Route 363) from UGT into TT. These four crossing points are shown in Appendix A on the UGT Collection System map.

The first crossing point is just south of the Sumney Forge Shopping Center located at the corner of Sumneytown Pike and Valley Forge Road. This crossing point contains approximately eighty to eighty five percent (80-85%) of the total flow from UGT to the TMA WWTP.

The second crossing point is at Jacks Lane. This contains approximately six percent (6%) of the total flow from UGT to the TMA WWTP.

The third crossing point is located at Anders Road. This contains the smallest amount of flow of the four crossing points, approximately one percent (1%) of the total flow.

The fourth crossing point is located just north of the Pennsylvania Turnpike bridge on Valley Forge Road. This crossing point contains approximately eleven percent (11%) of the total flow.

Flow from the first and the fourth crossing points is what is being proposed to divert to the UGT WWTP.

III.B.4 COLLECTION SYSTEM ISSUES

Sections of the UGT collection system that flow to the UGT WWTP and the TMA WWTP have experienced Sanitary Sewer Overflows (SSO) in the past. UGT has been working on reducing Infiltration & Inflow (I/I) for over 10 years. During this time, UGT has greatly reduced the quantity of I/I entering the system and has also greatly reduced the number of SSO. In fact, SSO have been eliminated at certain manholes that previously experienced SSO. The work done by UGT to improve the operation of its collection system is described in detail in a Corrective Action Plan (CAP) that UGT submitted to the PADEP. The most recent update was submitted to PADEP in February 2016. A copy of the UGT CAP is included in Appendix M.

In addition to the CAP submitted by UGT, TMA submitted two CAPs to the PADEP to address SSO issues in the Kriebel Road Interceptor and the TMA WWTP Influent Pump Station. This is relevant to UGT because the service area located in UGT that flows to the TMA WWTP flows through the KRI. The KRI has also experienced SSO. TMA is working on reducing I/I in the KRI and the TT collection system to work towards elimination of SSO in the KRI and TT collection system.

Diversion of UGT flow from the KRI and the TMA WWTP will greatly reduce the hydraulic loading on the KRI and will also greatly reduce, if not eliminate, SSO on the KRI. This is a significant environmental benefit associated with UGT diverting flow.

IV. FUTURE GROWTH AND LAND PLANNING

IV.A EXISTING PLANNING

As stated in Section I, previous wastewater planning for Upper Gwynedd Township has included previous Act 537 Plans, two Act 537 Plan Special Studies, various Sewage Facilities Planning Modules for individual development projects, annual Chapter 94 Wasteload Management Reports, and a Corrective Action Plan.

The most recent Act 537 document on record is the Act 537 Plan – Special Study done as part of UGT's CAP. This Special Study was published for public comment in June 2016 and was submitted to PADEP in August 2016 for review and approval.

IV.B GROWTH

Growth and new development in Upper Gwynedd Township are controlled and regulated by land use and zoning regulations. A copy of the current Upper Gwynedd Township Zoning map is included in Appendix N.

Upper Gwynedd Township is primarily built out and there is not much land available for development. There is, however, some development that is currently in progress and other development being planned in the future. Current and future development in UGT is contained in the Connection Management Plan (CMP) included in Appendix O. The CMP is a summary of existing and future development in the entire UGT service area, delineated by the individual

interceptor to which a particular development would flow. The CMP does not include the flow being diverted. This issue is addressed separately.

IV.B.1 EXISTING GROWTH

As described earlier, UGT is served by three main interceptors. The Southwest and East Interceptors currently flow to the UGT WWTP. The western section of the Township that flows to the TMA WWTP is served by the Kriebel Road Interceptor.

The CMP includes development in all three interceptor service areas. The CMP includes the name of the development, the number of connections (EDUs), the state of approval in the PADEP planning process, and the time frame for connection.

The CMP includes the following growth in each of the three interceptor service areas:

- East Interceptor – 50 EDUs
- Southwest Interceptor 32 - EDUs
- Kriebel Road Interceptor – 40 EDUs

The total existing growth is 122 EDUs. Using the UGT Act 537 flow number per EDU, the total projected flow is 28,914 gallons per day (GPD).

IV.B.2 FUTURE GROWTH

The CMP also includes other potential development projects that are not included in the previous section above because there are no plans at this point for these projects to request connection to the UGT system. However, for purposes of being conservative, the following is a more detailed discussion of these other projects with no near term plans to connect to the UGT system.

SOUTHWEST INTERCEPTOR

The Southwest Interceptor potential projects shown in yellow in the CMP include 1,203 potential EDUs (miscellaneous on lot systems are included in the 40 EDUs above). The Merck-Phase 5, Hancock Road, and Old Church Road projects are not being included because it is not felt that these EDUs will be connected in the next five years, if at all. The EDUs listed for Montgomery Township and Worcester Township are based on the legal agreements that UGT has with these two neighboring municipalities. At this point there are no new developments from Montgomery Township that are projected to request connection to UGT in the next five years. Once again, in the interest of being conservative, 50 EDUs are included for purposes of evaluating the capacity of the UGT WWTP.

KRIEBEL ROAD INTERCEPTOR

The CMP shows a total of 92 EDUs that are shown in yellow (the miscellaneous on lot systems are already included in the 40 EDUs listed above in Section IV.B.1 for the KRI). The 92 EDUs include the three Martin properties plus 20 EDUs for Lehigh Valley Dairy.

The total for future growth is 142 EDUs. Using the UGT Act 537 flow number per EDU, the total projected flow is 33,654 gallons per day (GPD).

IV.B.3 ULTIMATE BUILD OUT

As has been described above, there is the potential for additional EDU connections that are not included in Sections IV.B.1 and IV.B.2, but are included in the CMP. The additional build out EDUs are located in the Southwest Interceptor service area. These additional EDUs include the following:

- Old Church Road - 1 EDU
- Hancock Road -50 EDUs
- Worcester Township - 490 EDUs
- Montgomery Township -10 EDUs
- Merck Building 5-652 EDUs

The total of these ultimate build out EDUs is 1,203 EDUs. Regarding Merck and Montgomery Township, it is highly unlikely that these will be connected in the next five years.

Merck has already been allocated capacity that is not being used. This available capacity is already factored into the UGT WWTP available capacity in Section III.A. Even if Merck connected all of the 652 EDUs (154,524 GPD), Merck's unused, reserve capacity would still be over 1,500,000 GPD.

IV.B.4 GROWTH SUMMARY

The total for the existing (122 EDUs) and future (142 EDUs) growth is 264 EDUs. Using the Act 57 flow number of 237 GPD, the total projected flow for the next five years is 62,568 GPD. This growth is accounted for in the UGT Chapter 94 report. The current and five year available capacities referenced in Section III.A already reflect the 62,568 GPD of growth.

If the ultimate buildout potential connections from Old Church Road, Hancock Road, and Worcester Township are included, this is another 541 EDUs. However, 385 of the Worcester EDUs and 30 of the Hancock Road EDUs are already factored into the available capacity based on the 2015 Chapter 94 report. Therefore, the additional EDUs from ultimate build include Old Church Road (1), Hancock Road (20), and Worcester (105) which is 126 EDUs. This equates to 29,862 GPD. In addition, it is also noted that Montgomery Township has approximately 120,000 GPD of unused capacity that is included in the ultimate build out flow projection.

Therefore, the projected flow for ultimate build out is 29,862 GPD plus 120,000 GPD which equals 149,862 GPD. For purposes of this Special Study, to be conservative, the flow being used for ultimate build out, future growth is 250,000 GPD

As stated above in Section III.A, the UGT WWTP has current, available capacity of 803,000 GPD and a five year future, available capacity of 643,000 GPD. Subtracting 250,000 GPD leaves the UGT WWTP with 393,000 GPD of future, available capacity. Therefore, there is

adequate capacity to accommodate the projected ultimate build out. UGT wants to maintain this capacity, in addition to the capacity needed for the flow diversion.

The additional capacity needed for the Flow Diversion project is addressed in Section V.A.

V. ALTERNATIVES FOR WASTEWATER DISPOSAL FACILITIES

There are two alternatives for Upper Gwynedd Township to treat flow generated in the western part of the township that currently flows to the TMA WWTP. The best and preferred alternative is for UGT to divert a significant majority of flow that currently flows to the TMA

WWTP, to the UGT WWTP. The second alternative is to continue to have UGT wastewater treated at the TMA WWTP. The following is a discussion of the two alternatives.

V.A DIVERT FLOW TO UGT WWTP

The UGT Flow Diversion project will divert a significant majority of wastewater generated in Upper Gwynedd Township and currently conveyed to the TMA WWTP, to the UGT WWTP. The average annual daily flow planned on being diverted is approximately 1.05 MGD, inclusive of 0.1 MGD Merck reserve capacity at the TMA WWTP. The remaining flow that will continue to go to the TMA WWTP is 0.12 MGD.

The Flow Diversion project will require additional capacity at the UGT WWTP as well as two pump stations and two force mains to convey the diverted wastewater to the UGT WWTP.

V.A.1 WASTEWATER TREATMENT PLANT

The current permitted capacity of the UGT WWTP is 5.7 MGD average annual daily flow and 6.5 MGD maximum monthly flow. Therefore, additional capacity needs to be added to the UGT WWTP to handle the increase in both average annual flow and maximum monthly flow.

Once again, it is noted that the additional capacity needed for the Flow Diversion project is in addition to the capacity discussed in Section IV.B.4.

The existing UGT WWTP is described in Section III.A. In order to accommodate the flow to be added with the flow diversion, additional capacity for several unit operations needs to be provided.

The unit operations requiring additional capacity are as follows:

- Influent pumping
- Headworks
- Secondary clarification
- UV Disinfection
- Effluent pumping

The following provides more detail on the UGT WWTP modifications needed to treat the additional flow being diverted.

Wastewater Treatment Plant Capacity

The WWTP is presently rated for an average annual flow of 5.7 MGD, a hydraulic design capacity of 6.5 MGD, a peak hour flow of 15 MGD and an organic design loading of 10,842 lbs. As part of the flow diversion project, Upper Gwynedd Township will be requesting an average annual flow of 7.0 MGD, a hydraulic design capacity of 8.0 MGD, a peak hour flow of 22.5 MGD and an organic design loading of 11,676 lbs. Note that the peak hour will be based on the combined hydraulic design capacity of the two pump stations.

Appendix K identifies the proposed modifications at the Upper Gwynedd WWTP.

Modifications at Headworks (Influent) Building

The existing Auger Monster will be replaced with a new screen. 20 MGD will be able to flow through the two indoor screens (one existing and one new), grit chambers and 24-inch parshall flume. Flows in excess of 20 MGD will flow by gravity to the existing screen outside the Headworks Building. The parshall flume can be calibrated up to 21.39 MGD. To measure all peak flows, a second flow meter will be installed upstream of the headworks building for utilization when flows exceed the rated capacity of the existing parshall flume. Additional grit removal equipment is not proposed because any flow not proceeding through the existing grit removal units will occur after the first flush has entered the WWTP and all that flow will proceed into primary clarifiers.

The new force main will connect into the existing headworks.

Modifications to Influent Pumping

Presently, the WWTP can pump 19 MGD with one (the largest) pump out of service. The influent pumping capacity will be increased by 5 MGD to convey the anticipated peak instantaneous flow.

Modifications to the Aeration Tanks and Clarifiers

The aeration tanks have adequate capacity to treat the projected organic load. An additional circular clarifier similar to the two existing 80' diameter circular clarifiers is proposed to treat peak flows from Aeration Tanks 3 through 6.

Modifications to Effluent Disinfection

The WWTP presently has two parallel channels with UV light disinfection. Each channel is capable of disinfecting in excess of 10 MGD. A third parallel channel with a capacity of 10 MGD is proposed for disinfecting peak flows.

Modifications to Effluent Pumping

Each existing effluent pump can pump 8.55 MGD. There are four pumps, so the capacity of the pump station with one pump out of service is 25.7 MGD. This exceeds the anticipated peak hour flow. The control panel and wiring do allow all four pumps to be operated for a capacity in excess of 34 MGD, which far exceeds any foreseeable

peak instantaneous flow. If a pump was out of a service, a portable self-priming pump could be placed at the effluent pump station.

Modification of the outfall pipe is anticipated to incorporate a second effluent flow meter to be utilized for measuring peak flows in excess of the rated capacity of the existing effluent flow meter.

Physical space is available at the existing WWTP to add the additional facilities required at the WWTP.

UGT proposes an annual average daily flow of 7.0 MGD and a maximum monthly flow of 8.0 MGD. The 7.0 MGD annual average daily capacity is 1.3 MGD more than currently exists. The 1.3 MGD figure includes 0.95 MGD of existing UGT flow being diverted from the TMA WWTP, plus 0.1 MGD of Merck reserve capacity at the TMA WWTP, plus 0.25 MGD of growth as summarized in Section IV.B.4.

As noted in the previous paragraph, the annual average flow being diverted is 0.95 MGD from the two crossing points referenced. For the other two crossing points at Jacks Lane and Anders Lane, the flow that will continue to flow to the TMA WWTP will be 0.11 MGD and 0.01 MGD, respectively. The total remaining flow from UGT to the TMA WWTP will be 0.12 MGD.

V.A.2 COLLECTION SYSTEM

The flow currently generated in UGT flows to the TMA WWTP by gravity. Therefore, to divert the flow to the UGT WWTP requires pump stations. As discussed in Section III.B.3, there are four points where flow from UGT crosses Valley Forge Road into Towamencin

Township. The flow from two of the four crossing points is being diverted. These are the points located just south of the Sumney Forge Shopping Center at the corner of Sumneytown Pike and Valley Forge Road and just north of the Pennsylvania Turnpike Northeast Extension on Valley Forge Road. Approximately 93% of the total flow that currently flows to the TMA WWTP is contained in these two crossing points.

V.A.2.1 PUMP STATIONS

The flow from each of the two crossing points from which flow will be diverted requires pump stations to pump the flow to the UGT WWTP. These pump stations are shown in Appendix J. The pump stations will be hereinafter referred to as the Valley Forge Road North (VFRN) Pump Station (just south of the Sumney Forge Shopping Center) and the Valley Forge Road South (VFRS) Pump Station (just north of the Turnpike). The VFRS Pump Station will be located in Towamencin Township.

The VFRN Pump Station will have a hydraulic design capacity of 6.0 MGD. The VFRS Pump Station will have a hydraulic design capacity of 1.5 MGD.

UGT has acquired the property needed for both the VFRN Pump Station and the VFRS Pump Station.

A list of all easements required for pump station and force main construction is included in Appendix J.

V.A.2.2 FORCE MAINS

The two pump stations will pump flow through separate force mains. Appendix A and Appendix J show the route of each of the two force mains.

The force main route from the VFRN Pump Station will be located mostly in existing Township easements. The force main route shown in Appendix A and Appendix J indicates the sections of the force main in private property and in existing Township easements. There is only a relatively small section of the force main that runs through private property and requires easements from the property owners. This force main is anticipated to be at most 24", but portions may be 20" diameter pipe.

As with the VFRN Pump Station, the VFRS Pump Station uses mostly existing Township easements. This force main is anticipated to be an 8" diameter pipe.

The Township will obtain easements for the force mains, where necessary, through agreements with property owners or, where necessary, by eminent domain proceedings.

To reduce construction costs, the two force mains combine on Garfield Avenue. The combined force main then continues to the UGT WWTP. This force main is anticipated to be at most 24", but portions may be 20" diameter pipe.

The capacity of the force main from the VFRN Pump Station is 6.0 MGD. The capacity of the VFRS Pump Station is1.5 MGD. The capacity of the force main that will handle the combined flow is 7.5 MGD.

We also note that UGT will continue with its I/I reduction program to reduce the amount of flow that currently flows to the UGT WWTP and the flow that will be diverted.

UGT's I/I program is described in detail in the UGT CAP attached as Appendix M. We note that the existing UGT collection system will not be used to convey the flow being diverted.

V.B CONTINUE TREATMENT AT TMA WWTP

The other option is effectively to do nothing and have UGT flow continue to be treated at the TMA WWTP. This option was determined to not be beneficial to UGT.

V.C LEGAL AGREEMENT TO DIVERT FLOW

Upper Gwynedd Township and Towamencin Township discussed and evaluated diverting flow for several years. The product of these discussions was execution of a legal agreement which provides for UGT to divert flow. Both Townships are party to this legal agreement. We note that the agreement does provide for continuing to treat UGT flow at the TMA WWTP should circumstances arise which would prevent flow diversion from occurring. UGT has determined that diverting flow is the best option and is proceeding with this option.

A copy of the legal agreement is included in Appendix B.

We make note of the fact that even with the Flow Diversion option, which UGT has chosen to implement, a small percentage of UGT wastewater will continue to be treated at the TMA WWTP. Diverting all flow was determined to not be cost effective or beneficial to UGT and its rate payers.

VI. EVALUATION OF WASTEWATER DISPOSAL ALTERNATIVES

As stated in Section V, Upper Gwynedd Township has chosen the alternative to divert flow from the TMA WWTP to the UGT WWTP. As will be discussed in this section, it has been determined that diverting flow is the most cost effective and beneficial option for UGT to pursue.

VI.A CONSISTENCY DETERMINATION AND RESOLUTION

As demonstrated throughout this Act 537 Plans – Special Study, the proposed alternative to divert flow is consistent with the following:

- **Clean Streams Law**-The Flow Diversion project will likely eliminate SSO from the Kriebel Road Interceptor and reduce the environmental impact of the SSO. UGT currently complies with its NPDES permit and construction of the additional facilities at the UGT WWTP will continue to allow UGT to maintain NPDES permit compliance after the flow is diverted

- **Clean Water Act**- UGT currently complies with its NPDES permit and construction of the additional facilities at the UGT WWTP will continue to allow UGT to maintain NPDES permit compliance after the flow is diverted
- **Municipal Wasteload Management Plans**-The additional facilities proposed for construction at the UGT WWTP will provide for UGT to treat the additional flow and loading resulting from the Flow Diversion project and maintain NPDES permit compliance.
- **UGT Corrective Action Plan**-The Flow Diversion project will improve operation of the UGT collection system by likely eliminating SSO on the Kriebel Road Interceptor and in the UGT collection system that feeds into the Kriebel Road Interceptor. The new force mains will be constructed using the latest technology and construction methods to minimize I/I in the new system.
- **UGT Chapter 94 Report**- The additional facilities proposed for construction at the UGT WWTP will provide for UGT to treat the additional flow and loading resulting from the Flow Diversion project and maintain NPDES permit compliance.
- **Comprehensive Plans developed under PA Municipalities Planning Code**-The Flow Diversion project is consistent with all Township planning documents.
- **Anti-degradation Requirements of Chapters 93, 95 and 102**-The additional facilities being constructed at the UGT WWTP will provide for continued NPDES permit compliance.
- **State Water Plan**-The additional facilities will continue to provide for discharge of a high quality effluent discharging to the Wissahickon Creek.

- **PA Prime Agricultural Land Policy**-This is not applicable to this project.
- **Plans adopted under the Storm Water Management Act**-All construction work for the WWTP, pump stations, and force mains will be in accordance with UGT and Montgomery County Storm Water Management Plans.
- **Wetland Protection under Chapter 105**-A wetlands delineation for the project is being performed. The construction will be done in a manner to comply with regulatory requirements, minimize the impact to wetlands, and provide for wetlands restoration.
- **Pennsylvania Natural Diversity Inventory (See Appendix P)** The PNDI for this project has already been performed and is included in Appendix P. No known conflicts were found.
- **Pennsylvania Historic Preservation Act**-This project will not have any impact related to this act.

VI.B ALTERNATIVE DISCUSSION

The following is a discussion of the alternatives evaluated:

a. Upper Gywnedd Township diverts approximately 950,000 gallons per day (0.95 MGD) that currently flows to the TMA WWTP, to the UGT WWTP

UGT diverting flow from the TMA WWTP to the UGT WWTP is the recommended alternative in this Act 537 Plan – Special Study. It is consistent with all the items listed in Section VI. A for the following reasons:

- The existing UGT WWTP has adequate capacity to handle the build out for all development included in the Connection Management Plan and as discussed in Section IV.B.4. The 0.95 MGD being diverted will require additional capacity at the existing UGT WWTP. UGT will construct the facilities necessary to handle the average annual and peak flows. This is discussed in Section V.A.1.

  Flow diversion also requires that two pump stations and two force mains be constructed to divert the flow that currently goes to the TMA WWTP, to the UGT WWTP. The property for both of the pump stations has already been acquired. This is discussed further in Section V.A.2

- The proposed force main routes utilizes mostly existing Township rights of way. There are very few additional permanent easements required. The required easements are listed in Appendix J. The largest easement will be through Wissahickon Valley Watershed Association (WVWA) property. UGT has already met with the WVWA and they are supportive of the Flow Diversion project. We note that UGT already has sewer lines in WVWA property that were previously negotiated.
- The proposed force main routes involve a minimal amount of environmental impact and construction on private property.
- All permits and approvals will be obtained for construction of the WWTP facilities, the dedicated force mains, and the two pump stations.

- Flow Diversion will greatly reduce the hydraulic loading in the Kriebel Road Interceptor. In turn, this will greatly reduce, if not eliminate, the SSO that have occurred in the past on the KRI.
- The additional flow being diverted to the UGT WWTP will provide significant economies of scale at the UGT WWTP and will reduce rate increases for UGT customers that could occur in the future.
- Flow Diversion will give UGT control over almost all of the wastewater treatment needs of the UGT community.
- The alternative to divert flow will be supportive of growth in UGT. Although UGT is mostly built out, there is growth that is projected. In addition, should certain existing properties be re-developed this would create additional growth. In the UGT service area that flows to the TMA WWTP, there is a connection prohibition due to SSO on the KRI. By diverting flow UGT will construct the new pump stations and force mains with adequate capacity to likely eliminate SSO in the new system, eliminate the connection prohibition, and facilitate future growth in UGT.
- Several years of negotiation went into the legal agreement to provide for UGT to divert flow. This required considerable time and effort on the part of both UGT and TT. All of this led to UGT determining that diverting flow was the best alternative for UGT.

We also note that UGT diverting flow will provide the TMA with the opportunity to better serve their customers in the future. Given the future facilities that will be

needed at the TMA WWTP to upgrade the WWTP and meet stricter, future permit limits, TMA will be able to tailor the size of the new facilities to its future customer base.

b. UGT does nothing and UGT flow that is currently treated at the TMA WWTP will continue to be treated there.

Although this alternative is feasible and is addressed in the legal agreement providing for UGT to divert flow, it does not support the long term best interests of Upper Gwynedd Township and its rate payers for a number of reasons:

- UGT will continue to not have control over a significant portion of the wastewater treatment needs of the UGT community
- Without a significant expense to increase the capacity of the KRI, SSO would likely continue to occur. This would continue to result in regulatory problems with the PADEP.
- The project is economically beneficial to UGT in the long run. This is discussed further in Sections VI. D and VI. E below.

VI.C ALTERNATIVE EVALUATION TO APPLICABLE STANDARDS

All proposed construction for the UGT WWTP, the two new pump stations, and the new force mains will be in accordance with the Upper Gwynedd Township "Construction

Repair and Replacement Requirements for Sanitary Sewers and Appurtenances and Detail Drawings", dated October 2016, and the Pennsylvania Department of Environmental Protection "Domestic Wastewater Facilities Manual", 362-0300-001, October 1997".

The existing UGT WWTP has an excellent record of compliance with the requirements of its existing NPDES permit. After construction of the additional UGT WWTP facilities to handle the diverted flow is completed, UGT will comply with a new NPDES permit issued by PADEP.

VI.D CAPITAL COST AND FUNDING EVALUATION

a. As stated above in this Section, the diversion of flow is the alternative chosen by UGT. This alternative requires the construction of additional treatment facilities at the UGT WWTP, two new pump stations, and new force mains.

1. The capital cost analysis for the Flow Diversion project is included in Appendix Q. The cost includes engineering and a 20% contingency. Construction of the new facilities needed to divert flow is scheduled to be completed within approximately four years. This is discussed further in Section VIII.

2. UGT plans on funding the cost through two means. Work on the Engineering and regulatory aspects of the project has already been started. UGT plans on funding this work through inclusion in its annual budgeting process. Once the project gets to the construction phase, the remaining Engineering cost will be included with the construction cost. This will be funded by a 15 to 25 year (depending on market conditions) bond issue that UGT will obtain in the amount of approximately fifteen million dollars. Spreading the cost of the project over 15 to 25 years will reduce the economic impact on customers. Therefore, even though construction is scheduled to be completed in approximately four years, the cost to UGT's customers will be spread out over 15 to 25 years.

3. There are two other significant funding sources for the project available to UGT. First, as part of the legal agreement between UGT and TT, UGT was paid $7,100,000 upon leaving the TMA (formerly UGTMA). The second source is $4,900,000 in sewer reserve funds held by UGT.

b. Do nothing and continue to treat UGT flow at TMA WWTP.

1. Although there are no costs to divert flow for this option, there are still very significant costs associated with UGT continuing to have their flow treated at the TMA WWTP. UGTMA, prior to becoming the TMA, was jointly owned and operated by UGT and TT. When the UGTMA was defeased, UGT was

no longer an owner, but rather just a customer. If UGT stays as part of the TMA it would incur very significant future, long term costs for upgrade of the TMA WWTP and the Kriebel Road Interceptor. An independent engineering study authorized by UGT and TT was performed by the nationally recognized engineering consulting firm of Hazen & Sawyer in 2013. The results of the study were accepted by both UGT and TT. This study provided cost estimates for the long term needs of the then UGTMA (now TMA) WWTP and collection system. Considering the age of the existing facility, the need to replace existing equipment and facilities, and the need to upgrade the WWTP to meet stricter, anticipated future permit limits, a cost estimate was generated. The UGT share of this cost is estimated to be $33,800,000. This means that over an extended period of time, UGT would have incurred this cost. This was a key reason that UGT decided to no longer be part of the UGTMA and to divert flow.

VI.E ECONOMIC IMPACT OF FLOW DIVERSION

As a result of flow being diverted to the UGT WWTP, the long term cost to operate the UGT WWTP and collection system will be affected in a positive way. Once the flow is diverted, there will be a significant number of additional UGT customers which will provide long term economies of scale for operation of the UGT WWTP. This will reduce rate increases for UGT customers that could occur in the future.

The additional customers will also help to pay for the bond issue that will be used to fund the capital cost. The bond issue will be paid for in 15 to 25 years, but the additional annual revenue increase from a greater number of UGT customers will continue long after the bond is paid off. This represents a significant, long term financial benefit to UGT and its rate payers.

Financing a 25 year bond issue will not result in any rate increase to UGT customers.

Depending on market conditions, UGT may decide to finance the project with a 15 year bond issue, which would pay off the bond 10 years sooner than a 25 year bond and reduce the interest paid over the life of the bond. This would also mean that the extra revenue coming from the additional customers will be available 10 years sooner for purposes other than to pay debt service on the bond.

Should UGT decide to use a 15 year bond, a single rate increase of $15 to each customer's semi-annual bill would result. As an example, the current semi-annual customer payment of $185 would increase to $200 to finance a 15 year bond.

If UGT does not divert flow, any costs to replace and upgrade the existing facilities at the TMA WWTP will be incorporated into the future sewer rates paid by UGT residents in the TMA service area. Therefore, by not diverting flow, UGT does not have long term control of the rates to be charged to the significant number of UGT customers served by the TMA. However, once UGT diverts flow, it will have control of the rates it charges to customers

whose flow is being diverted. We note that the sewer rates for UGT customers in the TMA service area will continue to be the same as sewer rates for UGT customers that currently flow to the UGT WWTP.

VI.F CONSTRUCTION PHASING

The flow can't be diverted until all of the WWTP, pump station, and force main construction is completed. There is no compelling reason for constructing any of the new facilities before the other(s). The project schedule was developed to provide the most economic benefit to UGT in terms of project bidding and facilitation of construction. A more detailed discussion of the project schedule is included in Section VIII.

VI.G LEGAL AUTHORITY

As stated earlier, UGT negotiated and finalized a legal agreement that provides for UGT diverting flow. Part of that agreement states that Towamencin Township will support UGT's efforts to divert flow. Other than this agreement, UGT plans on obtaining all regulatory approvals and permits necessary to successfully execute the project

VII. INSTITUTIONAL EVALUATION

VII. A UPPER GWYNEDD TOWNSHIP

UGT owns and operates its own WWTP and collection system. It has the authority to secure funding, operate and maintain its sanitary sewer treatment and collection system,

and regulate all users. The chosen alternative to divert flow can be implemented and incorporated into the UGT sanitary sewer system without any additional staff, departments, or authorities. UGT will have full ownership and operating responsibility for the additional WWTP facilities, the two new pump stations, and the new force mains.

Based on the legal agreement between Upper Gwynedd Township and Towamencin Township, UGT has the legal authority to divert flow to the UGT WWTP.

With the exception of the few functioning on-site systems, all wastewater within Upper Gwynedd Township will continue to be treated at publicly owned, NPDES permitted, wastewater treatment plants.

VIII. IMPLEMENTATION

VIII. A RECOMMENDATION

The chosen alternative is the following:

Upper Gywnedd Township diverts approximately 950,000 gallons per day (0.95 MGD) that currently flows to the TMA WWTP, to the UGT WWTP is the recommended alternative in this Act 537 Plan – Special Study

The chosen alternative meets all of the following important UGT goals:

- The existing UGT WWTP has adequate capacity to handle the build out for all development as shown in the Connection Management Plan discussed in Section IV.B.4. The 0.95 MGD being diverted will require additional capacity at the existing UGT WWTP. UGT will construct the facilities necessary to handle the average annual and peak flows. This is discussed in Section V.A.1.

Flow diversion also requires that two pump stations and two force mains be constructed to divert the flow that currently goes to the TMA WWTP, to the UGT WWTP. This is discussed in Section V.A.2. The property for both pump stations has already been acquired.

- The proposed route utilizes mostly existing Township rights of way. There are very few additional permanent easements required. The required easements are listed in Appendix J. The largest easement will be through Wissahickon Valley Watershed Association (WVWA) property. UGT has already met with the WVWA and they are supportive of the flow diversion project. We note that UGT already has sewer lines in WVWA property that were previously negotiated.
- The proposed force main routes involve a minimal amount of environmental impact and construction on private property.
- All permits and approvals will be obtained for the construction of the WWTP facilities, the force mains, and the two pump stations.
- Flow Diversion will greatly reduce the hydraulic loading in the Kriebel Road Interceptor. In turn, this will greatly reduce, if not eliminate, the many SSO that have occurred in the past on the KRI.
- The additional flow being diverted to the UGT WWTP will provide significant, long term economies of scale at the UGT WWTP and will reduce rate increases to UGT customers that could occur in the future.
- Flow Diversion will give UGT control over almost all of the wastewater treatment needs of the UGT community.
- The flow diversion alternative will be supportive of growth in UGT. Although UGT is mostly built out, there is some growth that is projected. In addition, certain existing properties have the potential to be re-developed that would

create additional growth. In the UGT service area that flows to the TMA WWTP, there is a connection prohibition due to SSO on the KRI. By diverting flow UGT will construct the new pump stations and force mains with adequate capacity to likely eliminate SSO, eliminate the connection prohibition, and facilitate growth in UGT

- Several years of negotiation went into the legal agreement to provide for UGT to divert flow. This required considerable time and effort on the part of both UGT and TT. All of this led to UGT determining that diverting flow was the best alternative for UGT.

We also note that UGT diverting flow will provide the TMA with the opportunity to better serve their customers in the future. Given the future facilities that will be needed at the TMA WWTP to upgrade the WWTP and meet stricter, future permit limits, TMA will be able to tailor the size of the new facilities to its future customer base.

VIII.B IDENTIFICATION OF COSTS AND FUNDING

The diversion of flow is the alternative chosen by UGT. This alternative requires the construction of additional treatment facilities at the UGT WWTP, two new pump stations, and new force mains.

UGT plans on funding the cost through two means. Work on Engineering and regulatory aspects of the project have already been started. UGT plans on funding this work through

inclusion in its annual budgeting process. Once the project gets to the construction phase, the remaining Engineering cost will be included with the construction cost, and this will be funded by a 15 to 25 year (depending on market conditions) bond issue in the amount of approximately fifteen million dollars. Spreading the cost of the project over 15 to 25 years will reduce the economic impact on customers. Therefore, even though construction is scheduled to be completed in approximately four years, the cost to UGT's customers will be spread out over 15 to 25 years.

There are two other significant sources of funding for the project for UGT. As part of the legal agreement between UGT and TT, UGT was paid $7,100,000 upon leaving the TMA (UGTMA). The other source is 4,900,000 in sewer reserve funds held by UGT

VIII.C PROJECT SCHEDULE

The Project Schedule is included in Appendix C. The schedule is formatted using PADEP approval of the Act 537 Plan as the start date (Time T=0). As the schedule indicates, work on several tasks has already begun. There are tasks that cannot proceed or be completed until PADEP Act 537 Plan approval is obtained and the schedule is consistent with this.

Meetings have been held with all regulatory agencies and other parties key to successful implementation of the project. Survey work and preliminary engineering is well underway. Property for both the VFRN Pump Station and the VFRS Pump Station has been acquired.

Work on obtaining easements for the force mains is underway. This Special Study is a key component of the project and provides an opportunity for public input.

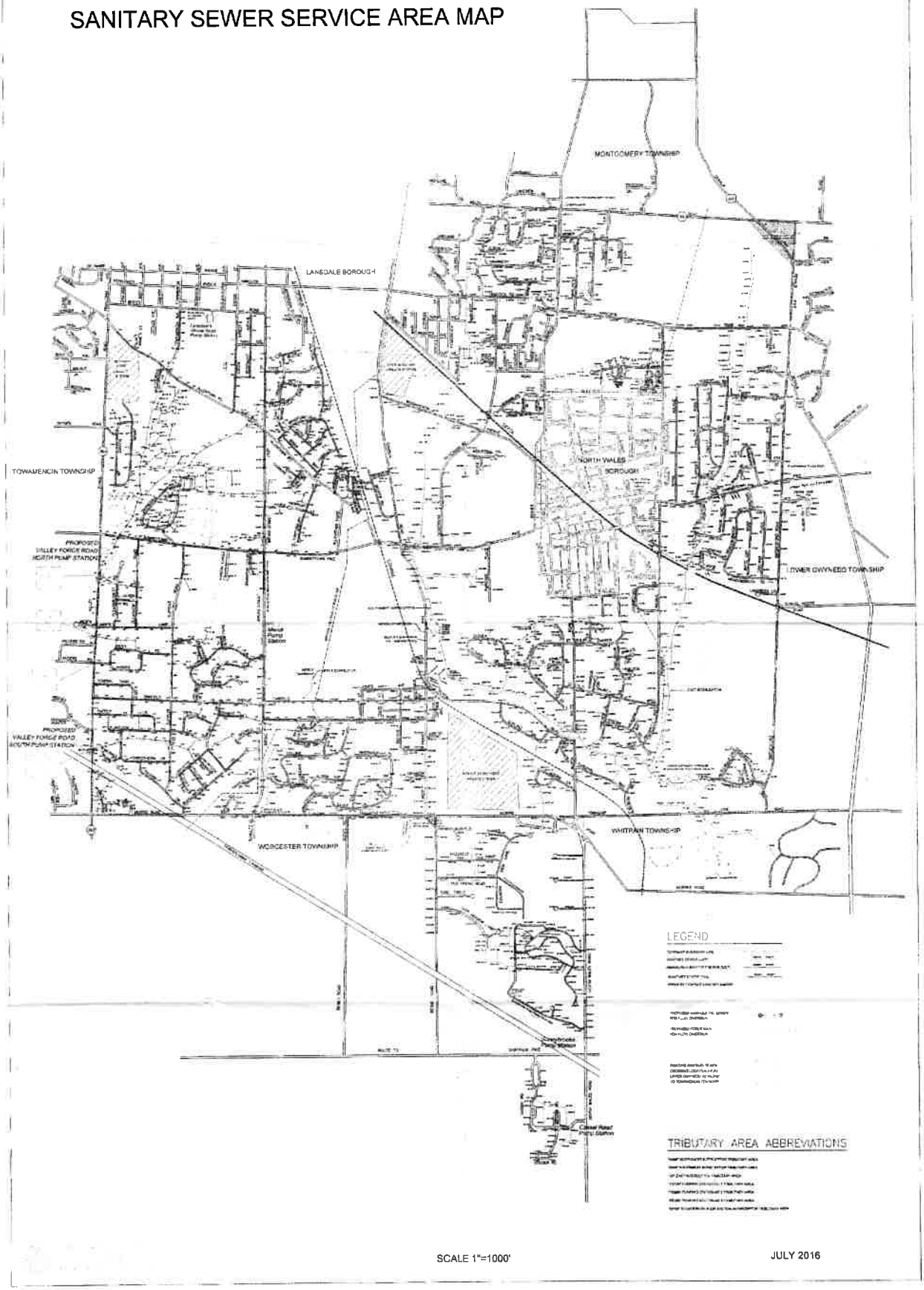
The project is anticipated to take approximately four years and be completed in 2020. Obtaining regulatory or other agency approvals, obtaining permits, and logistical issues associated with construction have the potential to impact the project schedule.

APPENDIX A

UPPER GWYNEDD TOWNSHIP
COLLECTION SYSTEM MAP

FIGURE 1

UPPER GWYNEDD TOWNSHIP
SANITARY SEWER SERVICE AREA MAP



SCALE 1"=1000'

JULY 2016

APPENDIX B

UPPER GWYNEDD TOWNSHIP/ TOWAMENCIN TOWNSHIP LEGAL AGREEMENT

CUSTOMER SERVICE AGREEMENT
BY AND BETWEEN
TOWAMENCIN TOWNSHIP
AND
UPPER GWYNEDD TOWNSHIP

THIS CUSTOMER SERVICE AGREEMENT made and concluded this 2nd day of March, 2015, by and between **TOWAMENCIN TOWNSHIP,** Montgomery County, Pennsylvania ("Towamencin"), and **UPPER GWYNEDD TOWNSHIP,** Montgomery County, Pennsylvania ("Upper Gwynedd").

WHEREAS, the parties will finalize a "Withdrawal Agreement" agreement which will result in the withdrawal of Upper Gwynedd Township from the Upper Gwynedd Towamencin Municipal Authority ("UGTMA") and provide for the continued operation of the Treatment Plant and an associated interceptor known as the Kriebel Road Interceptor by and through Towamencin and/or its assigns. Also, by such Agreement, Upper Gwynedd will commit to a redirection of at least eighty-five (85) percent of the existing sewage flow from the UGTMA service area located in Upper Gwynedd Township to a sewage treatment plant owned and operated by Upper Gwynedd ("the Project"); and

WHEREAS, Towamencin and Upper Gwynedd have agreed that Upper Gwynedd shall become a bulk customer of Towamencin for sanitary sewer treatment until such time that aforementioned redirection of sewage flow to a sewage treatment plant other than the Towamencin wastewater collection and treatment facilities; and

WHEREAS, a portion of Upper Gwynedd flows may remain tributary to Towamencin after the redirection of sewage flow, and for such remaining flows Upper Gwynedd shall continue to be a bulk customer of Towamencin for sanitary sewer treatment; and

WHEREAS, the UGTMA and/or its assigns owns and operates a sanitary sewer system that provides sanitary sewer service to the public in Towamencin Township and a portion of Upper Gwynedd Township, Montgomery County, Pennsylvania; and

NOW, THEREFORE, in consideration of the mutual promise herein contained and intending to be legally bound hereby, the parties hereby agree as follows:

1. **Defined Terms.** The terms defined in this Section, whenever used or referred to in this Agreement, shall have the respective meanings indicated unless a different meaning clearly appears from the context.

(a) Annual Average Daily Flow (AADF) shall mean the total flow received at the Wastewater Treatment Plant or discharged from a development or Municipality during any one (1) calendar year, divided by the number of days in the respective calendar year.

(b) Authority shall mean the Upper Gwynedd Towamencin Municipal Authority (UGTMA).

(c) Capacity shall mean the quantity of Sewage Flow measured in the manner described herein or, as calculated in the manner approved by governmental bodies having jurisdiction, measured in GPD or MGD.

(d) Common Transportation Facilities shall mean any underground pipeline or pipelines, operated and maintained by the UGTMA and used, inter alia, for the transportation of Sewage, regardless of its concomitant use by Towamencin Township to collect Sewage within the Towamencin Township Sewage Collection System, now or hereafter used in common by the UGTMA and Towamencin Township for the transportation of Sewage.

(e) Commonwealth shall mean the Commonwealth of Pennsylvania.

(f) Corrective Action Plan (CAP) shall mean a Plan required to address the planning, design, financing, construction and operation of the Sewage Facilities that may be necessary to provide Capacity that will meet anticipated demands for a reasonable time in the future and resulting in a project that is consistent with this Agreement and applicable official Plans approved under the Pennsylvania Sewage Facilities Act (Act 537). A CAP shall include, but not be limited to setting forth steps to be taken by the contributing Municipality to prevent the Capacity from being exceeded, and a Schedule showing the dates each step toward the compliance with the Agreement shall be completed. If necessary, to address exceedance of the Capacity, it will include limitations on, and a program for control of, new connections to the Sewage Facilities. A CAP may include a projection of the anticipated flow reduction. Where flow reduction projections

are applicable, they shall be determined by Agreement of the Towamencin Township Engineer and the Upper Gwynedd Township Engineer. The Municipality will be required to provide data, as requested, to the Towamencin Township Engineer to assist in the determination of the flow reduction. Upon completion of elements of a CAP, a Municipality shall receive the flow reduction credit associated with the improvements, as listed in the CAP, and the Capacity shall be modified for planning purposes.

(g) DEP shall mean the Department of Environmental Protection of the Commonwealth of Pennsylvania.

(h) Fiscal Year shall mean the fiscal year of the applicable Municipality as provided by the laws of the Commonwealth which, unless otherwise stated, shall be a calendar year.

(i) GPD shall mean gallons of Sewage per day.

(j) Maximum Month Flow (MMF) shall mean the highest monthly flow during a calendar year.

(k) MGD shall mean millions of gallons of Sewage per day.

(l) Person or Persons means an individual, a partnership, an association, a corporation, a joint stock company, a trust, an unincorporated association, a governmental body, a political subdivision, a municipality, a municipality authority, or any other group or entity.

(m) Projected Flow shall mean:

(i) Projected Flow will be the calculated flow from developments with approved planning modules, either during or prior to construction. The Projected Flow is the sum of residential and non-residential flows for the development.

(ii) Residential flow projections will be based on flow per Equivalent Dwelling Unit ("EDU"). Typically, the residential per EDU AADF at the property will be 200 gallons per day (GPD) and 280 GPD wastewater flows with I/I at the WWTP. If deemed necessary by the Towamencin Township Engineer, the Municipality will determine specific AADF GPD/EDU rates for the proposed development. These rates will be backed up by water meter data and/or metered sewage flows (3 year history) from developments of a similar age and type of property usage or, if requested, by an

alternative method deemed suitable by Towamencin Township. The Residential per EDU AADF at the WWTP is 280 GPD.

(iii) Non-residential flow projections will be based on water consumption data (3 year history) from an existing similar facility. This data will be used to predict AADF for the proposed development at 200 GPD per EDU.

(n) Service Agreement shall mean this document and any amendments and/or supplements hereto.

(o) Sewage shall mean domestic sanitary sewage and/or industrial wastes as such phrases usually and customarily are used by sanitary engineers.

(p) Sewage Collection System shall mean the Sewage collection and transportation system facilities existing or hereafter to be acquired and/or constructed by each respective township, for use and operation by it, together with all appurtenant facilities and properties which have been acquired or hereafter shall be acquired in connection therewith, excluding the UGTMA Sewage Collection System and the Common Transportation Facilities.

2. **Mutual Cooperation**. Towamencin and Upper Gwynedd agree to cooperate with each other in the obtaining of any and all permits, approvals and authorizations from DEP and any other regulatory, municipal or governmental agency which now has or may have jurisdiction over any aspect of the Project, in the obtaining of any necessary Act 537 Plan amendments, and in the obtaining of any available grants or other funding advantageous to the Project.

3. **Permitting Costs**. Upper Gwynedd shall bear all costs associated with obtaining all permits, approvals and authorizations from DEP and any other regulatory, municipal or governmental agency which now has or may have jurisdiction over any aspect of this Agreement pertaining to the Project, except that Towamencin shall bear all costs associated with preparation of any Act 537 Plan required of it and approval thereof by DEP.

4. **Acceptance of Sewage Flow**. Towamencin shall accept all sanitary sewer flow from Upper Gwynedd's service area that is located in the previous UGTMA service area located within Upper Gwynedd Township until completion of the Project. As of the

execution of this Agreement, Upper Gwynedd represents that it provides service to 4,000 Equivalent Dwelling Units (EDUs). The parties agree that this number is based in part upon Merck usage of 48,335 GPDs and Lehigh Valley Diaries' usage of 141,659 GPDs (for the purpose of audit). Any new residential purchase capacity would automatically (without the use of the audit) be added to the agreed 4,000 number upon connection. After completion of the Project, Towamencin shall continue to accept all sanitary sewer flow from those portions of Upper Gwynedd's service area from which service flows will not be redirected pursuant to the Project. Upper Gwynedd will be permitted to serve additional physical connections or more intense uses subject to the payment of additional per EDU tapping fees, the payment of the applicable annual sewer rental per EDU, and allocation of additional flow credits from DEP per any CAP and Connection Management Plan. Each residential unit will represent one EDU. Non-residential units will represent the number of EDUs derived by dividing the anticipated annual average daily water use by 200 gallons per day. These numbers may be amended in the future. Increases in sanitary sewer flow are limited to 2% per year with a maximum future additional capacity limited to 300 EDUs.

In the event that Upper Gwynedd Township exceeds the flow limits set forth herein, Upper Gwynedd Township agrees to immediately prohibit any further connections as directed by PADEP to the system until such time as Upper Gwynedd Township, Towamencin Township, and the Pennsylvania Department of Environmental Protection agree and implement a Corrective Action Process and/or Connection Management Plan.

5. **Sewer Charges and Surcharges**.

(a) Prior to completion of the Project Upper Gwynedd shall pay to Towamencin, in consideration of the acceptance by Towamencin of sewage flow as provided in paragraph 4 hereinabove an annual sewer rental of $1,125,000.00, calculated as follows: 4,000 EDUs x $375.00 per EDU x a treatment factor of 0.75. The Treatment Factor of 0.75 adjusts the Towamencin rate to eliminate the portion of Towamencin's rate associated with the cost of wastewater collection services, which are not provided by Towamencin to Upper Gwynedd. This rental shall be increased on an EDU basis as additional EDUs of sewage flow are either assigned to a property by Upper Gwynedd in its sole discretion or are purchased by Upper Gwynedd.

This annual sewer rental shall be paid in quarterly installments in advance on January 15, April 15, July 15, and October 15. Upper Gwynedd will be entitled to a 2 percent discount, however, should Upper Gwynedd pay the total annual rental prior to April 30th of each year. The per-EDU rate used to calculate this annual sewer rental shall not be changed by Towamencin, without the prior written consent of the Upper Gwynedd until January 1, 2018.

Beginning on the date six (6) months from the date of this Agreement and continuing once annually thereafter, an audit of the number of EDU's in use in Upper Gwynedd will be performed with the resulting number to be applied to determine the correct rental charge. For the purposes of this audit, each independent living unit shall be one EDU and each 200 GPD of metered water consumption for a non-residential customer shall be considered one EDU for billing purposes.

(b) From and after completion of the Project, the aforesaid annual sewer rental shall be calculated by using the lowest per-EDU rate then charged by Towamencin to any of its residential customers, multiplied by the Treatment Factor of 0.75. Said annual sewer rental shall continue to be paid in quarterly installments in advance on January 15, April 15, July 15, and October 15. Upper Gwynedd will be entitled to a 2 percent discount, however, should Upper Gwynedd pay the total annual rental prior to April 30th of each year.

(c) Prior to completion of the Project, Upper Gwynedd will pay no surcharges for excessive flows. Following completion of the Project or upon abandonment of the Project by Upper Gwynedd, Upper Gwynedd will pay a surcharge if the average daily flow for a month exceeds 400 gallons per day per EDU times the number of EDUs that remain within the UGTMA Collection System. The surcharge on such excess will be two times the per thousand gallon rate then charged by Towamencin to its non-residential customers multiplied by the treatment factor of 0.75 for volume overage in a month. Said surcharge shall be paid by the 15th day of the month following the month for which a surcharge is due. For example, for a surcharge occurring in September, Towamencin would expect to provide a bill to Upper Gwynedd for this calculated amount in October with payment expected within thirty (30) days of the invoice.

(d) In the event that Upper Gwynedd chooses not to complete the Project, Upper Gwynedd agrees to pay a Capital Contribution for use by Towamencin Township for the completion of the expansion of the Kriebel Road Interceptor Facilities and an installation of up to three (3) MG of equalization at the Treatment Plant. Such expansion and equalization projects are to be designed and constructed to accommodate flows from Upper Gwynedd Township and Towamencin Township as anticipated by this Agreement. Such contribution shall be equal to fifty percent of the cost for such improvements with such sum not to exceed the amount of $6,791,000 (as adjusted over the life of the Agreement by an inflation factor using ENR Construction Costs Index). The date that this payment must be made will be based upon the schedule contained in the Authority's Corrective Action Plan as approved by DEP.

(e) Billing Disputes. If Upper Gwynedd disputes a bill in good faith, Upper Gwynedd must, on or before the bill due date, (a) pay the undisputed portion of the bill, and (b) notify Towamencin in writing of the basis for the dispute. If the dispute is regarding meter accuracy, a meter test will be performed by the R. G. Malden Company or any other qualified firm acceptable to both parties. If the meter test proves that the meter is within 4% (four percent) accuracy, Upper Gwynedd shall, within two business days of such meter test, pay to Towamencin the disputed portion of the bill, together with accrued interest from the invoice date, and the cost of the meter test. If the meter test proves that the meter is not within 4% (four percent) accuracy, a billing adjustment will be made to reflect the volume that would have been transmitted had the meter been reading at 100% (one-hundred percent) accuracy for the billing period in question, Towamencin will pay for the cost of the meter test and the meter will be replaced or recalibrated at Towamencin's option.

(f) In instances where volume of discharge, or portions thereof, by Upper Gwynedd cannot be accurately measured by a particular flow meter by reason of malfunction of the meter, the volume of Sewage discharge shall be measured by estimates using one (1) of the following methods: (a) according to the number of "Equivalent Dwelling Units," as that term shall be defined, from time to time, constituting improved properties served by the particular Sewage Collection System, or portion thereof,

discharging Sewage through such flow meter or point of discharge; (b) measured or estimated water consumption by the applicable customers of Upper Gwynedd; (c) based upon a monthly average of Sewage flow measured at such location during a preceding twelve (12) month period; or (d) use of Graphical Correlation of flows based on the prior four (4) quarters of recorded date. The use of Graphical Correlation of flows shall be the preferred method of estimating flows whenever sufficient suitable historic data is available with which to develop the graph. Subject to the requirement for estimates described above, the readings set forth at said flow meters shall constitute conclusive evidence of the amount or volume of Sewage flow discharged by Upper Gwynedd into Towamencin.

6. **Meters**

(a) Meters shall continue to be *Palmer Bowlus Flume* with Bubbler Level measuring instrumentation and located at the following locations where Upper Gwynedd sanitary sewer flows cross in to Towamencin:

i. MH 24A near Bancroft Road
ii. MH 21.2 near Hillside Road
iii. MH 336 on Anders Road
iv. MH 236 on Valley Forge Road near PA Turnpike

(b) Meters shall be tested semi-annually at intervals of approximately six months by Towamencin according to industry standards for the type of meter in service. Towamencin shall provide Upper Gwynedd with copies of certified reports of test(s) on the accuracy of meter(s) commencing on the Effective Date of the Agreement, and once each year thereafter until termination of this Agreement, or any renewal terms hereof. If requested in writing by Upper Gwynedd, Upper Gwynedd shall have the right to be present when meter testing is performed. Upper Gwynedd may obtain access to inspect metering facilities upon written request made to Towamencin. Meter tests requested by Upper Gwynedd, in excess of the two semi-annual tests provided herein and not in connection with bill disputes pursuant to paragraph 6(d) hereof, shall be performed at the sole expense of Upper Gwynedd. Upper Gwynedd reserves the right to electronically monitor through its SCADA system or other similar means and to perform its own readings and tests on the accuracy of meter(s) at any time at Upper Gwynedd's expense.

7. **Records**. Upper Gwynedd represents that it maintains accurate records of connections to Upper Gwynedd's sewer system, estimated gallons of sewage contributed to said system by commercial and/or industrial customers based on the Upper Gwynedd's water meter records and any other records necessary for the accurate calculation of the sewer rates due and payable by Upper Gwynedd to Towamencin as described in paragraph 5 herein. As of March 1 of each year, Upper Gwynedd shall submit a report to Towamencin setting forth the number of connections made up through December 31st of the previous calendar year and, if different, the number of EDU's contributory to its service area at the beginning and at the end of such year. Upper Gwynedd shall include in its report the number of gallons assigned to each connection. It is understood by and agreed to by Towamencin, that notwithstanding the number of gallons assigned to each connection or EDU, that Towamencin shall be entitled to additional tapping fees for new connections only. There shall be no tapping fees paid for additional flow where surcharges are paid per paragraph 5.

8. **Maintenance and Repair**. Upper Gwynedd represents that it maintains and will continue to maintain all connections by its customer to its collection system, its collection lines and interceptors up to the point where the sewer system of Upper Gwynedd crosses the Towamencin Township boundary. All decisions regarding the repair, maintenance or replacement of any physical asset comprising Upper Gwynedd's collection system will remain the exclusive right of Upper Gwynedd.

9. **Wastewater Quality**

(a) Upper Gwynedd agrees to implement and operate a pretreatment program with respect to its commercial and industrial contributors consistent with that implemented and operated from time to time by Towamencin to the extent required by Towamencin, the Pennsylvania Department of Environmental Protection or the United States Environmental Protection Agency.

(b) Uniform Standards. Towamencin has uniform Sewage effluent quality standards which comply with the requirements of regulatory authorities. Upper Gwynedd will not discharge or permit the discharge of Sewage from its Sewage Collection System into the Common Transportation Facilities or the Treatment Plant that would violate any of

such standards. Towamencin will make no changes in said standards except upon ninety (90) days prior notice to Upper Gwynedd, and all such changes will apply equally to Towamencin and Upper Gwynedd.

(c) Compelling Compliance with Standards. Upper Gwynedd shall enact or cause to be enacted an ordinance, in a form acceptable to Towamencin, and will keep such ordinance in full force and effect at all times, prohibiting, and providing adequate penalties for, the discharge into its Sewage Collection System of anything violating the above-mentioned effluent quality restrictions of Towamencin and hereby covenants to enforce, and request the enforcement of, as applicable, the provisions thereof when brought to its attention. Such ordinance shall also prohibit and/or regulate the discharge into its Sewage Collection System by any Person of industrial waste, as defined in the applicable regulations of Towamencin. Upper Gwynedd will not permit any discharge into its Sewage Collection System except in the manner and in accordance with the provisions of said ordinance, as applicable.

(d) Treatment of Harmful Wastes. If any Sewage discharged by Upper Gwynedd into the Treatment Plant is in violation of Towamencin's standards as determined by this Article and requires special treatment or would be harmful to the Treatment Plant, then Upper Gwynedd will pay the entire cost of any special treatment as a separate charge, and, Upper Gwynedd, on written notice of violation from Towamencin, shall immediately act to enforce or obtain the enforcement of those quality standard Ordinances by connection ban or by providing or requiring pretreatment of such waste in such manner as is provided by said Ordinances or compel disconnection from the Sewage Collection System of the property from which harmful waste is being discharged. Failure by Upper Gwynedd to compel disconnection or pretreatment upon thirty (30) days written notice to same, shall entitle Towamencin to recover the Costs of any upgrading, enhancements or other remedial action deemed necessary by Towamencin as a result of such discharge and collect the same.

(e) Reimbursement For Damages From Improper Discharge. Upper Gwynedd will pay the cost of any damage to the Treatment plant or the Common Transportation Facilities resulting from discharge of improper waste from its Sewage Collection System in

violation of the above-mentioned quality standards and restrictions, within sixty (60) days after notice by Towamencin, and shall indemnify and hold harmless Towamencin with respect thereto.

10. **Infiltration and Inflow**. Upper Gwynedd represents that it will continue an inflow and infiltration abatement program during the life of this Agreement. Upper Gwynedd agrees to provide Towamencin, by March 1 of each calendar year, an annual report summarizing its efforts to monitor and reduce the quantities of inflow and infiltration from its sewerage system that flows in to Towamencin's system. If and to the extent that the sanitary sewage flow contributed by Upper Gwynedd to Towamencin's sewage system prior to completion of the Project exceeds any of the peak hourly flow rates in Appendix "A", or if required by the Pennsylvania Department of Environmental Protection, Upper Gwynedd agrees to revise and implement its infiltration and inflow program in an effort to reduce infiltration and inflow such that the peak hourly flow rate does not exceed said amount, said action to be accomplished within a time specified by required by the Pennsylvania Department of Environmental Protection, if applicable, or within a reasonable time. From and after completion of the Project, the threshold requiring said implementation shall be a peak hourly flow rate equal to 4.0 times the then number of EDU's contributory to the Towamencin sanitary sewer system times 280 gallons per EDU.

11. **Fines and Penalties**

(a) Sanitary Sewer Overflows ("SSOs"). In the event of the occurrence of any SSO in a line carrying flows from Upper Gwynedd, Upper Gwynedd agrees to pay 22.537 percent of any fines, penalties and assessment assessed by DEP and any other regulatory municipal or governmental agency having jurisdiction related to such SSO from February 19, 2015, until the completion of the Project. This contribution will be for SSOs in the KRI and not at the WWTP. Following completion of the Project, Upper Gwynedd will bear no responsibility for contribution to these costs.

(b) Upper Gwynedd shall not be responsible for any fines, penalties or assessments, or any percentage thereof, assessed by DEP and any other regulatory,

municipal or governmental agency which now has or may have jurisdiction over any aspect of the Project, for sanitary sewer overflows within Towamencin's sewer system.

12. **Hold Harmless**. Towamencin shall indemnify, defend and hold Upper Gwynedd harmless from and against any and all claims, suits, actions liabilities, losses, damages and expenses (including, without limitation, reasonable outside attorney's fees and court costs), whether relating to injury to property or to person (including death), arising solely from or in connection with the actions of Towamencin related to this Agreement.

Upper Gwynedd shall indemnify, defend and hold Towamencin harmless from and against any and all claims, suits, actions liabilities, losses, damages and expenses (including, without limitation, reasonable outside attorney's fees and court costs), whether relating to injury to property or to person (including death), arising solely from or in connection with the actions of Upper Gwynedd related to this Agreement.

13. **Miscellaneous**.

(a) The parties agree to defend the validity of this Agreement and to take no action to defeat or frustrate the intent and purposes of this Agreement.

(b) Towamencin and Upper Gwynedd may proceed to protect and enforce their respective rights hereunder under the laws of the Commonwealth of PA by such suits, actions or special proceedings in equity or at law, in the Court of Common Pleas of Montgomery County, Pennsylvania, whose jurisdiction shall be deemed exclusive, either for the specific performance of any covenant or agreement contained herein or in aid of execution of any power herein granted or for the enforcement of any proper legal or equitable remedy.

(c) All notices required or contemplated by this Agreement shall be personally served, sent by overnight delivery service or mailed, postage prepaid, with return receipt requested, or faxed to the parties addressed as follows:

To Towamencin:

If forwarded by U.S.P.S. mail to:

Towamencin Township
Attention: Township Manager
P.O. Box 303
Kulpsville, PA 19443

OR DELIVERED TO:

Towamencin Township
Attention: Township Manager
1090 Troxel Road
Lansdale, PA 19446

To Upper Gwynedd:

Upper Gwynedd Township
Parkside Place
P. O. Box 1
West Point, PA 19486
Attention: Township Manager
Fax Number: 215-699-8846

Notice given by personal delivery, overnight delivery service or mail shall be effective upon actual receipt. Any party may change any address to which notice is to be given to it by giving notice as provided above of such change of address.

(d) The authority of the officials of Towamencin and Upper Gwynedd to execute this Agreement shall be evidenced by a resolution properly passed by the Towamencin Township Board of Supervisors and the Upper Gwynedd Township Board of Commissioners prior to the execution hereof.

(e) A waiver of any breach of any provision of this Agreement shall not either constitute or operate as a waiver of any other breach of such provision or of any other provisions, nor shall any failure to enforce any provision hereof operate as a waiver of such provision or any other provision.

(f) Towamencin and Upper Gwynedd agree that the laws of the

Commonwealth of Pennsylvania shall govern the rights, obligations, duties and liabilities of the parties to this Agreement and shall govern the interpretation of this Agreement.

(g) No amendment to this Agreement shall be effective unless it is in writing, signed by the authorized representatives of both parties and certified as to the availability of an appropriation.

(h) The invalidity of one or more of the phrases, sentences, clauses or sections contained in this Agreement shall not affect the validity of the remaining portion of the Agreement so long as the material purposes of this Agreement can be determined and effectuated.

(i) If any provision of this Agreement is held to be illegal, invalid or unenforceable, that provision shall be enforced to the maximum extent permissible so as to affect the intent of the parties, and the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby. If necessary to effect the intent of the parties, the parties shall negotiate in good faith to amend this Agreement to replace the illegal, invalid or unenforceable language with legal, valid and enforceable language that as closely as possible reflects such intent. In any event, this Agreement shall be enforced to the fullest extent permitted by law.

(j) This Agreement shall be binding upon the parties hereto, their successors and permitted assigns.

(k) This is the entire agreement of the parties concerning the subject matter of this Agreement and supersedes all prior agreements between the parties, oral or written, to the extent they relate to the subject matter hereof.

(l) Any delays or failure of performance by Towamencin or Upper Gwynedd shall not constitute a default hereunder or give rise to any claims for damages if and to the extent that such delay or failure is caused by one or more occurrences which are beyond the reasonable control of the delaying or failing party including, but not limited to, terrorism strikes or other labor difficulties, war, riots, act of governmental authorities, abnormal weather (including blizzards, hurricanes or other severe storms that may adversely impact safe collection or facility operation) fire, flood, unavoidable casualties or delays in transportation.

(m) Arbitration. If any claims, controversies or disputes shall arise out of or be related to this Agreement or the breach thereof, the Parties agree to submit the said claim, controversy or dispute to binding arbitration in accordance with the prevailing rules of the American Arbitration Association. Said arbitration shall be held in the County of Montgomery, each Party to bear its own costs and the costs of the arbitrators to be borne equally by both Parties. As to any arbitration, each Party shall select one arbitrator, within ten (10) days of the event requiring said arbitration, and the two arbitrators so selected shall promptly select the third. If said arbitrators are unable to select a third arbitrator, one shall be assigned by the American Arbitration Association. If the claim, controversy or dispute concerns a termination of the Agreement based upon an event of default or otherwise, the termination shall be automatically stayed pending completion of the arbitration proceedings, including any appeal of the decision and award rendered by the arbitration panel.

IN WITNESS WHEREOF, the parties hereto have caused this Indenture to be properly executed the day and year above written.

UPPER GWYNEDD TOWNSHIP

Date: 3/2/2015 By: _____
President

Date: 3-2-2015 _____
Witness

TOWAMENCIN TOWNSHIP

Date: 3/2/2015 By: _____
Chair

Date: 3/2/2015 _____
Witness

March 2, 2015 Draft

APPENDIX "A"

24-Feb-15

FLOW RATE LIMITS

MH #	Location	# EDU	Flow /EDU	AADF	MMADF	Peak Hourly Rate
		#	GPD	MGD	MGD	MGD
24A	Bancroft Ct	3286	280	0.920	1.314	3.680
21.2	Hillside Rd	220	280	0.062	0.088	0.246
336	Anders Rd	60	280	0.017	0.024	0.067
236(35)	Valley Forge Rd (PA Turnpike)	434	280	0.122	0.174	0.486
	Totals	4000	280	1.120	1.600	4.480

Criteria:

AADF = # EDU * 280 GPD/EDU
5 Yr Avg MM/ADF UGTMA ratio= 1.323
Peak Hourly Rate= 4.0* AADF
MMMADF = #edu * 400/GPD/EDU 400 GPD/EDU

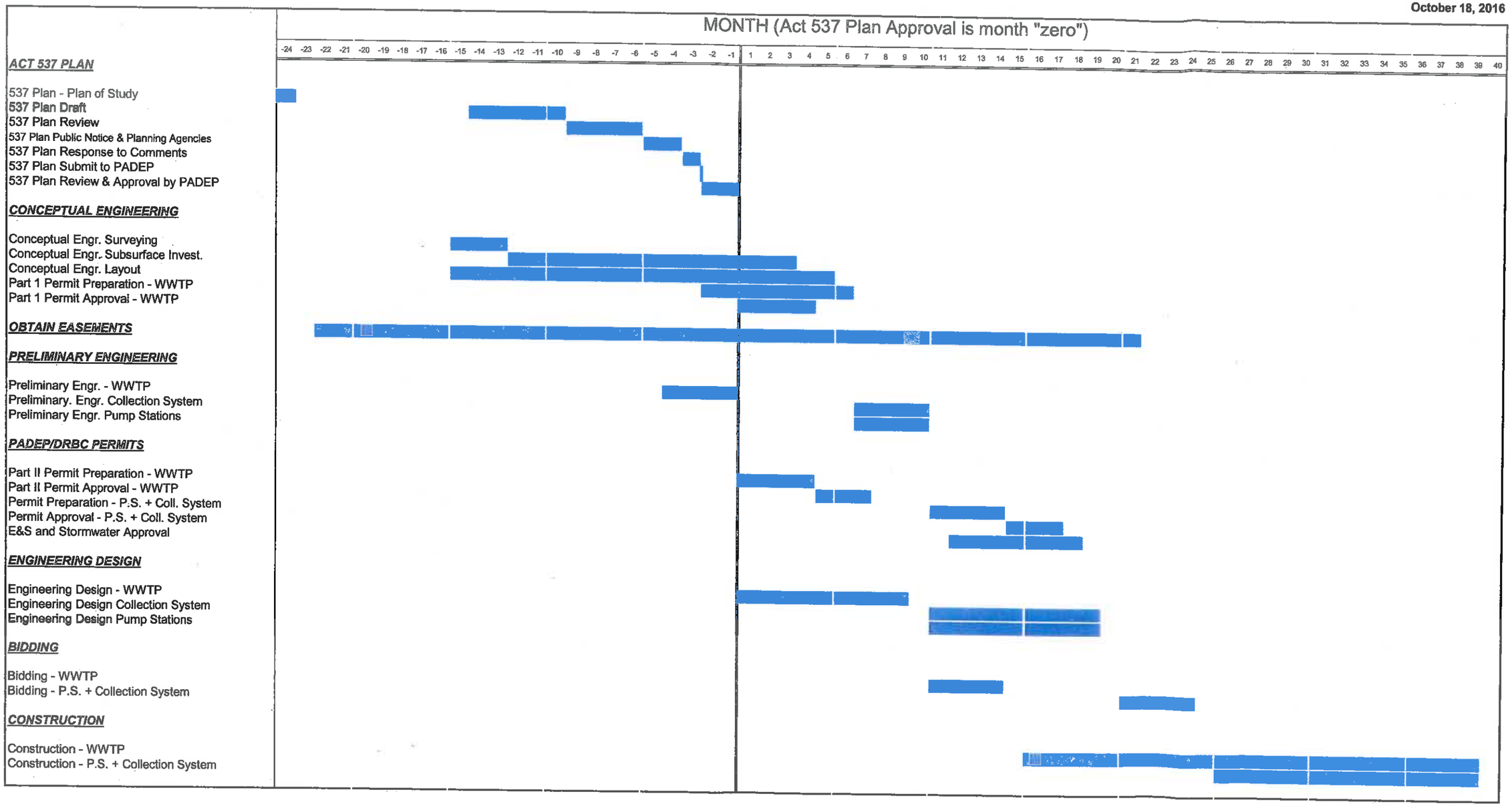
Note:

1 AADF is Annual Average Daily Flow
2 MMADF is Maximum Month Average Daily Flow
3 # EDU as agreed to by UGT and TT based on negotiations and available data from 12/31/13.
4 The 3286 EDU at MH 24A includes a Merck flow of 48,335 GPD and a Lehigh Valley Dairy flow of 141,659 GPD.
5 All non-residential EDU assumed to be tributary to MH 24A.

APPENDIX C

PROJECT SCHEDULE

UPPER GWYNEDD TOWNSHIP
TMA DIVERSION SCHEDULE
October 18, 2016



APPENDIX D

MONTGOMERY COUNTY PLANNING COMMISSION AND HEALTH DEPARTMENT NOTIFICATION

October 24, 2016

Mr. Drew Shaw, Section Chief
Montgomery County
Planning Commission
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3297
Return Receipt Requested

Dear Mr. Shaw:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

In accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period. You are being provided a copy of the Plan to facilitate your review.

Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact me with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Montgomery County
Health Department
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3303
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township, Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

In accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period. You are being provided a copy of the Plan to facilitate your review.

Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact me with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

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City, State, ZIP+4® Kulpsville PA 19443

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Street and Apt. No., or PO Box No. P.O. Box 303
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City, State, ZIP+4® West Point, PA 19486

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November 21, 2016

Mr. Drew Shaw, Section Chief
Montgomery County
Planning Commission
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3402
Return Receipt Requested

Dear Mr. Shaw,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

The revised Plan is being reissued for public comment. Therefore, in accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period.

We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

As will be discussed in Section V.A.2, there are two pump stations required for this project. One of these will be located in Towamencin Township. This pump station will be constructed outside the 100 year flood plain.

The second pump station will be located in Upper Gwynedd Townsbip. This pump station may or may not be located in the 100 year flood plain. This will be determined in the engineering design phase of work yet to be done.

Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

November 21, 2016

Montgomery County
Health Department
P.O. Box 311
Norristown, PA 19401

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3372
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

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Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

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City, State, ZIP+4® Norristown, PA 19404

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Street and Apt. No., or PO Box No. P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

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APPENDIX E

UPPER GWYNEDD TOWNSHIP & TOWAMENCIN TOWNSHIP PLANNING COMMISSIONS NOTIFICATION

October 24, 2016

Upper Gwynedd Township
Planning Commission
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3266
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

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Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Mr. Len Perrone
Township Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3310
Return Receipt Requested

Dear Mr. Perrone:

Environmental Engineering and Management Associates (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Plan-Special Study (Plan) for the Flow Diversion project.

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Please provide your comments, if any, to EEMA. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Towamencin Township
Planning Commission
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3273
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion project.

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Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager
Rob Ford, Towamencin Township Manager

October 24, 2016

Mr. Rob Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3280
Return Receipt Requested

Dear Mr. Ford:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion project.

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Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

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City, State, ZIP+4® Kulpsville PA 19443

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KULPSVILLE PA 19443 USPS OCT 24 2016
10/24/2016

Sent To Mr. Len Perrone Twp. Manager
Street and Apt. No., or PO Box No. Upper Gwynedd Township, P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

November 21, 2016

Upper Gwynedd Township
Planning Commission
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3358
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

The revised Plan is being reissued for public comment. Therefore, in accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period.

We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

As will be discussed in Section V.A.2, there are two pump stations required for this project. One of these will be located in Towamencin Township. This pump station will be constructed outside the 100 year flood plain.

The second pump station will be located in Upper Gwynedd Township. This pump station may or may not be located in the 100 year flood plain. This will be determined in the engineering design phase of work yet to be done.

Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

November 21, 2016

Mr. Len Perrone
Township Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3396
Return Receipt Requested

Dear Mr. Perrone,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

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November 21, 2016

Towamencin Township
Planning Commission
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3365
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

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November 21, 2016

Mr. Rob Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3389
Return Receipt Requested

Dear Mr. Ford,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

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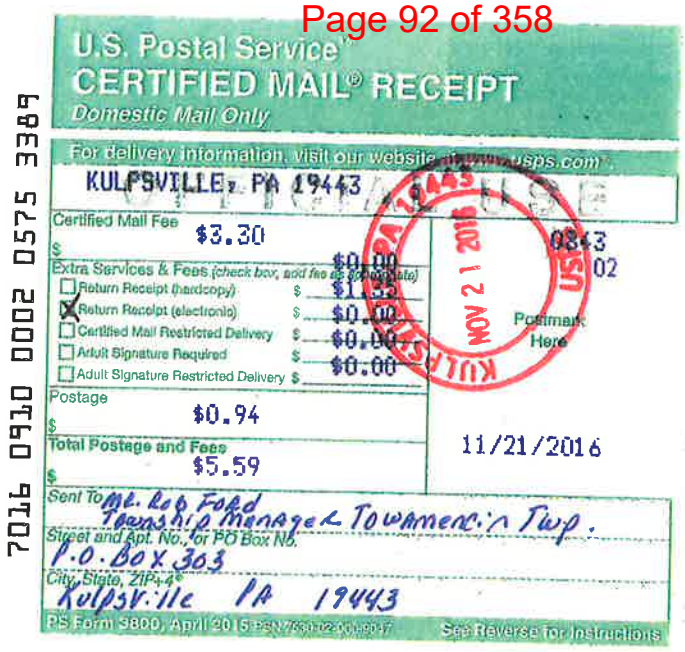

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Sent To MR. Len Perrone - Twp. MANAGER - UGT
Street and Apt. No., or PO Box No. P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

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APPENDIX F

PROOF OF PUBLICATION OF PUBLIC NOTICE

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UPPER GWYNEDD TOWNSHIP/LEGALS
P.O. BOX 1
WEST POINT, PA 19486
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF MONTGOMERY

The undersigned Nina O'Leary, being duly sworn the he/she is the principal clerk of The Reporter, The Reporter Digital, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

UPPER GWYNEDD TOWNSHIP/LEGALS

Published in the following edition(s):

The Reporter	10/24/16
The Reporter Digital	10/24/16

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN SCHMID, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 31, 2017

Sworn to the subscribed before me this 10/31/2016.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

LEGAL NOTICE

Notice is hereby given that Upper Gwynedd Township is proposing a Special Study to the Upper Gwynedd Township Act 537 Sewage Facilities Plan (hereinafter the 'Act 537 Plan – Special Study') for submission to the Pennsylvania Department of Environmental Protection for approval.

Comments concerning the Act 537 Plan – Special Study may be submitted for a period of 30 days following the date of publication of this Legal Notice. The particulars of the Act 537 Plan - Special Study and the place for submitting comments are as follows:

1. Name of Project: Upper Gwynedd Township Act 537 Sewage Facilities Plan – Special Study.

2. Type of project: Act 537 Plan - Special Study to the existing Upper Gwynedd Township comprehensive Act 537 Sewage Facilities Plan.

3. Location or areas of the municipalities affected: Upper Gwynedd Township and Towamencin Township.

4. Major recommendations of the new sewage facilities planning: Upper Gwynedd Township will divert a significant majority of flow from the western section of UGT that is currently served by the Towamencin Municipal Authority, to the UGT Wastewater Treatment Plant. UGT will construct two pump stations and two force mains to route the diverted flow to the UGT WWTP.

5. Where and when the Plan can be seen for review and comments: Upper Gwynedd Township municipal building, One Parkside Place, North Wales, Pennsylvania, 19454, telephone (215) 699-7777.

6. Comments on the Plan must be submitted in writing to the municipal offices as follows: Township Manager, Upper Gwynedd Township, P. O. Box 1, Parkside Place, West Point, PA 19486.

Leonard Perrone
Upper Gwynedd Township Manager
LAN 10/24 1-a

Advertisement Information

Client Id: 881232 **Ad Id:** 1159092 **PO:** Flow Div act 537 **Sales Person:** 093304

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AFFIDAVIT OF PUBLICATION

307 Derstine Avenue • Lansdale, PA 19446

UPPER GWYNEDD TOWNSHIP/LEGALS
P.O. BOX 1
WEST POINT, PA 19486
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF MONTGOMERY

The undersigned Nina O'Leary, being duly sworn the he/she is the principal clerk of The Reporter, The Reporter Digital, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

UPPER GWYNEDD TOWNSHIP/LEGALS

Published in the following edition(s):

The Reporter	11/21/16
The Reporter Digital	11/21/16

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN SCHMID, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 31, 2017

Sworn to the subscribed before me this 11/30/2016.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

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2. Type of project: Act 537 Plan - Special Study to the existing Upper Gwynedd Township Comprehensive Act 537 Sewage Facilities Plan.
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6. Comments on the Plan must be submitted in writing to the municipal offices as follows: Township Manager, Upper Gwynedd Township, P. O. Box 1, Parkside Place, West Point, PA 19486.
Leonard Perrone
Upper Gwynedd Township Manager
LAN 11/21 1-a

Advertisement Information

Client Id: 881232 **Ad Id:** 1185458 **PO:** Flow Div act 537 **Sales Person:** 093304

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Leonard Perrone
Upper Gwynedd Township Manager

APPENDIX G

AGENCY AND PUBLIC COMMENTS AND MUNICIPAL RESPONSE TO COMMENTS

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

November 10, 2016

File No. 16-01076T

Rob Ford, Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Reference: Upper Gwynedd Twp. Act 537 Plan Special Study Oct 2016
Plan Review 1

Dear Rob:

In accordance with the Township's request, we have reviewed the Upper Gwynedd Township (UGT) Act 537 Sewage Facilities Plan, Special Study, dated October 2016 as prepared by Environmental Engineering & Management Associates, Inc. We offer the following comments for your consideration:

1. The UGT Act 537 Plan, Special Study, is consistent with the March 2, 2015 intermunicipal agreement for the planned diversion of flows from the Towamencin Municipal Authority (TMA) Kriebel Road Interceptor service area to the Upper Gwynedd Township sewer service area. Flows are proposed to be diverted at two locations along Valley Forge Road, Valley Forge Road North (VFRN) near Sumneytown Pike and Valley Forge Road South (VFRS) near the Pa Turnpike. Flows from approximately 3700 EDU of the estimated 4000 EDU served by TMA are proposed to be diverted via the construction of two pump stations. The VFRM pump station is proposed to be constructed in UGT the VFRS pump station is located in Towamencin Township (TT).

2. The projected is anticipated to be completed in 2020.

3. The remaining flows from UGT to TT are tributary to TMA sewers at Hillside Avenue and Anders Road. The estimated average daily flows from these two locations total approximately 120,000 gallons per day.

4. Technical items we recommend be addressed in the plan are as follows:

   a. We suggest the Customer Service Agreement in Appendix B also include the March 2, 2015 Intermunicipal Agreement, as well as the attachments to the customer service agreement.

   b. An additional detailed map should be provided that clearly identifies the properties in UGT that will be serviced by TT. The overall collection system map in the plan is at scale that makes the specific service area boundary difficult to

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www.gilmore-assoc.com

identify relative to specific properties. The number of EDU that exist on each property served by TT should be identified. The projected future flows from vacant property to be served by TT should be estimated. The map should also identify the two remaining intermunicipal meter locations.

c. The collection system map in the report should be updated to indicate the sewers in UGT tributary to TMA are not owned or maintained by TMA. These sewers along with the PA Turnpike trunk sewer from Valley Forge Rd to MH 30 in TT were transferred to UGT in 2015.

d. All sewers tributary to the VFRS pump station that are located in UGT or TT should be owned and maintained by UGT. The five properties in TT served by those sewers should be identified with the number of EDU associated with each property (See attached map, Exhibit C of the intermunicipal agreement).

e. The plan should indicate that their will remain no interceptor or pump station bypass flow connection from UGT to TT sewer system in either sewer service area being diverted to UGT. UGT should remove a portion of the KRI upstream of MH 30 located in Towamencin Township and permanently plug the UGT sewer connection into MH 30. The flow meter at VFRS pump station site shall be removed and returned to TMA (See attached map, Exhibit C of the intermunicipal agreement). UGT should remove the UGT sewer tributary to TT last manhole on the KRI (MH 24A) near the VFRN pump station site and permanently plug the UGT sewer connection into the manhole.

f. The plan should address the planned KRI upgrades in Towamencin Township relative to timing and UGT payment of a portion of the costs per the intermunicipal agreement. The intermunicipal agreement targets substantial completion of the KRI upgrades for May 2018.

The above comments are made with the understanding that all information is accurately represented in the plan.

Should you have any questions or need further information, please feel free to contact me at 610-489-4949 or wdingman@gilmore-assoc.com.

Very truly yours,

William K. Dingman

William K. Dingman, P.E.
Senior Municipal Engineer
Gilmore & Associates, Inc.

cc: Jennifer Guckin, Director of Community Planning, Towamencin Township (email only)
Tom Zarko, P.E., CKS Engineers, Inc., Township Engineer (email only)
Brent Wagner, Manager, TMA (email only)

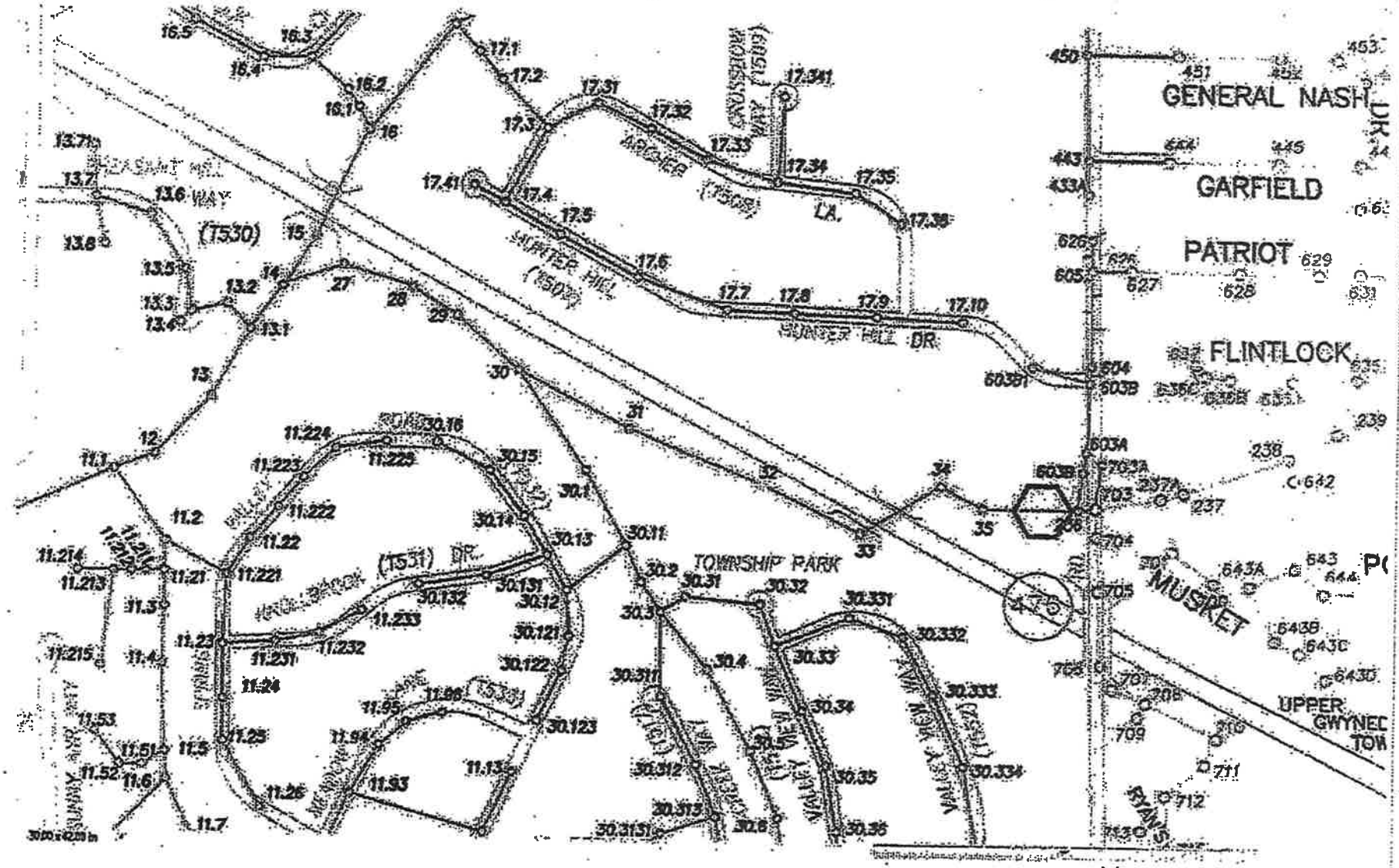


Exhibit "C"

Amended Attachment 19-A
Page 100 of 358

AGENCY AND PUBLIC COMMENTS AND MUNICIPAL RESPONSE TO COMMENTS

Upper Gwynedd Township (UGT) published Legal Notices on October 24, 2016 and November 21, 2016 soliciting public comments for the Act 537 Plan – Special Study Dated October 2016. The second notice was published to include one relatively minor revision that was discussed with PADEP. The first 30 day public comment period ran from October 24, 2016 to November 23, 2016. The second public comment period ran from November 21, 2016 to December 21, 2016. The Legal Notice and Proofs of Publication are included in Appendix F.

In addition to the Legal Notice for public comment, UGT also sent, via certified mail, notice to six entities notifying them, on two different dates, of publication of the Legal Notice (and the revision which prompted the second Legal Notice), and requesting their review and approval of the Act 537 Plan – Special Study Dated October 2016. The six entities to which certified mail letters were sent are:

Upper Gwynedd Township Board of Commissioners

Upper Gwynedd Township Planning Commission

Towamencin Township Board of Supervisors

Towamencin Township Planning Commission

Montgomery County Planning Commission

Montgomery County Health Department

Certified mail receipts are included in this appendix G.

Responses were received from four of these entities. Included in this Appendix G are the response letters. Of the four responses, only one of them, Towamenicn Township included comments. These comments are addressed herein.

RESPONSE TO TOWAMENICN TOWNSHIP COMMENTS

Towamencin Township's comments are included in their November 10, 2016 letter included in this Appendix G. The responses are being addressed in the order in which they are presented in paragraph 4 of the comments letter.

Comment 4 a: The March 2, 2015 Intermunicipal Agreement has been included in Appendix B. The attachment to the Customer Service agreement was already included in Appendix B.

Comment 4 b: Figure 2 has been added to Appendix A. Figure 2 is an enlargement of a section of the collection system included in Figure 1. Figure 2 highlights the two crossing points that will not be diverted. These crossing points are described in Section III.B.3, Page 12 of the Act 537 Plan. Crossing Point 2 is at Jacks Lane and Crossing Point 3 is at Anders Road. Based on discussions with Towamencin Township's Engineer, it was agreed that the properties which define the perimeter of each of these service areas would be included.

The properties for the Jacks Lane crossing point are as follows:

1816 Broad Street (Manhole 1038)

1888 Steuben Drive (Manhole 1016)

1837 & 1840 Supplee Road (Manhole 654)

1637 Valley Forge Road (Manhole 471 A)

1632 Clearview Road (Manhole 432

1634 & 1635 Clearbrook Road (Manhole 440)

The properties for the Anders Road crossing point are as follows:

864 Garfield Avenue (Manhole 1002)

1892 & 1895 Steuben Drive (Manhole 1003)

1901 General Nash Drive (Manhole 447)

1900 General Nash Drive (Manhole 446)

1901 Valley Forge Road (Manhole 443 A)

A note has been added to Figure 1 stating that each UGT property that will continue to be served by the Towamencin Municipal Authority (TMA) contains one Estimated Dwelling Unit (EDU). A note has also been added to Figure 1 stating that no additional flow is projected to come from the service areas that will continue to be served by the TMA.

Figure 2 includes the location of the two remaining meter locations. These meter locations are for the Jacks Lane and Anders Road crossing points service areas.

Comment 4 c: A note has been added to Figure 1 stating that the sewers in UGT tributary to TMA are now owned and maintained by UGT.

Comment 4 d: A note has been added to Figure 1 stating that all sewers tributary to the Valley Forge Road South (VFRS) Pump Station that are located in UGT or TT are owned and maintained by UGT. The note also includes that there are five properties in TT located on Valley Forge Road that will be tributary to the VFRS pump station and be served by UGT.

There are four residential properties and the church located just north of the PA Turnpike North East Extension. Reference is made to Attachment C in the Intermunicipal Agreement included in Appendix B.

Comment 4 e: An additional sentence has been added to Section V.A.2.2, Page 26 as follows: "There will be no interceptor or pump station bypass flow connection from the UGT sewer system to the TT sewer system in either sewer service area being diverted to UGT".

When the project is put out for public bid, the project plans will include the work necessary to remove a section of pipe upstream of each of Manholes 24A and 30 so that a plug can be inserted permanently preventing any flow from being diverted from UGT to TT. The plans will also include the work necessary to remove the flow meter at the VFRS pump station location and return the meter to TMA.

Comment 4 f: The Intermunicipal Agreement references the "Kriebel Road Interceptor Bottleneck Project" on Pages 5 and 6. It is TMA's decision as to how this project is addressed. UGT will abide by the terms of the Intermunicipal Agreement.

Upper Gwynedd Township
Planning Commission

P. O. BOX #1 • WEST POINT, PA. 19486

December 20, 2016

Board of Commissioners
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Act 537 Plan Revision – Diversion Project

Dear Commissioners:

At its December 5, 2016 meeting, the Planning Commission voted to recommend that the Board of Commissioners approve the above-noted plan as submitted.

Sincerely,

John Klein
Secretary

/ct

MONTGOMERYCOUNTY
BOARD OF COMMISSIONERS
VALERIE A. ARKOOSH, MD, MPH, CHAIR
JOSH SHAPIRO, VICE CHAIR
JOSEPH C. GALE

MONTGOMERY COUNTY
PLANNING COMMISSION
MONTGOMERY COUNTY COURTHOUSE • PO BOX 311
NORRISTOWN, PA 19404-0311
610-278-3722
FAX: 610-278-3941 • TDD: 610-631-1211
WWW.MONTCOPA.ORG
JODY L. HOLTON, AICP
DIRECTOR

RECEIVED
DEC 12 2016
BY:

December 8, 2016

MCPC 537 Number: 16-2186
UGT Flow Diversion Project
Upper Gwynedd Township
Date revision received by the County
Planning Commission: 10/25/16

Mr. Leonard T. Perrone, Manager
Upper Gwynedd Township
1 Parkside Place
North Wales, PA 19454

Dear Mr. Perrone:

We have reviewed the proposed UGT Flow Diversion Project in accordance with regulations issued under Act 537, "The Pennsylvania Sewage Facilities Act," as requested. We are forwarding this letter as a report of our review and recommendations.

BACKGROUND

The Township is proposing to divert approximately 0.95 MGD of sewage flows from the Towamencin Municipal Authority WWTP (TMA WWTP, formerly the UGTMA WWTP) to the Upper Gwynedd Township WWTP (UGT WWTP). The Special Study indicates that the proposed diversion will have environmental and economic benefits: the diversion will likely eliminate the SSO from the Kriebel Road Interceptor, and it avoids the costs associated with what would have been the Township's share of the cost for future upgrades of the TMA WWTP and Kriebel Road interceptor.

COMMENTS/ISSUES

Flow Diversion and Capacity: The Special Study indicates that 0.95 MGD of existing flow is to be diverted to the UGT WWTP. A 0.1 MDG reserve for Merck and a projected 0.25 MGD for future growth is added to the existing flow for a total of 1.3 MGD capacity needed. We understand that the Township is proposing an Annual Average Daily Flow of 7.0 MGD.

Growth Impacts: The Special Study indicates that limited growth (122 EDUs) may occur in Upper Gwynedd Township, and that the available capacity resulting in the TMA WWTP may

also encourage development. We note that the county comprehensive plan indicates that the majority of both townships are designated as developed land or potential development area, with the exception of the Towamencin 'panhandle'. Any extension of public sewers to serve growth that occurs as a result of the flow diversion project would likely be consistent with the County Comprehensive Plan, so long as it is outside of the 'panhandle' area.

RECOMMENDATION:

We have no objections to approval of this Special Study, provided it conforms to all applicable DEP requirements.

Should you have questions on the comments contained in this letter, please contact me. My contact information is provided below.

Sincerely,

Drew Shaw, AICP
Environmental Planning Section Chief
dshaw@montcopa.org
(610) 278-3733

Montgomery County Planning Commission
P. O. Box 311
Norristown, PA 19404-0311
www.planning.montcopa.org

c. Elizabeth Mahoney
John V. Interrante, P.E.

MONTGOMERY COUNTY
BOARD OF COMMISSIONERS
JOSH SHAPIRO, CHAIR
VALERIE A. ARKOOSH, MD, MPH, VICE CHAIR
JOSEPH C. GALE

HEALTH DEPARTMENT
PO Box 311
NORRISTOWN, PA 19404-0311

TEL: 610-278-5117
FAX: 610-278-5167
WWW.HEALTH.MONTCOPA.ORG

VALERIE A. ARKOOSH, MD, MPH
INTERIM MEDICAL DIRECTOR
IRSHAD A. SHAIKH, MD, PHD, MPH
HEALTH ADMINISTRATOR

November 4, 2016

Leonard T. Perrone, Manager
Upper Gwynedd Township
P. O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study
Sewage Facilities Planning Module Component 4C
Upper Gwynedd Township, Montgomery County, PA

Dear Mr. Perrone:

The Montgomery County Health Department (MCHD) has reviewed the Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study. MCHD has no objections at this time to the proposed revision of the Upper Gwynedd Township official plan to include this plan update.

If you have any further questions, please contact me at (610) 278-5117 extension 6730.

Sincerely,

Tori McQueen
Environmental Health Specialist/SEO
Division of Water Quality Management
tmcqueen@montcopa.org

Enclosures

xc: Department of Environmental Protection
Environmental Engineering & Management Associates, Inc.
File

3800-FM-BPNPSM0362C 11/2012

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

DEP Code #:

SEWAGE FACILITIES PLANNING MODULE
COMPONENT 4C - COUNTY OR JOINT HEALTH DEPARTMENT REVIEW

Note to Project Sponsor: To expedite the review of your proposal, one copy of your completed planning module package and one copy of this ***Planning Agency Review Component*** should be sent to the county or joint county health department for their comments.

SECTION A. PROJECT NAME (See Section A of instructions)

Project Name

Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study

SECTION B. REVIEW SCHEDULE (See Section B of instructions)

1. Date plan received by county or joint-county health department. October 26, 2016

   Agency name Montgomery County Health Department

2. Date review completed by agency November 4, 2016

SECTION C. AGENCY REVIEW (See Section C of instructions)

Yes	No		
☒	☐	1.	Is the proposed plan consistent with the municipality's Official Sewage Facilities Plan? If no, what are the inconsistencies?
☐	☒	2.	Are there any waste water disposal needs in the area adjacent to the new land development that should be considered by the municipality? If yes, describe
☐	☒	3.	Is there any known groundwater degradation in the area of the proposed subdivision? If yes, describe
☒	☐	4.	The county or joint county health department recommendation concerning this proposed plan is as follows: MCHD has no objections to Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study.
		5.	Name, title and signature of person completing this section:

Name: Tori McQueen

Title: Environmental Health Specialist/SEO

Signature: [signature]

Date: November 4, 2016

Name of County Health Department: Montgomery County Health Department

Address: 1430 DeKalb Street, P.O. Box 311, Norristown, Pa 19404

Telephone Number: 610-278-5117

SECTION D. ADDITIONAL COMMENTS (See Section D of instructions)

This Component does not limit county planning agencies from making additional comments concerning the relevancy of the proposed plan to other plans or ordinances. If additional comments are needed, attach additional sheets.

The county planning agency must complete this Component within 60 days.
This Component and any additional comments are to be returned to the applicant.

APPENDIX H

ORIGINAL SIGNED AND SEALED RESOLUTIONS BY UPPER GWYNEDD TOWNSHIP AND TOWAMENCIN TOWNSHIP

RESOLUTION NO. 18-2016 FOR PLAN REVISION

RESOLUTION OF THE BOARD OF COMMISSIONERS OF UPPER GWYNEDD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA (hereinafter "the municipality").

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, UPPER GWYNEDD TOWNSHIP has prepared an ACT 537 PLAN – SPECIAL STUDY which provides for revisions to the sewage facilities in a portion of UPPER GWYNEDD TOWNSHIP.

The alternative of choice to be implemented is ESTABLISHMENT OF AVERAGE ANNUAL FLOW CAPACITIES FOR THE EAST INTERCEPTOR, BRIAR GLEN PUMP STATION, AND CONRAD AVENUE PUMP STATION, AN EVALUATION OF THE FLOW PER ESTIMATED DWELLING UNIT FOR PLANNING PURPOSES, AND A DISCUSSION OF THE TEMPORARY LARGER PUMPS AT THE ABOVE REFERENCED PUMP STATIONS.

WHEREAS, UPPER GWYNEDD Township finds that the Facility Plan (Act 537 PLAN – SPECIAL STUDY) described above conforms to Upper Gwynedd's Connection Management Plan, Corrective Action Plan, applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of UPPER GWYNEDD Township hereby adopts and submits to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the municipality, the above referenced Facility Plan. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law. (Section 5, Pennsylvania Sewage Facilities Act as amended).

I, LEONARD T. PERRONE, Secretary, UPPER GWYNEDD Township Board of Commissioners hereby certify that the foregoing is a true copy of the Township's Resolution No. 18-2016, adopted AUGUST 22, 2016.

Attest:

BOARD OF COMMISSIONERS OF UPPER GWYNEDD TOWNSHIP MONTG. CO. PA

Leonard T. Perrone
Secretary

BOARD OF COMMISSIONERS
UPPER GWYNEDD TOWNSHIP

By: Kenneth E. Kroberger
Kenneth E. Kroberger
President

APPENDIX I

PADEP ACT 537 PLAN CHECKLIST

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

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 the Department of Environmental Protection (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 25 *Pa. Code* 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 (UER) process 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 *Guidelines for the Uniform Environmental Review Process in Pennsylvania* (381-5511-111) is available electronically in DEP's eLibrary online at www.dep.pa.gov.

After Municipal Adoption by Resolution, submit 3 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.

3850-FM-BCW0003 6/2016
Checklist

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name: Upper Gwynedd Township Act 537 Plan Revision - Special Study

2. Brief Project Description:

Flow Diversion from TMA WWTP to UGT WWTP

B. Client (Municipality) Information

Municipality Name	County	City	Boro	Twp
Upper Gwynedd Township	Montgomery	☐	☐	☒

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Perrone	Leonard	T		

Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
P.O. Box 1	

Address Last Line – City	State	ZIP+4
West Point	PA	19486

Phone + Ext.	FAX (optional)	Email (optional)
215-699-7777	215-699-8846	lperrone@uppergwynedd.org

C. Site Information

Site (or Project) Name: Upper Gwynedd Township (Municipal Name) Act 537 Plan

Site Location Line 1	Site Location Line 2

D. Project Consultant Information

Last Name	First Name	MI	Suffix
Interrante	John	V.	P.E.

Title	Consulting Firm Name
Principal Engineer	Environmental Engineering & Management Associates, Inc.

Mailing Address Line 1	Mailing Address Line 2
P.O. Box 232	

Address Last Line – City	State	ZIP+4	Country
Kulpsville	PA	19443	USA

Email	Phone + Ext.	FAX
jinterrante@eema-inc.com	215-368-3375	215-368-6739

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 DEP. Incomplete plans may be ***denied*** unless the municipality is clearly requesting an advisory review.
____	i	1. **Table of Contents**
		2. **Plan Summary**
____	2	A. Identify the proposed service areas and major problems evaluated in the plan (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	2	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	3	D. Identify the municipal commitments necessary to implement the Plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(iii)).
____	3	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 - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.31(f)) Section V.F. of the Planning Guide.
____	App. D & G	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 - 25 *Pa. Code* §71.31(b)) Section V.E.1 of the Planning Guide.
____	App. F	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 - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	App. G	6. **Comments and Responses:** Copies of ***all*** written comments received and municipal response to ***each*** comment in relation to the proposed plan. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	42	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 - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.21(c)).
____	27-32	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 25 *Pa. Code* §71.21 (a)(5)(i-iii). (Reference - 25 *Pa. Code* §71.31(e)). Appendix 8 of the Planning Guide

PART 3 GENERAL PLAN CONTENT CHECKLIST

DEP Use Only	Indicate Page #(s) in Plan		Item Required
____	~~5~~	I.	**Previous Wastewater Planning**
			A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
____	5		1. Previously undertaken under the Pennsylvania Sewage Facilities Act (Act). (Reference - Act 537, 35 P.S. §750.5(d)(1)).
____	N/A		2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A-D)). Section V.F of the Planning Guide.
____	5 & App.M		3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A&B)). Section V.D. of the Planning Guide.
____	~~5 &~~ App.O		4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)).
____	6 ~~& App. I~~ A		**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).
____	6 & App.A		A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference – 25 *Pa. Code* §71.21(a)(1)(i)).
____	N/A		B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
____	N/A		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 (IRSIS), and areas unsuitable for soil dependent systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
____	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(iii)).
____	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(ii)).
____	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(vi)). Section V.C. of the Planning Guide.
____	6 & App. J.		G. Wetlands-Identify wetlands as defined in 25 *Pa. Code* Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) 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 - 25 *Pa. Code* §71.21(a)(1)(v)). Appendix B, Section II.I of the Planning Guide.

8 & App. A

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:

8-11 & App. A

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 - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

App. K & App. L

2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's National Pollutant Discharge Elimination System (NPDES) permitted capacity, and the Clean Streams Law permit number. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

13 & App.M

3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under 25 *Pa. Code* 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 - 25 *Pa. Code* §71.21(a)(2)(i)(B)).

14-23 App. C & App. M

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 - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

N/A

5. A detailed description of the municipality's operation and maintenance (O & M) 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 (SMPs). (Reference – 25 *Pa. Code* §71.21(a)(2)(i)(C)).

N/A

6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

N/A

B. Using DEP's publication titled *Act 537 Sewage Disposal Needs Identification* (3800-BK-DEP1949), 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:

N/A

1. The types of onlot systems in use. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(A)).

N/A

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 Act, the Clean Stream Law or regulations promulgated thereunder. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

N/A

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 25 *Pa. Code* Chapter 73 (relating to standards for sewage disposal facilities). (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A

4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's *Act 537 Sewage Disposal Needs Identification* publication. (Reference – 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

N/A

5. Detailed description of O & M 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 SMPs. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(C)).

N/A

C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:

N/A

1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference – 25 *Pa. Code* §71.71).

N/A

2. Quantities of the types of sludges or septage generated. (Reference - 25 *Pa. Code* §71.71).

N/A

3. Present disposal methods, locations, capacities and transportation methods. (Reference - 25 *Pa. Code* §71.71).

14-18

IV. Future Growth and Land Development

A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:

App. N

1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).

N/A

2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – 25 *Pa. Code* §71.21(a)(3)(iv)).

N/A

3 All limitations and plans related to floodplain and stormwater management and special protection (25 *Pa. Code* Chapter 93) areas. (Reference - 25 *Pa Code* §71.21(a)(3)(iv)) Appendix B, Section II.F of the Planning Guide

14-19 & App. O

B. Delineate and describe the following through map, text and analysis.

App. O

1. Areas with existing development or platted subdivisions. Include the name, location, description, total number of equivalent dwelling units (EDUs) in development, total number of EDUs currently developed and total number of EDUs remaining to be developed (include time schedule for EDUs remaining to be developed). (Reference - 25 *Pa. Code* §71.21(a)(3)(i)).

N/A

2 Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas (Reference - 25 *Pa. Code* §71.21(a)(3)(ii)) Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning (Reference - 25 *Pa. Code* §71.21(a)(3)(iv))

14-19

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 - 25 *Pa. Code* §71.21(a)(1)(iv) and (a)(3)(iii)).

N/A

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 - 25 *Pa. Code* §71.21(a)(3)(iv)).
   --public ground/surface water supplies
   --recreational water use areas
   --groundwater recharge areas
   --industrial water use
   --wetlands

14-19 App.O

5. Sewage planning necessary to provide adequate wastewater treatment for 5 and 10-year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(3)(v)).

19 **V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities**

A. Conventional collection, conveyance, treatment and discharge alternatives including.

N/A 1. The potential for regional wastewater treatment. (Reference - 25 *Pa. Code* §71.21(a)(4))

N/A 2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i))

3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference - 25 *Pa Code* §71.21(a)(4)(ii)).

N/A a. Repair. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

N/A b. Upgrading. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

App.M c. Reduction of hydraulic or organic loading to existing facilities. (Reference - 25 *Pa. Code* §71.71).

N/A d. Improved O & M. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(C)).

N/A e. Other applicable actions that will resolve or abate the identified problems. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(D))

App.M 4. Repair or replacement of existing collection and conveyance system components. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

N/A 5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iii))

N/A 6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

N/A B. The use of individual sewage disposal systems including IRSIS systems based on:

N/A 1. Soil and slope suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 3. The establishment of a SMP. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)). See also Part "F" below.

N/A 4. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for onlot disposal considering: (Reference - 25 *Pa. Code* §71.21(a)(4)).

N/A a. Existing technology and sizing requirements of 25 *Pa. Code* Chapter 73. (Reference - 25 *Pa. Code* §73.31-§73.72).

N/A b. Use of expanded absorption areas or alternating absorption areas. (Reference - 25 *Pa. Code* §73.16).

N/A c. Use of water conservation devices. (Reference - 25 *Pa. Code* §71.73(b)(2)(iii)).

N/A

C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of. (Reference - 25 *Pa. Code* §71.64(d)).

N/A 1. Treatment and discharge requirements. (Reference - 25 *Pa. Code* §71.64(d)).

N/A 2. Soil suitability. (Reference - 25 *Pa. Code* §71.64(c)(1)).

N/A 3. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.64(c)(2)).

N/A 4. Municipal, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.64(d)). See Part "F" below

N/A D The use of community land disposal alternatives including:

N/A 1 Soil and site suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 3 Municipality, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §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.

N/A E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

N/A 1. Commercial, residential and industrial use. (Reference - 25 *Pa. Code* §71.63(e)).

N/A 2 Designated conveyance facilities (pumper trucks). (Reference - 25 *Pa. Code* §71.63(b)(2)).

N/A 3. Designated treatment facilities or disposal site. (Reference - 25 *Pa. Code* §71.63(b)(2)).

N/A 4. Implementation of a retaining tank ordinance by the municipality. (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.63(c)(2)).

N/A F. SMPs to assure the future O & M of existing and proposed sewage facilities through:

N/A 1. Municipal ownership or control over the O & M of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)).

N/A 2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.73(b)(2)).

N/A 4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv) and §71.73(b)(5)) through:

N/A a. Aggressive pro-active enforcement of ordinances that require O & M and prohibit malfunctioning systems. (Reference - 25 *Pa. Code* §71.73(b)(5)).

N/A b. Public education programs to encourage proper O & M and repair of sewage disposal systems.

N/A 5. Establishment of joint municipal SMPs. (Reference - 25 *Pa. Code*

§71.73(b)(8)).

6. Requirements for bonding, escrow accounts, management agencies or associations to assure O & M for non-municipal facilities. (Reference - 25 *Pa. Code* §71.71).

G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Modification of existing comprehensive plans involving:

a. Land use designations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

b. Densities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

c. Municipal ordinances and regulations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

d. Improved enforcement. (Reference - 25 *Pa. Code* §71.21(a)(4)).

e. Protection of drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference - 25 *Pa. Code* §71.21(a)(4)).

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 - 25 *Pa. Code* §71.21(a)(4)).

4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference - 25 *Pa. Code* §71.21(a)(4)).

H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Water quality/public health. (Reference - 25 *Pa. Code* §71.21(a)(4)).

2. Growth potential (residential, commercial, industrial). (Reference - 25 *Pa. Code* §71.21(a)(4)).

3. Community economic conditions. (Reference - 25 *Pa. Code* §71.21(a)(4)).

4. Recreational opportunities (Reference - 25 *Pa. Code* §71.21(a)(4)).

5. Drinking water sources (Reference - 25 *Pa. Code* §71.21(a)(4)).

6. Other environmental concerns (Reference - 25 *Pa. Code* §71.21(a)(4))

27-33

VI. Evaluation of Alternatives

A. Technically feasible alternatives identified in Section V of this checklist must be evaluated for consistency with respect to the following: (Reference - 25 *Pa. Code* §71.21(a)(5)(i)).

27-28

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 - 25 *Pa. Code* §71.21(a)(5)(i)(A)). Appendix B, Section II.A of the Planning Guide.

28

2. Municipal wasteload management **Corrective Action Plans or Annual Reports** developed under 25 *Pa. Code* Chapter 94. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(B)). The municipality's recent Wasteload Management (25 *Pa. Code* 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.

28

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 - 25 *Pa. Code* §71.21(a)(5)(i)(C)). Appendix B, Section II.E of the Planning Guide.

28

4 **Comprehensive plans developed under the Pennsylvania Municipalities Planning Code.** (Reference - 25 *Pa. Code* §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.

28

5. **Antidegradation requirements** as contained in 25 *Pa. Code* Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(E). Appendix B, Section II.F of the Planning Guide.

28

6. **State Water Plans** developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(F)). Appendix B, Section II.C of the Planning Guide.

29

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 - 25 *Pa. Code* §71.21(a)(5)(i)(G)). Appendix B, Section II.G of the Planning Guide.

29

8. **County Stormwater Management Plans** approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference - 25 *Pa. Code* §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.

29

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 - 25 *Pa. Code* §71.21(a)(5)(i)(I)) Appendix B, Section II.I of the Planning Guide.

29

10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference - 25 *Pa. Code* §71.21(a)(6)(i)(J)). Provide DEP with a copy of the completed *PNDI Manual Project Submission Form*. Also provide a copy of the response letters from the 4 jurisdictional agencies regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

29

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 (PHMC). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(K)). Provide DEP with a completed copy of a *Cultural Resource Notice* and a return receipt for its submission to PHMC. Provide a copy of the response letter or review stamp from the Bureau of Historic Preservation (BHP) indicating the project will have no effect on, or that there may be potential impacts on, known archaeological and historical sites and any avoidance and mitigation measures required. Appendix B, Section II.K of the Planning Guide.

N/A

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 - 25 *Pa. Code* §71.21(a)(5)(ii)) Appendix B of the Planning Guide.

27-28

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 - 25 *Pa. Code* §71.21(a)(5)(iii)).

33-36 & App. Q

D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, O & M 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 5 years from the date of plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(iv)).

33,34,41-42 & App. Q

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 5 years from the date of the plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(v)).

37

F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference - 25 *Pa. Code* §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 SMPs. (Reference - 25 *Pa. Code* §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 SMP justifying time schedules for each phase. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(B)).

36

G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(D)).

37-38

VII. Institutional Evaluation

A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:

37-38

1. Financial and debt status. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

2. Available staff and administrative resources. (Reference - 25 *Pa. Code* §71.61(d)(2))

37-38

3. Existing legal authority to:

37-38

a. Implement wastewater planning recommendations. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

b. Implement system-wide O & M activities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

c. Set user fees and take purchasing actions. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

d. Take enforcement actions against ordinance violators. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

e. Negotiate agreements with other parties. (Reference - 25 *Pa. Code* §71.61(d)(2)).

33-37

37-38

37-38

N/A

N/A

37-38

N/A

37-38 & App. B

24-25

N/A

App. B

App. C

29-31,37,38

42-43

f. Raise capital for construction and O & M of facilities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:

1. Need for new municipal departments or municipal authorities. (Reference - 25 *Pa. Code* §71.61(d)(2)).
2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference - 25 *Pa. Code* §71.61(d)(2)).
3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference - 25 *Pa. Code* §71.61(d)(2)).

C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:

1. Incorporation of authorities or agencies. (Reference - 25 *Pa. Code* §71.61(d)(2)).
2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference - 25 *Pa. Code* §71.61(d)(2)).
3. Description of activities to provide rights-of-way, easements and land transfers. (Reference - 25 *Pa. Code* §71.61(d)(2)).
4. Adoption of other municipal sewage facilities plans. (Reference - 25 *Pa. Code* §71.61(d)(2)).
5. Any other legal documents. (Reference - 25 *Pa. Code* §71.61(d)(2)).
6. Dates or timeframes for items 1-5 above on the project's implementation schedule.

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 - 25 *Pa. Code* §71.61(d)(2)).

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:

38-41

39-41

N/A

33-37 & 41-42

N/A

41-42 & App. Q

28-29

1 Existing wastewater disposal needs. (Reference - 25 *Pa. Code* §71.21(a)(6)).
2. Future wastewater disposal needs. (5 and 10 year growth areas). (Reference - 25 *Pa. Code* §71.21(a)(6))
3. O & M considerations. (Reference - 25 *Pa. Code* §71.21(a)(6))
4. Cost-effectiveness. (Reference - 25 *Pa. Code* §71.21(a)(6))
5 Available management and administrative systems. (Reference - 25 *Pa. Code* §71.21(a)(6)).
6 Available financing methods. (Reference - 25 *Pa. Code* §71.21(a)(6)).
7. Environmental soundness and compliance with natural resource planning and preservation programs (Reference - 25 *Pa. Code* §71.21(a)(6))

41-42

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 - 25 *Pa. Code* §71.21(a)(6))

42 & App.C

C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a SMP. (Reference – 25 *Pa. Code* §71.31(d))

N/A

N/A

IX. Environmental Report (ER) generated from the UER Process:

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.***

PENNVEST I.D. No. _____

ADDITIONAL REQUIREMENTS FOR PENNVEST PROJECTS

Municipalities that propose to implement their official sewage facilities plan updates with PENNVEST funds must meet 6 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
____	N/A	1. Environmental Impact Assessment (Planning Phase) The UER replaces the Environmental Impact Assessment that was a previous requirement for PENNVEST projects.
____	N/A	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)

IIA 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

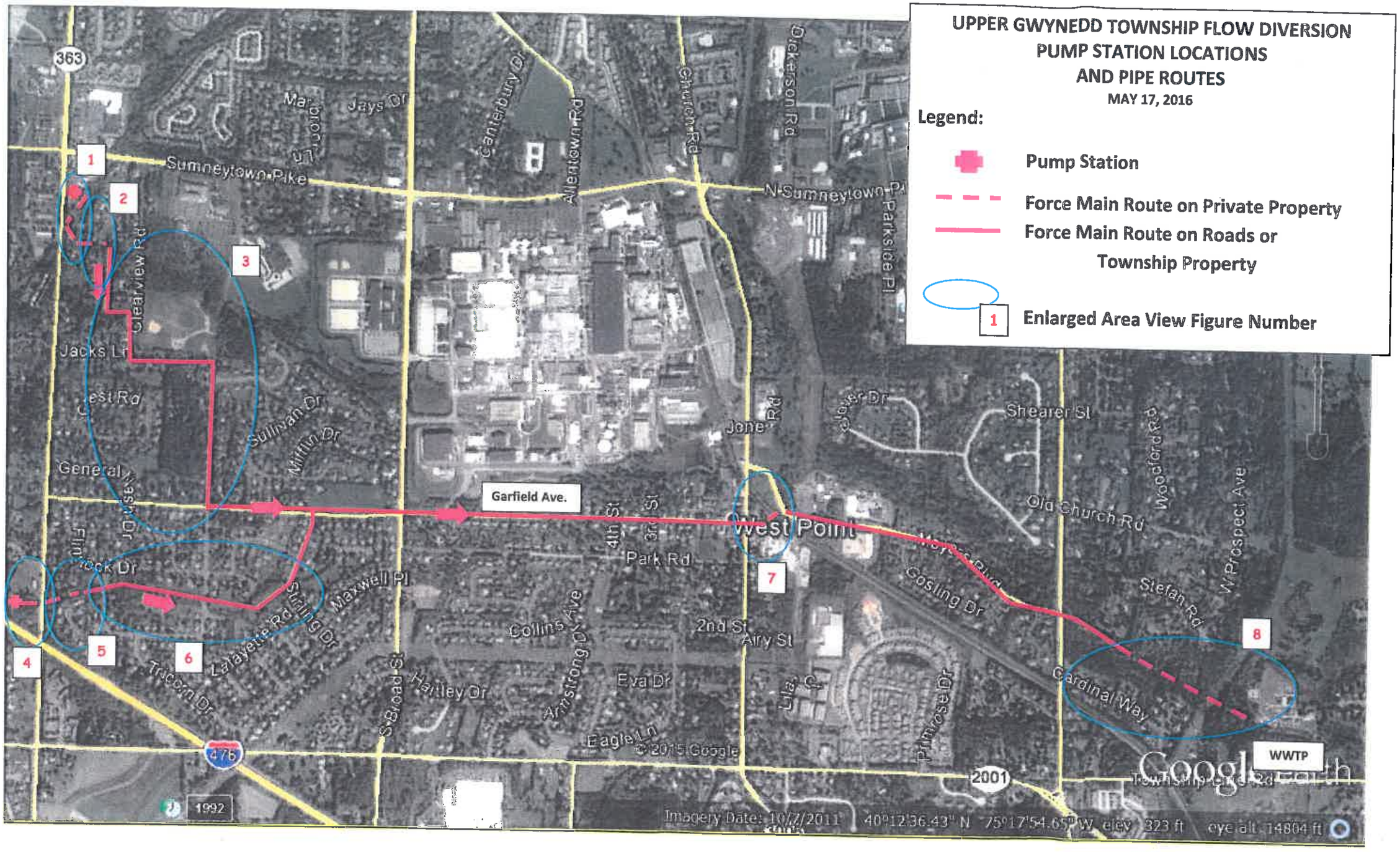
Anaerobic Digestion with more than 90 percent Methane Recovery
Cogeneration of Electricity
Self-Sustaining Incineration

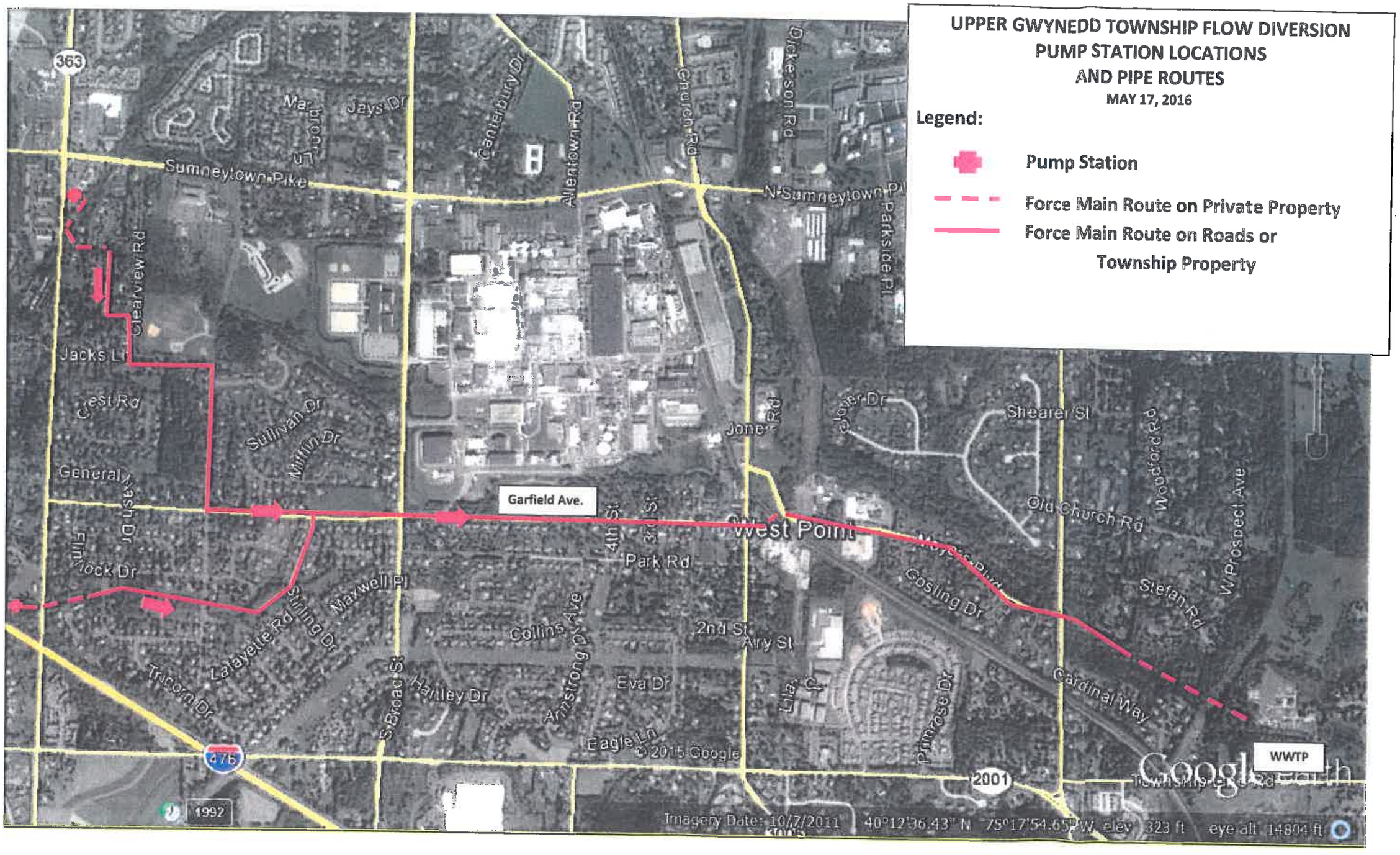
INDIVIDUAL & SYSTEM-WIDE COLLECTION TECHNOLOGIES

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

APPENDIX J

PUMP STATION AND FORCE MAIN MAP WITH EASEMENTS


UPPER GWYNEDD TOWNSHIP FLOW DIVERSION
PUMP STATION LOCATIONS
AND PIPE ROUTES
MAY 17, 2016
Legend:
Pump Station
Force Main Route on Private Property
Force Main Route on Roads or
Township Property
1
Enlarged Area View Figure Number
363
Sumneytown Pike
N Sumneytown Pk
Jays Dr
Canterbury Dr
Allentown Rd
Church Rd
Dickerson Rd
Parkside Pl
Clearview Rd
Jacks Ln
Sullivan Dr
Mifflin Dr
Jones Rd
Glover Dr
Shearer St
Garfield Ave.
West Point
4th St
3rd St
Park Rd
Old Church Rd
Woodford Rd
W Prospect Ave
Stefan Rd
Cardinal Way
Cosling Dr
Maxwell Pl
Lafayette Rd
Stirling Dr
Tricorn Dr
Collins Ave
Armstrong Dr
Eva Dr
Harley Dr
S Broad St
2nd St
Airy St
Lila Ct
Primrose Dr
Eagle Ln
476
2001
WWTP
1992
© 2015 Google
Imagery Date: 10/7/2011 40°12'36.43" N 75°17'54.65" W elev 323 ft eye alt 14804 ft
Google Earth


UPPER GWYNEDD TOWNSHIP FLOW DIVERSION
PUMP STATION LOCATIONS
AND PIPE ROUTES
MAY 17, 2016
Legend:
Pump Station
Force Main Route on Private Property
Force Main Route on Roads or
Township Property
363
Sumneytown Pike
Jays Dr
Canterbury Dr
Allentown Rd
Church Rd
Dickerson Rd
N Sumneytown Pl
Parkside Pl
Clearview Rd
Jacks Ln
Sullivan Dr
Jones Rd
Joyce Dr
Shearer St
General Nash Dr
Garfield Ave.
West Point
Old Church Rd
Woodford Rd
W Prospect Ave
Flintlock Dr
Park Rd
4th St
3rd St
Maxwell Pl
Lafayette Rd
Stirling Dr
Cosling Dr
Stefan Rd
Collins Ave
2nd St
Arry St
Tricorn Dr
Hartley Dr
S Broad St
Armstrong Dr
Eva Dr
Eagle Ln
Lila Ct
Primrose Dr
Cardinal Way
WWTP
475
2001
1992
© 2015 Google
Google earth
Imagery Date: 10/7/2011 40°12'36.43" N 75°17'54.65" W elev 323 ft eye alt 14804 ft

Valley Forge Road near Sumneytown Pike

Figure 1

Parcel Number	Owner & Address	Impact
560009013003	DANNER RODERICK JR & PATRICIA 1611 VALLEY FORGE RD	Pump Station Location Gravity Sewer Construction In Existing Easement Force Main Construction In Existing Easement Temporary Construction Easement
560009010006	PESESKO KATE 1615 VALLEY FORGE RD	Gravity Sewer Construction In Existing Easement Force Main Construction In Existing Easement Temporary Construction Easement
560009007108 560009007009	NOWAK HARRY W III 1619 VALLEY FORGE RD	Force Main Construction In Existing Easement Temporary Construction Easement

Clearbrook Road

Figure 2

Parcel Number	Owner & Address	Impact
560001343023	SHERIDAN JOSEPH B & MARY ELLEN 1614 CLEARBROOK RD	Force Main Construction In Existing Easement Temporary Construction Easement
560001343005	DUDA DENNIS J & DIANE S 1616 CLEARBROOK RD	Force Main Construction in New Easement ***NOTE:*** *Easement required ONLY if Force Main cannot be place in street above existing culvert.*

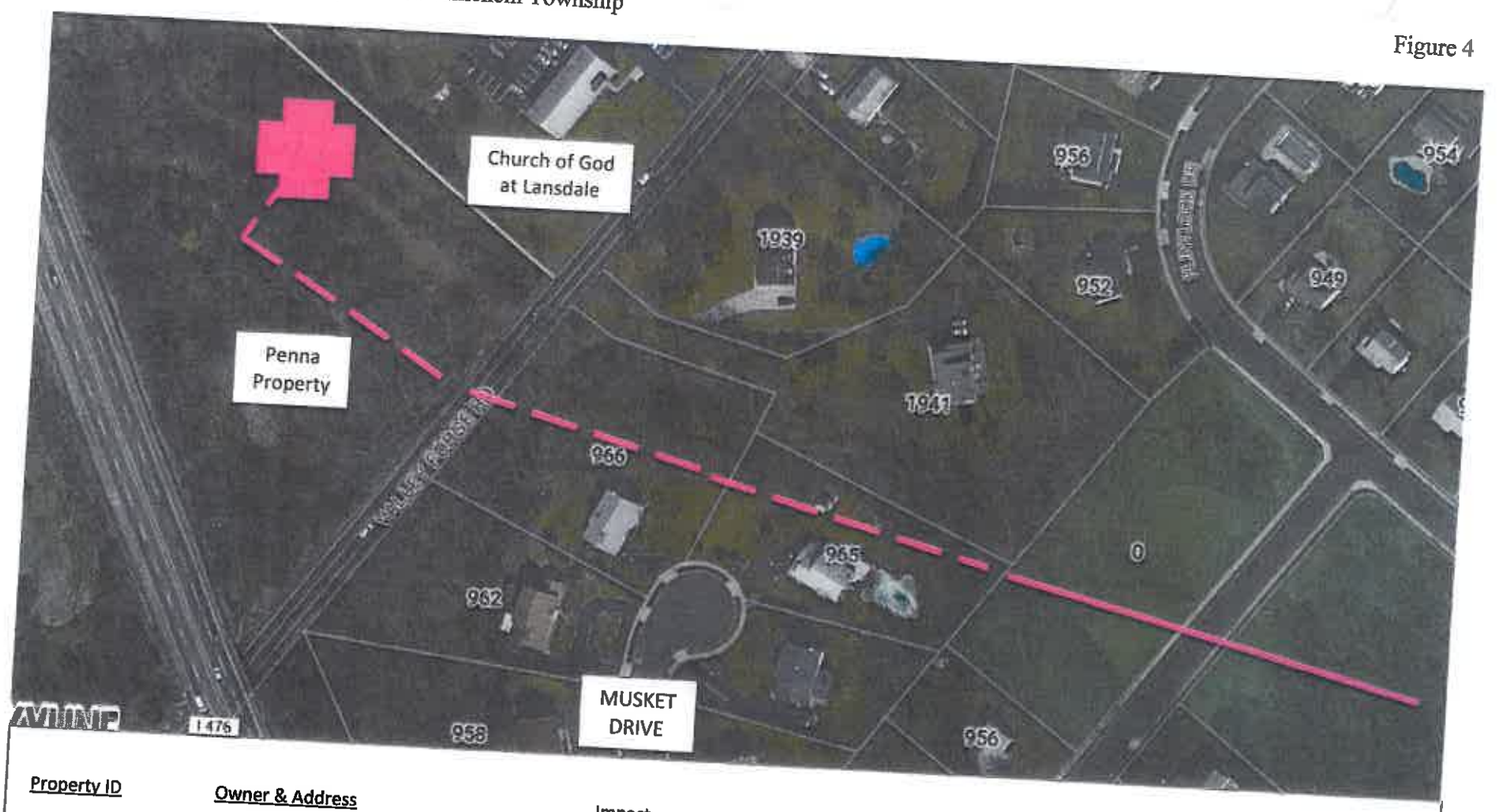
Public Streets – Clearbrook Road to Supplee Road

Figure 3

Force Main Construction in the following public streets:

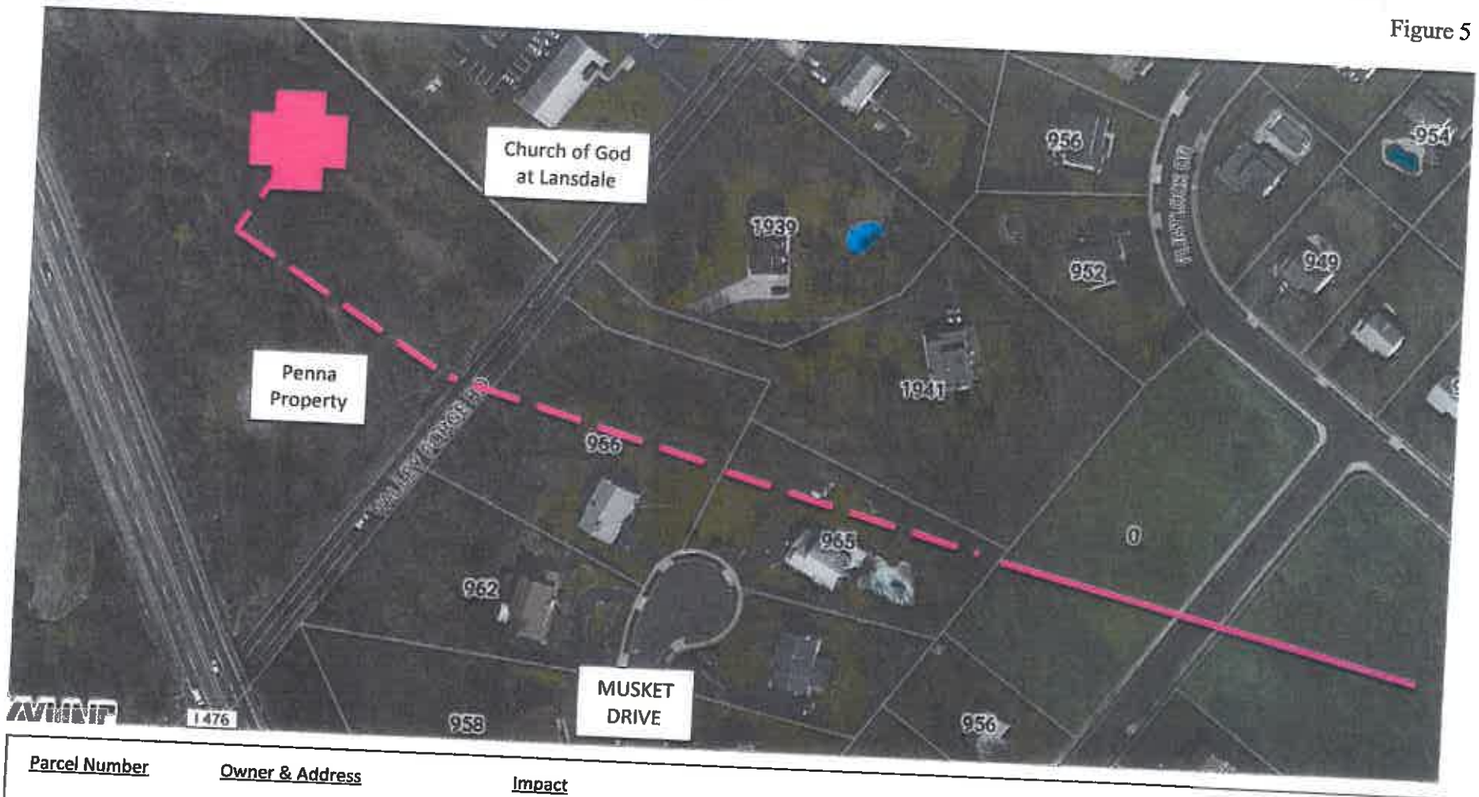
Clearbrook Road, Geyer Road, Clearview Road, Jacks Lane, Supplee Road

Figure 4



Property ID	Owner & Address	Impact
Block 13, Unit 81	PENNA DOMENIC A. & KAREN L	Permanent Easement for Pump Station and Force Main Construction Temporary Construction Easements
Block 13, Unit 80	CHURCH OF GOD AT LANSDALE	Alternate Access Easement to Pump Station

Figure 5



Parcel Number	Owner & Address	Impact
560005918281	GANNON PAUL S & ROSE M 966 MUSKET DR	Force Main Construction within Existing Sewer Easement Temporary Construction Easement
560005918308	PAGLIARO ANTHONY & KIMBERLY A 965 MUSKET DR	Force Main Construction within Existing Sewer Easement Temporary Construction Easement

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Township Open Space - Flintlock Dr. and Stirling Dr.

Figure 6

Force Main Construction within the following public streets:

Powderhorn Drive, Supplee Road, Stirling Drive

Force Main Construction within Existing Sanitary Sewer Easements, and Temporary Construction Easements, in the following parcels:

560002071015 (Flintlock Dr.) – Township Open Space

560008174176 (Stirling Dr.) – Township Open Space

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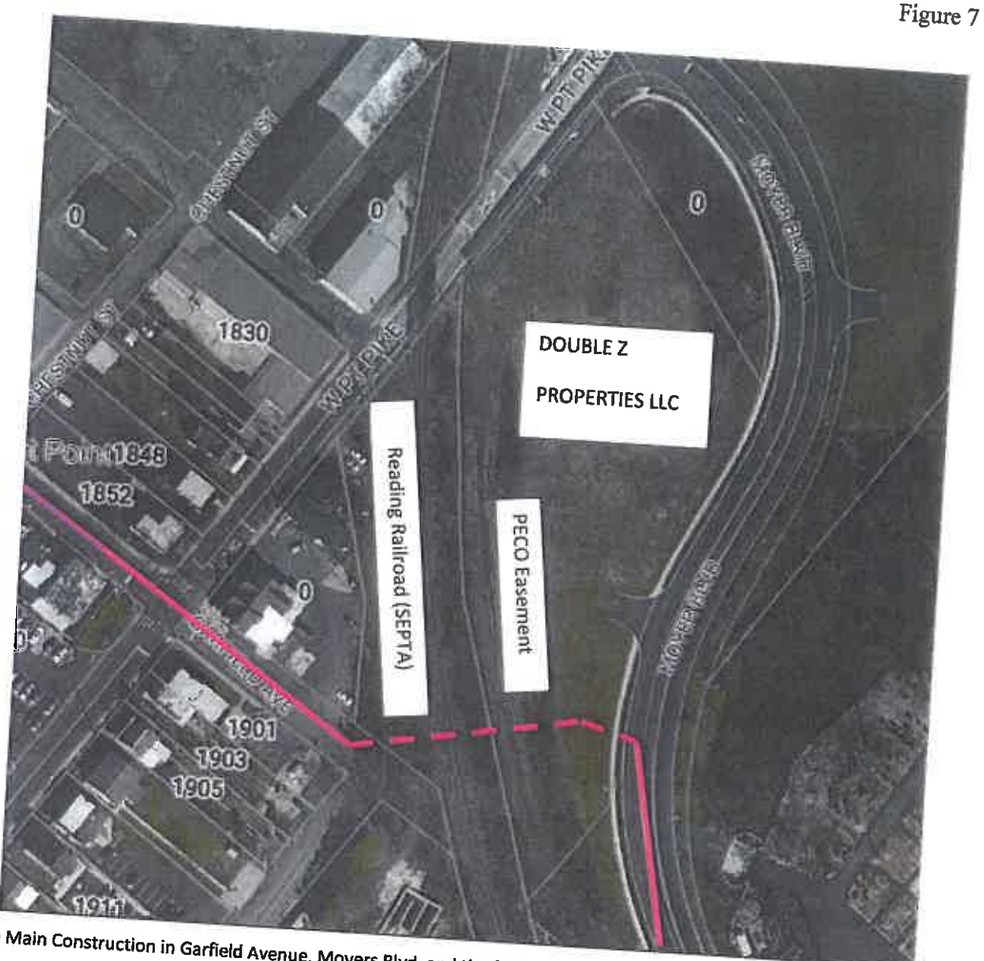
Railroad Crossing at West Point

Figure 7

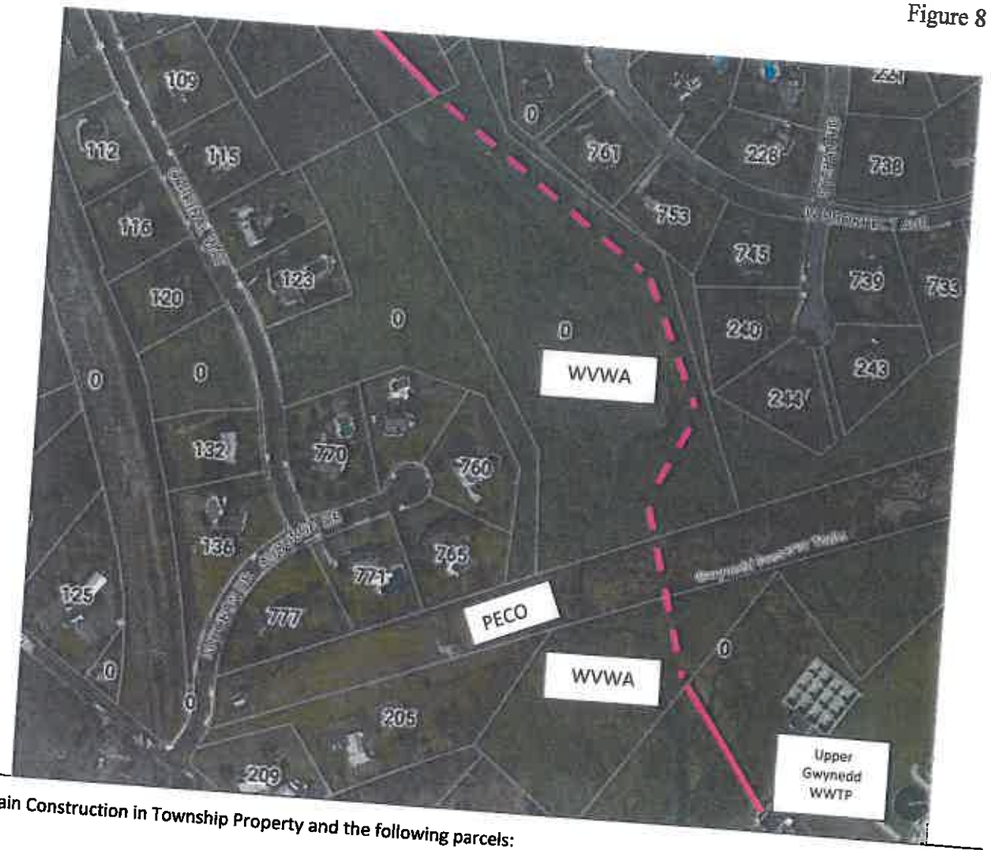


Force Main Construction in Garfield Avenue, Moyers Blvd, and the following parcels:

Parcel Number	Owner & Address	Impact
560009601009	HOFF PROPERTIES LLC 0 WEST POINT PIKE	Temporary Construction Easement
560009604006	READING RAILROAD CO (SEPTA)	Force Main Construction In New Easement Temporary Construction Easement
560009616021	DOUBLE Z PROPERTIES LLC 0 WEST POINT PIKE	Force Main Construction In New Easement Temporary Construction Easement
	PECO (Former Transit Easement)	Force Main Construction In New Easement Temporary Construction Easement

Wissahickon Valley Watershed Association

Figure 8

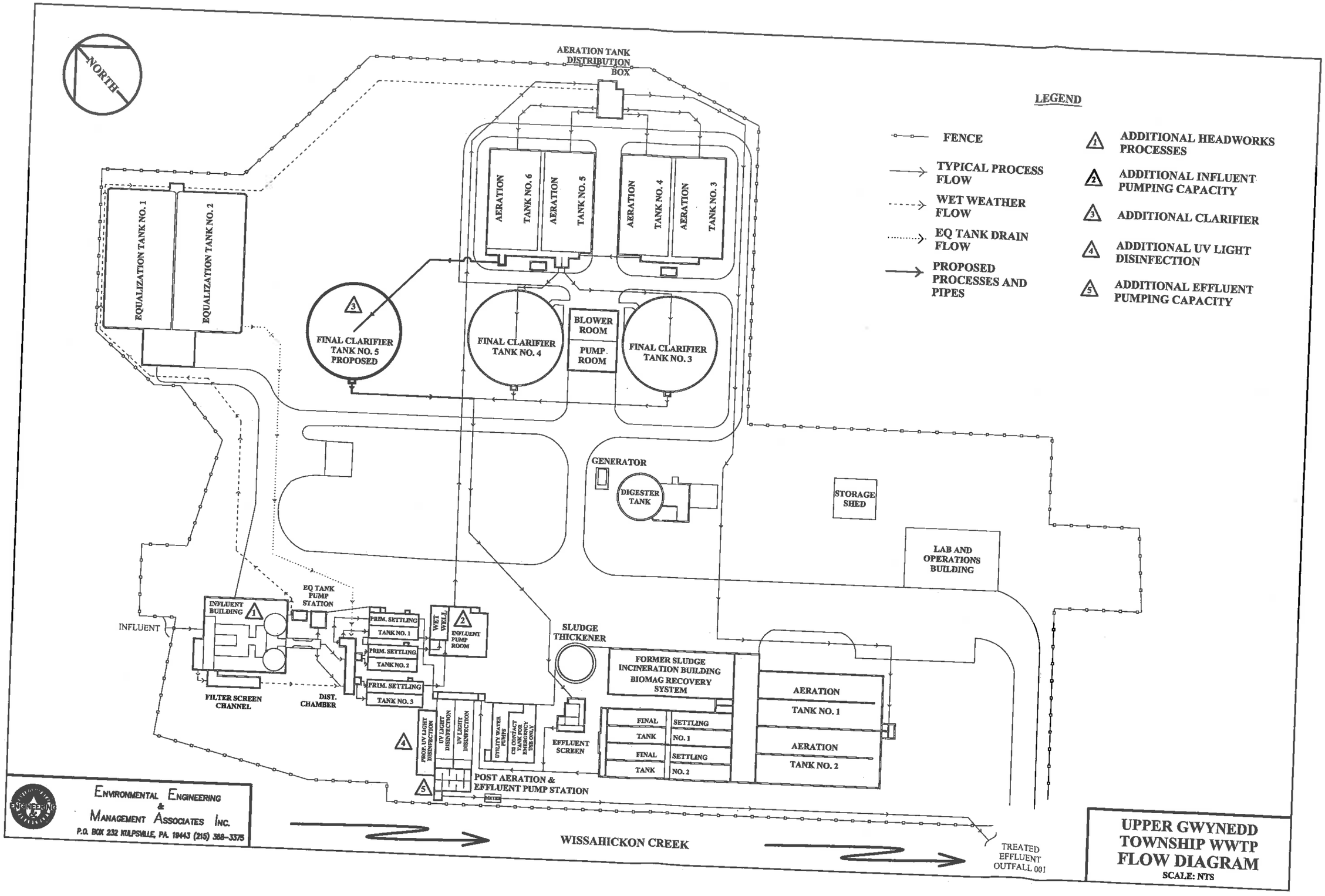


Force Main Construction in Township Property and the following parcels:

Parcel Number	Owner & Address	Impact
560000840121	WISSAHICKON VALLEY WATERSHED ASSOC 0 CARDINAL WAY	Force Main Construction In Existing Easement Temporary Construction Easement
560008398006	PECO 0 SUMNEYTOWN PIKE	Force Main Construction In Existing Easement Temporary Construction Easement

APPENDIX K

UPPER GWYNEDD TOWNSHIP WWTP
FLOW SCHEMATIC


NORTH
AERATION TANK DISTRIBUTION BOX
EQUALIZATION TANK NO. 1
EQUALIZATION TANK NO. 2
AERATION TANK NO. 6
AERATION TANK NO. 5
AERATION TANK NO. 4
AERATION TANK NO. 3
3
FINAL CLARIFIER TANK NO. 5 PROPOSED
FINAL CLARIFIER TANK NO. 4
BLOWER ROOM
PUMP ROOM
FINAL CLARIFIER TANK NO. 3
GENERATOR
DIGESTER TANK
STORAGE SHED
LAB AND OPERATIONS BUILDING
EQ TANK PUMP STATION
INFLUENT BUILDING
1
INFLUENT
PRIM. SETTLING TANK NO. 1
PRIM. SETTLING TANK NO. 2
PRIM. SETTLING TANK NO. 3
WET WELL
2
INFLUENT PUMP ROOM
FILTER SCREEN CHANNEL
DIST. CHAMBER
SLUDGE THICKENER
FORMER SLUDGE INCINERATION BUILDING BIOMAG RECOVERY SYSTEM
AERATION TANK NO. 1
AERATION TANK NO. 2
FINAL SETTLING TANK NO. 1
FINAL SETTLING TANK NO. 2
4
PROP. UV LIGHT DISINFECTION
UV LIGHT DISINFECTION
UV LIGHT DISINFECTION
UTILITY WATER PUMPS
CH CONTACT TANK FOR EMERGENCY USE ONLY
EFFLUENT SCREEN
5
POST AERATION & EFFLUENT PUMP STATION
WISSAHICKON CREEK
TREATED EFFLUENT OUTFALL 001
LEGEND
FENCE
TYPICAL PROCESS FLOW
WET WEATHER FLOW
EQ TANK DRAIN FLOW
PROPOSED PROCESSES AND PIPES
1 ADDITIONAL HEADWORKS PROCESSES
2 ADDITIONAL INFLUENT PUMPING CAPACITY
3 ADDITIONAL CLARIFIER
4 ADDITIONAL UV LIGHT DISINFECTION
5 ADDITIONAL EFFLUENT PUMPING CAPACITY
ENVIRONMENTAL ENGINEERING & MANAGEMENT ASSOCIATES INC.
P.O. BOX 232 KULPSVILLE, PA. 19443 (215) 368-3375
UPPER GWYNEDD TOWNSHIP WWTP FLOW DIAGRAM
SCALE: NTS

APPENDIX L

UPPER GWYNEDD TOWNSHIP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

3800-PM-WSFR0012 Rev. 10/2011
Permit

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

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM DISCHARGE REQUIREMENTS FOR PUBLICLY OWNED TREATMENT WORKS (POTWs)

NPDES PERMIT NO: PA0023256

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 *et seq.* ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 *et seq.*,

Upper Gwynedd Township
PO Box 1
West Point, PA 19486

is authorized to discharge from a facility known as **Upper Gwynedd Township WWTP**, located at **261 Township Line Road, Upper Gwynedd Township, Montgomery County**, to **Wissahickon Creek** in Watershed(s) **3F-Lower Schuylkill** in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON July 1, 2012

THIS PERMIT SHALL EXPIRE AT MIDNIGHT ON June 30, 2017

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with the terms, conditions or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. (40 CFR 122.41(a))

3. A complete application for renewal of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form. (40 CFR 122.41(b), 122.21(d))

   In the event that a timely and complete application for renewal has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports (DMRs), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application. (25 Pa. Code 92a.7(b), (c))

4. This NPDES permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

DATE PERMIT ISSUED June 8, 2012

ISSUED BY

Jenifer L. Fields, P.E.
Clean Water Program Manager
Southeast Regional Office

Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 11' 24.00" , **Longitude** 75° 17' 1.00" , **River Mile Index** 18.74 , **Stream Code** 00844

Discharging to Wissahickon Creek

which receives wastewater from Upper Gwynedd Township WWTP.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	7.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.016	XXX	0.052	See Permit	Grab
CBOD5 May 1 - Oct 31	238	357	XXX	5.0	7.5	10	1/day	24-Hr Composite
CBOD5 Nov 1 - Apr 30	475	713	XXX	10	15	20	1/day	24-Hr Composite
Total Suspended Solids	1,426	2,139	XXX	30	45	60	1/day	24-Hr Composite
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/day	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

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Outfall 001, Continued (from July 1, 2012 through June 30, 2017)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	35	XXX	XXX	0.74	XXX	1.48	1/day	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	106	XXX	XXX	2.22	XXX	4.44	1/day	24-Hr Composite
Orthophosphate May 1 - Oct 31	48	XXX	XXX	1.00	XXX	2.00	1/day	24-Hr Composite
Orthophosphate Nov 1 - Apr 30	174	XXX	XXX	3.64	XXX	7.28	1/day	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Copper	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Iron	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Chronic toxicity (Ceriodaphnia) (TUc)	XXX	XXX	XXX	XXX	1.05 Max	XXX	1/quarter	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

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Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002, Latitude 40° 11' 23.00", Longitude 75° 17' 1.00", River Mile Index _____, Stream Code 00844

Discharging to Wissahickon Creek

which receives stormwater from eastern portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002

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Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. C. **For Outfall** 003 , **Latitude** 40° 11' 27.00" , **Longitude** 75° 17' 6.00" , **River Mile Index** _____ , **Stream Code** _____

Discharging to Wissahickon Creek

which receives stormwater from western portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 003

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PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. D. For Outfall 004, Latitude 40° 11' 30.00", Longitude 75° 17' 7.00", River Mile Index _____, Stream Code _____

Discharging to Unnamed Tributary to Wissahickon Creek

which receives stormwater from northwestern portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 004

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PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)

Additional Requirements

1. The permittee may not discharge:

   a. Floating solids, scum, sheen or substances that result in observed deposits in the receiving water. (25 Pa Code 92a.41(c))

   b. Oil and grease in amounts that cause a film or sheen upon or discoloration of the waters of this Commonwealth or adjoining shoreline, or that exceed 15 mg/l as a daily average or 30 mg/l at any time (or lesser amounts if specified in this permit). (25 Pa. Code 92a.47(a)(7) and 95.2(2))

   c. Substances in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life. (25 Pa Code 93.6(a))

   d. Foam or substances that produce an observed change in the color, taste, odor or turbidity of the receiving water, unless those conditions are otherwise controlled through effluent limitations or other requirements in this permit. (25 Pa Code 92a.41(c))

2. The monthly average percent removal of BOD_5 or $CBOD_5$ and TSS must be at least 85% for POTW facilities on a concentration basis except where 25 Pa. Code 92a.47(g) and (h) are applicable to facilities with combined sewer overflows (CSOs) or as otherwise specified in this permit. (25 Pa. Code 92a.47(a)(3))

Footnotes

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

Supplemental Information

(1) If the permit requires reporting of average weekly limitations use the following guideline. If the "maximum average concentration" and the "maximum average mass loading" does not occur within the same week, both the highest weekly average concentration and the highest weekly average mass load should be reported, regardless of whether they both occur during the same calendar week.

(2) The hydraulic design capacity of 6.5 million gallons per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to help determine whether a "hydraulic overload" situation exists, as defined in Title 25 Pa. Code Chapter 94.

(3) The effluent limitations for this outfall were determined using an effluent discharge rate of 5.7 million gallons per day.

II. DEFINITIONS

At Outfall (XXX) means a sampling location in outfall line XXX below the last point at which wastes are added to outfall line (XXX), or where otherwise specified.

Average refers to the use of an arithmetic mean, unless otherwise specified in this permit. (40 CFR 122.41(l)(4)(iii))

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution to surface waters of the Commonwealth. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (25 Pa. Code 92a.2)

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i))

Calendar Week is defined as the seven consecutive days from Sunday through Saturday, unless the permittee has been given permission by DEP to provide weekly data as Monday through Friday based on showing excellent performance of the facility and a history of compliance. In cases when the week falls in two separate months, the month with the most days in that week shall be the month for reporting.

Clean Water Act means the Federal Water Pollution Control Act, as amended (33 U.S.C.A. §§1251 to 1387).

Composite Sample (for all except GC/MS volatile organic analysis) means a combination of individual samples (at least eight for a 24-hour period or four for an 8-hour period) of at least 100 milliliters (mL) each obtained at spaced time intervals during the compositing period. The composite must be flow-proportional; either the volume of each individual sample is proportional to discharge flow rates, or the sampling interval is proportional to the flow rates over the time period used to produce the composite. (EPA Form 2C)

Composite Sample (for GC/MS volatile organic analysis) consists of at least four aliquots or grab samples collected during the sampling event (not necessarily flow proportioned). The samples must be combined in the laboratory immediately before analysis and then one analysis is performed. (EPA Form 2C)

Daily Average Temperature means the average of all temperature measurements made, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar day or during the operating day if flows are of a shorter duration.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (25 Pa. Code 92a.2, 40 CFR 122.2)

Daily Maximum Discharge Limitation means the highest allowable "daily discharge."

Discharge Monitoring Report (DMR) means the DEP or EPA supplied form(s) for the reporting of self-monitoring results by the permittee. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Estimated Flow means any method of liquid volume measurement based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

Geometric Mean means the average of a set of n sample results given by the n^{th} root of their product.

Grab Sample means an individual sample of at least 100 mL collected at a randomly selected time over a period not to exceed 15 minutes. (EPA Form 2C)

Hauled-In Wastes means any waste that is introduced into a treatment facility through any method other than a direct connection to the sewage collection system. The term includes wastes transported to and disposed of within the treatment facility or other entry points within the collection system.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act. (40 CFR 122.2)

Immersion Stabilization (i-s) means a calibrated device is immersed in the wastewater until the reading is stabilized.

Indirect Discharger means a non-domestic discharger introducing pollutants to a Publicly Owned Treatment Works (POTW) or other treatment works. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Industrial User means a source of Indirect Discharge. (40 CFR 403.3)

Instantaneous Maximum Effluent Limitation means the highest allowable discharge of a concentration or mass of a substance at any one time as measured by a grab sample. (25 Pa. Code 92a.2)

Measured Flow means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

Monthly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. (25 Pa. Code 92a.2)

Municipality means a city, town, borough, county, township, school district, institution, authority or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes. (25 Pa. Code 92a.2)

Publicly Owned Treatment Works (POTW) means a treatment works as defined by §212 of the Clean Water Act, owned by a state or municipality. The term includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. The term also includes sewers, pipes or other conveyances if they convey wastewater to a POTW providing treatment. The term also means the municipality as defined in section 502(4) of the Clean Water Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works. (25 Pa Code 92a.2 and 40 CFR 122.2)

Severe Property Damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR 122.41(m)(1)(ii))

Stormwater means the runoff from precipitation, snow melt runoff, and surface runoff and drainage. (25 Pa. Code 92a.2)

Stormwater Associated With Industrial Activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant, and as defined at 40 CFR §122.26(b)(14)(i) – (ix) and (xi) and 25 Pa. Code 92a.2.

Toxic Pollutant means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains may, on the basis of information available to DEP cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations in these organisms or their offspring. (25 Pa. Code 92a.2)

Weekly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

III. SELF-MONITORING, REPORTING AND RECORDKEEPING

A. Representative Sampling (40 CFR 122.41(j)(1))

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. Records Retention (40 CFR 122.41(j)(2))

Except for records of monitoring information required by this permit related to the permittee's sludge use and disposal activities which shall be retained for a period of at least 5 years, all records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for 3 years from the date of the sample measurement, report or application, unless a longer retention period is required by the permit. The 3-year period shall be extended as requested by DEP or the EPA Regional Administrator.

3. Recording of Results (40 CFR 122.41(j)(3))

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date and time of sampling or measurements.
b. The person(s) who performed the sampling or measurements.
c. The date(s) the analyses were performed.
d. The person(s) who performed the analyses.
e. The analytical techniques or methods used; and the associated detection level.
f. The results of such analyses.

4. Test Procedures (40 CFR 122.41(j)(4))

Facilities that test or analyze environmental samples used to demonstrate compliance with this permit shall be in compliance with laboratory accreditation requirements of Act 90 of 2002 (27 Pa. C.S. §§4101-4113) and 25 Pa. Code Chapter 252, relating to environmental laboratory accreditation. Unless otherwise specified in this permit, the test procedures for the analysis of pollutants shall be those approved under 40 CFR Part 136 (or in the case of sludge use or disposal, approved under 40 CFR Part 136, unless otherwise specified in 40 CFR Part 503 or Subpart J of 25 Pa. Code Chapter 271), or alternate test procedures approved pursuant to those parts, unless other test procedures have been specified in this permit.

5. Quality/Assurance/Control

In an effort to assure accurate self-monitoring analyses results:

a. The permittee, or its designated laboratory, shall participate in the periodic scheduled quality assurance inspections conducted by DEP and EPA. (40 CFR 122.41(e), 122.41(i)(3))

b. The permittee, or its designated laboratory, shall develop and implement a program to assure the quality and accurateness of the analyses performed to satisfy the requirements of this permit, in accordance with 40 CFR Part 136. (40 CFR 122.41(j)(4))

B. Reporting of Monitoring Results

1. The permittee shall effectively monitor the operation and efficiency of all wastewater treatment and control facilities, and the quantity and quality of the discharge(s) as specified in this permit. (40 CFR 122.41(e), 122.44(i)(1))

2. Unless instructed otherwise in Part C of this permit, properly completed DMR(s) must be received by the agency(ies) below within 28 days after the end of each reporting period. The permittee shall complete all Supplemental Reporting forms (Supplemental DMRs) provided by DEP in this permit (or an approved equivalent), and submit the signed, completed forms as an attachment to the DMR(s). If the permittee elects to use DEP's electronic DMR (eDMR) system, one electronic submission may be made for DMRs and Supplemental DMRs. If paper forms are used, the completed forms shall be mailed to:

   Department of Environmental Protection
   Clean Water Program
   2 East Main Street
   Norristown, PA 19401

   NPDES Enforcement Branch (3WP42)
   Office of Permits & Enforcement
   Water Protection Division
   U.S. EPA - Region III
   1650 Arch Street
   Philadelphia, PA 19103-2029

3. If the permittee elects to begin using DEP's eDMR system to submit DMRs required by the permit, the permittee shall, to assure continuity of business operations, continue using the eDMR system to submit all DMRs and Supplemental Reports required by the permit, unless the following steps are completed to discontinue use of eDMR:

   a. The permittee shall submit written notification to the regional office that issued the permit that it intends to discontinue use of eDMR. The notification shall be signed by a principal executive officer or authorized agent of the permittee.

   b. The permittee shall continue using eDMR until the permittee receives written notification from DEP's Central Office that the facility has been removed from the eDMR system, and electronic report submissions are no longer expected.

4. The completed DMR Form shall be signed and certified by either of the following applicable persons, as defined in 25 Pa. Code 92a.22:

   - For a corporation - by a principal executive officer of at least the level of vice president, or an authorized representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
   - For a partnership or sole proprietorship - by a general partner or the proprietor, respectively.
   - For a municipality, state, federal or other public agency - by a principal executive officer or ranking elected official.

   If signed by a person other than the above, written notification of delegation of DMR signatory authority must be submitted to DEP in advance of or along with the relevant DMR form. (40 CFR 122.22(b))

5. If the permittee monitors any pollutant at monitoring points as designated by this permit, using analytical methods described in Part A III.A.4. herein, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR. (40 CFR 122.41(l)(4)(ii))

C. Reporting and Notification Requirements

1. Planned Changes to Physical Facilities – The permittee shall give notice to DEP as soon as possible but no later than 30 days prior to any planned physical alterations or additions to the permitted facility. A permit under 25 Pa. Code Chapter 91 may be required for these situations prior to implementing the planned changes. A permit application, or other written submission to DEP, can be used to satisfy the notification requirements of this section.

Notice is required when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b). (40 CFR 122.41(l)(1)(i))

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in this permit. (40 CFR 122.41(l)(1)(ii))

c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR 122.41(l)(1)(iii))

d. The planned change may result in noncompliance with permit requirements. (40 CFR 122.41(l)(2))

e. The facility is proposing an expansion or modifications to its treatment processes. (25 Pa. Code 92a.24(a))

2. Planned Changes to Waste Stream – Under the authority of 25 Pa. Code 92a.24(a) and 40 CFR 122.42(b), the permittee shall provide notice to DEP and EPA as soon as possible but no later than 45 days prior to any changes in the volume or pollutant concentration of its influent waste stream as a result of indirect discharges or hauled-in wastes, as specified in paragraphs 2.a. and 2.b., below. Notice shall be provided on the "Planned Changes to Waste Stream" Supplemental Report (3800-FM-WSFR0482), available on DEP's website. The permittee shall provide information on the quality and quantity of waste introduced into the POTW, and any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW (40 CFR 122.42(b)(3)). The Report shall be sent via Certified Mail or other means to confirm DEP's receipt of the notification. DEP will determine if the submission of an application and receipt of an amended permit is required.

a. Introduction of New Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(1))

New pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were not detected in the facilities' influent waste stream as reported in the permit application, or were otherwise not analyzed in the influent and reported to DEP prior to permit issuance;

(ii) Have not been previously approved to be included in the permittee's influent waste stream by DEP and/or EPA in writing;

(iii) Are previously unapproved pollutants introduced into the POTW from an indirect discharger which would be subject to Sections 301 and 306 of the Clean Water Act if it were directly discharging those pollutants (40 CFR 122.42(b)(1)).

The permittee shall provide notification of the introduction of new pollutants in accordance with paragraph 2 above. The permittee may not authorize the introduction of new pollutants until the permittee receives DEP's and/or EPA's written approval.

b. Increased Loading of Approved Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(2))

Approved pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were detected in the facilities' influent waste stream as reported in the permittee's permit application or were otherwise analyzed and reported to DEP prior to permit issuance;

(ii) Have an effluent limitation or monitoring requirement in this permit;

(iii) Have been previously approved for the permittee's influent waste stream by DEP in writing.

The permittee shall provide notification of the introduction of increased influent loading (lbs/day) of approved pollutants in accordance with paragraph 2 above when (1) the cumulative increase in influent loading (lbs/day) exceeds 10% of the maximum loading reported in the permit application, or a loading previously approved by DEP, or (2) may cause an exceedance in the effluent of Effluent Limitation Guidelines (ELGs) or limitations in Part A of this permit, or (3) may cause interference or pass through at the POTW, or (4) may cause exceedances of the applicable water quality standards in the receiving stream. Unless specified otherwise in this permit, if DEP and/or EPA does not respond to the notification within 30 days of its receipt, the permittee may proceed with the increase in loading. The acceptance of increased loading of approved pollutants may not result in an exceedance of ELGs or effluent limitations, may not result in a hydraulic or organic overload condition as defined in 25 Pa. Code 94.1, and may not cause exceedances of the applicable water quality standards in the receiving stream.

c. New Information on Existing Discharges

The permittee shall notify DEP and EPA where it discovers new information, not reported previously, on the quality and quantity of the effluent introduced into the POTW by an industrial user or an indirect discharger and the anticipated impact of the change in the quality and quantity of effluent to be discharged from the POTW. (40 CFR 122.42(b)(3))

3. Reporting Requirements for Hauled-In Wastes

a. Receipt of Residual Waste

(i) The permittee shall document the receipt of all hauled-in residual wastes (including but not limited to wastewater from oil and gas wells, food processing waste, and landfill leachate) received for processing at the treatment facility. The permittee shall report hauled-in residual wastes on a monthly basis to DEP on the "Hauled In Residual Wastes" Supplemental Report (3800-FM-WSFR0450) as an attachment to the DMR. If no residual wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report. The information used to develop the Report shall be retained by the permittee for five years from the date of receipt and must be made available to DEP or EPA upon request.

(1) The dates that residual wastes were received.

(2) The volume (gallons) of wastes received.

(3) The license plate number of the vehicle transporting the waste to the treatment facility.

(4) The permit number(s) of the well(s) where residual wastes were generated, if applicable.

(5) The name and address of the generator of the residual wastes.

(6) The type of wastewater.

(7) Documentation of whether or not a chemical analysis of the residual wastes were reported on a Residual Waste Form 26R, or a separate waste characterization using the parameters from Form 26R.

The transporter of residual waste must maintain these and other records as part of the daily operational record (25 Pa. Code 299.219). If the transporter is unable to provide this information, the residual wastes shall not be accepted by the permittee until such time as the transporter is able to provide the required information.

(ii) The following conditions apply to the characterization of residual wastes received by the permitted treatment facility:

(1) The permitted facility must receive and maintain on file a characterization of the residual wastes it receives from the generator, as required by 25 Pa. Code 287.54. The characterization shall conform to the Bureau of Waste Management's Form 26R except as noted in paragraph (2), below. Each load of residual waste received must be characterized accordingly.

(2) For wastewater generated from hydraulic fracturing operations ("frac wastewater") within the first 30 production days of a well site, the characterization may be a general frac wastewater characterization approved by DEP. Thereafter, the characterization must be waste-specific and reported on the Form 26R.

b. Receipt of Municipal Waste

(i) The permittee shall document the receipt of all hauled-in municipal wastes (including but not limited to septage and liquid sewage sludge) received for processing at the treatment facility. The permittee shall report hauled-in municipal wastes on a monthly basis to DEP on the "Hauled In Municipal Wastes" Supplemental Report (3800-FM-WSFR0437) as an attachment to the DMR. If no municipal wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report:

(1) The dates that municipal wastes were received.

(2) The volume (gallons) of wastes received.

(3) The BOD_5 concentration (mg/l) and load (lbs) for the wastes received.

(4) The location(s) where wastes were disposed of within the treatment facility.

(ii) Sampling and analysis of hauled-in municipal wastes must be completed to characterize the organic strength of the wastes, unless composite sampling of influent wastewater is performed at a location downstream of the point of entry for the wastes. The influent BOD_5 characterization for the treatment facility, as reported in the annual Municipal Wasteload Management Report per 25 Pa. Code Chapter 94, must be representative of the hauled-in municipal wastes received.

4. Unanticipated Noncompliance or Potential Pollution Reporting

a. Immediate Reporting - The permittee shall immediately report any incident causing or threatening pollution in accordance with the requirements of 25 Pa. Code Sections 91.33 and 92a.41(b).

(i) If, because of an accident, other activity or incident a toxic substance or another substance which would endanger users downstream from the discharge, or would otherwise result in pollution or create a danger of pollution or would damage property, the permittee shall immediately notify DEP by telephone of the location and nature of the danger. Oral notification to the Department is required as soon as possible, but no later than 4 hours after the permittee becomes aware of the incident causing or threatening pollution.

(ii) If reasonably possible to do so, the permittee shall immediately notify downstream users of the waters of the Commonwealth to which the substance was discharged. Such notice shal include the location and nature of the danger.

(iii) The permittee shall immediately take or cause to be taken steps necessary to prevent injury to property and downstream users of the waters from pollution or a danger of pollution and, in addition, within 15 days from the incident, shall remove the residual substances contained thereon or therein from the ground and from the affected waters of this Commonwealth to the extent required by applicable law.

b. The permittee shall report any noncompliance which may endanger health or the environment in accordance with the requirements of 40 CFR 122.41(l)(6). These requirements include the following obligations:

(i) 24 Hour Reporting - The permittee shall orally report any noncompliance with this permit which may endanger health or the environment within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported within 24 hours under this paragraph (40 CFR 122.41(l)(6)(ii)):

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and

(3) Violation of the maximum daily discharge limitation for any of the pollutants listed in the permit as being subject to the 24-hour reporting requirement.

(ii) Written Report - A written submission shall also be provided within 5 days of the time the permittee becomes aware of any noncompliance which may endanger health or the environment. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(iii) Waiver of Written Report - DEP may waive the written report on a case-by-case basis if the associated oral report has been received within 24 hours from the time the permittee becomes aware of the circumstances which may endanger health or the environment. Unless such a waiver is expressly granted by DEP, the permittee shall submit a written report in accordance with this paragraph. (40 CFR 122.41(l)(6)(iii))

5. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under paragraph C.4 of this section or specific requirements of compliance schedules, at the time DMRs are submitted, on the Non-Compliance Reporting Form (3800-FM-WSFR0440). The reports shall contain the information listed in paragraph C.4.b.(ii) of this section. (40 CFR 122.41(l)(7))

PART B

I. MANAGEMENT REQUIREMENTS

A. Compliance Schedules (25 Pa. Code 92a.51, 40 CFR 122.47(a))

1. The permittee shall achieve compliance with the terms and conditions of this permit within the time frames specified in this permit.

2. The permittee shall submit reports of compliance or noncompliance, or progress reports as applicable, for any interim and final requirements contained in this permit. Such reports shall be submitted no later than 14 days following the applicable schedule date or compliance deadline. (40 CFR 122.47(a)(4))

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term in accordance with 25 Pa. Code 92a.72 and 40 CFR 122.41(f).

2. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. (40 CFR 122.41(f))

3. In the absence of DEP action to modify or revoke and reissue this permit, the permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time specified in the regulations that establish those standards or prohibitions. (40 CFR 122.41(a)(1))

C. Duty to Provide Information

1. The permittee shall furnish to DEP, within a reasonable time, any information which DEP may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. (40 CFR 122.41(h))

2. The permittee shall furnish to DEP, upon request, copies of records required to be kept by this permit. (40 CFR 122.41(h))

3. Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to DEP, it shall promptly submit the correct and complete facts or information. (40 CFR 122.41(l)(8))

4. The permittee shall provide the following information in the annual Municipal Wasteload Management Report, required under the provisions of Title 25 Pa. Code Chapter 94:

   a. The requirements identified in 25 Pa. Code 94.12.

   b. The identity of any indirect discharger(s) served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also specify the total volume of discharge and estimate concentration of each pollutant discharged into the POTW by the indirect discharger.

   c. A "Solids Management Inventory" including the following information for the preceding year, at a minimum: average annual flow (MGD), average influent BOD_5 (mg/l), average effluent $CBOD_5$ (mg/l), total volume of sludge wasted (gallons), average solids concentration of return or waste sludge flow (mg/l), and total sludge or biosolids generated (wet or dry tons).

   d. The total volume of hauled-in residual and municipal wastes received during the year, by source.

e. The Annual Report requirements for permittees required to implement an industrial pretreatment program listed in Part C, as applicable.

D. General Pretreatment Requirements

1. POTWs shall require indirect dischargers to the treatment works subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act and regulations thereunder.

2. Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (MGD) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to Pretreatment Standards will be required to establish a POTW Pretreatment Program unless specifically exempted by the Approval Authority. A POTW with a design flow of 5 MGD or less may be required to develop a POTW Pretreatment Program if the Approval Authority finds that the nature or volume of the industrial influent, treatment process upsets, violations of effluent limitations, contamination of sludge, or other circumstances warrant in order to prevent interference or pass through. (40 CFR 403.8)

3. Each POTW with an approved Pretreatment Program pursuant to 40 CFR 403.8 shall develop and enforce specific limits to implement the prohibitions listed in 40 CFR 403.5(a)(1) and (b), and shall continue to develop these limits as necessary and effectively enforce such limits. This condition applies, for example, when there are planned changes to the waste stream as identified in Part A III.C.2. If the permittee is required to develop or continue implementation of a Pretreatment Program, detailed requirements will be contained in Part C of this permit.

4. For all POTWs, where pollutants contributed by indirect dischargers result in interference or pass through, and a violation is likely to recur, the permittee shall develop and enforce specific limits for indirect dischargers and other users, as appropriate, that together with appropriate facility or operational changes, are necessary to ensure renewed or continued compliance with this permit or sludge use or disposal practices. Where POTWs do not have an approved Pretreatment Program, the permittee shall submit a copy of such limits to DEP when developed. (25 Pa. Code 92a.47(d))

E. Proper Operation and Maintenance

1. The permittee shall employ operators certified in compliance with the Water and Wastewater Systems Operators Certification Act (63 P.S. §§1001-1015.1).

2. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, adequate laboratory controls including appropriate quality assurance procedures. This provision also includes the operation of backup or auxiliary facilities or similar systems that are installed by the permittee, only when necessary to achieve compliance with the terms and conditions of this permit. (40 CFR 122.41(e))

F. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR 122.41(d))

G. Bypassing

1. Bypassing Not Exceeding Permit Limitations - The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions in paragraphs two, three and four of this section. (40 CFR 122.41(m)(2))

2. Other Bypassing - In all other situations, bypassing is prohibited and DEP may take enforcement action against the permittee for bypass unless:

   a. A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage." (40 CFR 122.41(m)(4)(i)(A))

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance. (40 CFR 122.41(m)(4)(i)(B))

   c. The permittee submitted the necessary notice required in paragraph G.4 below. (40 CFR 122.41(m) (4)(i)(C))

3. DEP may approve an anticipated bypass, after considering its adverse effects, if DEP determines that it will meet the conditions listed in paragraph G.2 above. (40 CFR 122.41(m)(4)(ii))

4. Notice

   a. Anticipated Bypass – If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least 10 days before the bypass. (40 CFR 122.41(m)(3)(i))

   b. Unanticipated Bypass

      (i) The permittee shall submit immediate notice of an unanticipated bypass causing or threatening pollution. The notice shall be in accordance with Part A III.C.4.a.

      (ii) The permittee shall submit oral notice of any other unanticipated bypass within 24 hours, regardless of whether the bypass may endanger health or the environment or whether the bypass exceeds effluent limitations. The notice shall be in accordance with Part A III.C.4.b.

II. PENALTIES AND LIABILITY

A. Violations of Permit Conditions

Any person violating Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act or any permit condition or limitation implementing such sections in a permit issued under Section 402 of the Act is subject to civil, administrative and/or criminal penalties as set forth in 40 CFR §122.4l(a)(2).

Any person or municipality, who violates any provision of this permit; any rule, regulation or order of DEP; or any condition or limitation of any permit issued pursuant to the Clean Streams Law, is subject to criminal and/or civil penalties as set forth in Sections 602, 603 and 605 of the Clean Streams Law.

B. Falsifying Information

Any person who does any of the following:

- Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, or

- Knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or noncompliance)

Shall, upon conviction, be punished by a fine and/or imprisonment as set forth in *18 Pa.C.S.A § 4904* and 40 CFR §122.41(j)(5) and (k)(2).

C. Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance pursuant to Section 309 of the Clean Water Act or Sections 602, 603 or 605 of the Clean Streams Law.

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under the Clean Water Act and the Clean Streams Law.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. 40 CFR 122.41(c)

III. OTHER RESPONSIBILITIES

A. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania's Clean Streams Law, and Title 25 Pa. Code Chapter 92a and 40 CFR §122.41(i), the permittee shall allow authorized representatives of DEP and EPA, upon the presentation of credentials and other documents as may be required by law:

1. To enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; (40 CFR 122.41(i)(1))

2. To have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; (40 CFR 122.41(i)(2))

3. To inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and (40 CFR 122.41(i)(3))

4. To sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Clean Streams Law, any substances or parameters at any location. (40 CFR 122.41(i)(4))

B. Transfer of Permits

1. Transfers by modification. Except as provided in paragraph 2 of this section, a permit may be transferred by the permittee to a new owner or operator only if this permit has been modified or revoked and reissued, or a minor modification made to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (40 CFR 122.61(a))

2. Automatic transfers. As an alternative to transfers under paragraph 1 of this section, any NPDES permit may be automatically transferred to a new permittee if:

   a. The current permittee notifies DEP at least 30 days in advance of the proposed transfer date in paragraph 2.b. of this section; (40 CFR 122.61(b)(1))

   b. The notice includes the appropriate DEP transfer form signed by the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and (40 CFR 122.61(b)(2))

   c. DEP does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue this permit, the transfer is effective on the date specified in the agreement mentioned in paragraph 2.b. of this section. (40 CFR 122.61(b)(3))

d. The new permittee is in compliance with existing DEP issued permits, regulations, orders and schedules of compliance, or has demonstrated that any noncompliance with the existing permits has been resolved by an appropriate compliance action or by the terms and conditions of the permit (including compliance schedules set forth in the permit), consistent with 25 Pa. Code 92a.51 (relating to schedules of compliance) and other appropriate Department regulations. (25 Pa. Code 92a.71)

3. In the event DEP does not approve transfer of this permit, the new owner or controller must submit a new permit application.

C. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (40 CFR 122.41(g))

D. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit. (40 CFR 122.41(b))

E. Other Laws

The issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations.

IV. ANNUAL FEE

Permittees shall pay an annual fee in accordance with 25 Pa. Code § 92a.62. Annual fee amounts are specified in the following schedule and are due on each anniversary of the effective date of the most recent new or reissued permit. All flows identified in the schedule are annual average design flows. (25 Pa. Code 92a.62)

Small Flow Treatment Facility (SRSTP and SFTF)	$0
Minor Sewage Facility < 0.05 MGD (million gallons per day)	$250
Minor Sewage Facility ≥ 0.05 and < 1 MGD	$500
Minor Sewage Facility with CSO (Combined Sewer Overflow)	$750
Major Sewage Facility ≥ 1 and < 5 MGD	$1,250
Major Sewage Facility ≥ 5 MGD	$2,500
Major Sewage Facility with CSO	$5,000

As of the effective date of this permit, the facility covered by the permit is classified in the following fee category: **Major Sewage Facility >=5 MGD**.

Invoices for annual fees will be mailed to permittees approximately three months prior to the due date. In the event that an invoice is not received, the permittee is nonetheless responsible for payment. Throughout a five year permit term, permittees will pay four annual fees followed by a permit renewal application fee in the last year of permit coverage. Permittees may contact the DEP at 717-787-6744 with questions related to annual fees.

Payment for annual fees shall be remitted to DEP at the address below by the anniversary date. Checks should be made payable to the Commonwealth of Pennsylvania.

PA Department of Environmental Protection
Bureau of Point and Non-Point Source Management
Re: Chapter 92a Annual Fee
P.O. Box 8466

Harrisburg, PA 17105-8466

PART C

I. OTHER REQUIREMENTS

1. Notification of the designation of the responsible operator(s) must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced.

2. If, at anytime, the DEP determines that the discharge permitted herein creates a public nuisance or causes environmental harm to the receiving water of the Commonwealth, the DEP may require the permittee to adopt such remedial measures as will produce a satisfactory effluent. If the permittee fails to adopt such remedial measures within the time specified by the DEP, the right to discharge herein granted shall, upon notice by the DEP, cease and become null and void.

3. No stormwater from pavements, area ways, roofs, foundation drains, or other sources shall be admitted to the sanitary sewers associated with the herein approved discharge.

4. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance, and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress, and regress.

5. The attention of the permittee is directed to the fact that the herein approved discharge is directed to a small stream which affords a limited dilution potential. If the effluent creates a health hazard or nuisance, the permittee shall upon notice from the DEP, provide such additional treatment as may be required by the DEP.

6. If there is a change in ownership of this facility or in permittee name, an application for transfer of permit must be submitted to the DEP.

7. During normal operations, the facility uses ultraviolet (UV) light as the primary method of disinfection of the final effluent. The facility is equipped with a chlorine disinfection system as a backup to the UV system. Use of the chlorine disinfection system is limited to during the period when the facility is experiencing extreme peak wet weather flows when the design capacity of the UV system is exceeded, or during an emergency situation where the UV system is inoperable. When the backup chlorine disinfection system is in operation, the effluent must be dechlorinated as required to meet the TRC limits listed in this permit. The facility shall collect samples for Total Residual Chlorine (TRC) every two hours when the backup chlorine disinfection system is in operation and report the results to the Department with the monthly discharge monitoring report. Sampling for TRC is not required if the backup chlorination system is not in use.

   The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine (TRC) in the discharge effluent does not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting required chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body. The TRC data shall be recorded during the use of chlorine and maintained at the facility.

   If the DEP determines or receives documented evidence that levels of TRC in the permittee's effluent are causing adverse water quality impacts in the receiving water, the permittee shall be required to institute necessary additional steps to reduce or eliminate such impact.

8. The limits of this NPDES permit are based on the installation of an ultra-violet disinfection system. If an alternate disinfection method is installed, this NPDES permit must be modified to address appropriate discharge limitations prior to operation of the treatment facility.

9. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 281, 283, and 285 (relating to general provisions and requirements for landfilling, land application, composting, processing, and storage of municipal waste), Chapters 261a, 262a, 263a, and 270a (related to identification of hazardous waste, requirements for generators and transporters, and hazardous waste permit programs) and applicable Federal Regulations, the Federal Clean Water Act, RCRA, and their amendments.

10. The DEP may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the DEP, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the DEP, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits. In the event that DEP requires the submission of data pursuant to this condition, the permittee shall have the right to appeal or otherwise contest the requirement.

11. The facility shall be operated under the charge of a responsible operator(s) certified under the Pennsylvania Water and Wastewater Systems Operations Certification Act (Act 11). The operator(s) shall comply with the continuing education requirements required under the regulations and guidelines related to Act 11.

12. Instantaneous maximum limitations for Outfall 001 are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee does not have to monitor for the instantaneous maximum limitation except for the parameters pH, total residual chlorine, and fecal coliform.

13. The permittee shall develop a treatment facility operations and maintenance plan addressing key wastewater processes. The plan shall be reviewed yearly and updated when appropriate. Said plan shall be in writing or in an electronic format. Upon request, this plan shall be submitted to DEP for review. For the purpose of this section, a key wastewater process includes any piece of equipment, or a process that if it fails may likely cause the discharge of raw wastewater or wastewater that fails to meet NPDES permit discharge requirements, or a failure that may likely threaten human or environmental health. Said plan shall include:

    - A process control strategy that includes a schedule for process control sampling, monitoring, testing, and recordkeeping.

    - A plan that identifies how key wastewater processes shall be monitored and adjusted while the facility is staffed.

    - A plan that identifies how key wastewater processes will be monitored while the treatment facility is not staffed.

    - For treatment plants that are impacted by wet weather flows, the permittee shall develop and implement a wet weather operations strategy that minimizes or eliminates the wash out of solids from the treatment system while maximizing the flow through the treatment plant.

    - An emergency plan that identifies how the facility will be operated during times of emergency. For example, the plan shall detail how key wastewater processes will be repaired or replaced in the event of a failure while minimizing loss of life and property damage to the facility. This plan shall also include emergency contact numbers for local emergency response agencies, plant personnel, critical suppliers and vendors, and DEP contacts, at a minimum.

    - A preventative maintenance plan that includes a schedule for preventative maintenance for all equipment within the treatment system. A spare parts inventory shall be included as part of this plan.

    - A solids management plan that identifies how solids produced by the facility will be wasted, treated, and ultimately disposed of.

14. Laboratory Certification

The Environmental Laboratory Accreditation Act of 2002 requires that all environmental laboratories register with the DEP. An environmental laboratory is any facility engaged in the testing or analysis of environmental samples required by a statute administered by the DEP relating to the protection of the environment or of public health, safety, and welfare.

15. The seasonal effluent limitations for fecal coliform are based on Chapter 92a (§ 92a.47(4) & (5)) of DEP's regulations and Delaware River Basin Commission's (DRBC's) Water Quality Regulations at § 4.30.4.A. DEP's regulations govern the summer limits for fecal coliform while the winter limits are based on DRBC's regulations. The DRBC regulations state that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. For reporting purposes, a copy of the guidelines on the 10 percent rule is enclosed with the permit.

16. Chronic Whole Effluent Toxicity (WET) Monitoring Required for Permit Renewal

The permittee shall conduct Chronic Whole Effluent Toxicity (WET) Testing within the final 18 months of this permit cycle, according to Federal Regulation 40 CFR § 122.21(j)(5). The permittee shall conduct a minimum of four quarterly tests during the year preceding the submission of the permit application, and shall submit the results with the permittee's next NPDES Permit renewal application. The tests shall include chronic survival and reproduction data for the cladoceran, *Ceriodaphnia dubia* and survival and growth data for the fathead minnow, *Pimephales promelas.* The dilution series for the testing shall be **100%, 95%, 90%, 86%, 81%**, unless modified in writing by the DEP. The appropriate biomonitoring protocol for the testing can be obtained from the DEP regional office.

17. **Chronic Whole Effluent Toxicity (WET) Permit Limit**

A. General Requirements

The permittee shall conduct chronic whole effluent toxicity (WET) tests in accordance with the appropriate test protocols or guidance described in Section E, Test Conditions and Methods, below. The permittee shall collect discharge samples and perform WET tests to generate chronic survival and reproduction data for the cladoceran, *Ceriodaphnia dubia*. These results will be expressed as No Observed Effect Concentration (NOEC) and a dose-response curve shall be plotted, if possible. NOEC results will be reported on DMRs as Chronic Toxicity Units (TUc).

B. Test Frequency

Chronic WET testing shall be conducted quarterly starting within three months of the permit's effective date. If the results of four consecutive chronic WET tests indicates toxicity equal to or less than 1.05 TUc, the permittee may request that the DEP reevaluate the performance of the facility and the effects of the facility effluent upon the aquatic community and reduce or remove the WET testing frequency for the remainder of the permit cycle.

C. Toxicity Identification/Reduction Evaluation

If any of the quarterly WET tests results exceed 1.05 TUc, the permittee shall within 30 days of test completion collect additional discharge samples and perform an additional WET test. If the result of the additional WET test also exceeds 1.05 TUc, the permittee shall commence a Toxicity Identification Evaluation (TIE) and Toxicity Reduction Evaluation (TRE). The TIE/TRE evaluates the possible causes of the effluent toxicity, the possible sources of the causative agents, possible control options to reduce or eliminate the effluent toxicity, and implementation of controls. Quarterly WET testing will continue during the period the permittee is conducting the TIE/TRE.

Within 30 days of submitting the chronic test report that triggers a TIE/TRE requirement, the permittee must submit either a written report on the results of the TIE/TRE, or if the TIE/TRE is not completed, a schedule for completing the TIE/TRE. The schedule must contain specific time frames for completing major elements of the TIE/TRE.

The TIE/TRE must be conducted in accordance with EPA's guidance in "Methods for Aquatic Identification Evaluations," Phase I (600/3-88/034, September 1988), Phase II (600/3-88/035, February 1989), Phase III (600/3-88/036, February 1989), or current approved TIE/TRE protocols.

Once the toxicant(s) or other cause(s) of the WETT failure(s) is (are) identified, confirmed, and controlled to acceptable levels through establishment of chemical specific limits or institutional methods, the permittee may submit a request to the DEP for modification of the permit condition, documenting the changes instituted to achieve the toxicity reduction. Documentation may include, but is not limited to: the results of TIE/TRE, pretreatment program changes, plant operation and maintenance, design changes, or establishment of and compliance with chemical limits that address the effluent toxicity.

The DEP will decide if the toxicity has been properly addressed based upon the permittee's report and completion of four consecutive WET tests which indicates toxicity equal to or less than 1.05 TUc, subsequent to institution of the controls specified in the report.

D. Sample Collection

For each chronic testing event, three 24-hour flow-proportioned, composite samples shall be collected over a seven-day exposure period. The samples shall be collected at a frequency of not greater than every two hours and flow proportioned. The samples must be collected at the NPDES permit sampling point. The permittee shall collect chemical and physical data on the effluent samples specified in this permit.

E. Test Conditions and Methods

The permittee shall follow the EPA manual "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh Water Organisms, 4th Edition, October 2002 (EPA-821-R-02-013)," or the most current version. The tests shall be performed in accordance with the enclosed QA/QC procedures and shall include the enclosed summary coversheets for *Ceriodaphnia dubia*. The laboratory must prepare a series of effluent dilutions which are specific to your discharge. **The dilution series shall be 100%, 100%, 95%, 90%, 86%, 81%.** If proper chronic test acceptability criteria are not met or the proper QA/QC conditions were not followed, you must perform a retest within 30 days.

F. Chemical Analysis

The chemistry tests shall include pH, conductivity, total alkalinity, total hardness, total residual chlorine, total ammonia (unionized ammonia), dissolved oxygen, and temperature. Chemical analyses as described in the EPA Methods (above) shall be performed for each sampling event, including each new batch of dilution water and each testing event.

In addition to the chemical analyses required above, those parameters listed in PART A and PART C of the NPDES permit for the outfall(s) tested shall be analyzed concurrently with the WET test by using the method specified in the NPDES permit or, if not specified, by using EPA Methods at 40 C.F.R. Part 136; Standard Methods for the Examination of Water and Wastewater, American Public Health Association; and approved methods cited in 25 Pa. Code Chapter 16, Water Quality Toxics Management Strategy, Statement of Policy.

G. Chronic Toxicity Test Report Elements

At a minimum, the following must be reported with each chronic WET test:

1. General test description: origin and age of test organisms, dates and results of reference toxicant tests, light and temperature regimes, and other information on test conditions.

2. Completion of Ceriodaphnia dubia coversheets (Forms 3620-FM-WQ0145).

3. Description of sample collection procedures and of the sample location.

4. Names of individuals collecting and transporting samples, times and dates of sample collection and analysis, and temperature of sample upon receipt.

5. Description, time, and date of sample renewals.

6. All chemical and physical data, including method detection levels and observations made on the species. The chronic WET test hardness shall be reported with each test.

7. Copies of raw data sheets and/or bench sheets with data entries and signatures.

8. Dechlorination procedures with test statistical comparisons.

9. All observations or test conditions affecting the test outcome. All Type 1 or Type II errors must be explained.

10. The reference toxicant shall be identified and be a commonly used toxicant approved by EPA. Reports of reference toxicant tests shall include all information needed for the proper evaluation of the test. This includes the following: water chemistry parameters of controls and test concentrations, chronic endpoint with appropriate statistical analyses, and control charts (for point estimates, cumulative mean ± two standards deviations; for NOEC's central tendency ± one for concentration interval).

H. Submission of Test Reports

The permittee shall submit copies of all chronic WET test reports to DEP at the address listed below within 30 days of the test completion:

Department of Environmental Protection
Southeast Regional Office
Water Quality Management
2 East Main Street
Norristown, PA 19401

18. The Operation and Implementation of a Pretreatment Program

A. General Requirements - The permittee shall operate and implement an industrial pretreatment program in accordance with the Federal Clean Water Act, the Pennsylvania Clean Stream Law, and the federal General Pretreatment Regulations at 40 C.F.R. 403. The program shall also be implemented in accordance with the pretreatment program and any modifications thereto submitted by the permittee and approved by the Approval Authority.

B. Annual Report and Other Requirements - The permittee shall submit an Annual Report by March 31 of each year to the DEP and Environmental Protection Agency (EPA) that describes the permittee's pretreatment activities for the previous calendar year. The Annual Report shall include a description of pretreatment activities in all municipalities from which wastewater is received at the permittee's Publicly Owned Treatment Works (POTW). The submission to the DEP shall be incorporated into the permittee's Annual Municipal Wasteload Management Report required by 25 Pa. Code Chapter 94. In addition, the permittee shall meet all of the conditions specified below whether or not they relate to the Annual Report:

1. Control Mechanism Issuance - The Annual Report shall contain a summary of Significant Industrial User (SIU) control mechanism issuance, including a list of issuance and expiration dates for each SIU.

2. Sampling and Inspection - The Annual Report shall contain a summary of the number and type of inspections and samplings of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected, and the reason that the sampling and/or inspection was not conducted.

3. Industrial User (IU) Compliance and POTW Enforcement - The Annual Report shall contain a summary of the number and type of violations of pretreatment standards and requirements, including local limits, and the actions taken by the permittee to obtain compliance, including civil penalty assessments and actions for injunctive relief. The report shall state whether each SIU was in significant noncompliance, as that term is defined in 40 C.F.R. Section 403.8(f)(2)(vii).

4. Industrial Listing - The Annual Report shall contain an updated industrial listing showing all current SIUs and the categorical standard, if any, applicable to each. In addition, the report shall contain a summary of any trucked or hauled wastewater accepted at the plant including the source of the wastewater (domestic, commercial, or industrial), and the discharge point designated by the POTW for acceptance of such wastewater. For each industrial source, the report shall indicate the name and address of the industrial source, the average (per discharge day) amount of wastewater received on a monthly basis, a brief description of the type of process operations conducted at the industrial facility, whether the source facility is a categorical industry, significant industry or non-significant user, and any controls imposed on the user.

5. Summary of POTW Operations - The Annual Report shall contain a summary of any interference, pass-through, or permit violations by the POTW which may be attributed to industrial users, and actions taken to address these events. The summary shall also include sampling and analysis of treatment plant influent, effluent, and sludge for toxic and any other pollutants for which a local limit exists, and an analysis of any trends in such data for the last three years.

6. Pretreatment Program Changes - The Annual Report shall contain a summary of any changes to the approved program and the date of submission to the Approval Authority.

7. Monitoring - The permittee shall conduct monitoring at its treatment plant that, at a minimum, includes quarterly influent, effluent, and sludge analysis for all local limit parameters, and an annual priority pollutant scan for influent and sludge.

C. Notification of Pass-Through or Interference - The permittee shall notify EPA and the DEP, in writing, of any instance of pass-through or interference related to an industrial discharge from an IU into the POTW. The notification shall be attached to the DMR submitted to the DEP and EPA and shall describe the incident, including the date, time, length, cause (including responsible user if known), and the steps taken by the permittee and IU (if identified) to address the incident. A copy of the notification shall also be sent to the EPA at the address provided below.

D. Headwork Analysis - The permittee shall submit to the DEP and EPA a reevaluation of its local limits based on a headworks analysis of its treatment plant within one (1) year of permit issuance. The list of pollutants to be evaluated, as well as a sampling plan for collection of necessary data, shall be submitted to the DEP and EPA within three (3) months of permit issuance. Within four (4) months of acceptance of the headwork analysis by the Approval Authority, the permittee shall adopt the revised local limits and notify all contributing municipalities of the need to adopt the revised local limits.

F. Changes to Pretreatment Program - The DEP and EPA may require the permittee to submit for approval changes to its pretreatment program if any one or more of the following conditions is present:

1. The program is not implemented in accordance with 40 C.F.R. Part 403.

2. Problems such as interference, pass-through or sludge contamination, develop or continue.

3. Federal, state, or local requirements change.

4. Changes are needed to assure protection of waters of the Commonwealth.

G. Procedure For Pretreatment Program Changes - Upon submittal by the permittee, and written notice of approval by the Approval Authority to the permittee of any changes to the permittee's approved pretreatment program, such changes are effective and binding upon the permittee unless the permittee objects within 30 days of receipt of the written notice of approval. Any such objections must be submitted in writing to both the DEP and EPA at the addresses shown below.

H. Correspondence - The Approval Authority shall be EPA at the following address:

Pretreatment Coordinator (3WP41)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Copies of all correspondence and reports dealing with this program shall be sent to:

Department of Environmental Protection
Southeast Regional Office
Water Management Program
2 East Main Street
Norristown, PA 19401

19. REQUIREMENTS APPLICABLE TO STORMWATER OUTFALLS

A. Prohibition of Nonstormwater Discharges

1. Except as provided in A.2, all discharges to stormwater Outfalls 002 thru 004 shall be composed entirely of stormwater and allowable nonstormwater as specified in A.2 below.

2. The following nonstormwater discharges may be authorized, provided the discharge is in compliance with D.2.b: discharges from fire fighting activities; fire hydrant flushings, potable water sources, including waterline flushings, irrigation drainage, lawn watering, routine external building washdown which does not use detergents or other compounds, pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used, air conditioning condensate, springs, uncontaminated groundwater, and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Spills

This permit does not authorize the discharge of any polluting substances resulting from an on-site spill. Such spills shall be controlled through proper implementation of a Preparedness, Prevention, and Contingency (PPC) Plan as stated in Section D below.

C. This permit does not authorize any discharge (stormwater or nonstormwater) containing any pollutant that may cause or contribute to an impact on aquatic life or pose a substantial hazard to human health or the environment due to its quantity or concentration.

D. PPC Plans

1. Development of Plan

Operators of facilities shall have developed a PPC Plan in accordance with 25 Pa. Code Section 91.34 and the "Guidelines for the Development and Implementation of Environmental Emergency Response Plans." The PPC Plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the facility. In addition, the PPC Plan shall describe the BMPs that are to be used to reduce the pollutants in stormwater discharges at the facility ensuring compliance with the terms and conditions of this permit. The PPC Plan shall be completed within 90 days from the permit effective date.

2. Nonstormwater Discharges

a. The PPC Plan shall contain a certification that the discharge has been tested or evaluated for the presence of nonstormwater discharges. The certification shall include the identification of potential significant sources of nonstormwater at the site, a description of the results of any test and/or evaluation for the presence of nonstormwater discharges, the evaluation criteria or testing methods used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge does not have access to an outfall, manhole, or other point of access to the ultimate conduit that receives the discharge. In such cases, the source identification section of the PPC Plan shall indicate why the certification was not feasible. A discharger that is unable to provide the certification must notify the DEP within 90 days of the effective date of this permit.

b. Except for flows from fire fighting activities, sources of nonstormwater listed in A.2. (authorized nonstormwater discharges) that are combined with stormwater discharges must be identified in the Plan. The Plan shall identify and ensure the implementation of appropriate pollution prevention measures for the nonstormwater component(s) of the discharge.

3. Comprehensive Site Compliance Evaluations and Recordkeeping

Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall include:

a. Visual inspection and evaluation of areas contributing to a stormwater discharge for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the Plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the Plan, such as spill response equipment, shall be made.

b. Based on the results of the inspection, the description of potential pollutant sources identified in the PPC Plan, and pollution prevention measures and controls identified in the Plan shall be revised as appropriate within 15 days of such inspection and shall provide for implementation of any changes to the Plan in a timely manner, but in no case more than 90 days after the inspection.

c. A report summarizing the scope of the inspection, using the DEP's Annual Inspection form shall be completed and made available upon request and retained as part of the PPC Plan for at least one year after coverage under this permit terminates.

E. Stormwater Management Best Management Practices (BMPs)

The permittee shall implement at least the following BMPs:

1. Manage sludge in accordance with all applicable permit requirements; temporarily collect and store sludge in enclosed containers or tanks.

2. Store chemicals in secure and covered areas on impervious surfaces away from storm drains.

3. For new facilities and improvements: Design wastewater treatment facilities to avoid, to the maximum extent practicable, stormwater commingling with sanitary wastewater.

4. Efficiently use herbicides for weed control; where practicable, investigate use of the least toxic herbicides; do not apply during windy conditions.

5. Do not wash parts or equipment over impervious surfaces that wash into storm drains.

6. Conduct Good Housekeeping Practices.

7. Implement infiltration techniques, including infiltration basins, trenches, dry wells, porous pavements, etc., wherever practicable.

F. Stormwater Sampling and Reporting

1. If stormwater samples are required by this permit, they shall be collected as grab samples during the first 30 minutes, but no later than one-hour of the discharge resulting from a storm event that occurs at least 72 hours from the previously measurable storm event.

2. When the discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit, in lieu of sampling data, a description of why samples could not be collected, including available documentation of the event. This sampling waiver may not be used more than once during a two-year period.

3. Stormwater monitoring results shall be summarized on a DMR form and the DEP's "Additional Information for the Reporting of Stormwater Monitoring" form.

4. When a facility has two or more outfalls that may reasonably be believed to discharge substantially identical effluents, based on a consideration of features and activities within the area drained by the outfall, the permittee may sample one such outfall and report that the quantitative data also applies to the substantially identical outfalls.

20. There is an existing site-specific criteria modification for total recoverable copper for this facility (*Pennsylvania Bulletin*, Volume 26, No. 15, April 13, 1996). Based on the results of a recalculation and water effects ratio (WER) study and a hardness of 200 mg/l as $CaCO_3$, DEP approved the site-specific chronic and acute life criteria for total recoverable copper of 0.17 mg/l and 0.27 mg/l, respectively. Without the WER, the site-specific criteria are 0.0348 mg/l (CCC) and 0.0554 mg/l (CMC), respectively. The basis for the site-specific criteria is as follows:

$$CCC = 4.89 \times Exp (0.8545 \times \ln[H] - 0.9773)$$
$$CMC = 4.89 \times Exp (0.9422 \times \ln[H] - 0.9772)$$

Due to significant changes in wastewater characteristics expected from recent and/or proposed treatment plant modifications, the Department requests that the facility submit an updated WER to the Department, or otherwise develop updated site-specific water quality criteria for copper [25 PA Code 93.8d]. Approved methods to develop site-specific criteria are listed in 25 Pa Code 93.8d(c). The Department will also accept proposed site-specific criteria based on the Biotic Ligand Model (BLM), as described in EPA's updated aquatic life criteria for copper.

The permittee shall submit to the Department a proposed plan of study for an updated WER or site-specific water quality criteria at least 24 months prior to the expiration date of this permit [25 Pa Code 93.8d(d)]. The completed WER or scientific study shall be submitted with the next NPDES Permit renewal application.

APPENDIX M

UPPER GWYNEDD TOWNSHIP
CORRECTIVE ACTION PLAN

CORRECTIVE ACTION PLAN

AND

CONNECTION MANAGEMENT PLAN

UPPER GWYNEDD TOWNSHIP

SEPTEMBER 2009

REVISED SEPTEMBER 2010

REVISED SEPTEMBER 2011

REVISED MARCH 2013

REVISED FEBRUARY 2016

Prepared by:

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KULPSVILLE, PA 19443

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A UPPER GWYNEDD TOWNSHIP COLLECTION SYSTEM

SECTION 1.0 PURPOSE

The Pennsylvania Department of Environmental Protection (PADEP) sent a letter to Upper Gwynedd Township (UGT), dated May 20, 2009, requesting that UGT develop a Corrective Action Plan (CAP) to ultimately terminate Sanitary Sewer Overflows (SSO) in the UGT collection system. UGT submitted a CAP to the PADEP on September 17, 2009. PADEP provided comments in a January 11, 2010 letter to UGT. UGT and PADEP had several meetings in 2010 to discuss the CAP and related issues. A revised CAP was submitted in September 2010 to address PADEP's January 11, 2010 letter and update the progress of our I/I program. PADEP provided additional comments in a March 22, 2011 letter to UGT. UGT and the PADEP had phone conversations and meetings since the September 2010 CAP revision was submitted to discuss the March 22 comments and related issues. UGT submitted a revised CAP in September 2011 to address PADEP's January 11, 2010 and March 22, 2011 letters and further update the progress of UGT's I/I program. The CAP was approved by PADEP in a letter dated February 2, 2012. UGT subsequently submitted another CAP revision in March 2013.

This CAP is intended to document the I/I Abatement Program work UGT has performed since the March 2013 CAP and to request EDU credits and a lifting of the connection prohibition based on the success in reducing both Infiltration & Inflow (I/I) and Sanitary Sewer Overflows (SSO). Also included with this CAP is a Connection Management Plan (CMP) which will state the Estimated Dwelling Units (EDU) that UGT will need to accommodate future growth.

SECTION 2.0 UGT COLLECTION SYSTEM DESCRIPTION

The Upper Gwynedd Township collection system serves the entire Township. There are two major service areas in the Township that are delineated by a ridge line running through the Merck facility that are serviced by the Towamencin Municipal Authority (TMA formerly UGTMA) Wastewater Treatment Plant (WWTP) and UGT WWTP. The TMA WWTP serves the portion of the collection system west of the drainage divide, while the UGT WWTP serves the portion east of the drainage divide. A map of the UGT collection system is included in Appendix A.

There are nine SSO that UGT has reported in the UGT service area.

There are nine SSO that UGT has reported in the TMA service area.

2.1 UGT WWTP SERVICE AREA

The UGT WWTP is served by two main interceptors, the East Interceptor and the Southwest Interceptor. The majority of flow is from the Southwest Interceptor. Of the eight manholes that have experienced SSO in the UGT service area, four are located on the East Interceptor and five are located on the Southwest Interceptor.

EAST INTERCEPTOR

The manholes that have overflowed on the East Interceptor are:

- Manhole E1700
- Manhole E2800
- Manhole E3000
- Manhole E3100

Manhole E1700 is located just south of the railroad tracks at Node J.
Manhole E2800 is located just south of Sumneytown Pike, right next to Node F on the map.
Manholes E3000 and E3100 are located just north of Sumneytown Pike, right next to Node F also.

SOUTHWEST INTERCEPTOR

The manholes that have overflowed on the Southwest Interceptor are:

- Manhole PS 200
- Manhole PS 323
- Manhole NW 600
- Manhole NW 2600
- Manhole NW 4000A

Manhole PS 200 is located right near (upstream of) the Briar Glen Pump Station, located just off the intersection of Morris Road and Broad Street.

Manhole PS323 is located on Morris Road Upstream of Conrad Avenue and downstream of Briar Glen), just west of the intersection of Morris Road and Berks Road.

Manhole NW 600 is located just north of Sumneytown Pike, between Nodes G and H.

Manhole NW 2600 is located on Hancock Road, just west of Dickerson Road.

Manhole NW 4000A is located on Sumneytown Pike near Ivy Lane.

SECTION 2.2 KRIEBEL ROAD INTERCEPTOR

The TMA drainage area located within UGT is served by the Kriebel Road Interceptor (KRI). This service area is situated west of Broad Street south of Sumneytown Pike, and west of the railroad tracks north of Sumneytown Pike. There are four points where the flow from the UGT collection system crosses the Township line into Towamencin Township. The crossing manhole locations are:

- Manhole 201/24A
- Manhole 473/21.1
- Manhole 475
- Manhole 236/35

These manholes are all located south of Sumneytown Pike. Manhole 201 is located just north of the bridge that crosses Towamencin Creek. MH 24A is just south of the bridge and west of Route 363.

Manhole 473 is located just south of Jacks Lane on Valley Forge Road. MH 21.1 is located just north of Hillside Ave. and just west of Route 363 in Towamencin Township. Manhole 475 is located on Route 363 south of Anders Road, just into Towamencin Township. Manhole 236 is located just on the Towamencin Township side of Route 363, just north of the PA Turnpike overpass. MH 35 is located one manhole downstream (west) of MH 236.

Please note that where two manhole designations are used, it is either because TMA has a different numbering system than UGT or because flow meter locations were moved from one manhole to an adjacent manhole (e.g. MH 236/MH35) due to field logistical reasons. All of these manholes represent the crossing points where the UGT system crosses Route 363 into Towamencin Township.

All of these manholes, which collect the entire flow from UGT going to the TMA WWTP, ultimately flow into the KRI. The KRI also drains a significant portion of Towamencin Township.

Nine SSO are located in the TMA service area. These are:

- Manhole 237A
- Manhole 239
- Manhole 244
- Manhole 249
- Manhole 250
- Manhole 833
- Manhole 834
- Manhole 204A
- Manhole 456

Manhole 237A is located at the end of Musket Drive, just east of Route 363, north of Morris Road, and just upstream from Manhole 236.

Manhole 239 is located just east of Powderhorn Drive and upstream from Manhole 237

Manhole 244 is located on Supplee Road, upstream from Manhole 237A. Manholes 249 and 250 are located just upstream of Manhole 244.

Manholes 833 and 834 are located just north of Allentown Road on Sturbridge Avenue.

Manhole 204A is located just north of Sumneytown Pike and just east of Route 363.

Manhole 456 is located on Sumneytown Pike, just east of Manhole 204A.

SECTION 3.0 UGT COLLECTION SYSTEM STUDY

3.1 INTRODUCTION

UGT has been submitting bi-annual Infiltration/Inflow Abatement Program reports to the PADEP since 2004. These reports have discussed the actions that UGT has taken to investigate and reduce I/I from the collection system. The most recent report, was submitted to the PADEP on March 31, 2015. Based on discussions with PADEP UGT is no longer required to submit these bi-annual reports.

These bi-annual reports have described, in detail, the studies and investigations that UGT has performed, the Township-wide program that has been undertaken, corrective actions that have been implemented, and future actions needed to further reduce I/I. As these reports have clearly indicated, UGT has developed, maintained, and implemented an aggressive I/I program for many years. UGT has spent a considerable amount of money as one means of demonstrating its commitment to removing I/I.

The studies, investigations, and corrective actions that have been performed include a variety of actions. This work is ongoing and continues to progress since our last CAP submittal in March 2013. The work described in the following sections of this CAP includes only those actions taken since the last CAP revision in March 2013.

The I/I work performed to date includes a variety of activities. Section 3.2 describes the work that has been performed on identifying sources of I/I since March 2013. The format used and the title of the section headings is the same as in the previous CAP.

3.2 DESCRIPTION OF I/I SOURCES

MARCH 2013 TO SEPTEMBER 2015

During the period March 2013 to December 2015, UGT continued to perform a variety of activities to identify potential sources of I/I. Several sources of note were discovered during two major construction projects to improve the UGT collection system, reduce I/I, and eliminate SSO.

EAST INTERCEPTOR PROJECT

Two significant sources of I/I were discovered during the East Interceptor improvement project completed in December 2013. During construction an underground spring was found to be leaking into MH E2300. Also clear water was found leaking into MH E3000. The project was amended to include repairs to eliminate these sources of I/I. They were successfully completed with an estimated I/I reduction of 45 GPM.

SOUTHWEST INTERCEPTOR PROJECT

During the Southwest Interceptor construction project done as part of the inter-connection with the North Wales Water Authority, a significant source of I/I was found. During the excavation work, a break in a 27 inch pipe was found. An underground spring was found to be entering the break in the pipe. Based on the size of the pipe and visual estimates of the rate of flow, it is estimated that approximately 500,000 gallons per day (gpd) of infiltration was eliminated when the pipe was replaced with a new pipe.

Please note that the information in the sections below is presented in segments for each of the three interceptors that we are focusing on, as this is the way UGT collects and tracks information. All of the segments in this section represent work done by UGT during the period March 2013 to September 2015.

2013 - EAST INTERCEPTOR

- Televised 2,970 feet of sewer main
    1. Lower Valley Road
    2. Sumneytown Pike
    3. Upper Valley Road
    4. Barberry Road

UGT staff performed visual inspection of manholes during several rain events to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. This information is used to identify potential, future repairs. Section 5 discusses future I/I reduction work in the East Interceptor drainage area.

2013 - SOUTHWEST INTERCEPTOR

- Televised 1,580 feet of sewer main on the following streets
    1. Wissahickon Avenue
    2. Park Road
    3. Collins Avenue

- Inspected ten manholes as follows:
    1. Hancock Road; Manholes NW 2602 to NW 2608; NW 2615 to NW 2617
- Televised fourteen laterals on the following streets
    1. Whitaker Place
    2. Hazelwood Drive
    3. North Lane
    4. West Point Pike
    5. Collins Avenue
    6. Tranquility Lane
    7. Eva Drive
    8. Borman Lane
    9. Aldrin Avenue

We also note that UGT performed a collection system wide inspection of manholes during the rain events of June 7 and June 10, 2013. The inspections were done at selected manholes which have shown the highest levels of I/I in the past.

2013 - KRIEBEL ROAD INTERCEPTOR

- Televised 5,140 feet of sewer main
    1. Stirling Drive
    2. Green Street
    3. Sullivan Drive
    4. Smallwood Drive

- Inspected 24 manholes
    1. Towamencin Ave (MH 300-308
    2. MH 209 to MH 213
    3. MH 226 to MH 235

- Televised fourteen laterals
    1. Allentown Road
    2. State Street
    3. Green Street
    4. Crest Road
    5. Hartley Place

UGT staff performed visual inspections of manholes during rain events. For the MH 255 drainage area, the inspection was performed on March 12, 2013. For the MH 251 drainage area the inspection was performed on July 1, 2013. As described in the sections below, UGT uses these inspections to identify leaks in manholes and identify drainage areas which have the highest I/I rates. The repairs are, in part, based on these valuable field inspections.

We also note that UGT performed a collection system wide inspection of manholes during the rain events of June 7 and June 10. The inspections were done at selected manholes which have shown the highest levels of I/I in the past.

2013-2014 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 10,475 feet of sewer main on the following streets
    1. Lower Valley Road
    2. Sumneytown Pike
    3. Upper Valley Road
    4. Jenkins Ave.
    5. Croft Road
    6. Hibbert Road
    7. Britt Road

All of these streets except for Jenkins Ave. are tributary to MH E3000. Most of this work was done in preparation for the large C.I.P.P lining project UGT performed in 2014.

UGT staff also performed visual inspection of 30 manholes on Lower Valley Road, Upper Valley Road, Gwynedd Manor Road, Letitia Lane, and Sumneytown Pike during rain events on December 23 and 29, 2013 and February 5 and 21, 2014 to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. All of these manholes are tributary to MH E3000. This information is used to identify potential, future repairs.

2013 -2014 SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 500 feet of sewer main
    1. Hancock Road

UGT also televised seven laterals on North Lane. No significant sources of I/I were found.

2013 – 2014 KRIEBEL ROAD INTERCEPTOR

- Televised 1,840 feet of sewer main
    1. Supplee Road
    2. Barry Lane

Barry Lane is tributary to MH 205 and MH 24A and Supplee is tributary to MH 245.

- UGT inspected twenty five manholes during rain and non-rain event periods as follows:
    1. Gwynnedale Townhouse development
    2. Charter Oaks development
    3. Stonegate development
    4.

These developments are tributary to MH 205

Three manholes in the Ryans Run development at the intersection of Morris Road and Valley Forge Road were also inspected during the above listed rain events in December and February. No significant sources of 1/1 were located during these observation periods. Ryans Run is tributary to MH 35 in the UGTMA service area and ultimately flows to the Kriebel Road Interceptor.

- Televised two laterals
    1. Barry Lane

UGT's home inspection program continued with the inspection of 226 homes in the Sugar Valley area identified in previous reports. No significant sources of I/I were found during these inspections.

2014 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 5,065 feet of sewer main on the following streets
    1. Sumneytown Pike
    2. Swedesford Road
    3. Meadowbrook Road
    4. West Prospect Avenue

In addition to this televising work, 11,500 feet of sewer main was televised for the East Interceptor CIPP and manhole lining projects.

UGT staff also performed visual inspection of forty manholes on Lower Valley Road, Upper Valley Road, Gwynedd Manor Road, Letitia Lane, Britt Road, Hibbert Road and Sumneytown Pike during 2014 rain events on March 30, April 15, and May 16 to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. All of these manholes, except those on Gywnedd Manor Road, are tributary to MH E3000. This information is used to identify the effectiveness of repairs already completed or potential, future repairs.

In addition, UGT inspected ninety five homes as part of our home inspection program. These homes were on:

- Croft Road
- Lower Valley Road
- Upper Valley Road

These homes are all tributary to MH E3000.

No significant sources of I/I were found during these inspections.

2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 900 feet of sewer main on the following streets
    1. Hancock Road
    2. Armstrong Drive
    3. Eagle Lane

Armstrong and Eagle Lane are tributary to the Conrad Avenue pump station.

UGT also televised four laterals on Hancock Road, Sumneytown Pike, Haines Drive, and Dickerson Road. No significant sources of I/I were found.

UGT also inspected twenty five manholes during the 2014 rain events of March 30, April 15, and May 16.

2014 - KRIEBEL ROAD INTERCEPTOR

- Televised 5,108 feet of sewer main
    1. Whitney Place
    2. S. Broad St.
    3. State St.
    4. Jarvis Lane
    5. Sumneytown Pike
    6. Muhlenburg Drive
    7. Supplee Road
    8. Hartley Place
    9. Tricorn Drive

The first five listed above are tributary to MH 24A. The last four are tributary to MH 237A.

UGT also inspected twenty manholes during the rain events of March 30, April 15, and May 16, 2014.

These manholes are tributary to MH 237A, MH 245, and MH 24A.

MH 801 was repaired. This is tributary to MH 24A.

- Televised one lateral
    1. Sumneytown Pike

Ninety manholes were inspected as part of UGT's ongoing field inspection efforts. These manholes are all tributary to MH 237A.

UGT also started work on inspection of commercial properties. Six commercial properties were inspected during the last six month period. These are all tributary to MH 24A.

2015 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 1,510 feet of sewer main on the following streets
    1. Jenkins Lane
    2. Swedesford Road
    3. West Prospect Avenue

- Televised 900 feet of sewer main in anticipation of the CIPP lining project
    1. Jenkins Lane

- Televised eight laterals on the following streets
    1. West Prospect Avenue
    2. Lower Valley Road
    3. Township Line Road
    4. Swedesford Road

5. Brian Way
6. Sumneytown Pike

UGT staff also performed visual inspection of eighteen manholes in the Haines Run development (this pumps to a small pump station at the UGT WWTP which feeds directly to the WWTP influent) The manholes inspected were PS110 thru PS123, PS100, PS101, PS106, PS107, and PS108. The UGT collection system staff looked for indications of leakage in these manholes. This information is used to identify potential future repairs. Section 3 discusses I/I work performed and Section 5 discusses future I/I work in the East Interceptor drainage area.

2015 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 6,180 feet of sewer main on the following streets
  1. Sumneytown Pike
  2. Dickerson Road
  3. Clover Drive

These areas are directly tributary to the Southwest Interceptor and do not go through any pump station.

UGT also televised ninety four laterals on the following streets:

- Clover Drive
- Shearer Street
- Comly Circle
- Gage Lane
- Old Church Road

UGT inspected fifteen manholes (PS204 thru PS217) that flow to the Briar Glen Pump Station as follows:

- Dunleavy Place
- Collins Avenue
- Hartley Drive

2015 – KRIEBEL ROAD INTERCEPTOR

- Televised 4,795 feet of sewer main in anticipation of the CIPP lining project
  1. State Street
  2. S. Broad St.
  3. Stirling Drive
  4. Lafayette Drive
  5. Easement between Manholes 675 and 681A
  6. Easement between MH250 & MH251

The first two listed above are tributary to MH 24A. The last four are tributary to MH 237A.

- Televised one lateral

Valley Forge Road

One hundred three manholes were inspected as part of UGT's ongoing field inspection efforts. Ninety eight of these manholes are tributary to MH 237A, four are tributary to MH 21.1 (one of the other crossing points), and one is tributary to MH 24A. The manholes tributary to MH 237A are included in the manhole repair work described in Table 3.14. These manholes are located as follows:

- Conway Place
- Flintlock Drive
- Garfield Avenue
- General Nash Drive
- Lafayette Drive
- Maxwell Place
- McIntosh Way
- Muhlenberg Drive
- Musket Drive
- Patriot Drive
- Powderhorn Drive
- Pulaski Drive
- Scott's way
- Shepard Drive
- S. Broad Street
- Stirling Drive
- Supplee Road
- Tricorn Drive

3.3 CORRECTIVE ACTION

The corrective actions UGT implemented prior to March 2013 have been documented in previous semi-annual I/I reports and in our EDU credit requests to PADEP so they are not repeated herein.

During the period March 2013 through the end of 2015, UGT performed a significant amount of I/I repair & rehabilitation work. The tables referenced in Sections 3.3.1, 3.3.2, and 3.3.3, for the East Interceptor, the Southwest Interceptor, and the Kriebel Road Interceptor, respectively represent the work UGT has performed from March 2013 through the end of 2015.

3.3.1 EAST INTERCEPTOR

For the East Interceptor, Table 3.1 includes manhole repair work; Table 3.2 includes CIPP lining work; Table 3.3 includes spot repairs using CIPP; Table 3.4 includes the I/I reduction work done during the East Interceptor improvement project and several miscellaneous repairs.

In additional to the work described in these tables, UGT successfully completed the East Interceptor improvement project. This project increased the capacity of several section of the

East Interceptor and made improvements to MH E3000 which has been the location of past SSO. Since completion of this project MH E3000 hasn't even surcharged let alone experience an SSO.

3.3.2 SOUTHWEST INTERCEPTOR

For the Southwest Interceptor, Table 3.5 includes manhole I/I reduction work done upstream of the Briar Glen pump station; Table 3.6 includes manhole I/I reduction work done upstream of the Conrad Avenue pump station; Table 3.7 includes repairs and improvements to sanitary sewer mains; Table 3.8 includes repairs and improvements to homeowner sewer laterals; Table 3.9 includes repairs and improvements to Township sanitary sewer laterals.

In addition to the work described in these tables, UGT successfully completed the Southwest Interceptor improvement project. This project was done as part of the North Wales Interconnection project. As stated earlier, a significant source of I/I was located and corrected as part of this project.

3.3.3 KRIEBEL ROAD INTERCEPTOR

For the Kriebel Road Interceptor, Table 3.10 includes manhole repair work for the MH 24A drainage area. Table 3.11 includes CIPP lining work for the MH 24A drainage area.

Table 3.12 includes 2014 manhole repair work in the MH 35 drainage area. Table 3.13 includes CIPP lining work in the MH 35 drainage area. Table 3.14 includes 2015 manhole repair work in the MH35 drainage area

3.3.4 OTHER I/I CORRECTIVE ACTIONS

During the period March 2013 to September 2015, UGT continued to perform a variety of Corrective Action besides the repair and rehabilitation work described in Sections 3.3.1, 3.3.2, and 3.3.3 to eliminate I/I. As noted above in Section 3.2, UGT identified and eliminated significant sources of I/I during the East Interceptor and Southwest Interceptor improvement projects.

Two major sources of I/I were discovered during the East Interceptor project in 2013. During construction, clear water was observed flowing into existing MH E2000 and new MH E2100C from upstream sources. Upper Gwynedd televised these upstream sections contributing to these manholes and repair work to eliminate these sources was performed in 2014. The work for these repairs are included in Table 3.4. Also, the pipe from MH E3001 that went to MH E3000 was found to be leaking. This was repaired during the East Interceptor project.

As stated in Section 3.2, during the Southwest Interceptor project done for the North Wales Interconnection, a break in a 27 inch pipe was found which a significant source of I/I was. An underground spring was found to be entering the break in the pipe. Based on the size of the pipe and visual estimates of the rate of flow, it is estimated that this pipe beak contributed approximately 500,000 gallons per day (gpd) of infiltration. This source was eliminated when the pipe was replaced with a new pipe.

Listed below are other Corrective Actions UGT performed from March 2013 through the end of 2015. Please note that in this section, the information is presented in segments for each of the two interceptors that we are focusing on, as this is the way UGT collects and tracks the information. All of the segments in this section represent additional I/I Corrective Actions done by UGT during the period March 2013 through the end of 2015.

2013 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 9,235 feet of sewer main

- Swedesford Road
- Sumneytown Pike
- Lower Valley Road
- Meadowbrook Road
- Barberry Road

2013 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 1,920 feet of sewer main

- Sumneytown Pike
- Dickerson Road
- North Lane

2013 – KRIEBEL ROAD INTERCEPTOR DRAIANAGE AREA

Performed preventative maintenance cleaning of 9,275 feet of sewer main

- Jackson Street
- State Street
- Allentown Road
- S. Broad Street
- Sullivan Drive
- Smallwood Drive

2013 – 2014 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 4,190 feet of sewer main

- Swedesford Road
- Meadowbrook Road

One last important note on the East Interceptor is that the East Interceptor project was completed in December 2013. This included replacement of approximately 2,400 of the Interceptor along with a reconfiguration of MH E3000. We note that since the project there have not been any SSO events at MH E3000. In addition, based on our field work, MH E3000 has not even surcharged. This is indicative of the efficacy of this project.

2013 - 2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 3,425 feet of sewer main

- Sumneytown Pike
- Lafayette Ave.
- Allentown Road
- Dickerson Road
- Farm Lane

2013 -2014 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 2,925 feet of sewer main

- Sumneytown Pike
- Lafayette Ave.
- Allentown Road
- Dickerson Road

2014 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 6,200 feet of sewer main

- W. Prospect Ave.
- Sumneytown Pike
- Swedesford Road
- Meadowbrook Road

UGT rehabilitated two manholes:

- MH E2300
- MH E2301

We would make note of the one big project in these tables. Table 3.2 includes the lining (C.I.P.P.) of 11,500 feet of sewer main in the East Interceptor drainage area that is tributary to MH E3000. Table 3.1 includes the lining of forty three (43) manholes, also tributary to MH E3000. Work on this project, which included both the CIPP and manhole lining, started in March 2014 and was successfully completed in July 2014.

2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 1,520 ft. of sewer main

- Sumneytown Pike
- DickersonRoad

- Armstrong Drive
- Eagle Lane

We also note the successful completion of another significant project in September 2014. This is the Conrad Ave. and Briar Glen pump station upgrade project. The larger pumps included as part of this project at each pump station are responsible for eliminating the SSO at MH PS200 and MH PS323, except for an equipment malfunction noted in previous reports.

2014 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 11,808 feet of sewer main

- S. Broad St.
- Allentown Road
- Jackson St.
- Supplee Road
- Hartley Place
- Lafayette Road

The first three are tributary to MH 24A. The last three are tributary to MH 237A.

2015 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 2,800 feet of sewer main

- Swedesford Road (Manholes E2030, E2301, E2032, E3019, E3020, E3021)
- Meadowbrook Road (Manholes E2018, E2023, MH E2029
- Sumneytown Pike (Manholes E3010, E3011, E3019,

UGT made four lateral repairs as follows:

- Lower Valley Road
- Airy Street
- Township Line Road

2015 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 2,160 ft. of sewer main

- Sumneytown Pike (Manholes NW102, NW103, NW500, SW3800, SW3801, SW3807, SW2308
- Dickerson Road (Manholes NW701, NW702, NW714, NW715)

UGT rehabilitated MH PS 323 which flows to the Conrad Avenue Pump Station.

UGT reset the frame on MH NW101

2015 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 1,650 feet of sewer main

- Allentown Road (Manholes 488, 489, & 490, 401A to 402)

These manholes are tributary to MH 24A.

UGT repaired/rehabilitated ten manholes as follows:

- Shepard Drive MH 1109
- Maxwell Place MH 669
- Hartley Place MH 682 & 683
- Patterson Drive 1018
- S. Broad St MH 1102
- Muhlenburg Drive MH 676
- Quinn Drive MH 651A2
- Supplee Road MH 651B &651C

The first six streets listed above are tributary to MH 237A. The last two are tributary to one of the other crossing points, MH 473.

UGT installed plugs in the vents that are below ground in the Sumney Forge Shopping Center which flows to MH201 to prevent I/I.

4.0 EFFECTIVENESS OF CORRECTIVE MEASURES

The effectiveness of our corrective action program through March 2013 has been documented in previous semi-annual I/I reports and EDU credit requests to PADEP and is not included herein.

The following summarizes the UGT flow monitoring program from March 2013 through November 2015 by drainage area within UGT.

4.1 EAST INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through 2015 for the East Interceptor. Specifically, flow monitoring was performed at the following manholes:

- E100
- E2005
- E2701
- E3010
- E3400
- E3402
- E3411
- E3418

Reference is made to Table 4.1 in the attachments. This table shows the carrying capacity of individual sections of the East Interceptor as well as identification of manholes where flow has been monitored. Also included is the peak flow for rain events greater than one inch during times when flow was being monitored. The table has been updated to include rain events through November 2015. Please note that not all manholes were being flow monitored at the same time.

MH E100 includes the total flow for the East Interceptor. All of the other manholes monitored are tributary to MH E3000. Although we have eliminated the SSO at MH E3000, UGT continued to perform I/I reduction work in 2014 and 2015 after completion of the East Interceptor improvement project. In addition, more work is planned for 2016 as described in Section 5.

Please note the following qualifier for 2014 flow data during the March 29, April 15, April 29, and May 16, rain events. During these rain events some manholes were open as part of implementation of the sewer main and manhole lining project included in Tables 3.1 and 3.2. In addition, the NWWA was doing some water line flushing for maintenance purposes, specifically during the April 29 event. These actions could have influenced the flow data during these periods.

As noted in Section 3, the East Interceptor CIPP lining project was completed in June 2014. Along with the East Interceptor capacity project completed in December 2013 these projects have been and will continue to be very successful in reducing I/I and eliminating SSO at MH 3000. UGT collection system personnel performed field reconnaissance during rain events. Based on this field reconnaissance, MH E3000 has not had a SSO nor has it even surcharged since completion of the East Interceptor improvement project. We note that there have been significant rain events that occurred in 2014 and 2015. We will, of course, continue to monitor this manhole.

4.2 SOUTHWEST INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through November 2015 for the Southwest Interceptor. Flow metering was performed at the following manholes:

- MH PS 202
- MH PS 323
- MH PS 324
- MH PS325
- MH PS 326
- MH 2346A
- MH NW4013

The flow meter at MH 2346A (on West Point Pike) was installed at the request of PADEP to confirm that adequate capacity exists in this main trunk line tributary to the Southwest Interceptor. Flow data and field observations during heavy rain events has confirmed that this line does not surcharge.

The flow meter at MH 324 was installed in July 2014 to help meter flow from the Briar Glen pump station.

Other than MH 2346A, these locations were chosen specifically to address the SSO that have occurred at Manholes PS200 and PS323. We note that with minor exception we have eliminated the SSO at manholes PS200 and PS323. This exception occurred at MH PS200 because of a pump equipment malfunction. The reason for the pump not going on was corrected.

Reference is made to Table 4.2 in the attachment. This table shows the carrying capacity of individual sections as well as identification of manholes where flow has been monitored. This table has been updated to include the flow for rain events greater than one inch through November 2015 when the flow was being monitored.

We would emphasize that UGT has continued with significant I/I reduction efforts on the Southwest Interceptor drainage area despite the fact that we have eliminated the SSO at MH PS200 and MH PS323. We recognize that we still have I/I and will continue to work on this. Section 5 includes additional I/I reduction work that UGT has planned for 2016.

4.3 KRIEBEL ROAD INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through the end of 2015 for the Kriebel Road Interceptor

Since March 2013, UGT worked with TMA on continuing to implement a comprehensive flow monitoring program for the KRI drainage area. UGT has monitored flow at the following manholes:

- MH 35
- MH 21.1
- MH 24A
- MH 473
- MH 205
- MH 459A
- MH 245
- MH 251
- MH 255
- MH 237A
- MH 694
- MH 1103

The first four manholes represent the crossing points from UGT into TT. MH 205 and MH 459A are tributary to MH 24A. MH 245 is tributary to MH 21.1. MH 251, MH 255, and MH 237A are tributary to MH 35.

The last two manholes are contributory to the MH 255 drainage area.

Reference is made to Table 4.3 in the attachment for flow data during heavy precipitation events. This figure has been updated to include rain events greater than 1' through December 2015. Please note that not all manholes were being flow monitored at the same time.

The drainage area tributary to MH 237 A is the only area where UGT continues to have SSO.

Section 6.3 includes documentation on I/I flow reduction as part of our request for additional EDUs in the KRI service area.

5.0 FUTURE I/I PROGRAM ACTIVITIES

UGT has been implementing an aggressive I/I Abatement Program since our last CAP in March 2013. The Corrective Actions UGT has taken since March 2013 are included in Section 3. Included below is a summary of the I/I reduction work UGT has planned for 2016.

5.1 EAST INTERCEPTOR

FUTURE REPAIR WORK

Tables 5.1 and 5.2 include the I/I repair work UGT has planned for 2016. Table 5.1 includes pipe bursting to replace 2,300 feet of sewer main. Table 5.2 includes manhole repairs to 14 manholes. This work is tributary to MH E3000. This demonstrates our commitment that even though UGT has eliminated the SSO at MH E3000, it will continue to reduce I/I even further.

5.2 SOUTHWEST INTERCEPTOR

FUTURE REPAIR WORK

UGT has additional repairs that are planned for 2016. Table 5.3 includes manhole repair/rehabilitation work scheduled in 2016. This work is being done in a new area of the UGT collection system. This area is the Northwest Interceptor which represents the upper part of the Southwest Interceptor.

5.3 KRIEBEL ROAD INTERCEPTOR
FUTURE REPAIR WORK

UGT has additional repairs that are planned for 2016. Table 5.4 includes manhole repair/rehabilitation work in the MH 24A drainage area. Table 5.5 includes lateral lining work in the MH 24A drainage area. Table 5.6 includes wye repair work also in the MH 24A drainage area.

5.4 SUMMARY OF FUTURE ACTIONS

We are providing you with our summary of actions UGT plans on doing based on what we know now. The sections below includes these recommended actions. Each drainage basin is discussed separately.

5.4.1 EAST INTERCEPTOR

UGT plans on implementing the following actions for the East Interceptor

- Continue with flow monitoring at manholes E100, E2005, E3010, E3400, and E3701
- Implement work described in Tables 5.1 and 5.2
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

5.4.2 SOUTHWEST INTERCEPTOR

UGT plans on implementing the following actions for the Southwest Interceptor

- Continue with flow monitoring at Manholes PS202, PS323, PS325, 2346A, and NW4013
- Implement repairs in attached Table 5.3
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

5.4.3 KRIEBEL ROAD INTERCEPTOR

UGT plans on implementing the following actions for the Kriebel Road Interceptor

- Continue with flow monitoring at Manholes 24A, 35, 21.1, 473, 205, 237A, 245, 251, 255, and 459A
- Implement repairs in attached Tables 5.4, 5.5, and 5.6
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

6.0 CONNECTION MANAGEMENT PLAN

Due to anticipated development in the Township, we anticipate the need to be able to make additional connections into the system over the next five to seven years. The most recent Connection Management Plan (CMP) is attached as Table 6.1. The CMP shows the proposed development for UGT. UGT has proposed an ambitious program to eliminate SSO in the years ahead.

To help implement CMP, UGT will need additional approvals and actions by the PADEP as discussed below.

6.1 EAST INTERCEPTOR

As had been stated in the many I/I reports UGT has provided to the PADEP, MH E3000 was the location of repeated SSO. Over the last few years UGT has undertaken significant actions to reduce I/I in the area tributary of MH E3000 and the entire East Interceptor drainage basin. The success of this program was last documented to the PADEP in our November 20, 2012 request for EDU credits. Based on this work PADEP released 15 EDUs to UGT for future connections. It is noted that the documented amount of I/I reduction was equivalent to forty five EDUs.

As we have noted herein, the East Interceptor improvement project was successfully completed in 2013. Since then MH E3000 has not experienced an SSO or even surcharged. UGT collection staff regularly does field reconnaissance during rain events so this statement can be made with certainty.

Based on our successful elimination of the SSO at MH E3000, UGT is requesting that the connection prohibition be removed for the East Interceptor. We, once again, note that we will continue to perform I/I reduction work in the east Interceptor drainage basin. This is commitment is demonstrated by the fact that we have done significant I/I reduction work after the E3000 SSO was eliminated and plan on doing more work in 2016.

6.2 SOUTHWEST INTERCEPTOR

The Southwest Interceptor SSO at MH PS200 and MH PS323 have also been eliminated based on the significant amount of I/I reduction work UGT has successfully performed. Based on our past work and to accommodate future growth included in the CMP, UGT is requesting additional EDU credits be approved by the PADEP. Included below is the documentation of I/I reduction based on flow monitoring before and after I/I reduction work. This documentation is structured the same as our previous EDU requests to the PADEP.

6.2.1 SOUTHWEST INTERCEPTOR EDU REQUEST

I/I REDUCTION WORK OVERVIEW

In order to document the success of the I/I reduction work in the Southwest Interceptor drainage basin work and the resulting reduction in I/I, UGT did pre and post flow metering at MH PS202 and MH PS323. MH PS202 is upstream of the Briar Glen pump station and MH PS323 is upstream of the Conrad Avenue pump station. The rain events being used are when the rainfall total was greater than 1" as requested by PADEP. The pre repair flow metering being used for both manholes for this analysis was performed on March 29-31, 2014 following a significant rain event (2.68"). For the post repair monitoring, it is our understanding that PADEP wants multiple post repair rain events to document the magnitude and sustainability of the I/I reduction. Therefore, this request for additional EDUs includes two rain events for MH PS202 (September 28, 2015 and October 2, 2015) and three rain events (August 20, 2015, September 28, 2015, and October 2, 2015. The rain associated with these events in chronological order are 2.43", 2.2", and 2.19", respectively.

I/I REDUCTION METHODOLOGY

To provide documentation for our I/I reduction, we are using two different methods. The first method compares the peak hourly flow for the pre and post rain events. As the data below will clearly show, the peak flow for all three post repair events is significantly lower than the pre repair rain event. The second method being used incorporates calculations for net I/I reduction to account for variations in rainfall, groundwater conditions, and climate conditions. We will use the average flow for the 10 day period prior to each rain event and compare it to the peak flows to generate a net I/I rate. This net I/I rate will be compared for the pre and post repair events to show net I/I reduction.

Having both methods for the rain events shows the effectiveness of our I/I reduction program in achieving significant, documented I/I reduction.

As has been reported to PADEP, flow metering is ongoing at these manhole locations, so flow data exists before, during, and after the actual rain events and is documented herein.

For Manholes PS202 and PS323, we are providing extensive flow data in both graphic and tabular form. Attached to this CAP is the following flow and rainfall information:

- Flow graphs for Manholes PS202 and PS323 showing a comparison of the flows and rainfall during all four referenced rain events on the same graph
- A tabular summary of the flows at Manholes PS202 and PS323 for each rain event with hourly flow interval data
- A graphic and tabular summary of the flows for Manholes PS202 and PS323 and each rain event for the entire month of the rain events

PEAK FLOW I/I REDUCTION ANALYSIS

MANHOLE PS 202

For MH PS202, the peak hourly flow for the pre repair March 2014 rain event is 0.322 mgd. For the two post repair rain events the average peak hourly flow is 0.025 mgd (September 28 = 0.001 mgd; October 2 = 0.049 mgd).

The total documented I/I reduction using the average post repair reduction for the two rain events for Manhole PS 202 is 0.322 mgd minus 0.025 mgd which equals 0.297 mgd (206 gpm).

Based on the reduction of 0.297 mgd, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 125 EDUs.

MANHOLE PS323

For MH PS323, the peak hourly flow for the pre repair March 2014 rain event is 0.934 mgd. For the three post repair rain events the average peak hourly flow is 0.308 mgd (August 20 = 0.424; September 28 = 0.154; October 2 = 0.347 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole PS 323 is 0.934 mgd minus 0.308 mgd which equals 0.626 mgd (435 gpm).

Based on the reduction of 0.626 mgd, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 264 EDUs.

The average for these two manholes is 195 EDUs

NET I/I REDUCTION ANALYSIS

The second method being used is to calculate net I/I reduction using net I/I rates. To do this, we took the 10 day period prior to each rain event and calculated the average daily flow. We then took the peak daily flow for each rain event and compared the average and peak daily flow rates. The average daily flow was subtracted from the peak daily flow to obtain a net I/I rate. The net I/I for the pre and post events was compared. Reference is made to the attached Tables 6.2 and 6.3.

MANHOLE PS 202

For MH PS202, the net I/I for the March 2014 rain event is 0.147 mgd (102 gpm). The average net I/I for the two post repair rain events is 0.0064 mgd (4 gpm). Therefore, the net I/I reduction is 0.147 minus 0.0064 which equals 0.141 mgd (98 gpm).

Using a net I/I reduction of 141,000 GPD and the same method as above for the peak flow comparison, this equates to 59 EDUs.

MANHOLE PS 323

For MH PS323, the net I/I for the March 2014 rain event is 0.503 mgd (350 gpm). The average net I/I for the three post repair rain events is 0.04 mgd (23 gpm). Therefore, the net I/I reduction is 0.503 minus 0.04 which equals 0.47 mgd (327 gpm).

Using a net I/I reduction of 470,000 GPD and the same method as above for the peak flow comparison, this equates to 198 EDUs.

The average using the Net I/I reduction method is 129 EDUs

PEAKING FACTOR ANALYSIS

We would add one last piece of documentation to show significant I/I reduction. As part of the second method using net I/I reduction, the average daily flow for the 10 day period prior the rain event was calculated for each rain event. We compared the peak daily flow to the 10 day average daily flow for each rain event.

MANHOLE PS 202

For MH PS202, the peaking factor for the pre repair rain event in March 2014 is 10.8. The average of the peaking factors for the two post repair rain events is 6.2. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

MANHOLE PS 323

For MH PS323, the peaking factor for the pre repair rain event in March 2014 is 7.5. The average of the peaking factors for the three post repair rain events is 1.5. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

EDU REQUEST SUMMARY

UGT has documented significant I/I reduction using two different methods. The first method using peak hourly flow I/I reduction justifies 195 EDU credits. The second method using net I/I reduction justifies 129 EDUs credits.

Therefore, UGT is requesting EDUs credits for the Southwest Interceptor which represent the average of the two methods, 162 EDUs.

6.3 KRIEBEL ROAD INTERCEPTOR

The number and frequency of SSO in the UGT service area that flows to the Kriebel Road Interceptor have been greatly reduced based on the significant amount of I/I reduction work UGT has successfully performed. Based on our past work and to accommodate future growth included in the CMP, UGT is requesting additional EDU credits be approved by the PADEP. Included below is the documentation of I/I reduction based on flow monitoring before and after I/I reduction work. This documentation is structured the same as our previous EDU requests to the PADEP.

6.3.1 KRIEBEL ROAD INTERCEPTOR EDU REQUEST

I/I REDUCTION WORK OVERVIEW

In order to document the success of the I/I reduction work in the Kriebel Road Interceptor drainage basin work and the resulting reduction in I/I, UGT did pre and post flow metering at MH 24A and MH 35. These manholes represent two of the four crossing points from UGT into TMA. MH 24A has the largest amount of flow of the four crossing points while MH 35 has the second most amount of flow. Combined, these two crossing points convey over 90% of the flow from UGT to TMA.

The rain events being used are when the rainfall total was greater than 1" as requested by PADEP. The pre repair flow metering being used for both manholes for this analysis was

performed on March 29-31, 2014 following a significant rain event (2.68"). For the post repair monitoring, it is our understanding that PADEP wants multiple post repair rain events to document the magnitude and sustainability of the I/I reduction. Therefore, this request for additional EDUs includes three rain events for each of the manholes. August 20, 2015, September 28, 2015, and October 2, 2015. The rain associated with these events in chronological order are 2.43", 2.2", and 2.19", respectively.

I/I REDUCTION METHODOLOGY

To provide documentation for our I/I reduction, we are using two different methods. The first method compares the peak hourly flow for the pre and post rain events. As the data below will clearly show, the peak flow for all three post repair events is significantly lower than the pre repair rain event of March 29, 2014. The second method being used incorporates calculations for net I/I reduction to account for variations in rainfall, groundwater conditions, and climate conditions. We will use the average flow for the 10 day period prior to each rain event and compare it to the peak flows to generate a net I/I rate. This net I/I rate will be compared for the pre and post repair events to show net I/I reduction.

Having both methods for the rain events shows the effectiveness of our I/I reduction program in achieving significant, documented I/I reduction.

As has been reported to PADEP, flow metering is ongoing at these manhole locations, so flow data exists before, during, and after the actual rain events and is documented herein.

For Manholes 24A and 35, we are providing extensive flow data in both graphic and tabular form. Attached to this CAP is the following flow and rainfall information:

- Flow graphs for Manholes 24A and 35 showing a comparison of the flows and rainfall during all four referenced rain events on the same graph
- A tabular summary of the flows at Manholes 24A and 35 for each rain event with hourly flow interval data
- A graphic and tabular summary of the flows for Manholes 24A and 35 and each rain event for the entire month of the four rain events

PEAK FLOW I/I REDUCTION ANALYSIS

MANHOLE 24A

For MH 24A, the peak hourly flow for the pre repair March 2014 rain event is 4.373 mgd. For the three post repair rain events the average peak hourly flow is 2.328 mgd (August 20 = 2.818, September 28 = 1.728 mgd; October 2 = 2.437 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole 24A is 4.373 mgd minus 2.328 mgd which equals 2.045 mgd (1,421 gpm).

Based on the reduction of 2,045,000 GPD, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 863 EDUs.

MANHOLE 35

For MH 35, the peak hourly flow for the pre repair March 2014 rain event is 1.414 mgd. For the three post repair rain events the average peak hourly flow is 0.423 mgd (August 20 = 0.368; September 28 = 0.309; October 2 = 0.593 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole 35 is 1.414 mgd minus 0.423 mgd which equals 0.991 mgd (689 gpm).

Based on the reduction of 991,000 GPD, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 418 EDUs.

The average for these two manholes is 641 EDUs

NET I/I REDUCTION ANALYSIS

The second method being used is to calculate net I/I reduction using net I/I rates. To do this, we took the 10 day period prior to each rain event and calculated the average daily flow. We then took the peak daily flow for each rain event and compared the average and peak daily flow rates. The average daily flow was subtracted from the peak daily flow to obtain a net I/I rate. The net I/I for the pre and post events was compared. Reference is made to the attached Tables 6.4 and 6.5.

MANHOLE 24A

For MH 24A, the net I/I for the March 2014 rain event is 1.988 mgd (1,382 gpm). The average net I/I for the three post repair rain events is 0.389 mgd (270 gpm). Therefore, the net I/I reduction is 1.988 mgd minus 0.389 mgd which equals 1.589 mgd (1,104 gpm).

Using a net I/I reduction of 1,589,000 GPD and the same method as above for the peak flow comparison, this equates to 670 EDUs.

MANHOLE 35

For MH 35, the net I/I for the March 2014 rain event is 0.781 mgd (543 gpm). The average net I/I for the three post repair rain events is 0.098 mgd (68 gpm). Therefore, the net I/I reduction is 0.781 minus 0.098 which equals 0.683 mgd (475 gpm).

Using a net I/I reduction of 683,000 GPD and the same method as above for the peak flow comparison, this equates to 288 EDUs.

The average using the Net I/I reduction method is 479 EDUs

PEAKING FACTOR ANALYSIS

We would add one last piece of documentation to show significant I/I reduction. As part of the second method using net I/I reduction, the average daily flow for the 10 day period prior the rain event was calculated for each rain event. We compared the peak daily flow to the 10 day average daily flow for each rain event.

MANHOLE 24A

For MH 24A, the peaking factor for the pre repair rain event in March 2014 is 3.05. The average of the peaking factors for the three post repair rain events is 1.53. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

MANHOLE 35

For MH 35, the peaking factor for the pre repair rain event in March 2014 is 5.1. The average of the peaking factors for the three post repair rain events is 2.2. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

EDU REQUEST SUMMARY

UGT has documented significant I/I reduction using two different methods. The first method using peak hourly flow I/I reduction justifies 641 EDU credits. The second method using net I/I reduction justifies 479 EDUs credits.

Therefore, UGT is requesting EDUs credits for the Kriebel Road Interceptor which represent the average of the two methods, 560 EDUs.

CAP SUMMARY

As you can see, UGT continues to be serious about reducing I/I and is making a commitment of significant resources to address the issue aggressively. We will keep PADEP informed of our progress as needed in the future. We are confident we will continue to address PADEP's concerns and further reduce I/I in UGT.

TABLES

Table 3.1

Upper Gwynedd Township Collection System

East Interceptor

Manhole Repairs 2014

1 The following manholes were spray lined.
New lids and frames were installed on the manholes listed below prior to being spray
2 lined.

	Street:	Lower Valley Rd.		
	Manhole #	Depth	Construction	Date
1	E3402	5' 8"	Brick	May-14
2	E3403	6' 4"	Brick	May-14
3	E3404	6' 0"	Brick	May-14
4	E3418	5' 10"	Brick	May-14
5	E3419	6' 0"	Brick	May-14
6	E3420	6' 10"	Brick	May-14
7	E3421	6' 7"	Brick	May-14
8	E3422	6' 6"	Brick	May-14
9	E3423	10' 2"	Brick	May-14
10	E3429	7' 0"	Brick	May-14
11	E3432	6' 6"	Brick	May-14

	Street:	Croft Rd.		
	Manhole #	Depth	Construction	Date
1	E3401	6' 9"	Brick	May-14
2	E3411	5' 8"	Brick	Apr-14
3	E3412	6' 3"	Brick	Apr-14
4	E3413	6' 1"	Brick	Apr-14
5	E3414	5' 9"	Brick	Apr-14
6	E3415	6' 2"	Brick	Apr-14
7	E3416	6' 1"	Brick	Apr-14
8	E3417	5' 8"	Brick	Apr-14

	Street:	Upper Valley Rd.		
	Manhole #	Depth	Construction	Date
1	E3203	13' 5"	Brick	May-14
2	E3404	6' 0"	Brick	May-14
3	E3405	5' 10"	Brick	May-14
4	E3406	5' 10"	Brick	May-14
5	E3407	6' 0'	Brick	May-14
6	E3408	6' 0"	Brick	May-14
7	E3409	6' 0"	Brick	May-14
8	E3410	5' 10"	Brick	May-14

Table 3.1

Upper Gwynedd Township Collection System

East Interceptor

Manhole Repairs 2014

	Street:	Britt Rd.		
	Manhole #	Depth	Construction	Date
1	E3424	6' 2"	Brick	May-14
2	E3425	6' 4"	Brick	May-14
3	E3426	5' 7"	Brick	May-14
4	E3427	5' 10"	Brick	May-14
5	E3428	6' 8"	Brick	May-14

	Street:	Hibbert Rd.		
	Manhole #	Depth	Construction	Date
1	E3430	6' 0"	Brick	Apr-14
2	E3431	5' 10"	Brick	Apr-14

	Street:	Barberry Rd.		
	Manhole #	Depth	Construction	Date
1	E3702	7' 2"	Brick	May-14
2	E3703	6' 8"	Brick	May-14
3	E3704	7' 10"	Brick	May-14
4	E3705	5' 0"	Brick	May-14
5	E3706	4' 1"	Brick	May-14

	Street:	Swedesford Rd.		
	Manhole #	Depth	Construction	Date
1	E2034	9' 10"	Block	May-14
2	E2036	9' 6"	Block	May-14
3	E3019	7' 8"	Block	May-14
4	E3020	7' 9"	Block	May-14
5	E2031	9 ft. 10"	Block	Sep-14

	Street:	Gwynedd Manor Rd.	Construction	
	Manhole #	Depth		Date
1	Gwynedd Manor Rd.	11'5"	Block	Sep-14

Total: 45 Manholes

Table 3.2

Upper Gwynedd Township Collection System
East Interceptor
CIPP Lining 2014

CIPP Liner was installed in the following 47 sections of 8 inch VCP sanitary sewers

	Street:	Lower Valley Rd.		
	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3402	E3401	221	Apr-14
2	E3403	E3402	141	Apr-14
3	E3404	E3403	327	Apr-14
4	E3418	E3401	274.6	Apr-14
5	E3419	E3418	258.7	Apr-14
6	E3420	E3419	376.8	Apr-14
7	E3421	E3420	316	Apr-14
8	E3422	E3421	320	Apr-14
9	E3423	E3422	341	Apr-14
10	E3429	E3423	204	May-14
11	E3432	E3429	186	May-14
		Total	**2966.1**	

	Street:	Croft Rd.		
	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3417	E3416	319	Apr-14
2	E3416	E3415	284	Apr-14
3	E3415	E3414	307	Apr-14
4	E3414	E3413	298	Apr-14
5	E3413	E3412	297	Apr-14
6	E3412	E3411	220	Apr-14
7	E3411	E3401	237	Apr-14
		Total	**1962**	

	Street:	Jenkins Lane		
	Downstream Manhole	Upstream Manhole	Footage	Date of
1	E2000	E2001.1	162	Oct-14
2	E2001.1	E2001	19	Oct-14
3	E2001	E2005	293	Oct-14
4	E2005	E2006	216	Oct-14
5	E2006	E2007	323	Oct-14
		Total	**1013**	

Table 3.2

Upper Gwynedd Township Collection System

East Interceptor

CIPP Lining 2014

Street: **Upper Valley Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3410	E3409	386	Apr-14
2	E3409	E3408	391	Apr-14
3	E3408	E3407	390	Apr-14
4	E3407	E3406	377	Apr-14
5	E3406	E3405	379	Apr-14
6	E3405	E3404	375	Apr-14
7	E3205	E3204	109	Apr-14
8	E3204	E3203	300	Apr-14
9	E3203	E3202	317	May-14
10	E3202	E3201	129	May-14
11	E3201	E3200	36	May-14
		Total	**3189**	

Street: **Britt Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3428	E3427	253	Apr-14
2	E3427	E3426	396	Apr-14
3	E3426	E3425	368	Apr-14
4	E3425	E3424	361	Apr-14
5	E3424	E3423	129	Apr-14
		Total	**1507**	

Street: **Hibbert Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3431	E3430	318	Apr-14
2	E3430	E3429	354	Apr-14
		Total	**672**	

Street: **Barberry Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3706	E3705	399	May-14
2	E3705	E3704	283	May-14
3	E3704	E3703	125	May-14
4	E3703	E3702	141	May-14
5	E3702	E3701	208	May-14
6	E3701	E3700 A	40	May-14
		Total	**1196**	

Total CIPP Linear Feet: **12505.1**

Table 3.3

Upper Gwynedd Township Collection System

East Interceptor

CIPP Spot Repairs 2014

	Downstream Manhole	Upstream Manhole	Location - Footage	Street	Defect Description	Repair Type	GPM Estimate	Date of Repair
1	E5001A	E5001	133 ft.	Hancock Rd	Fractured 8" x6" Wye	3 ft. CIPP	3	Sep-14
2	E5006	E5007	255 ft.	Hancock Rd	Heavy Roots	4 ft. CIPP	2	Sep-14
3	E2900	E2901	2 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
4	E2900	E2901	41.3 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
5	E2900	E2901	162.4 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
6	E2901	E2902	57 ft.	Sumneytown Pike	Fractured 8" x6" Wye	3 ft. CIPP	2	Sep-14
7	E1906	E1907	157 ft.	W. Prospect Ave	Fractured 8" x6" Wye	4 ft. CIPP	3	Sep-14
8	E2026	E2027	382 ft. to 385 ft.	Oakland Place	Holes in Pipe	6 ft. CIPP	5	Sep-14
9	E3401	E3418	270 ft.	Lower Valley Rd.	Hole in Wye	2 ft. CIPP	3	Sep-14
10	E3429	E3432	120 ft.	Lower Valley Rd.	Hole in Wye	2 ft. CIPP	3	Sep-14

* ***Above repairs describe CIPP point repairs within 8" A/C and VCP mains***

Total Estimated Reduction 27

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Table 3.4

Upper Gwynedd Township

East Interceptor

Repairs & Improvements to the Sanitary Sewer Collection System to Reduce I/I

Date	Address or Location	Repair Description	Estimated I/I Reduction
Oct-13	601 Sumneytown Pike	Replaced 10 ft. of 6" A/C sewer lateral with SDR-26 and a PVC 8'x6" wye connection	10
Nov-13	Manhole E3705 - Barberry Rd.	Grouted upstream pipe connection to manhole	5
Sept - 13 to Dec. 2013	East Interceptor Capacity Improvement Project	M.H. E3000 - Replacement of 10 l.f. of 8" A/C main	25
pt - 13 to ec. 2013	East Interceptor Capacity Improvement Project	M.H. E2300 - Sealed the leaking pipe connections in manhole	20
Sept - 13 to Dec. 2013	East Interceptor Capacity Improvement Project	Replacement of 2,030 l.f. of 8" A/C sanitary main with 16" C905 PVC pipe	70
Sept - 13 to Dec. 2014	East Interceptor Capacity Improvement Project	Replacement of 8 existing manholes, modification of 2 manholes and installation of 3 new additional manholes	40
		Total Estimated Reduction	**170**

Table 3.5
Upper Gwynedd Township
South West Drainage Area Manhole Improvements 2015

Manhole Improvements Upstream of the Briar Glen Pump Station

The brick and mortar risers were replaced with precast concrete riser rings and riser adjustment rings. The leaking manhole frames and lids were replaced with gasketed manhole frames and secure lids on the manholes listed below.

Dunleavy Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS209	Precast	Brick & Mortar	13.5"	3

Hartley Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS204	Precast	Brick & Mortar	3.5"	10
2	PS205	Precast	Brick & Mortar	8.5"	5
3	PS206	Precast	Brick & Mortar	6.5"	10
4	PS207	Precast	Brick & Mortar	11.5"	7
5	PS208	Precast	Brick & Mortar	2"	3

Collins Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS210	Precast	Brick & Mortar	8"	10
2	PS211	Precast	Brick & Mortar	7.5"	5
3	PS212	Precast	Brick & Mortar	3"	10
4	PS213	Precast	Brick & Mortar	5"	10
5	PS214	Precast	Brick & Mortar	5.5"	5
6	PS215	Precast	Brick & Mortar	8"	5
7	PS216	Precast	Brick & Mortar	10"	3
				Total GPM Reduction	**86**

Table 3.6

Upper Gwynedd Township

South West Drainage Area Manhole Improvements 2015

Manhole Improvements Upstream of the Conrad Pump Station

The brick and mortar risers were replaced with precast concrete riser rings and riser adjustment rings. The leaking manhole frames and lids were replaced with gasketed manhole frames and secure lids on the manholes listed below.

	Aldrin Ave.				
	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS332	Precast	Brick and Mortar	6"	6
2	PS335	Precast	Brick and Mortar	8.5"	5
				Total GPM Reduction	**11**

Table 3.7

Upper Gwynedd Township

South West Interceptor

Repairs & Improvements to the Sanitary Sewer Mains 2013

Date	Address or Location	Repair Description	GPM Reduction
Jan-13	PS338 to PS339	Grout 5 - 6" VCP laterals	15
Jan-13	PS328 to PS329	Grout 3 - 6" VCP laterals	8
Jan-13	PS341 ,PS342 PS343	Grout all joints in 8" VCP mains	15
Jan-13	PS300.1	Mortar repair and grout leaking manhole	10
May-13	PS211 to PS212	4ft. length CIPP spot repairs at 8ft. and 55 ft. covering holes in 8"A/C mains	12
May-13	PS219 to PS220	7 ft. CIPP spot repair in 8" PVC mains covering leaking offset joints	5
May-13	PS200, PS201, PS203, PS204, PS205, PS207,PS320.1	Grouting & mortar repair to leaking manholes upstream of the Briar Glen pump station	10
May-13	1615 West Point Pike	Replaced 7ft of 6" VCP lateral with SDR-18 PVC pipe	5
Sep-13	2908 ft. of 8" A/C & PVC sanitary sewer that flows to Briar Glen Pump Station	Grouting & Pressure Testing	8
Sep-13	1807 ft. of 8" VCP & PVC sanitary sewer that flows to the Conrad Ave. Pump Station	Grouting & Pressure Testing	10
Sep-13	Manhole NW3209A	Grouted leaking wall joint	4
		Total Estimated Reduction	**102**

Upper Gwynedd Township Collection System

South West Interceptor

Repairs & Improvements to the Sanitary Sewer Mains 2014

The sewer laterals listed below were repaired by contractors. The repairs were a combination of CIPP spot repairs, grouting and excavation, removal of the defective pipe and installation of PVC pipe.

	Manholes	Pipe	Street	Observations	Type of Repair Performed	Date of Repair	GPM
1	PS328 to PS329	8" VCP and 6" VCP Pipe	Armstrong Drive	Groundwater infiltration at CIPP & wye connections	Grouting of pipe connections and 6" VCP for 4 laterals	Apr-14	20
2	PS338 to PS339	8" VCP and 6" VCP Pipe	Armstrong Drive	Groundwater infiltration at CIPP & wye connections	Grouting of pipe connections and 6" VCP for 5 laterals	Apr-14	10
3	PS328, PS337, PS338, PS339, PS340, PS341, PS342, PS343.	8" VCP	Armstrong Drive	Groundwater infiltration at VCP Pipe Joints	Pressure Testing and grouting of 1245 ft. of 8" VCP pipe joints	Apr-14	15
4	PS325, PS326, PS327	8" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Pressure Testing and grouting of 482 ft. of 8" VCP pipe joints	Apr-14	10
5	PS328 to PS327	8" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Installation of 173 ft. of CIPP liner	May-14	10
6	PS328 to PS327	8" CIPP & 6" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Grouting of 8" & 6" pipe connections	May-14	10
7	PS216 to PS217	6"VCP & 4" cast iron	728 Collins Ave.	Roots & groundwater infiltration at transition coupling	Excavation & repair	Jul-14	2
8	NW4021 to NW4022	8" ACP	Cathy's Lane	Infiltration at joint	CIPP	Sep-14	3
9	NW4001 to NW4022	8" ACP	Welsh Road	Hole in pipe	CIPP	Sep-14	2
10	NW2111 to NW2112	8" ACP	Dickerson Road	Hole in pipe	CIPP	Sep-14	5

This table reflects pipe repairs between the manholes listed.

Total Estimated Reduction: **87**

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Upper Gwynedd Township Collection System
South West Interceptor
Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
1	707 Aldrin Ave.	VCP	Heavy Roots at 20' at transition to 4" cast iron	May-13	2
2	708 Aldrin Ave.	VCP	Medium roots at joint 21.4'	May-13	2
3	720 Aldrin Ave.	VCP	Light Roots at transition to 4" cast iron at 25' 6"	May-13	1
4	743 Aldrin Ave.	VCP	Medium Roots at joint 32.7'; Disconnected sump pump from lateral connection	May-13	7
5	1901 Armstrong Drive	VCP	Light roots at 16.4' Medium roots at 20.4' and 26.4' Heavy roots at 24.4'	Apr-13	1
6	1926 Armstrong Drive	VCP	Medium Roots at joint at 17'	Jun-13	2
7	1932 Armstrong Drive	VCP	Light Roots at joint at 16'	Jul-13	1
8	1933 Armstrong Drive	VCP	Medium roots at joint at 22.4'	Jul-13	2
9	1958 Armstrong Drive	VCP	Heavy roots at 26 .2', at transition to 4" cast iron	Sep-13	2
10	1979 Armstrong Drive	VCP	Medium roots at 16', Heavy Roots at 25'	Jul-13	2
11	1985 Armstrong Drive	VCP	Medium Roots at 16' 6"	Oct-13	2

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Upper Gwynedd Township Collection System

South West Interceptor

Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
12	1972 Blue Fox Drive	PVC	Medium Roots at 4" cast iron to 6" PVC transition coupling	Oct-13	1
13	615 Collins Ave	VCP	Medium roots at 13', 21' and 25' at transition to 4" cast iron	Oct-13	2
14	623 Collins Ave	VCP	Heavy roots at 13' 5", 17' 5", 21', and 24'.	May-13	2
15	754 Hartley Drive	VCP	Heavy Roots at 63' 6"	Apr-13	2
16	617 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 24.6'	Jun-13	2
17	636 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 36.6'	Mar-13	2
18	637 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 12.5'	Mar-13	2
19	671 Eagle Lane	VCP	roots heavy at transition to 4"cast iron 25'	Jun-13	2
20	694 Eagle Lane	VCP	roots at 21.8' and 25'	Jun-13	1
21	1919 Eva Drive	PVC	I & I running at trans to 4" cast iron 25'	Aug-13	2
22	1930 Eva Drive	PVC	I & I gushing at trans to 4" cast iron 24.4'	Sep-13	3

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Upper Gwynedd Township Collection System

South West Interceptor

Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
23	1964 Eva Drive	PVC	roots light at transition to 4" cast iron 25'	Jul-13	1
24	1968 Eva Drive	PVC	roots medium at transition to 4" cast iron 25.2'	Aug-13	2
25	1971 Eva Drive	PVC	I & I running at trans to 4" cast iron 24.2'	Aug-13	2
26	720 Tranquility Lane	VCP	Root mass at 16'	Jun-13	2
27	736 Tranquility Lane	VCP	roots at 35', 39.3', 43.6' and 46'	Mar-13	1
28	611 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	May-13	1
29	612 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	May-13	3
30	620 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	Sep-13	2
31	624 Whittaker Place	PVC	roots heavy at transition to 4" cast iron 26.2'	Aug-13	2
32	631 Whittaker Place	PVC	root mass at transition to 4" cast iron 26'	Sep-13	2

Total GPM Reduction **57**

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Table 3.9

Upper Gwynedd Township Collection System

South West Interceptor

Repairs & Improvements to Township Sanitary Sewer Laterals 2013

The sewer laterals listed below were repaired by contractors. The repairs were a combination of CIPP spot repairs; and excavation, removal of the defective pipe and installation of PVC pipe.

	Address	Pipe	Observations	Type of Repair Performed	Date of Repair	GPM
1	708 Aldrin Ave.	VCP	Heavy roots at wye connection	New 8" by 6" wye & 15'6" PVC pipe	May-13	5
2	750 Aldrin Ave.	VCP	Heavy roots at 1st joint from wye connection. 3', heavy roots at 1.5' and 6'	New 8" by 6" wye & 14' of PVC pipe	May-13	5
3	1991 Armstrong Dr.	VCP	Light roots at joint at 10.8'	3' PVC spot repair	May-13	1
4	754 Hartley Dr.	VCP	Roots at 6' And 10'	Installation of 14.6' of 6" PVC pipe	May-13	3
5	1943 Armstrong Dr.	VCP	Roots at 1st joint of wye connection	New 8" by 6" wye & 6' of PVC pip	May-13	5
6	627 Whittaker Pl.	PVC	I & I at wye connection	CIPP Repair at wye connection	May-13	3
7	1901 Armstrong Dr.	VCP	Light roots at 13.4', I & I at wye connection	New 8" by 6" wye & 14' of PVC pipe	May-13	6
8	1907 Armstrong Dr.	VCP	Medium roots at 9.6'	3' PVC spot repair	May-13	2
9	720 Tranquility Ln.	VCP	Roots at 4'	New 8" by 6" wye & 10' of 6" PVC pipe	May-13	3
10	1979 Armstrong Dr.	VCP	Roots	New 8" by 6" wye & 14' of PVC pipe	Jul-13	2
				Total Estimated GPM Reduction		**35**

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Table 3.10

Upper Gwynedd Township Collection System

Manhole 24A Drainage Basin

Improvements contributory to the Kriebel Road Interceptor

Manhole Repairs

	Manhole #	Street	Manhole Depth	Observations	Repair Type	GPM Estimate	Date of Repair
1	812	Jackson St.	8 ft. 4"	Infiltration at pipe connections	Grouting and mortar repair	8	Nov-14
2	814	State St.	9 ft. 8"	Infiltration at pipe connections	Grouting and mortar repair	4	Nov-14

Lateral Repairs

	Downstream Manhole	Upstream Manhole	Location	Observations	Repair Description	GPM Estimate	Date of Repair
1	477	814	234 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 10 ft. of 6" VCP lateral and 8" x 6" VCP wye.	5	Sep-14
2	814	812	233 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 14 ft. of 6" VCP lateral and 8" x 6" VCP wye.	3	Sep-14
3	814	812	238 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 12 ft. of 6" VCP lateral and 8" x 6" VCP wye.	3	Sep-14
4	814	812	239 State St.	Broken 8" main at connection to 4" cast iron	Excavate, remove and replace 4ft. of 8" VCP sanitary main. Install cast iron wye and	10	Sep-14
					Total Estimated Reduction	**33**	

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Table 3.11
Upper Gwynedd Township Collection System
Manhole 24A Drainage Basin
CIPP Lining of 8" Sanitary Mains & Lateral Grouting - 2014
Improvements contributory to the Kriebel Road Interceptor

The following sections of 8" A/C sanitary sewers were damaged by H2S. Groundwater infiltration was identifed at the pipe connections.

MH 205 Drainage Area — **30 Laterals were grouted.**

	Upstream Manhole	Downstream Manhole	Location	Footage	GPM Reduction Estimate
1	219	220	S. Broad St.	290	2
2	220	816	S. Broad St.	98	1
3	816	413	S. Broad St.	380	1
4	413	414	S. Broad St.	348	2
5	414	414A	S. Broad St.	370	3
6	414A	801	S. Broad St.	30	1
7	801	415	S. Broad St.	200	1
8	415	416	S. Broad St.	220	2
9	416	417	S. Broad St.	262	1
10	417	418	S. Broad St.	200	2

The following sections of 8" VCP sanitary sewers were damaged by root intrusions, and circumferential cracks. Infiltration was also identifed at the pipe connections and laterals .

205 Drainage Area — **47 Laterals were grouted.**

	Upstream Manhole	Downstream Manhole	Location	Footage	GPM Reduction Estimate
1	477	814	State St.	440	3
2	814	812	State St.	295	5
3	812	813	Jackson St.	157	10
4	812	811	Jackson St.	305	12
5	811	815	Jackson St.	154	5
		Totals:		**3,749**	**51**

Table 3.12
Upper Gwynedd Township
Manhole 35 Drainage Area

Manhole Spray Lining and Grouting

Improvements contributory to the Kriebel Road Interceptor

	Manhole #	Construction	Street	Observations	Type of Repair Performed	Date of Repair	GPM Estimate
1	682	Precast	Hartley Place	Groundwater Infiltration in Manhole Riser	Interior Manhole Lining at Riser	Sep-14	5
2	683	Precast	Hartley Place	Groundwater Infiltration in Manhole Wall Joints	Interior Manhole Lining	Sep-14	5
3	676	Precast	Muhlenburg Drive	Groundwater Infiltration in Manhole Wall Joints	Interior Manhole Lining	Sep-14	8
4	699	Precast	Maxwell Place	Groundwater Infiltration at 3 Pipe Connections in Manhole	Interior Manhole Lining	Sep-14	5
5	1109	Precast	Shepard Drive	Groundwater Infiltration at Manhole Wall Joints	Interior Manhole Lining	Sep-14	8
6	696	Precast	S. Broad St.	manhole wall joints, at incoming pipe connection & frame/riser connection.	Interior Manhole Lining	Sep-14	8
7	1102	Precast	S. Broad St.	pipe connections, at frame/riser connection and within riser.	Interior Manhole Lining	Sep-14	5
8	681	Precast	Hartley Place (R.O.W.)	Groundwater Infiltration at pipe connections	Grouting and mortar repair	Nov-14	3

Total Estimated Reduction 47

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Table 3.13

Upper Gwynedd Township

Manhole 35 Drainage Area

CIPP Lining of 8" Sanitary Mains & Lateral Grouting - 2014

Improvements contributory to the Kriebel Road Interceptor

The following sections of 8" A/C sanitary sewers were damaged by H2S. Groundwater infiltration was identifed at the pipe connections.

237A -Drainage Area **19 Laterals were grouted.**

	Upstream MH	Downstream MH	Location	Footage	GPM Reduction Estimate
1	252	664	Lafayette Rd.	160	2
2	664	666	Lafayette Rd.	398	6
3	252	251	Easement	203	2
4	251	250	Easement	198	3
5	666	674	Stirling Drive	347	3
6	674	675	Stirling Drive	348	2
7	675	680	Easement	190	5
8	680	681	Easement	252	5
9	681	682	Easement	178	2
10	681	681A	Easement	139	1
			Totals:	**2,413**	**31**

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Conway Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	693	Precast	Brick & Mortar	8.5"	6
2	694	Precast	Brick & Mortar	2"	2

Flintlock Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	254	Precast	Brick & Mortar	17.25"	1
2	698	Precast	Brick & Mortar	10.5"	1
3	638B	Precast	Brick & Mortar	11.25"	3
4	634	Precast	Brick & Mortar	8.5"	3
5	633	Precast	Brick & Mortar	3"	2
6	635	Precast	Brick & Mortar	0.5"	5
7	636A	Precast	Brick & Mortar	1.5"	2
8	636B	Precast	Brick & Mortar	1.5"	2
9	636C	Precast	Brick & Mortar	12.75"	2
10	637	Precast	Brick & Mortar	4"	2

Garfield Ave.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1004	Precast	Precast	3"	3
2	1006	Precast	Precast	2.25"	3
3	1005A	Precast	Precast	8"	2
4	1005	Precast	Brick & Mortar	14"	4
5	1008	Precast	Brick & Mortar	7.25"	2
6	1009	Precast	Brick & Mortar	14"	3
7	1010	Precast	Brick & Mortar	14.5"	1
8	697D	Precast		8"	3

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

General Nash Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	630	precast	Brick & Mortar	1.25"	1

Lafayette Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	660		Brick & Mortar	17.25"	2
2	661		Brick & Mortar	5.5"	3
3	252		Brick & Mortar	21"	2
4	664		Brick & Mortar	15.5"	1

Maxwell Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	669	Precast	brick & mortar	4.5"	2
2	670	Precast	brick & mortar	6"	2
3	671	Precast	brick & mortar	6"	2

McIntosh Way

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	665	Precast	Brick & Mortar	20.5"	3

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Muhlenburg Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	688A	Precast	Brick & Mortar	7.5"	1
2	688B	Precast	Brick & Mortar	5"	3
3	688	Precast	Brick & Mortar	1/2"	1
4	685	Precast	Brick & Mortar	2"	3
5	684	Precast	Brick & Mortar	8"	4
6	675	Precast	Brick & Mortar	21"	2
7	676	Precast	Brick & Mortar	3.5"	2
8	677	Precast	Brick & Mortar	10.5"	10
9	645F	Precast	Brick & Mortar	17.5"	2
10	645G	Precast	Brick & Mortar	4.5"	2

Musket Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	643A	Precast	None	1.5"	1
2	700	Precast	Precast	4.5"	3
3	701	Precast	Precast	12"	3

Park Rd.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1105	Precast	Brick & Mortar	10"	2
2	1104	Precast	Brick & Mortar	4"	1
3	1103	Precast	Brick & Mortar	6.5"	2

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Patriot Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	627	Precast	Brick & Mortar	12.5"	2
2	628	Precast	Brick & Mortar	19"	4
3	629	Precast	Brick & Mortar	14.5"	2
4	631	Precast	Brick & Mortar	1/2"	1
5	632	Precast	Brick & Mortar	1/2"	1
6	641	Precast	Brick & Mortar	10"	3
7	640	Precast	Brick & Mortar	12"	2
8	639	Precast	Brick & Mortar	1/2"	1

Powderhorn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	238	Precast	Brick & Mortar	30"	2
2	642	Precast	Brick & Mortar	12"	1
3	643	Precast	Brick & Mortar	2"	1
4	644	Precast	Brick & Mortar	6.5"	2
5	645	Precast	Brick & Mortar	22"	3
6	646	Precast	Brick & Mortar	1/2"	1
7	647	Precast	Brick & Mortar	10.5"	2
8	648	Precast	Brick & Mortar	3.5"	2

Pulaski Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	687	Precast	Brick & Mortar	11.5"	2

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Scott's Way

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	662	Precast	Brick & Mortar	7"	2
2	663	Precast	Brick & Mortar	10"	2

Shepard Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1108	Precast	Brick & Mortar	14"	2
2	1107	Precast	Brick & Mortar	13.5"	2
3	1106	Precast	Brick & Mortar	8.5"	3

South Broad St.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1102	Precast	Brick & Mortar	8"	1
2	1102A	Precast	Brick & Mortar	3.5"	1
3	1100	Precast	Brick & Mortar	1.5"	1
4	1101	Precast	Precast	10"	1
5	697	Precast	Precast	7"	2
6	697A	Precast	Precast	2.5"	1
7	697B	Precast	Precast	10"	2
8	697C	Precast	Precast	9.5"	1
9	696	Precast	Precast	3"	3

Stirling Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	256	Precast	Brick & Mortar	9"	4
2	690	Precast	Brick & Mortar	10.5"	2
3	690A	Precast	Brick & Mortar	16.5"	2
4	691	Precast	Brick & Mortar	3"	3
5	692	Precast	Brick & Mortar	1"	1
6	666	Precast	Brick & Mortar	9.5"	1
7	674	Precast	Brick & Mortar	11"	1

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Supplee Rd.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	655	Precast	Precast	10"	2
2	499	Precast	Precast	3"	1
3	498	Precast	Precast	3"	2
4	498A	Precast	Precast	5"	2
5	243A	Precast	Precast	6"	3
6	656	Precast	Precast	5"	2
7	657	Precast	Precast	5"	2
8	658	Precast	Brick & Mortar	21"	2
9	659	Precast	Brick & Mortar	18"	3
10	244	Precast	Brick & Mortar	14.5"	4
11	243	Precast	Brick & Mortar	17.5"	3

Tricorn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	645A	Precast	Brick & Mortar	21"	4
2	645B	Precast	Brick & Mortar	9.25"	2
3	645C	Precast	Brick & Mortar	6.5"	2
4	645D	Precast	Brick & Mortar	11"	3
5	645E	Precast	Brick & Mortar	6"	3

Twinlyn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	699	Precast	Brick & Mortar	6.5"	1
2	699A	Precast	Brick & Mortar	5.5"	1

Total GPM Reduction Estimate **224**

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS >THAN 1"

EAST INTERCEPTOR CAPACITY

MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
SW300	281.56	275.51	277.4				
				405	0.0044	3.57	2.31
E100	288.09	279.19	279.40				
				577	0.0036	3.52	2.27
E200	288.86	283.08	283.22				
				150	0.0152	4.40	2.84
E300	290.62	285.20	285.23				
				316	0.0154	4.42	2.86
E400	295.96	290.10	290.10				
				270	0.0119	3.89	2.51
E500	299.61	293.32	293.34				
				296	0.0106	3.67	2.37
E600	302.20	296.48	296.51				
				354	0.0099	3.55	2.29
E700	306.18	300.03	300.70				
				238	0.0074	3.06	1.98
E800	309.17	302.46	302.51				
				251	0.0071	2.99	1.93
E900	310.33	304.28	304.28				
				191	0.0074	3.07	1.98
E1000	311.46	305.70	305.72				
				398	0.0097	3.51	2.27
E1100	315.60	309.56	309.61				
				396	0.0141	4.23	2.73
E1200	321.13	315.20	315.30				
				270	0.0123	3.96	2.56
E1300	326.08	318.63	318.67				
				365	0.0117	3.85	2.49
E1400	328.36	322.94	322.96				
				220	0.0061	2.78	1.80
E1500	331.00	324.30	324.38				
				100	0.0194	4.96	3.20
E1600	333.33	326.32	326.46				
				326	0.0038	2.19	1.41
E1700	334.39	327.69	327.75				
				314	0.0293	6.10	3.94
E1800	344.43	336.95	338.01				
RAILROAD				182	0.0207	5.13	3.31

Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.

E1900	353.87	341.78	341.90				
				388	0.0024	1.74	1.13
E2000	349.96	342.83	342.99				
E1900	353.87	341.78	341.99				
				17	0.0024	3.72	2.40
E1900A	353.00	342.03	342.05				
				370	0.0024	3.76	2.43
E2000A	350.00	342.94	342.96				
E2005							
				287	0.0076	6.67	4.31
E2100	352.00	345.13	345.15				
				74	0.0073	6.55	4.23
E2100A	353.00	345.69	345.71				
				84	0.0073	6.54	4.22
E2100B	351.40	346.32	346.34				
				114	0.0073	6.54	4.23
E2100C	356.00	347.17	347.19				
				62	0.0085	7.09	4.58
E2400	354.50	347.72	347.74				
				154	0.0085	7.07	4.57
E2500	358.00	349.05	349.07				
				48	0.0085	7.09	4.58
E2600	359.00	349.48	349.50				
				474	0.0120	8.41	5.43
E2700	364.00	355.20	355.22				
				276	0.0085	7.08	4.57
E2800	366.79	357.56	357.58				
				63	0.0167	9.90	6.40
E2900	369.87	358.63	358.63				
Summerytown Pk.				62	0.0192	2.21	1.43
E3000	368.26	359.26	359.42				
				204	0.0241	3.40	2.20
E3100	375.00	364.34	364.45				
				17	0.0382	4.28	2.77
E3200	371.98	365.10	365.29				
				99	0.0043	1.44	0.93
E3300		365.72	365.72				
				390	0.0060	1.70	1.10
E3400		368.06	368.06				
E3402							
E3411							
E3418							
E3701							

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

EAST INTERCEPTOR CAPACITY

MH #	Calculated Capacity (MGD)	(gpm)
SW300		
	2.31	1,602
E100		
	2.27	1,579
E200		
	2.84	1,972
E300		
	2.86	1,983
E400		
	2.51	1,745
E500		
	2.37	1,646
E600		
	2.29	1,593
E700		
	1.98	1,374
E800		
	1.93	1,342
E900		
	1.98	1,378
E1000		
	2.27	1,573
E1100		
	2.73	1,898
E1200		
	2.56	1,774
E1300		
	2.49	1,728
E1400		
	1.80	1,247
E1500		
	3.20	2,225
E1600		
	1.41	981
E1700		
	3.94	2,735
E1800		
	3.31	2,300
E1900		
	1.13	782
E2000		
E1900		
	2.40	1,669
E1900A		
	2.43	1,688
E2000A		
E2005		
	4.31	2,992
E2100		
	4.23	2,939
E2100A		
	4.22	2,932
E2100B		
	4.23	2,936
E2100C		
	4.58	3,181
E2400		
	4.57	3,174
E2500		
	4.58	3,180
E2600		
	5.43	3,773
E2700		
	4.57	3,174
E2800		
	6.40	4,442
E2900		
Summerytown Pk.	1.43	990
E3000		
	2.20	1,529
E3010		
	2.77	1,921
E3200		
	0.93	645
E3300		
	1.10	761
E3400		
Merrybrook Neighborhood		
E3402		
E3411		
E3418		
E3701		

Feb-16

Observed Peak Flows in gpm[1]

Date	04/10/13	05/10/13	05/23/13	06/06/13	06/10/13	06/26/13	07/01/13	07/12/13	07/22/13	08/01/13	08/12/13	10/09/13	11/26/13	12/06/13	12/14/13	12/29/13
Total Rain	1.61"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
	460	611	778	2673	2639	230	1093	594	944	623	1099	508	884	61		1018

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS >THAN 1"

EAST INTERCEPTOR CAPACITY

MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
SW300	281.56	275.51	277.4				
				405	0.0044	3.57	2.31
E100	288.09	279.19	279.40				
				377	0.0068	3.52	2.27
E200	288.86	283.06	283.22				
				130	0.0152	4.40	2.84
E300	290.62	285.20	285.23				
				316	0.0154	4.42	2.86
E400	295.95	290.10	290.10				
				270	0.0119	3.89	2.51
E500	299.61	293.32	293.34				
				296	0.0106	3.67	2.37
E600	302.20	296.48	296.51				
				354	0.0099	3.55	2.29
E700	306.18	300.03	300.70				
				238	0.0074	3.06	1.98
E800	309.17	302.46	302.51				
				251	0.0071	2.99	1.93
E900	310.33	304.28	304.28				
				191	0.0074	3.07	1.98
E1000	311.46	305.70	305.72				
				395	0.0097	3.51	2.27
E1100	315.60	309.56	309.61				
				396	0.0141	4.23	2.73
E1200	321.13	315.20	315.30				
				270	0.0123	3.96	2.56
E1300	326.08	318.63	318.67				
				365	0.0117	3.85	2.49
E1400	328.36	322.94	322.96				
				220	0.0061	2.78	1.80
E1500	331.00	324.30	324.38				
				100	0.0194	4.96	3.20
E1600	333.33	326.32	326.46				
				326	0.0038	2.19	1.41
E1700	334.39	327.69	327.75				
				314	0.0293	6.10	3.94
E1800	344.43	336.95	338.01				
RAILROAD				182	0.0207	5.13	3.31

Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.

E1900	353.87	341.78	341.90				
				388	0.0024	1.74	1.13
E2000	349.96	342.83	342.99				
E1900	353.87	341.78	341.99				
				17	0.0024	3.72	2.40
E1900A	353.00	342.03	342.05				
				370	0.0024	3.76	2.43
E2000A	350.00	342.94	342.96				
E2005							
				287	0.0076	6.67	4.31
E2100	352.00	345.13	345.15				
				74	0.0073	6.55	4.23
E2100A	353.00	345.69	345.71				
				84	0.0073	6.54	4.22
E2100B	351.40	346.32	346.34				
				114	0.0073	6.54	4.23
E2100C	356.00	347.17	347.19				
				62	0.0085	7.09	4.58
E2400	354.50	347.72	347.74				
				154	0.0085	7.07	4.57
E2500	356.00	349.05	349.07				
				48	0.0085	7.09	4.58
E2600	359.00	349.48	349.50				
				474	0.0120	8.41	5.43
E2700	364.00	355.20	355.22				
				275	0.0085	7.08	4.57
E2800	366.79	357.56	357.58				
				63	0.0157	9.90	6.40
E2900	369.87	358.63	358.63				
Sumneytown Pk.				62	0.0102	2.21	1.43
E3000	368.26	359.26	359.42				
				204	0.0241	3.40	2.20
E3100	375.00	364.34	364.45				
				17	0.0362	4.28	2.77
E3200	371.98	365.10	365.29				
				59	0.0043	1.44	0.93
E3300		365.72	366.72				
				390	0.0060	1.70	1.10
E3400		368.06	368.06				
E3402							
E3411							
E3418							
E3701							

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
EAST INTERCEPTOR CAPACITY

Feb-15

MH #	Calculated Capacity (MGD)	(gpm)	03/29/14 2.68"	04/15/14 1.99"	04/29/14 5.12"	05/16/14 2.57	05/28/14 1.30"	06/09/14 1.71"	07/14/14 1.37"	07/27/14 1.08"	10/15/14 1.20"	11/26/14 1.05"	12/08/14 1.37"
SW300													
	2.31	1,602											
E100			2813	1091	1536	1317	398	409	393	224	No Data	No Data	703
	2.27	1,579											
E200													
	2.84	1,972											
E300													
	2.86	1,983											
E400													
	2.51	1,745											
E500													
	2.37	1,646											
E600													
	2.29	1,593											
E700													
	1.98	1,374											
E800													
	1.93	1,342											
E900													
	1.98	1,378											
E1000													
	2.27	1,573											
E1100													
	2.73	1,898											
E1200													
	2.56	1,774											
E1300													
	2.49	1,728											
E1400													
	1.80	1,247											
E1500													
	3.20	2,225											
E1600													
	1.41	981											
E1700													
	3.94	2,735											
E1800													
	3.31	2,300											
E1900													
	1.13	782											
E2000													
E1900													
	2.40	1,669											
E1900A													
	2.43	1,688											
E2000A													
E2005													
	4.31	2,992											
E2100													
	4.23	2,939											
E2100A													
	4.22	2,932											
E2100B													
	4.23	2,936											
E2100C													
	4.58	3,181											
E2400													
	4.57	3,174											
E2500													
	4.58	3,180											
E2600													
	5.43	3,773											
E2700													
	4.57	3,174											
E2800													
	6.40	4,442											
E2900													
Sumneytown Pk.	1.43	990											
E3000													
	2.20	1,526											
E3010													81	260	259
	2.77	1,921											
E3200													
	0.93	648											
E3300													
	1.10	761											
E3400			1227	577	1325	909					130	174	190
Merrybrook Neighborhood													
E3402			111										
E3411			111										
E3418			104										
E3701			43			11		8	10	8	15	14	14

Note: Flows are for rain event

Amended Attachment 19-A
Page 229 of 358

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS >THAN 1"

EAST INTERCEPTOR CAPACITY

MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
SW300	281.56	275.51	277.4				
				405	0.0044	3.57	2.31
E100	288.09	279.19	279.40				
				377	0.0056	3.52	2.27
E200	285.86	283.08	283.22				
				130	0.0152	4.40	2.84
E300	290.62	285.20	285.23				
				316	0.0154	4.42	2.86
E400	295.96	290.10	290.10				
				270	0.0119	3.89	2.51
E500	299.61	293.32	293.34				
				296	0.0106	3.67	2.37
E600	302.20	296.48	296.51				
				354	0.0099	3.55	2.29
E700	306.18	300.03	300.79				
				238	0.0074	3.06	1.98
E800	309.17	302.46	302.51				
				251	0.0071	2.99	1.93
E900	310.33	304.28	304.28				
				151	0.0074	3.07	1.98
E1000	311.46	305.70	305.72				
				396	0.0097	3.51	2.27
E1100	315.60	309.56	309.61				
				396	0.0141	4.23	2.73
E1200	321.13	315.20	315.30				
				270	0.0122	3.96	2.56
E1300	326.08	318.63	318.67				
				365	0.0117	3.85	2.49
E1400	328.36	322.94	322.96				
				220	0.0061	2.78	1.80
E1500	331.00	324.30	324.38				
				100	0.0194	4.96	3.20
E1600	333.33	326.32	326.46				
				326	0.0038	2.19	1.41
E1700	334.39	327.69	327.75				
				314	0.0293	6.10	3.94
E1800	344.43	336.95	338.01				
RAILROAD				182	0.0207	5.13	3.31

Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.

E1900	353.87	341.78	341.90				
				368	0.0024	1.74	1.13
E2000	349.96	342.83	342.99				
E1900	353.87	341.78	341.99				
				17	0.0024	3.72	2.40
E1900A	353.00	342.03	342.05				
				370	0.0024	3.76	2.43
E2000A	350.00	342.94	342.96				
E2005				287	0.0076	6.67	4.31
E2100	352.00	345.13	345.15	74	0.0073	6.55	4.23
E2100A	353.00	345.69	345.71	84	0.0073	6.54	4.22
E2100B	351.40	346.32	346.34	114	0.0073	6.54	4.23
E2100C	356.00	347.17	347.19	62	0.0065	7.09	4.58
E2400	354.50	347.72	347.74	154	0.0065	7.07	4.57
E2500	356.00	349.05	349.07	48	0.0065	7.09	4.58
E2600	359.00	349.48	349.50	474	0.0120	8.41	5.43
E2700	364.00	355.20	355.22	275	0.0085	7.08	4.57
E2800	366.79	357.56	357.58	63	0.0167	9.90	6.40
E2900	369.87	358.63	358.63	62	0.0102	2.21	1.43
Sunnyetown Pk.							
E3000	368.26	359.26	359.42	204	0.0241	3.40	2.20
E3100	375.00	364.34	364.45	17	0.0382	4.28	2.77
E3200	371.98	360.10	365.29	99	0.0043	1.44	0.93
E3300		365.72	365.72	390	0.0060	1.70	1.10
E3400		368.06	368.06				
E3402							
E3411							
E3418							
E3701							

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
EAST INTERCEPTOR CAPACITY

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)
SW300		
	2.31	1,602
E100		
	2.27	1,578
E200		
	2.84	1,972
E300		
	2.86	1,983
E400		
	2.51	1,745
E500		
	2.37	1,646
E600		
	2.29	1,593
E700		
	1.98	1,374
E800		
	1.93	1,342
E900		
	1.98	1,378
E1000		
	2.27	1,573
E1100		
	2.73	1,898
E1200		
	2.56	1,774
E1300		
	2.49	1,728
E1400		
	1.80	1,247
E1500		
	3.20	2,225
E1600		
	1.41	981
E1700		
	3.94	2,735
E1800		
	3.31	2,300
E1900		
	1.13	782
E2000		
E1900		
	2.40	1,669
E1900A		
	2.43	1,688
E2000A		
E2005		
	4.31	2,992
E2100		
	4.23	2,939
E2100A		
	4.22	2,932
E2100B		
	4.23	2,936
E2100C		
	4.58	3,181
E2400		
	4.57	3,174
E2500		
	4.58	3,180
E2600		
	5.43	3,773
E2700		
	4.57	3,174
E2800		
	6.40	4,442
E2900		
Sunnyetown Pk.	1.43	990
E3000		
	2.20	1,526
E3010		
	2.77	1,921
E3200		
	0.93	648
E3300		
	1.10	761
E3400		
Merrybrook Neighborhood		
E3402		
E3411		
E3418		
E3701		

Note: Flows are for rain even

Feb-15														
01/03/15 1.00"	1/18/2015 1.44"	04/20/15 1.71"	05/31/15 2.32"	06/08/15 1.4"	6/26/2015 2.30"	07/05/15 1.16"	07/14/15 1.15"	08/10/15 1.26"	08/20/15 2.43"	09/09/15 1.29"	09/29/15 2.2"	10/01/15 2.19"	10/28/15 1.49"	11/19/15 1.1"
			320	510	772	450	564	393	1391	332	434	787	478	

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS > THAN 1"

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
Conrad Ave. Pump Station Wet Well		293.16	316	0.0052	0.87	0.56
PS322	294.79	295.95	270	0.0061	0.94	0.61
PS323	297.60	297.59	296	0.0202	1.72	1.11
PS324	303.56	303.56				

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)
NW 4013 Weber Conrad Ave. Pump Station Wet Well	0.56	389
PS322	0.61	424
PS323	1.11	770
PS324		
MH PS325		
MH PS 326		
MH PS202		
MH 2346A		

Observed Peak Flows in gpm [1]

Date	4/10/2013	5/10/2013	5/23/2015	6/6/2013	6/10/2013	6/26/2013	7/1/2013	7/12/2013	7/22/2013	8/1/2013	8/12/2013	10/9/2013	11/26/2013	12/6/2013	12/14/2013	12/29/2013
Total Rain	1.61"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
					FEBRUARY 2016											
PS324									57	50	352	79	172	119	114	182
MH PS325																
MH PS 326	22		17	457	588	26	111	47								
MH PS202	49	35			207				16	11	11	34	85	64	42	85
MH 2346A	385	372	203	1869	2227	298	828	498	57	394	1275	327	610	495	423	983
PS323	161	138	64	819	1380					100	631	152	288	220	225	289

Note:

1. Flows listed are for rain events greater than 1 inch.

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS > THAN 1"

February 2016

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Observed Peak Flows in gpm [1]
										Date
										Total Rai
							NW 4013			
Conrad Ave.							Conrad Ave.			
Pump Station							Pump Station			
Wet Well		293.16					Wet Well			
			316	0.0052	0.87	0.56		0.56	389	
PS322	294.79	295.95					PS322			
			270	0.0061	0.94	0.61		0.61	424	
PS323	297.60	297.59					PS323			
			296	0.0202	1.72	1.11		1.11	770	
PS324	303.56	303.56					PS324			
							MH PS325			
							MH PS 326			
							MH PS202			
							MH 2346A			

Observed Peak Flows in gpm [1]											
3/29/2014	4/15/2014	4/29/2014	5/16/2014	5/28/2014	6/9/2014	7/14/2014	7/27/2014	10/15/2014	11/26/2014	12/8/2014
2.66"	1.99"	5.12"	2.97"	1.30"	1.71"	1.37"	1.08"	1.20"	1.05"	1.37"
649	497	751	672	173	56	85	72	76	258	341
476	254	620	486	78	25	37	39			
								90	88	79
224	180	344	1398	53	13	11	9	12	29	67
1570	1305	2056	1762	629	276	307	140	339	342	525

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENT >THAN 1"

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

	MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
MH #	Conrad Ave. Pump Station Wet Well		293.16				
Conrad Ave.				316	0.0052	0.87	0.56
Pump Station	PS322	294.79	295.95				
Wet Well				270	0.0061	0.94	0.61
	PS323	297.60	297.59				
PS322				298	0.0202	1.72	1.11
	PS324	303.56	303.56				
PS323							
PS324							

Note:

1. Flows listed are for rain events greater than 1 inch.

	Calculated Capacity		Observed Peak Flows in gpm [1]																	

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS > THAN 1"

KRIEBEL ROAD TRIBUTARY CAPACITY[1]

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Observed Peak Flows in gpm [2] Date								February 2016											
										Total Rain	1.28"	1.59"	1.61"	1.00"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
							24A				2097	2836	1014	1405	1614	812	3162	3400	1047	2895	1526	2476	1309	3150	1649	2284	1697	1420	2113
							21.1				449	735	235	302	80	120	899	1066	116	482	445	475	177	754	218	371	323	217	426
							35				733	926	291	509	291	182	887	926	156	560	693	601	245	851	275	589	327	599	715
205							205				1322	2129	713	573	992	553	2407	2356	596	571	1134	1570	673	2366	945	1647	1060	864	1236
236	252.68	252.68					236																						
			34.59	0.0246	1.69	1.22		1.22	849																				
236A	253.53	253.50					236A																						
			289.71	0.0126	1.35	0.87		0.87	607																				
237A	257.14	257.19					237A				487	766	292	342	324	94	774	797	130	405	361	374	151	654	215	373	263	274	447
			80.54	0.0226	1.82	1.17		1.17	815																				
237	259.01	259.12					237																						
			401.66	0.0142	1.44	0.93		0.93	646																				
238	264.83	265.05					238																						
			295.73	0.0106	1.24	0.80		0.80	557																				
239	268.17	268.27					239																						
			359.36	0.0348	2.25	1.46		1.46	1,011																				
240	280.79	280.85					240																						
			250.16	0.0126	1.35	0.87		0.87	606																				
241	283.98	283.97					241																						
			264.81	0.0106	1.25	0.80		0.80	559																				
242	287.00	287.26					242																						
			125.65	0.0249	1.91	1.23		1.23	855																				
243	290.39	291.00					243																						
			20.91	-0.0053	0.00	0.00		0.00	=																				
243A	290.89	291.09					243A																						
			96.5	0.0058	0.92	0.59		0.59	413																				
244	291.65	291.53					244																						
			252.47	0.0041	0.76	0.50		0.50	348																				
245							245				200	360	94	187	143	41	457	828	46	241	203	222	87	344	137	236	197	151	182
249	292.57	292.67					249																						
			223.88	0.0113	1.28	0.83		0.83	576																				
250	295.40	295.53					250																						
			344.45	0.0188	1.65	1.07		1.07	742																				
251							251				267	344	91	123	91	48	438	666	34	159	176	169	67	372	109	186	114	140	209
253	301.99	302.41					253																						
			325.56	0.0173	1.59	1.03		1.03	713																				
255	308.04	307.95					255				152	218	86	27	24	31	96	403	38	48	100	60	72	49	94	78	70	72	155
			90.43	0.0412	2.45	1.58		1.58	1,101																				
256	311.88	311.72					256																						
459A							459A				507	631	384	381	392														
477							477																						
694							694																						

Notes:

1 The Manhole in this table are located in Upper Gwynedd Township with the exceptions of Manholes #24A, 21.1, 35 and #236, which is located just west of the Township dividing line

2 Flows listed are for rain events greater than 1 inch.

3 This section of pipe slopes slightly up.

Amended Attachment 19-A

Table 4.3

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS > THAN 1"

KRIEBEL ROAD TRIBUTARY CAPACITY[1]

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
205						
			34.59	0.0246	1.89	1.22
236	252.68	252.68				
			289.71	0.0126	1.35	0.87
236A	253.53	253.50				
			80.54	0.0226	1.82	1.17
237A	257.14	257.19				
			401.66	0.0142	1.44	0.93
237	259.01	259.12				
			295.73	0.0106	1.24	0.80
238	264.82	265.05				
			359.36	0.0348	2.25	1.46
239	268.17	268.27				
			250.16	0.0125	1.35	0.87
240	280.79	280.85				
			284.81	0.0106	1.25	0.80
241	283.98	283.97				
			125.65	0.0249	1.91	1.23
242	287.00	287.26				
			20.91	-0.0053	0.00	0.00
243	290.39	291.00				
			96.5	0.0058	0.92	0.59
243A	290.88	291.09				
			252.47	0.0041	0.78	0.50
244	291.65	291.53				
			223.88	0.0113	1.28	0.83
245						
			344.45	0.0188	1.65	1.07
249	292.57	292.87				
			325.56	0.0173	1.59	1.03
250	295.40	295.53				
			90.43	0.0412	2.45	1.58
251						
253	301.99	302.41				
255	308.04	307.95				
256	311.68	311.72				
459A						
477						
694						

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Date	3/29/2014	4/15/2014	4/30/2014	5/16/2014	5/26/2014	6/9/2014	7/14/2014	February 2016 7/27/2014	10/15/2014	11/26/2014	12/8/2014
			Total Rain	2.66"	1.99"	5.12"	2.97"	1.30"	1.71"	1.37"	1.08"	1.20"	1.05"	1.37"
24A				3037	3203	3418	3316	1249	1117	1425	836	1527	1307	1414
21.1				900	883	1065	1023	295	137	104	86	134	182	3047
35				882	996	971	936	447	306	221	148	213	273	711
205				1877	2352	2394	2283	716	757	851	597	983	833	1028
236														
	1.22	849												
236A														
	0.87	607												
237A				796	721	776	772	305	161	137	102	143	177	364
	1.17	815												
237														
	0.93	646												
238														
	0.80	557												
239														
	1.46	1,011												
240														
	0.87	606												
241														
	0.80	559												
242														
	1.23	855												
243														
	0.00													
243A														
	0.59	413												
244														
	0.50	348												
245				425	503	837	958	127	62	38	26	81	103	218
249														
	0.83	576												
250														
	1.07	742												
251				400	350	596	526	128	52	28	51	48		
253														
	1.03	713												
255				162	138	418	191	71	31	16	13	9	19	75
	1.58	1,101												
256														
459A				874	669	761	755	365	303	335	280	335	371	419
477				202	210	260	241	81	74	108	33		19	22
694														

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Table 4.6

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN FLOWS FOR RAIN EVENTS > THAN 1"								Calculated Capacity		Observed Peak Flows in gpm [2]							February 2016										
KRIEBEL ROAD TRIBUTARY CAPACITY[1]										Date	1/18/2015	4/20/2015	5/31/2015	6/8/2015	6/26/2015	7/9/2015	7/14/2015	8/10/2015	8/20/2015	9/9/2015	9/29/2015	10/1/2015	10/26/2015	11/19/2015	12/17/2015	12/23/2015	12/27/2015
										Total Rain	1.44"	1.73"	2.32"	1.4"	2.30"	1.16"	1.16"	1.26"	2.43"	1.29"	2.2"	2.19"	1.49"	1.1"	1.02"	1.03"	1.5"
MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	(MGD)	(gpm)																		
							24A				1281	1511	818	1326	1682	795	1041	790	1957	898	1351	1692	1242	1621	1399	583	1735
							21.1				299	263	90	277	332	78	111	72	273	85	119	207	164	214	290	384	529
							35				715	326	184	222	400	143	154	108	255	141	215	412	333	356	393	574	191
205							205				1284	1221	656	994	1093	556	708	535	1671	540	967	1263	876	1043	1084	1218	681
236	252.68	252.68					236																				
			34.59	0.0246	1.89	1.22		1.22	849																		
236A	253.53	253.50					236A																				
			289.71	0.0126	1.35	0.87		0.87	607																		
237A	257.14	257.19					237A				382	320	142	243	386	121	130	109	302	101	138	297	876	210	277	309	72
			80.54	0.0226	1.82	1.17		1.17	815																		
237	259.01	259.12					237																				
			401.66	0.0142	1.44	0.93		0.93	646																		
238	264.82	265.05					238																				
			295.73	0.0106	1.24	0.80		0.80	557																		
239	268.17	268.27					239																				
			359.36	0.0348	2.25	1.46		1.46	1,011																		
240	280.79	280.85					240																				
			250.16	0.0125	1.35	0.87		0.87	606																		
241	283.98	283.97					241																				
			284.81	0.0106	1.25	0.80		0.80	559																		
242	287.00	287.26					242																				
			125.65	0.0249	1.91	1.23		1.23	855																		
243	290.39	291.00					243																				
			20.91	-0.0053	0.00	0.00		0.00	[3]																		
243A	290.89	291.09					243A																				
			96.5	0.0058	0.92	0.59		0.59	413																		
244	291.65	291.53					244																				
			252.47	0.0041	0.78	0.50		0.50	348																		
245							245				166	160	56	106	155	46	52	46	163	50	86	166	112	116	208	220	97
249	292.57	292.87					249																				
			223.88	0.0113	1.28	0.83		0.83	576																		
250	295.40	295.53					250																				
			344.45	0.0188	1.65	1.07		1.07	742																		
251							251					68	23	52	120	27	24	42	164	61	49	106	57	56	140	190	47
253	301.99	302.41					253																				
			325.56	0.0173	1.59	1.03		1.03	713																		
255	308.04	307.95					255				132	94	43	45	95	74	58	47	102	17	28	76	29	24	47	63	45
			90.43	0.0412	2.45	1.58		1.58	1,101																		
256	311.68	311.72					256																				
459A							459A				440	421	299	403	431	236	197	265	324	231	281	353	326	317	363	388	363
477							477				38		7	46	73	7	43	9	84	28	37	93	78	110			
694							694																				

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Table 5.1

Upper Gwynedd Township Collection System

Scheduled Repairs & Improvements 2016

East Interceptor

The eight (8) sections of sanitary sewer listed below will be replaced utilizing pipe bursting and excavations. All necessary repairs to laterals that flow to these sections of sanitary mains will also be included within this project.

	Downstream Manhole	Upstream Manhole	Street	Footage	# of Lateral Connections
1	E2030	E2031	Swedesford Rd.	422	2
2	E2031	E2032	Swedesford Rd.	400	5
3	E2032	E2033	Swedesford Rd.	357	5
4	E2033	E2034	Swedesford Rd.	224	5
5	E2034	E2035	Swedesford Rd.	230	2
6	E2035	E2036	Swedesford Rd.	210	1
7	E2036	E2037	Swedesford Rd.	226	1
8	E2037	E2038	Swedesford Rd.	200	1
			Total	**2269**	**22**

Table 5.2
Upper Gwynedd Township Collection System
Scheduled Repairs & Improvements for 2016
East Inteceptor Drainage Area

Improvements are scheduled for 14 manholes within East Interceptor of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames.

The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	E5000	Hancock St.
2	E5001	Hancock St.
3	E5001A	Hancock St.
4	E5002	Hancock St.
5	E5003	Hancock St.
6	E5004	Hancock St.
7	E5005	Hancock St.
8	E5006	Hancock St.
9	E5007	Hancock St.
10	E3013	Gwynedd Ave.
11	E3014	Gwynedd Ave.
12	E3015	Gwynedd Ave.
13	E3016	Gwynedd Ave.
14	E3017	Sixth St.

Table 5.3
Upper Gwynedd Township Collection System
Scheduled Repairs & Improvements for 2016
South West Interceptor

Groundwater infiltration has been identified at the pipe connections and wall joints in the 9 manholes listed below. All 9 manholes are scheduled to be spray-lined in 2016.

	Manhole #	Street
1	NW4014	Weber's Lane
2	NW4017	Weber's Lane
3	NW4020	Weber's Lane
4	NW4023	Sandy's Lane
5	NW4030	Sandy's Lane
6	NW4031	Sandy's Lane
7	NW4032	Sandy's Lane
8	NW4033	Sandy's Lane
9	NW4034	Sandy's Lane

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Table 5.3

Upper Gwynedd Township Collection System

Scheduled Repairs & Improvements for 2016

South West Interceptor

Improvements are scheduled for 30 manholes within the South West Interceptor of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames. The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	NW2628	Hancock St.
2	NW2629	Marlyn's Lane
3	NW2630	Marlyn's Lane
4	NW2631	Marlyn's Lane
5	NW2632	Cathy's Lane
6	NW2633	Cathy's Lane
7	NW2634	Cathy's Lane
8	NW2635	Cathy's Lane
9	NW2643	Hancock St.
10	NW2644	Hancock St.
11	NW2645	Hancock St.
12	NW4013	Weber's Lane
13	NW4014	Weber's Lane
14	NW4015	Marlyn's Lane
15	NW4016	Marlyn's Lane
16	NW4017	Weber's Lane
17	NW4018	Weber's Lane
18	NW4019	Weber's Lane
19	NW4020	Weber's Lane
20	NW4021	Cathy's Lane
21	NW4022	Cathy's Lane
22	NW4023	Sandy's Lane
23	NW4024	Sandy's Lane
24	NW4030	Sandy's Lane
25	NW4031	Sandy's Lane
26	NW4032	Sandy's Lane
27	NW4033	Sandy's Lane
28	NW4034	Sandy's Lane
29	NW4035	Sandy's Lane
30	NW4036	Sandy's Lane

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Table 5.4
Upper Gwynedd Township Collection System
Manholes
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

Improvements are scheduled for 15 manholes within the Manhole 24A Drainage Area of the Towamencin Municipal Authority portion of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames.

The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	402	Green St.
2	403	Green St.
3	404	Green St.
4	405	Green St.
5	406	Green St.
6	407	Green St.
7	408	Green St.
8	409	Green St.
9	419	Park Ave.
10	420	Rosemont Ave.
11	421	Rosemont Ave.
12	422	Rosemont Ave.
13	423	Rosemont Ave.
14	424	Rosemont Ave.
15	NW4016	Rosemont Ave.

Table 5.5
Upper Gwynedd Township Collection System
Laterals
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

The sections of sanitary sewer mains listed below were lined from manhole to manhole with Cured-In-Place Pipe in 2014. In 2016 the 43 VCP (clay) laterals, that were not previously replaced with PVC pipe, on State St. and Jackson St. that are listed below are scheduled to be lined from the main to the 4" cast- iron pipe with CIPP liner.
This will eliminate the possibility of ground water infiltration at the joints within the VCP laterals and between the previously installed liner and the lateral connections at the main.

	Downstream Manhole	Upstream Manhole	Street	# of lateral connections
1	477	814	State St.	11
2	814	812	State St.	1
3	812	813	Jackson St.	9
4	812	811	Jackson St.	13
5	811	815	Jackson St.	9
			Total:	43

Table 5.6
Upper Gwynedd Township Collection System
Wyes
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

The sections of sanitary sewers listed below were lined from manhole to manhole with Cured-In-Place Pipe in 2014. In 2016 the 30 lateral connections on S. Broad St. that are listed below will be sealed at the wye connections with CIPP to eliminate the possibility of groundwater infiltration entering the sanitary sewers between the lateral and the previously installed CIPP liner.

	Downstream Manhole	Upstream Manhole	Street	Lateral Connections
1	219	220	S. Broad St.	3
2	220	816	S. Broad St.	2
3	816	413	S. Broad St.	6
4	413	414	S. Broad St.	5
5	414	414A	S. Broad St.	7
6	414A	801	S. Broad St.	0
7	801	415	S. Broad St.	5
8	415	416	S. Broad St.	2
9	416	417	S. Broad St.	0
10	417	418	S. Broad St.	0
			Total :	30

CONNECTION MANAGEMENT PLAN
UPDATED: 02/04/16

TABLE 6.1

UGT WWTP

				Connection Status								
	DEP Code No.	Flow Approved	Date Approved by DEP	EDUs Approved	EDUs Connected	EDUs Remaining	Remaining gpd	2015	2016	2017	2018	Tributary to SSO
Upper Gwynedd Township		gpd										
EAST INTERCEPTOR												
[illegible]												
Gwynedd Manor On-Lot Systems						30						
Misc. On-Lot Systems						3	711		3			MH E1700
						10	2,370		5	5		
SOUTHWEST INTERCEPTOR												
[illegible]												
116 Old Church Road						1	237					None
Hancock Road						50	11,850				30	None
Worcester Township						490	116,130				385	None
Montgomery Township						10	2,370				5	None
Misc. On Lot Systems						9	2,133	3	4	5	8	
Merck-Phase 5						652	154,524				352	
TMA SERVICE AREA												None
[illegible]												
Misc. On Lot Systems						10	2,370		2			
Martin I Green Street							9,480		2	2		
Martin II Allentown Rd.							4,740		20	20		None
Martin III S. Broad St.							2,844		10	10		None
									6	6		None

1. 237 Gal/EDU is used in accordance with Act 57 calculations
2. There is one connection for Clemrock that is part of the Providence Reserve development.
3. Where "None" is shown in the last column, "Tributary to SSO", this means that the project is not tributary to any SSO within UGT.
   We recognize that there are SSO on the KRI & that all UGT flow goes to the KRI.
4. Note that EDUs included for the Preserve at Worcester are included in the total allocation for Worcester Township.

[illegible] Ready to go. Subject to filing Building Permit and buying EDU's.

[illegible] Need Planning Module approval

[illegible] On lot Septic System with problems

[illegible] No approval pending or applied for and working on lot systems

TABLE 6.2

UGT NET 1/1 REDUCTION[1]

BRIAR GLEN SERVICE

AREA

MANHOLE PS 202

	Peak Daily Flow	Average Daily Flow[2]	Net I/I[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.162	0.015	0.147		10.8
September 28, 2015	0.002	0.001	0.001	0.146	2.0
October 2, 2015	0.013	0.001	0.012	0.135	10.5

AVG. Net I/I Reduction 0.141

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the two post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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TABLE 6.3

UGT NET 1/1 REDUCTION[1]

CONRAD AVENUE PUMP

STATION SERVICE AREA

MANHOLE PS 323

	Peak Daily Flow	Average Daily Flow[2]	Net I/1[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.581	0.078	0.503		7.5
August 20, 2015	0.218	0.184	0.034	0.469	1.2
September 28, 2015	0.082	0.061	0.021	0.482	2.0
October 2, 2015	0.141	0.077	0.064	0.439	1.8

AVG. Net I/I Reduction 0.47

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the two post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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TABLE 6.4

UGT NET 1/1 REDUCTION[1]

KRI SERVICE AREA

MANHOLE 24A

	Peak Daily Flow	Average Daily Flow[2]	Net I/1[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	2.957	0.969	1.988		3.05
August 20, 2015	1.184	0.676	0.508	1.48	1.75
September 28, 2015	0.942	0.815	0.127	1.86	1.16
October 2, 2015	1.327	0.794	0.533	1.46	1.67

AVG. Net I/I Reduction = 1.6 mgd

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the three post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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TABLE 6.5

UGT NET 1/1 REDUCTION[1]

KRI SERVICE AREA

MANHOLE 35

	Peak Daily Flow	Average Daily Flow[2]	Net I/1[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.97	0.189	0.781		5.13
August 20, 2015	0.155	0.053	0.102	0.679	2.92
September 28, 2015	0.124	0.086	0.038	0.743	1.44
October 2, 2015	0.276	0.121	0.155	0.626	2.28

AVG. Net I/I Reduction = 0.683 mgd

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the three post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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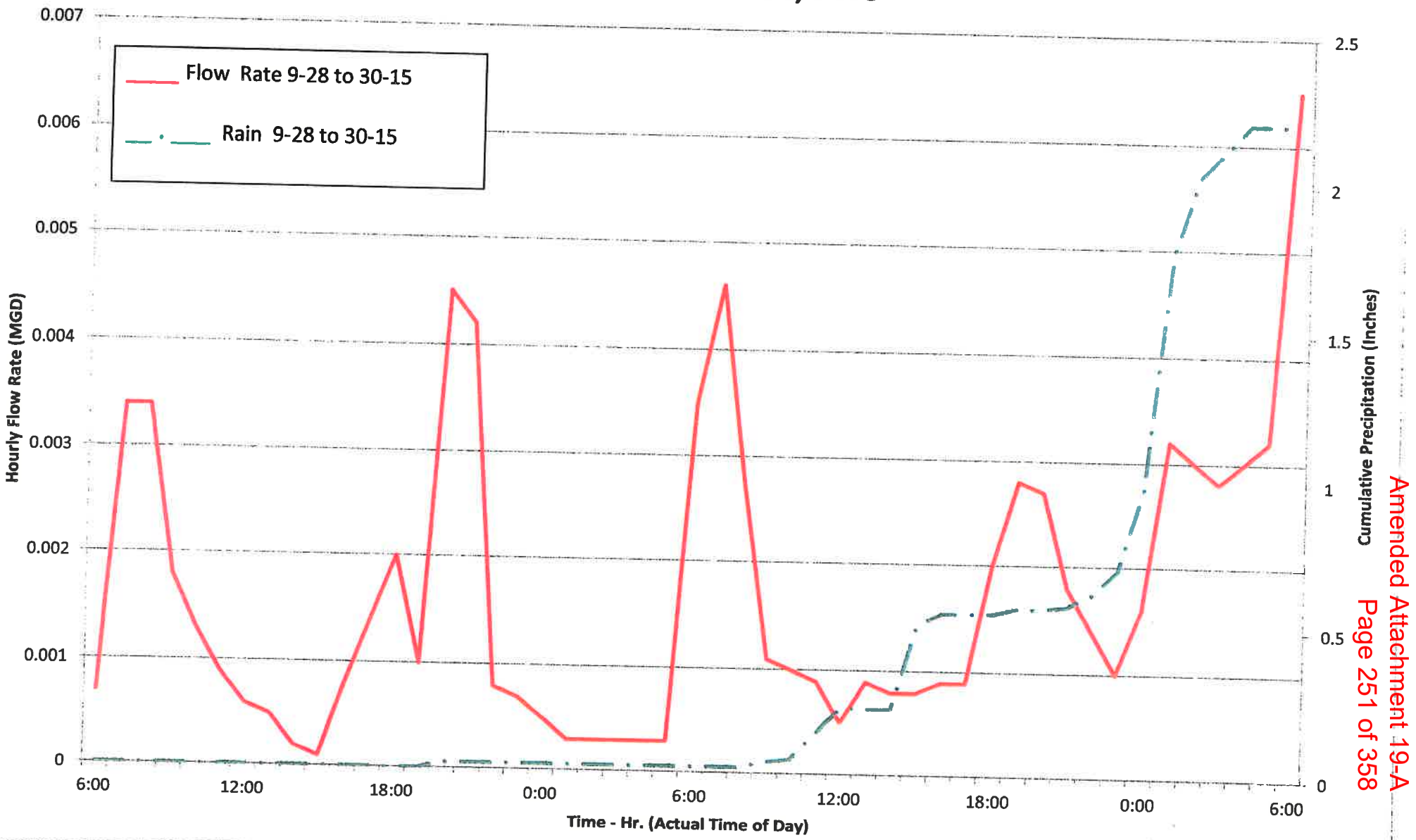
SOUTHWEST INTERCEPTOR

EDU REQUEST

FLOW DATA AND INFORMATION

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS202 - Upstream of the Briar Glen Pump Station - September 28 to 30, 2015



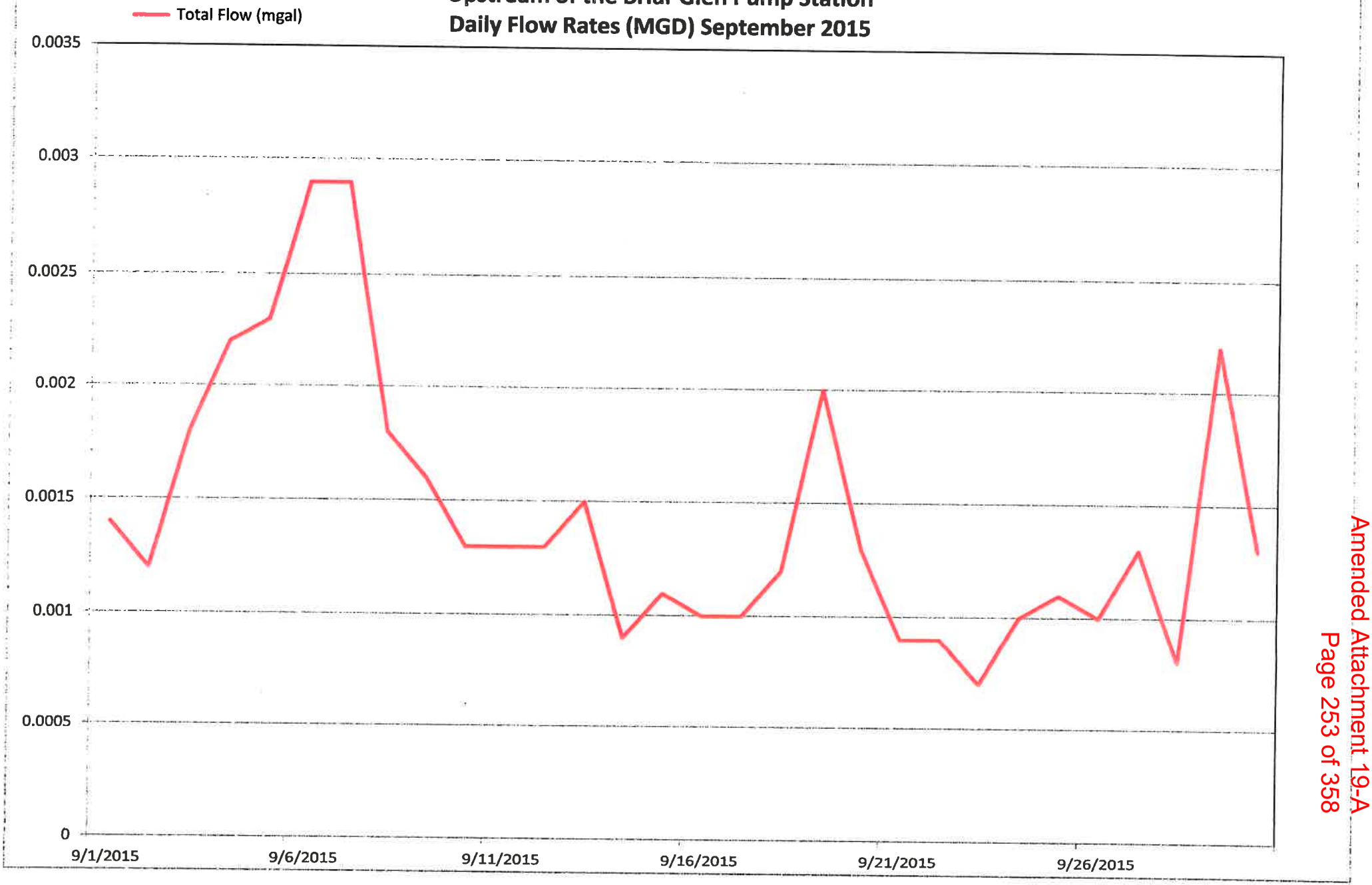
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS202 for Rain Event: September 28 to 30, 2015

Date	Time	Flow Rate (MGD)	Hourly Rain Totals
9/28/2015	6:00	0.0007	0
9/28/2015	7:00	0.0034	0
9/28/2015	8:00	0.0034	0
9/28/2015	9:00	0.0018	0
9/28/2015	10:00	0.0013	0
9/28/2015	11:00	0.0009	0
9/28/2015	12:00	0.0006	0
9/28/2015	13:00	0.0005	0
9/28/2015	14:00	0.0002	0
9/28/2015	15:00	0.0001	0
9/28/2015	16:00	0.0008	0
9/28/2015	17:00	0.0014	0
9/28/2015	18:00	0.002	0
9/28/2015	19:00	0.001	0
9/28/2015	20:00	0.0045	0.02
9/28/2015	21:00	0.0042	0.02
9/28/2015	22:00	0.0008	0.02
9/28/2015	23:00	0.0007	0.02
9/29/2015	0:00	0.0005	0.02
9/29/2015	1:00	0.0003	0.02
9/29/2015	2:00	0.0003	0.02
9/29/2015	3:00	0.0003	0.02
9/29/2015	4:00	0.0003	0.02
9/29/2015	5:00	0.0003	0.02
9/29/2015	6:00	0.0035	0.02
9/29/2015	7:00	0.0046	0.02
9/29/2015	8:00	0.0027	0.02
9/29/2015	9:00	0.0011	0.04
9/29/2015	10:00	0.001	0.05
9/29/2015	11:00	0.0009	0.14
9/29/2015	12:00	0.0005	0.23
9/29/2015	13:00	0.0009	0.23
9/29/2015	14:00	0.0008	0.23
9/29/2015	15:00	0.0008	0.51
9/29/2015	16:00	0.0009	0.55
9/29/2015	17:00	0.0009	0.55
9/29/2015	18:00	0.002	0.55
9/29/2015	19:00	0.0028	0.57
9/29/2015	20:00	0.0027	0.57
9/29/2015	21:00	0.0018	0.58
9/29/2015	22:00	0.0014	0.62
9/29/2015	23:00	0.001	0.7
9/30/2015	0:00	0.0016	0.98
9/30/2015	1:00	0.0032	1.77
9/30/2015	2:00	0.003	2.03
9/30/2015	3:00	0.0028	2.12
9/30/2015	4:00	0.003	2.21
9/30/2015	5:00	0.0032	2.21
9/30/2015	6:00	0.0065	2.21

Upper Gwynedd Township - Manhole PS202

Upstream of the Briar Glen Pump Station

Daily Flow Rates (MGD) September 2015

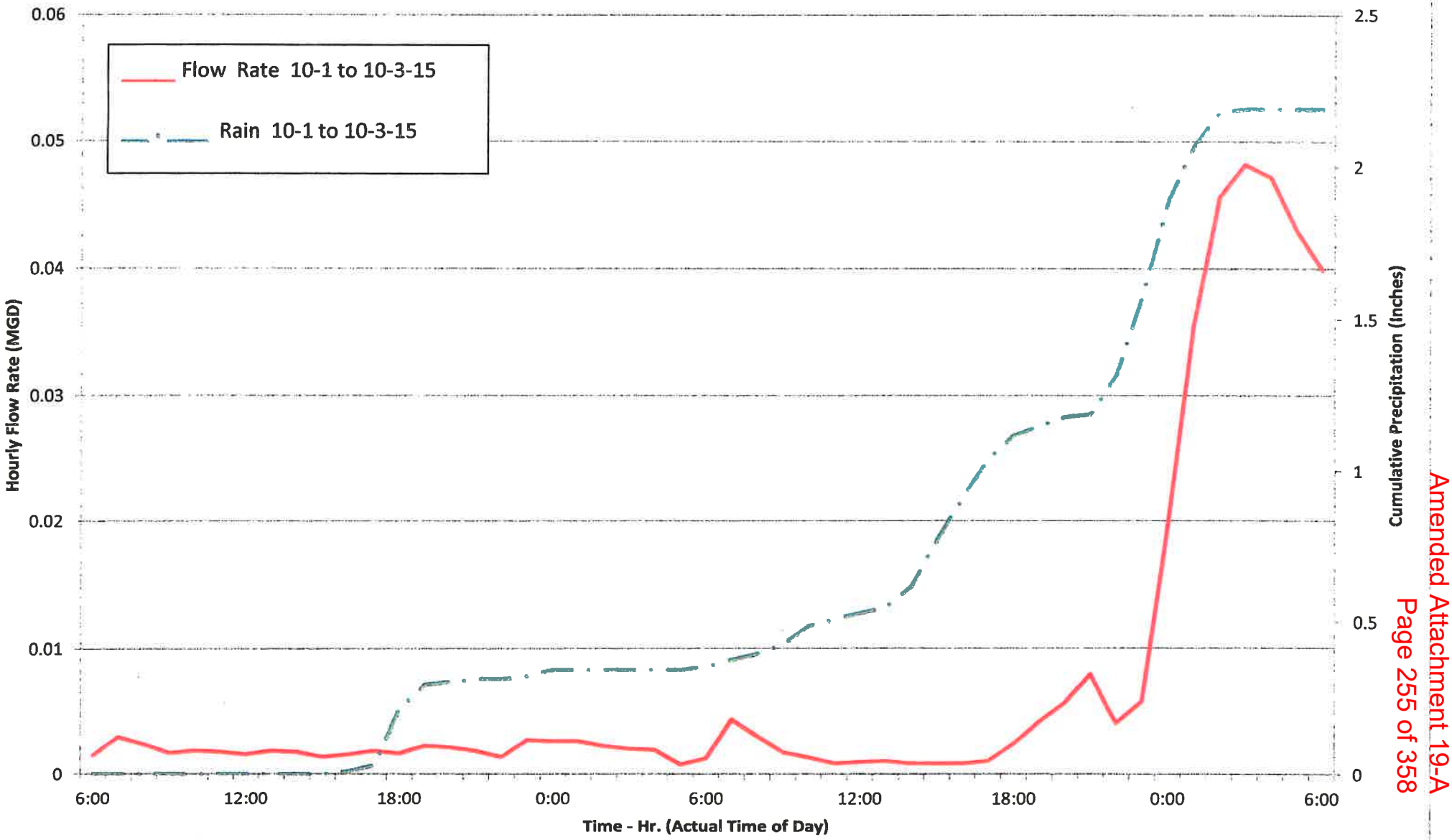


Upper Gwynedd Township - Manhole PS202

September 2015

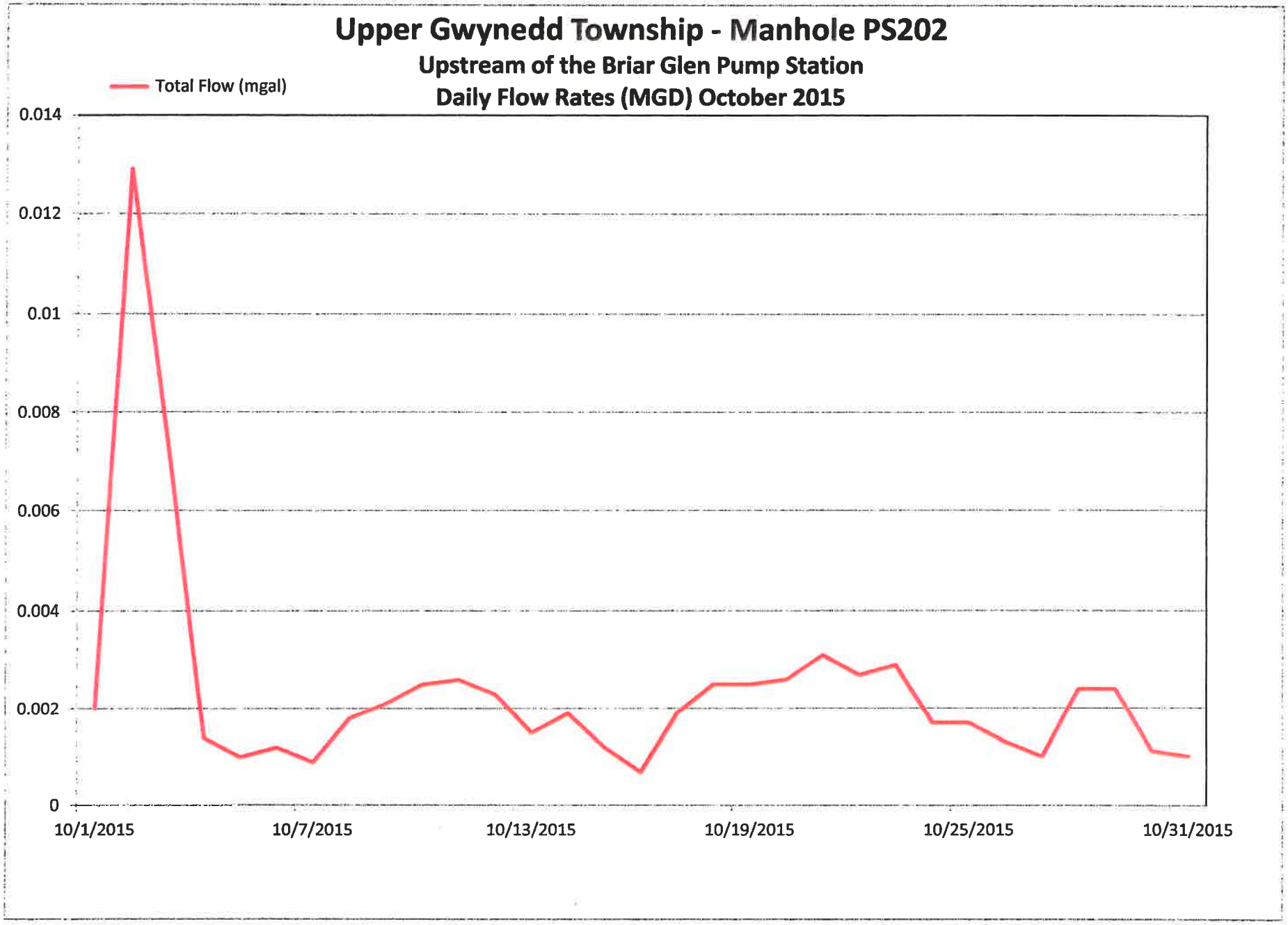
Date / Time	Total Flow (mgal)
9/1/2015	0.0014
9/2/2015	0.0012
9/3/2015	0.0018
9/4/2015	0.0022
9/5/2015	0.0023
9/6/2015	0.0029
9/7/2015	0.0029
9/8/2015	0.0018
9/9/2015	0.0016
9/10/2015	0.0013
9/11/2015	0.0013
9/12/2015	0.0013
9/13/2015	0.0015
9/14/2015	0.0009
9/15/2015	0.0011
9/16/2015	0.001
9/17/2015	0.001
9/18/2015	0.0012
9/19/2015	0.002
9/20/2015	0.0013
9/21/2015	0.0009
9/22/2015	0.0009
9/23/2015	0.0007
9/24/2015	0.001
9/25/2015	0.0011
9/26/2015	0.001
9/27/2015	0.0013
9/28/2015	0.0008
9/29/2015	0.0022
9/30/2015	0.0013

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS202 - Upstream of the Briar Glen Pump Station - October 1 to 3, 2015



Upper Gwynedd Township Flow Data & Cumulative Precipitation at PH PS 206 for Rain Event: October 1 to 3, 2015

Date	Time	Flow Rate mgd	Hourly Rain Totals
10/1/2015	6:00	0.0015	0
10/1/2015	7:00	0.003	0
10/1/2015	8:00	0.0024	0
10/1/2015	9:00	0.0017	0
10/1/2015	10:00	0.0019	0
10/1/2015	11:00	0.0018	0
10/1/2015	12:00	0.0016	0
10/1/2015	13:00	0.0019	0
10/1/2015	14:00	0.0018	0
10/1/2015	15:00	0.0014	0
10/1/2015	16:00	0.0016	0.01
10/1/2015	17:00	0.0019	0.03
10/1/2015	18:00	0.0017	0.22
10/1/2015	19:00	0.0023	0.3
10/1/2015	20:00	0.0022	0.31
10/1/2015	21:00	0.0019	0.32
10/1/2015	22:00	0.0014	0.32
10/1/2015	23:00	0.0028	0.33
10/2/2015	0:00	0.0027	0.35
10/2/2015	1:00	0.0027	0.35
10/2/2015	2:00	0.0023	0.35
10/2/2015	3:00	0.0021	0.35
10/2/2015	4:00	0.002	0.35
10/2/2015	5:00	0.0008	0.35
10/2/2015	6:00	0.0013	0.36
10/2/2015	7:00	0.0044	0.38
10/2/2015	8:00	0.0031	0.4
10/2/2015	9:00	0.0018	0.43
10/2/2015	10:00	0.0014	0.49
10/2/2015	11:00	0.0009	0.51
10/2/2015	12:00	0.001	0.53
10/2/2015	13:00	0.0011	0.55
10/2/2015	14:00	0.0009	0.62
10/2/2015	15:00	0.0009	0.77
10/2/2015	16:00	0.0009	0.91
10/2/2015	17:00	0.0011	1.04
10/2/2015	18:00	0.0025	1.12
10/2/2015	19:00	0.0042	1.15
10/2/2015	20:00	0.0058	1.18
10/2/2015	21:00	0.008	1.19
10/2/2015	22:00	0.0041	1.32
10/2/2015	23:00	0.0059	1.58
10/3/2015	0:00	0.0196	1.89
10/3/2015	1:00	0.0355	2.07
10/3/2015	2:00	0.0456	2.18
10/3/2015	3:00	0.0482	2.19
10/3/2015	4:00	0.0472	2.19
10/3/2015	5:00	0.043	2.19
10/3/2015	6:00	0.0399	2.19



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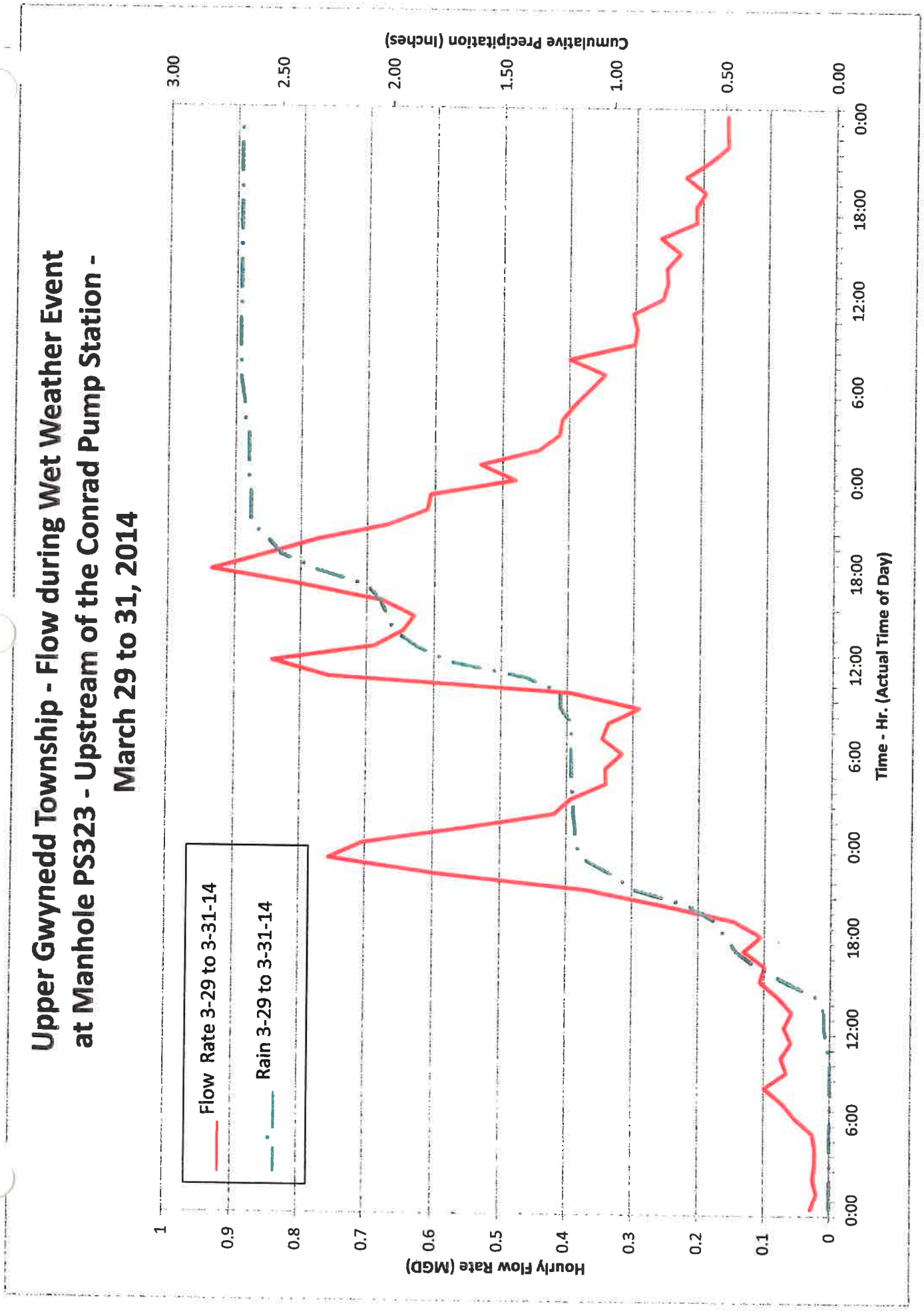
Upper Gwynedd Township - Manhole PS202

October 2015

Date / Time	Total Flow (mgal)
10/1/2015	0.002
10/2/2015	0.0129
10/3/2015	0.0074
10/4/2015	0.0014
10/5/2015	0.001
10/6/2015	0.0012
10/7/2015	0.0009
10/8/2015	0.0018
10/9/2015	0.0021
10/10/2015	0.0025
10/11/2015	0.0026
10/12/2015	0.0023
10/13/2015	0.0015
10/14/2015	0.0019
10/15/2015	0.0012
10/16/2015	0.0007
10/17/2015	0.0019
10/18/2015	0.0025
10/19/2015	0.0025
10/20/2015	0.0026
10/21/2015	0.0031
10/22/2015	0.0027
10/23/2015	0.0029
10/24/2015	0.0017
10/25/2015	0.0017
10/26/2015	0.0013
10/27/2015	0.001
10/28/2015	0.0024
10/29/2015	0.0024
10/30/2015	0.0011
10/31/2015	0.001

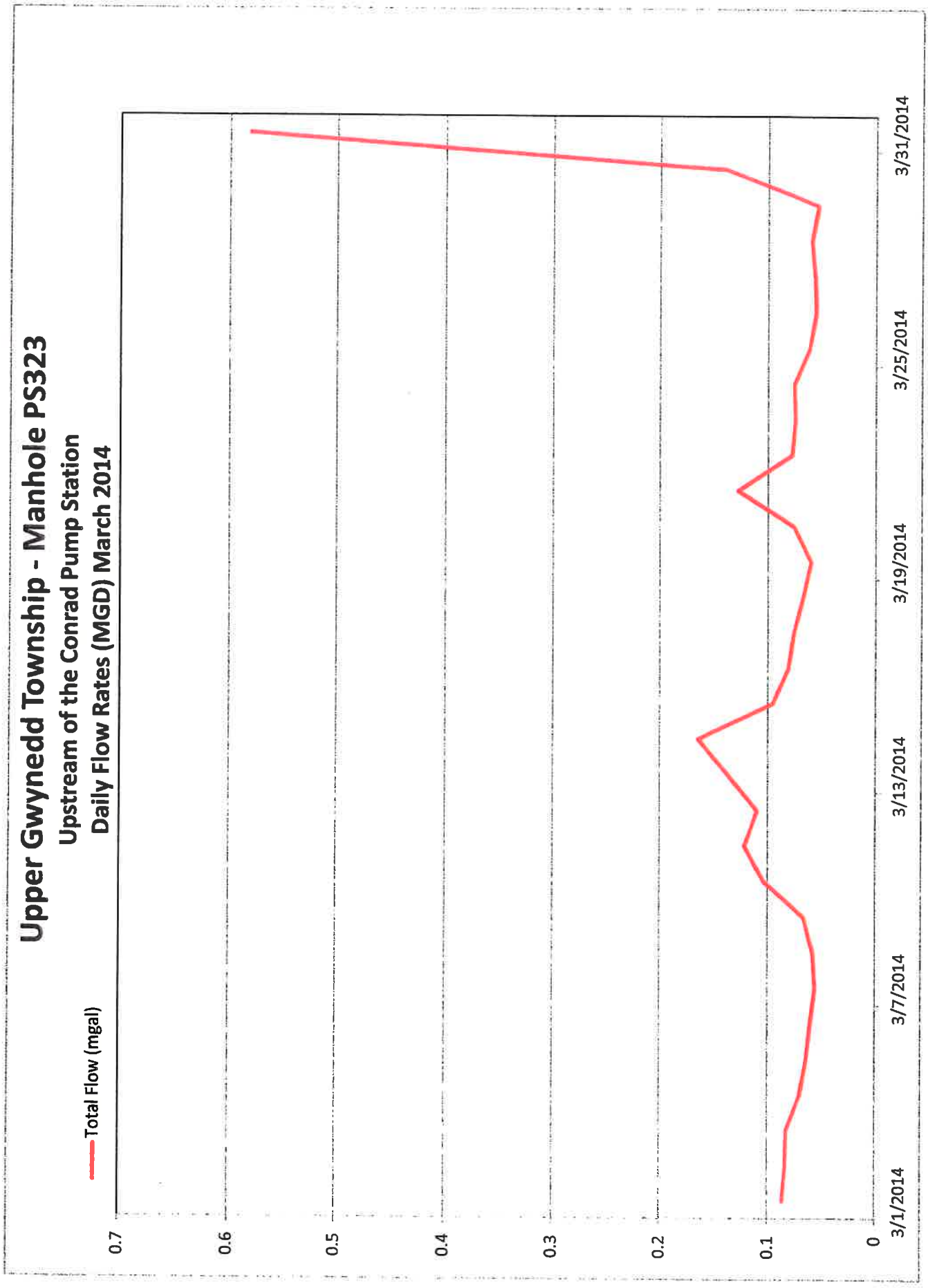

Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole PS323 - Upstream of the Conrad Pump Station -
March 29 to 31, 2014
Flow Rate 3-29 to 3-31-14
Rain 3-29 to 3-31-14
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0.00
0.50
1.00
1.50
2.00
2.50
3.00
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS323 for Rain Event: March 29 to 30, 2014

Date / Time		Flow (gpm)	Hourly Rain Totals
3/29/2014	0:00	0.028	0.00
3/29/2014	1:00	0.02	0.00
3/29/2014	2:00	0.025	0.00
3/29/2014	3:00	0.022	0.00
3/29/2014	4:00	0.022	0.00
3/29/2014	5:00	0.026	0.00
3/29/2014	6:00	0.053	0.00
3/29/2014	7:00	0.073	0.00
3/29/2014	8:00	0.1	0.00
3/29/2014	9:00	0.067	0.00
3/29/2014	10:00	0.075	0.00
3/29/2014	11:00	0.06	0.02
3/29/2014	12:00	0.071	0.03
3/29/2014	13:00	0.059	0.03
3/29/2014	14:00	0.08	0.06
3/29/2014	15:00	0.107	0.21
3/29/2014	16:00	0.1	0.34
3/29/2014	17:00	0.132	0.43
3/29/2014	18:00	0.106	0.48
3/29/2014	19:00	0.147	0.53
3/29/2014	20:00	0.253	0.65
3/29/2014	21:00	0.37	0.89
3/29/2014	22:00	0.595	0.99
3/29/2014	23:00	0.755	1.12
3/30/2014	0:00	0.705	1.16
3/30/2014	1:00	0.558	1.16
3/30/2014	2:00	0.419	1.17
3/30/2014	3:00	0.394	1.17
3/30/2014	4:00	0.341	1.18
3/30/2014	5:00	0.342	1.18
3/30/2014	6:00	0.317	1.18
3/30/2014	7:00	0.347	1.18
3/30/2014	8:00	0.338	1.18
3/30/2014	9:00	0.291	1.23
3/30/2014	10:00	0.396	1.23
3/30/2014	11:00	0.757	1.39
3/30/2014	12:00	0.843	1.74
3/30/2014	13:00	0.689	1.88
3/30/2014	14:00	0.647	1.98
3/30/2014	15:00	0.63	2.01
3/30/2014	16:00	0.677	2.04
3/30/2014	17:00	0.795	2.10
3/30/2014	18:00	0.935	2.33
3/30/2014	19:00	0.854	2.49
3/30/2014	20:00	0.776	2.55
3/30/2014	21:00	0.67	2.63
3/30/2014	22:00	0.612	2.63
3/30/2014	23:00	0.607	2.63

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS323 for Rain Event: March 29 to 30, 2014

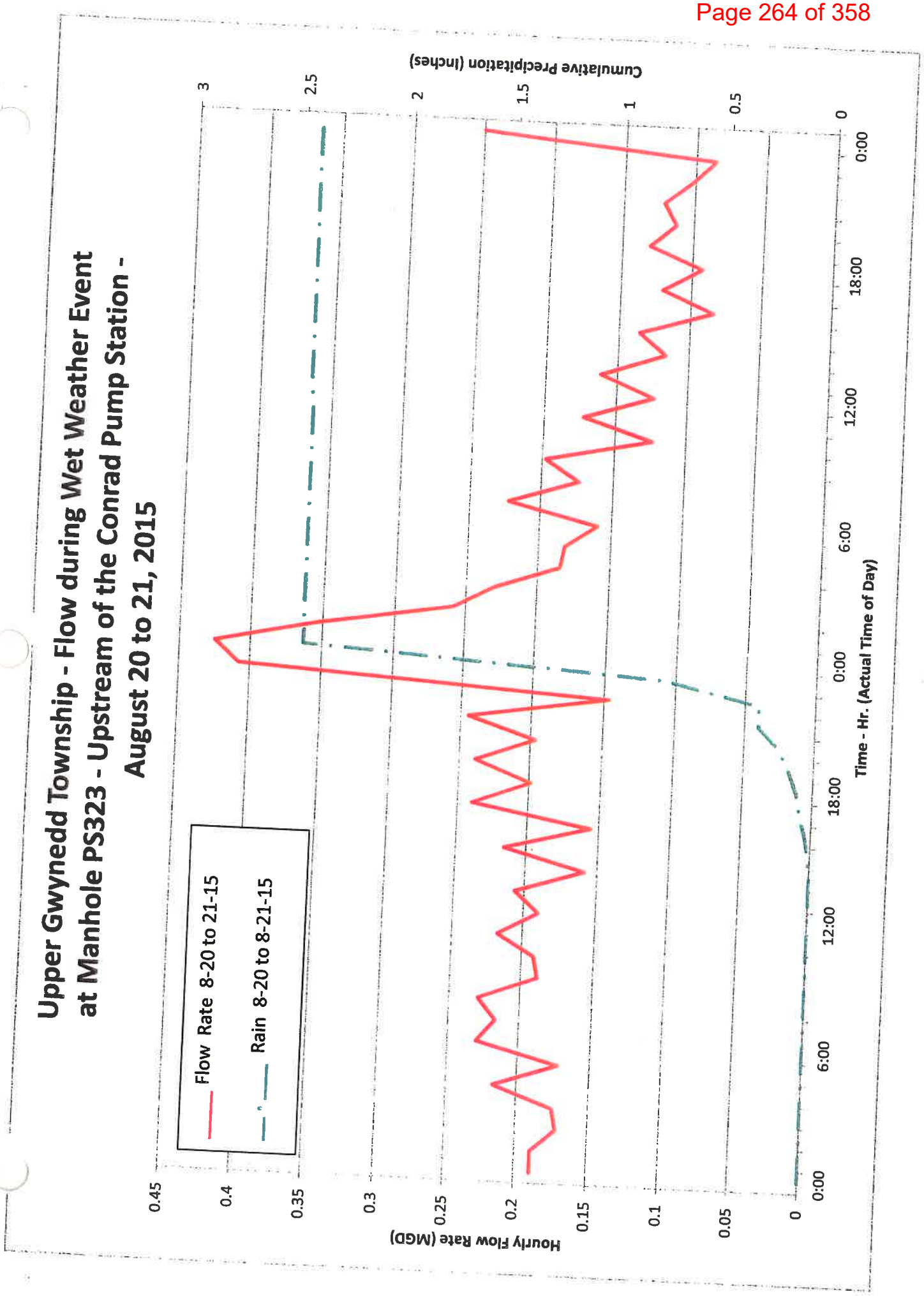
Date / Time		Flow (gpm)	Hourly Rain Totals
3/31/2014	0:00	0.481	2.64
3/31/2014	1:00	0.533	2.64
3/31/2014	2:00	0.446	2.64
3/31/2014	3:00	0.415	2.64
3/31/2014	4:00	0.411	2.66
3/31/2014	5:00	0.392	2.66
3/31/2014	6:00	0.369	2.67
3/31/2014	7:00	0.346	2.68
3/31/2014	8:00	0.4	2.68
3/31/2014	9:00	0.302	2.68
3/31/2014	10:00	0.298	2.68
3/31/2014	11:00	0.304	2.68
3/31/2014	12:00	0.26	2.68
3/31/2014	13:00	0.253	2.68
3/31/2014	14:00	0.254	2.68
3/31/2014	15:00	0.234	2.68
3/31/2014	16:00	0.263	2.68
3/31/2014	17:00	0.21	2.68
3/31/2014	18:00	0.211	2.68
3/31/2014	19:00	0.197	2.68
3/31/2014	20:00	0.226	2.68
3/31/2014	21:00	0.191	2.68
3/31/2014	22:00	0.163	2.68
3/31/2014	23:00	0.164	2.68
4/1/2014	0:00	0.164	2.68


Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

Upper Gwynedd Township-Manhole PS323

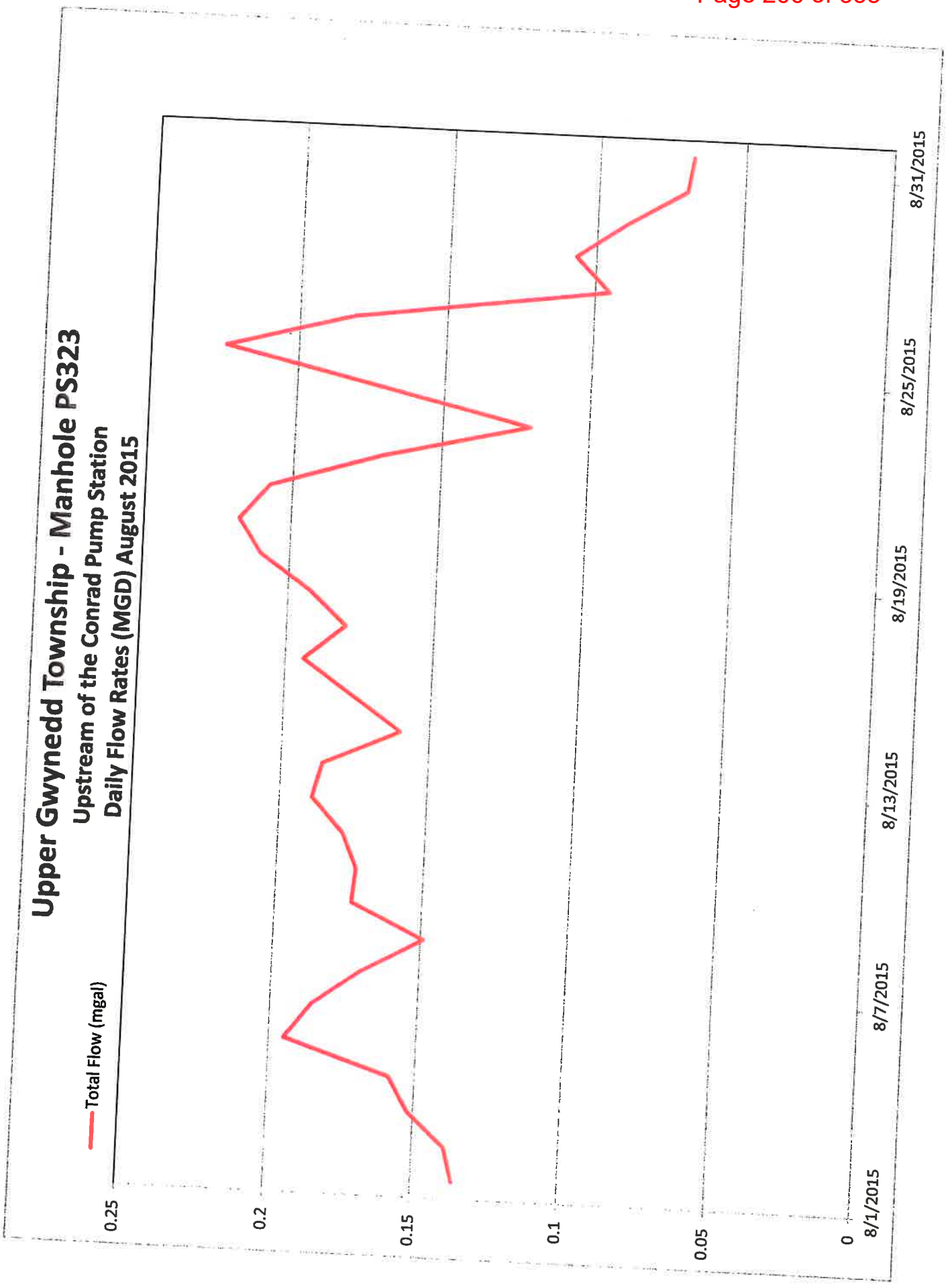
March 1 to March 31, 2014

Date	Total Flow (mgal)
3/1/2014	0.086
3/2/2014	0.083
3/3/2014	0.082
3/4/2014	0.069
3/5/2014	0.063
3/6/2014	0.059
3/7/2014	0.055
3/8/2014	0.057
3/9/2014	0.066
3/10/2014	0.104
3/11/2014	0.122
3/12/2014	0.11
3/13/2014	0.137
3/14/2014	0.165
3/15/2014	0.096
3/16/2014	0.081
3/17/2014	0.076
3/18/2014	0.067
3/19/2014	0.059
3/20/2014	0.076
3/21/2014	0.128
3/22/2014	0.078
3/23/2014	0.075
3/24/2014	0.076
3/25/2014	0.061
3/26/2014	0.055
3/27/2014	0.056
3/28/2014	0.059
3/29/2014	0.053
3/30/2014	0.139
3/31/2014	0.581


Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole PS323 - Upstream of the Conrad Pump Station -
August 20 to 21, 2015
Flow Rate 8-20 to 21-15
Rain 8-20 to 8-21-15
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
3
2.5
2
1.5
1
0.5
0
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation for Rain Event : August 20 to 21, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
8/20/2015	0:00	0.189	0
8/20/2015	1:00	0.189	0
8/20/2015	2:00	0.172	0
8/20/2015	3:00	0.175	0
8/20/2015	4:00	0.217	0
8/20/2015	5:00	0.172	0
8/20/2015	6:00	0.23	0
8/20/2015	7:00	0.217	0
8/20/2015	8:00	0.23	0
8/20/2015	9:00	0.189	0
8/20/2015	10:00	0.192	0
8/20/2015	11:00	0.218	0
8/20/2015	12:00	0.19	0
8/20/2015	13:00	0.207	0
8/20/2015	14:00	0.159	0
8/20/2015	15:00	0.216	0.01
8/20/2015	16:00	0.156	0.03
8/20/2015	17:00	0.24	0.06
8/20/2015	18:00	0.199	0.08
8/20/2015	19:00	0.239	0.12
8/20/2015	20:00	0.197	0.17
8/20/2015	21:00	0.245	0.27
8/20/2015	22:00	0.147	0.27
8/20/2015	23:00	0.408	0.73
8/21/2015	0:00	0.425	2.42
8/21/2015	1:00	0.353	2.42
8/21/2015	2:00	0.259	2.42
8/21/2015	3:00	0.23	2.42
8/21/2015	4:00	0.185	2.42
8/21/2015	5:00	0.182	2.42
8/21/2015	6:00	0.16	2.42
8/21/2015	7:00	0.223	2.42
8/21/2015	8:00	0.174	2.42
8/21/2015	9:00	0.198	2.42
8/21/2015	10:00	0.124	2.42
8/21/2015	11:00	0.173	2.42
8/21/2015	12:00	0.124	2.43
8/21/2015	13:00	0.162	2.43
8/21/2015	14:00	0.117	2.43
8/21/2015	15:00	0.136	2.43
8/21/2015	16:00	0.084	2.43
8/21/2015	17:00	0.121	2.43
8/21/2015	18:00	0.093	2.43
8/21/2015	19:00	0.131	2.43
8/21/2015	20:00	0.113	2.43
8/21/2015	21:00	0.122	2.43
8/21/2015	22:00	0.102	2.43
8/21/2015	23:00	0.086	2.43
8/22/2015	0:00	0.25	2.43

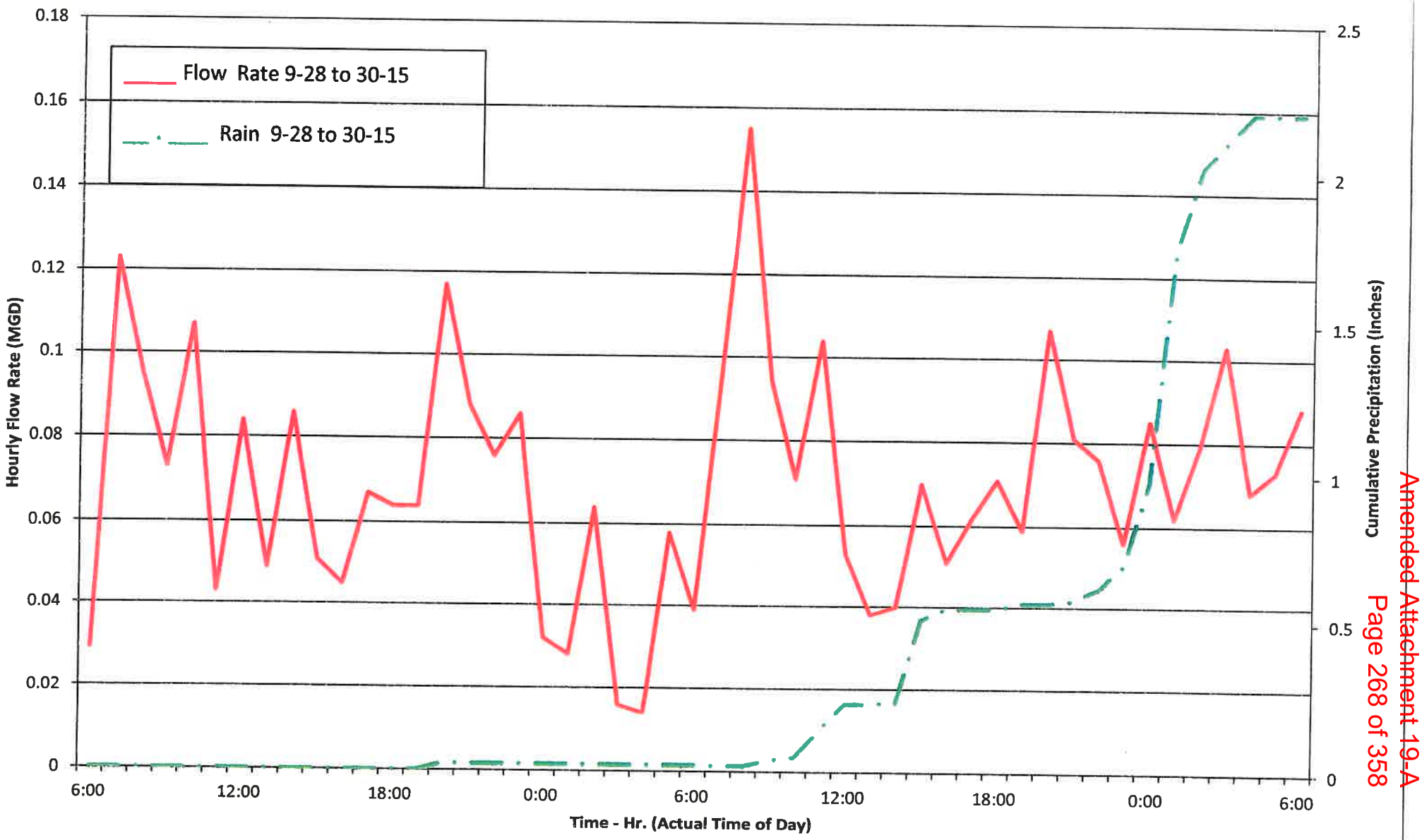

Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) August 2015
Total Flow (mgal)
0.25
0.2
0.15
0.1
0.05
0
8/1/2015
8/7/2015
8/13/2015
8/19/2015
8/25/2015
8/31/2015

Upper Gwynedd Township-Manhole PS323

August 1 to 31, 2015

Date	Total Flow (mgal)
8/1/2015	0.136
8/2/2015	0.139
8/3/2015	0.152
8/4/2015	0.159
8/5/2015	0.195
8/6/2015	0.186
8/7/2015	0.17
8/8/2015	0.149
8/9/2015	0.174
8/10/2015	0.173
8/11/2015	0.178
8/12/2015	0.189
8/13/2015	0.186
8/14/2015	0.16
8/15/2015	0.177
8/16/2015	0.194
8/17/2015	0.18
8/18/2015	0.193
8/19/2015	0.21
8/20/2015	0.218
8/21/2015	0.208
8/22/2015	0.17
8/23/2015	0.12
8/24/2015	0.172
8/25/2015	0.225
8/26/2015	0.181
8/27/2015	0.095
8/28/2015	0.107
8/29/2015	0.09
8/30/2015	0.07
8/31/2015	0.068

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS323 - Upstream of the Conrad Pump Station - September 28 to 30, 2015



Amended Attachment 19-A
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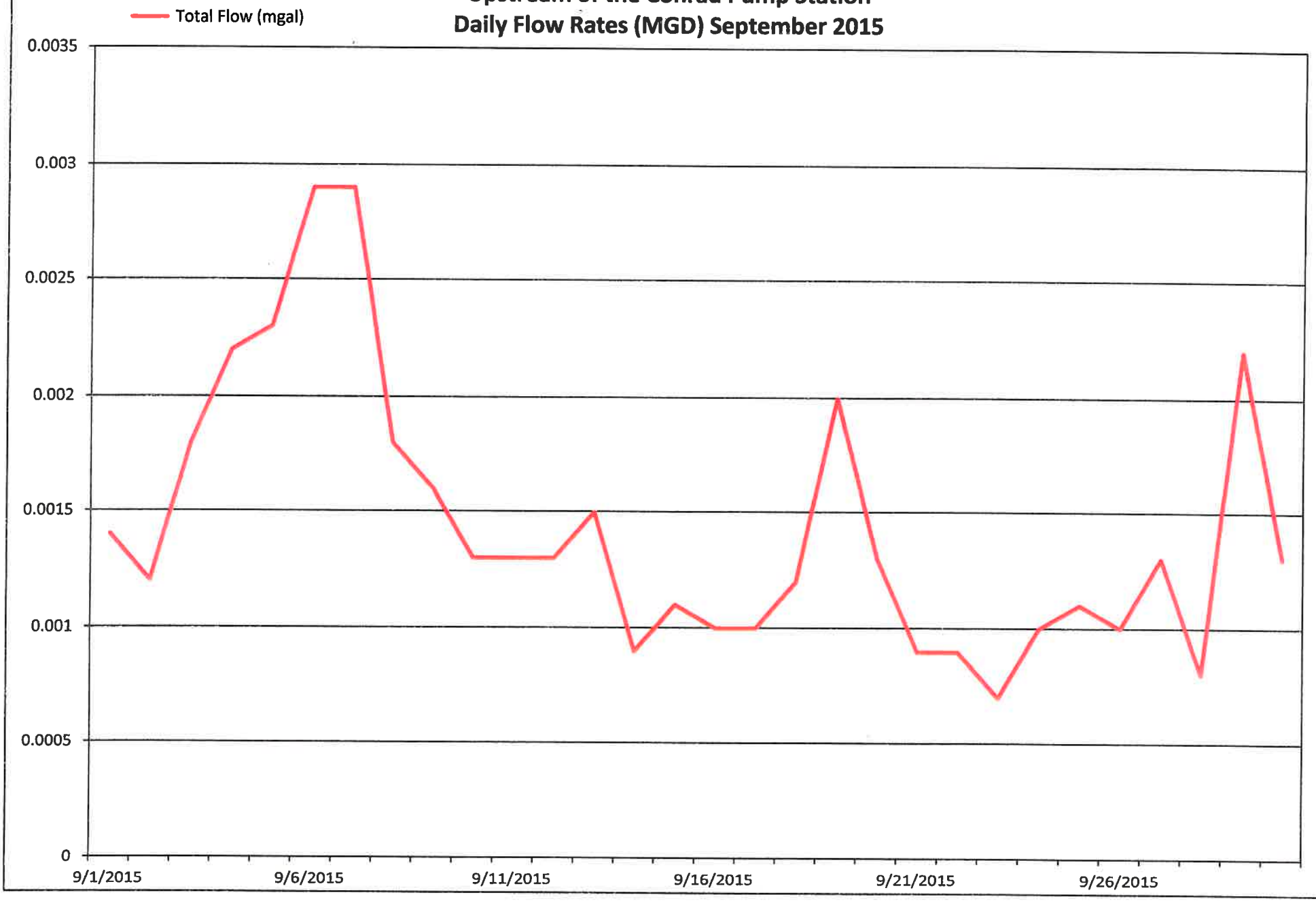
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS328 for Rain Event: September 28 to 30, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.029	0
9/28/2015 7:00	7:00	0.123	0
9/28/2015 8:00	8:00	0.095	0
9/28/2015 9:00	9:00	0.073	0
9/28/2015 10:00	10:00	0.107	0
9/28/2015 11:00	11:00	0.043	0
9/28/2015 12:00	12:00	0.084	0
9/28/2015 13:00	13:00	0.049	0
9/28/2015 14:00	14:00	0.086	0
9/28/2015 15:00	15:00	0.051	0
9/28/2015 16:00	16:00	0.045	0
9/28/2015 17:00	17:00	0.067	0
9/28/2015 18:00	18:00	0.064	0
9/28/2015 19:00	19:00	0.064	0
9/28/2015 20:00	20:00	0.117	0.02
9/28/2015 21:00	21:00	0.088	0.02
9/28/2015 22:00	22:00	0.076	0.02
9/28/2015 23:00	23:00	0.086	0.02
9/29/2015 0:00	0:00	0.032	0.02
9/29/2015 1:00	1:00	0.028	0.02
9/29/2015 2:00	2:00	0.064	0.02
9/29/2015 3:00	3:00	0.016	0.02
9/29/2015 4:00	4:00	0.014	0.02
9/29/2015 5:00	5:00	0.058	0.02
9/29/2015 6:00	6:00	0.039	0.02
9/29/2015 7:00	7:00	0.095	0.02
9/29/2015 8:00	8:00	0.155	0.02
9/29/2015 9:00	9:00	0.094	0.04
9/29/2015 10:00	10:00	0.071	0.05
9/29/2015 11:00	11:00	0.104	0.14
9/29/2015 12:00	12:00	0.053	0.23
9/29/2015 13:00	13:00	0.038	0.23
9/29/2015 14:00	14:00	0.04	0.23
9/29/2015 15:00	15:00	0.07	0.51
9/29/2015 16:00	16:00	0.051	0.55
9/29/2015 17:00	17:00	0.062	0.55
9/29/2015 18:00	18:00	0.071	0.55
9/29/2015 19:00	19:00	0.059	0.57
9/29/2015 20:00	20:00	0.107	0.57
9/29/2015 21:00	21:00	0.081	0.58
9/29/2015 22:00	22:00	0.076	0.62
9/29/2015 23:00	23:00	0.056	0.7
9/30/2015 0:00	0:00	0.085	0.98
9/30/2015 1:00	1:00	0.062	1.77
9/30/2015 2:00	2:00	0.079	2.03
9/30/2015 3:00	3:00	0.103	2.12
9/30/2015 4:00	4:00	0.068	2.21
9/30/2015 5:00	5:00	0.073	2.21
9/30/2015 6:00	6:00	0.088	2.21

Upper Gwynedd Township - Manhole PS323

Upstream of the Conrad Pump Station

Daily Flow Rates (MGD) September 2015

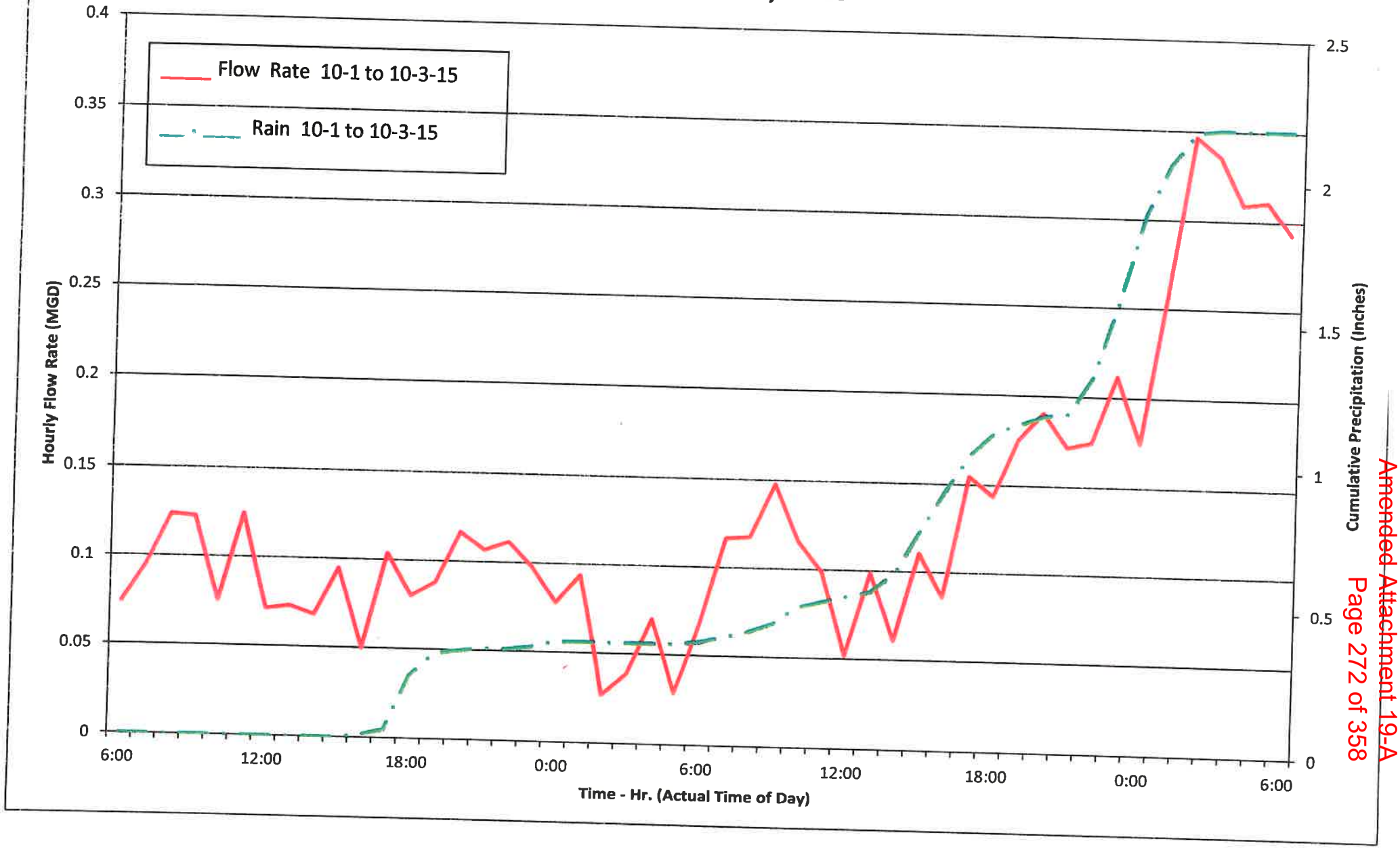


Upper Gwynedd Township-Manhole PS323

September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.055
9/2/2015	0.065
9/3/2015	0.067
9/4/2015	0.064
9/5/2015	0.064
9/6/2015	0.066
9/7/2015	0.08
9/8/2015	0.073
9/9/2015	0.074
9/10/2015	0.07
9/11/2015	0.067
9/12/2015	0.039
9/13/2015	0.031
9/14/2015	0.055
9/15/2015	0.068
9/16/2015	0.071
9/17/2015	0.073
9/18/2015	0.067
9/19/2015	0.064
9/20/2015	0.072
9/21/2015	0.082
9/22/2015	0.076
9/23/2015	0.082
9/24/2015	0.079
9/25/2015	0.073
9/26/2015	0.076
9/27/2015	0.067
9/28/2015	0.074
9/29/2015	0.064
9/30/2015	0.062

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS323 - Upstream of the Conrad Pump Station - October 1 to 3, 2015



Amended Attachment 19-A
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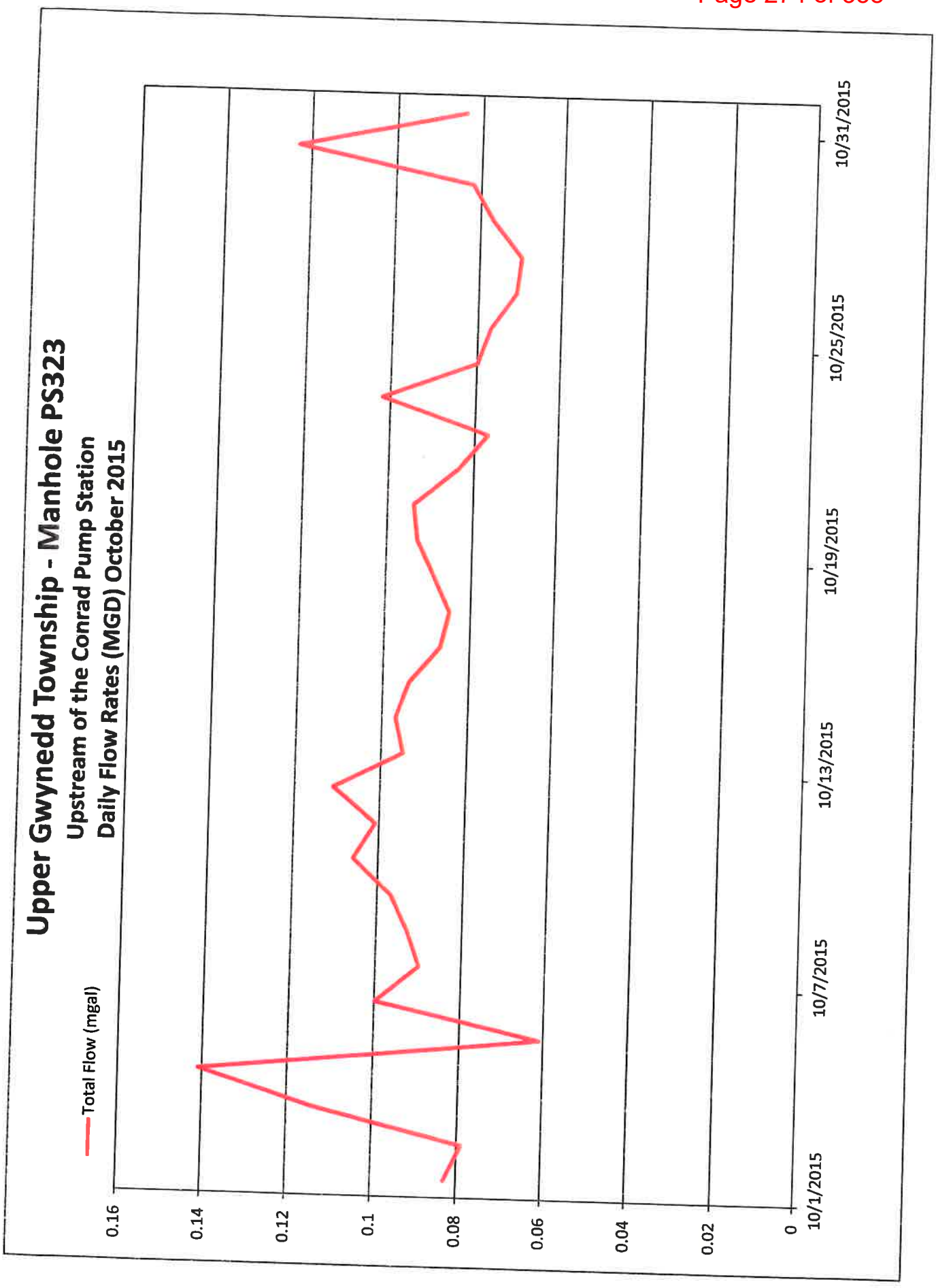
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS23 for Rain Event: October 1 to 3, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
10/1/2015	6:00	0.074	0
10/1/2015	7:00	0.095	0
10/1/2015	8:00	0.124	0
10/1/2015	9:00	0.123	0
10/1/2015	10:00	0.075	0
10/1/2015	11:00	0.125	0
10/1/2015	12:00	0.071	0
10/1/2015	13:00	0.073	0
10/1/2015	14:00	0.068	0
10/1/2015	15:00	0.095	0
10/1/2015	16:00	0.05	0.01
10/1/2015	17:00	0.104	0.03
10/1/2015	18:00	0.08	0.22
10/1/2015	19:00	0.088	0.3
10/1/2015	20:00	0.117	0.31
10/1/2015	21:00	0.107	0.32
10/1/2015	22:00	0.112	0.32
10/1/2015	23:00	0.098	0.33
10/2/2015	0:00	0.078	0.35
10/2/2015	1:00	0.094	0.35
10/2/2015	2:00	0.027	0.35
10/2/2015	3:00	0.039	0.35
10/2/2015	4:00	0.07	0.35
10/2/2015	5:00	0.029	0.35
10/2/2015	6:00	0.069	0.36
10/2/2015	7:00	0.117	0.38
10/2/2015	8:00	0.118	0.4
10/2/2015	9:00	0.148	0.43
10/2/2015	10:00	0.116	0.49
10/2/2015	11:00	0.099	0.51
10/2/2015	12:00	0.052	0.53
10/2/2015	13:00	0.099	0.55
10/2/2015	14:00	0.061	0.62
10/2/2015	15:00	0.111	0.77
10/2/2015	16:00	0.086	0.91
10/2/2015	17:00	0.155	1.04
10/2/2015	18:00	0.144	1.12
10/2/2015	19:00	0.176	1.15
10/2/2015	20:00	0.191	1.18
10/2/2015	21:00	0.172	1.19
10/2/2015	22:00	0.175	1.32
10/2/2015	23:00	0.212	1.58
10/3/2015	0:00	0.175	1.89
10/3/2015	1:00	0.257	2.07
10/3/2015	2:00	0.347	2.18
10/3/2015	3:00	0.336	2.19
10/3/2015	4:00	0.309	2.19
10/3/2015	5:00	0.311	2.19
10/3/2015	6:00	0.293	2.19


Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

Upper Gwynedd Township-Manhole PS323

October 1 to 31, 2015

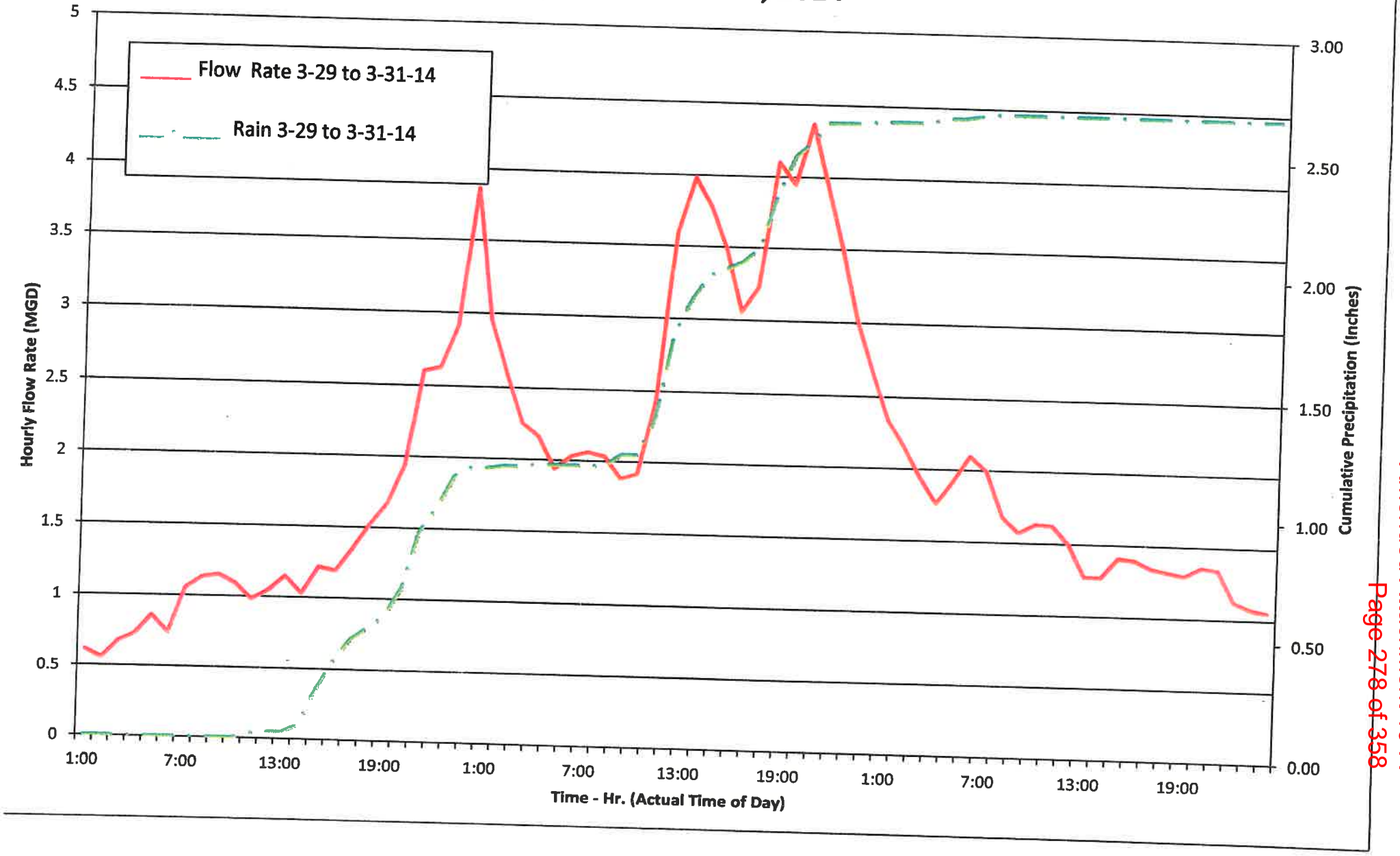
Date	Total Flow (mgal)
10/1/2015	0.083
10/2/2015	0.079
10/3/2015	0.114
10/4/2015	0.141
10/5/2015	0.061
10/6/2015	0.1
10/7/2015	0.09
10/8/2015	0.093
10/9/2015	0.097
10/10/2015	0.106
10/11/2015	0.101
10/12/2015	0.111
10/13/2015	0.095
10/14/2015	0.097
10/15/2015	0.094
10/16/2015	0.087
10/17/2015	0.085
10/18/2015	0.089
10/19/2015	0.093
10/20/2015	0.094
10/21/2015	0.084
10/22/2015	0.077
10/23/2015	0.102
10/24/2015	0.08
10/25/2015	0.077
10/26/2015	0.071
10/27/2015	0.07
10/28/2015	0.077
10/29/2015	0.082
10/30/2015	0.123
10/31/2015	0.084

KRIEBEL ROAD INTERCEPTOR

EDU REQUEST

FLOW DATA AND INFORMATION

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A- Located in TMA on the KRI - March 29 to 31, 2014

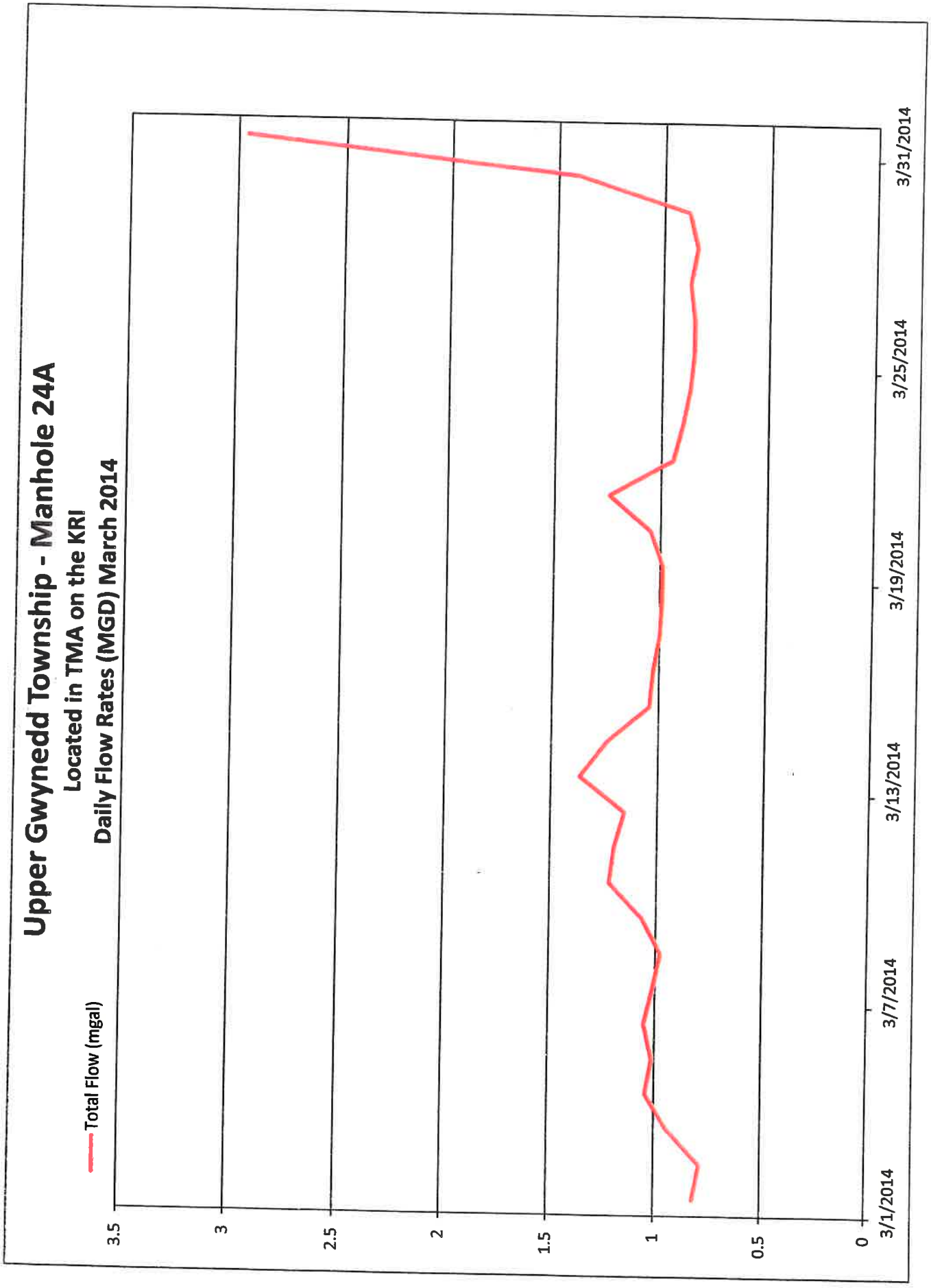


Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/29/2014	1:00	0.615	0.00
3/29/2014	2:00	0.558	0.00
3/29/2014	3:00	0.678	0.00
3/29/2014	4:00	0.729	0.00
3/29/2014	5:00	0.86	0.00
3/29/2014	6:00	0.741	0.00
3/29/2014	7:00	1.057	0.00
3/29/2014	8:00	1.135	0.00
3/29/2014	9:00	1.153	0.00
3/29/2014	10:00	1.095	0.00
3/29/2014	11:00	0.984	0.02
3/29/2014	12:00	1.051	0.03
3/29/2014	13:00	1.152	0.03
3/29/2014	14:00	1.032	0.06
3/29/2014	15:00	1.223	0.21
3/29/2014	16:00	1.195	0.34
3/29/2014	17:00	1.35	0.43
3/29/2014	18:00	1.525	0.48
3/29/2014	19:00	1.67	0.53
3/29/2014	20:00	1.937	0.65
3/29/2014	21:00	2.603	0.89
3/29/2014	22:00	2.631	0.99
3/29/2014	23:00	2.916	1.12
3/30/2014	0:00	3.87	1.16
3/30/2014	1:00	2.959	1.16
3/30/2014	2:00	2.594	1.17
3/30/2014	3:00	2.259	1.17
3/30/2014	4:00	2.169	1.18
3/30/2014	5:00	1.942	1.18
3/30/2014	6:00	2.034	1.18
3/30/2014	7:00	2.065	1.18
3/30/2014	8:00	2.04	1.18
3/30/2014	9:00	1.883	1.23
3/30/2014	10:00	1.918	1.23
3/30/2014	11:00	2.434	1.39
3/30/2014	12:00	3.594	1.74
3/30/2014	13:00	3.983	1.88
3/30/2014	14:00	3.785	1.98
3/30/2014	15:00	3.481	2.01
3/30/2014	16:00	3.059	2.04
3/30/2014	17:00	3.234	2.10
3/30/2014	18:00	4.106	2.33
3/30/2014	19:00	3.949	2.49
3/30/2014	20:00	4.373	2.55
3/30/2014	21:00	3.936	2.63
3/30/2014	22:00	3.491	2.63
3/30/2014	23:00	3.017	2.63
3/31/2014	0:00	2.668	2.64

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/31/2014	1:00	2.339	2.64
3/31/2014	2:00	2.158	2.64
3/31/2014	3:00	1.943	2.64
3/31/2014	4:00	1.766	2.66
3/31/2014	5:00	1.921	2.66
3/31/2014	6:00	2.103	2.67
3/31/2014	7:00	1.998	2.68
3/31/2014	8:00	1.683	2.68
3/31/2014	9:00	1.575	2.68
3/31/2014	10:00	1.636	2.68
3/31/2014	11:00	1.629	2.68
3/31/2014	12:00	1.499	2.68
3/31/2014	13:00	1.28	2.68
3/31/2014	14:00	1.279	2.68
3/31/2014	15:00	1.413	2.68
3/31/2014	16:00	1.4	2.68
3/31/2014	17:00	1.346	2.68
3/31/2014	18:00	1.322	2.68
3/31/2014	19:00	1.299	2.68
3/31/2014	20:00	1.36	2.68
3/31/2014	21:00	1.345	2.68
3/31/2014	22:00	1.12	2.68
3/31/2014	23:00	1.073	2.68
4/1/2014	0:00	1.054	2.68

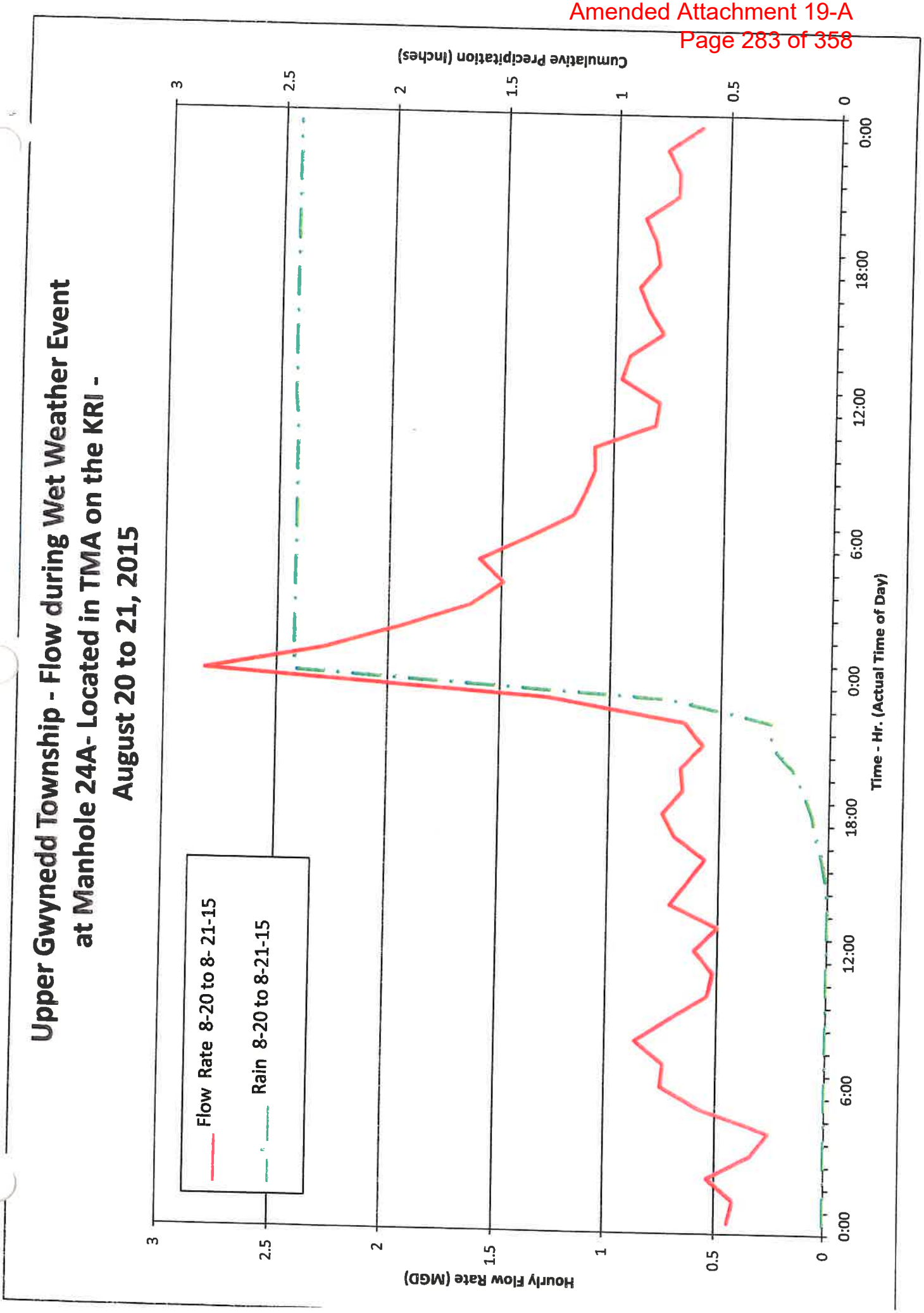

Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
3.5
3
2.5
2
1.5
1
0.5
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

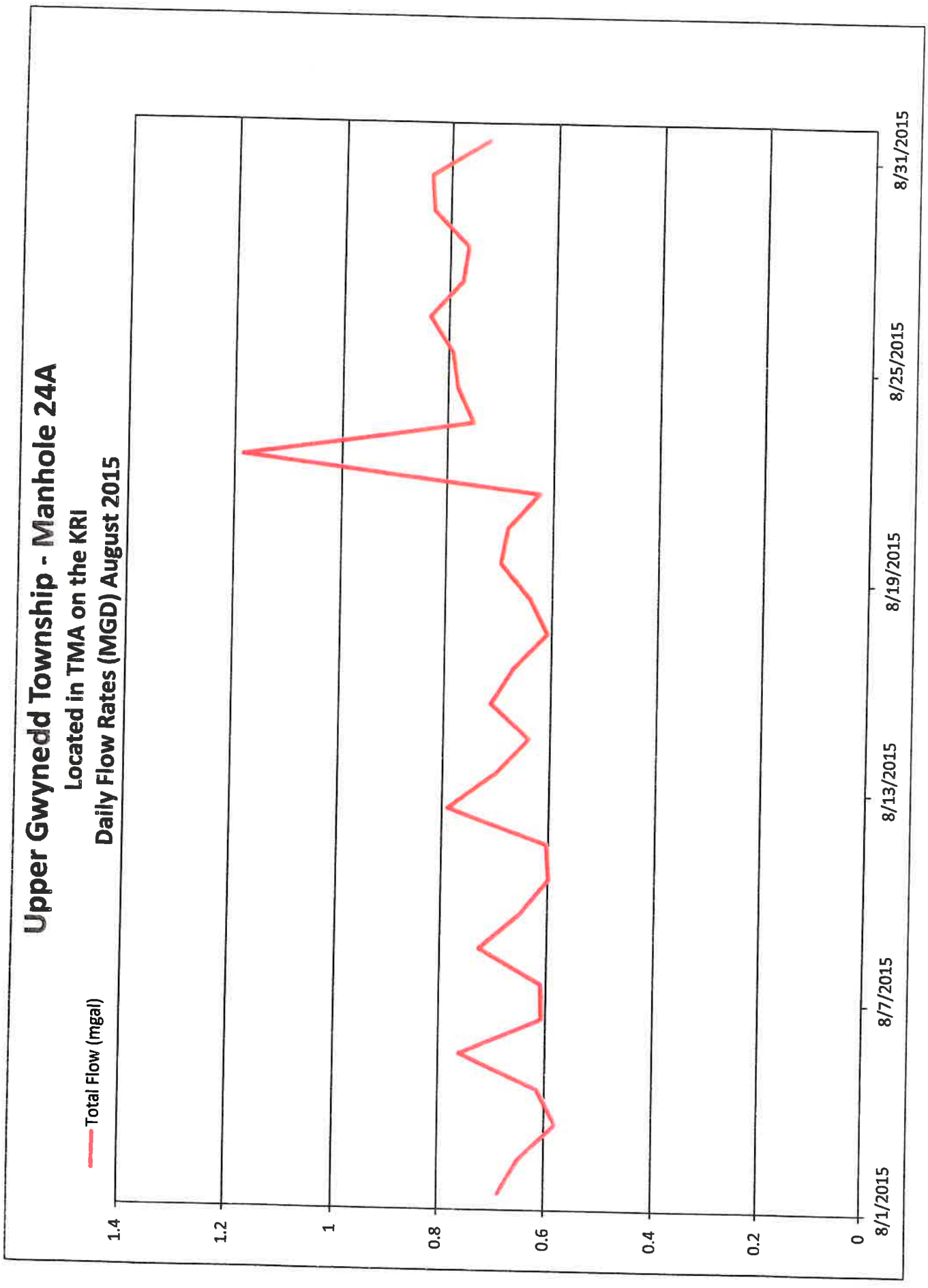
March 1 to March 31, 2014

Date	Total Flow (mgal)
3/1/2014	0.817
3/2/2014	0.785
3/3/2014	0.937
3/4/2014	1.042
3/5/2014	1.013
3/6/2014	1.052
3/7/2014	1.012
3/8/2014	0.977
3/9/2014	1.068
3/10/2014	1.225
3/11/2014	1.202
3/12/2014	1.156
3/13/2014	1.368
3/14/2014	1.242
3/15/2014	1.045
3/16/2014	1.03
3/17/2014	1
3/18/2014	0.991
3/19/2014	0.989
3/20/2014	1.049
3/21/2014	1.245
3/22/2014	0.948
3/23/2014	0.906
3/24/2014	0.872
3/25/2014	0.854
3/26/2014	0.855
3/27/2014	0.874
3/28/2014	0.843
3/29/2014	0.883
3/30/2014	1.407
3/31/2014	2.957


Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole 24A- Located in TMA on the KRI -
August 20 to 21, 2015
Flow Rate 8-20 to 8- 21-15
Rain 8-20 to 8-21-15
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0
0.5
1
1.5
2
2.5
3
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: August 20 to 21, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
8/20/2015	0:00	0.438	0
8/20/2015	1:00	0.414	0
8/20/2015	2:00	0.532	0
8/20/2015	3:00	0.337	0
8/20/2015	4:00	0.256	0
8/20/2015	5:00	0.565	0
8/20/2015	6:00	0.747	0
8/20/2015	7:00	0.736	0
8/20/2015	8:00	0.864	0
8/20/2015	9:00	0.707	0
8/20/2015	10:00	0.542	0
8/20/2015	11:00	0.519	0
8/20/2015	12:00	0.603	0
8/20/2015	13:00	0.501	0
8/20/2015	14:00	0.718	0
8/20/2015	15:00	0.639	0.01
8/20/2015	16:00	0.562	0.03
8/20/2015	17:00	0.702	0.06
8/20/2015	18:00	0.757	0.08
8/20/2015	19:00	0.668	0.12
8/20/2015	20:00	0.678	0.17
8/20/2015	21:00	0.578	0.27
8/20/2015	22:00	0.664	0.27
8/20/2015	23:00	1.283	0.73
8/21/2015	0:00	2.818	2.42
8/21/2015	1:00	2.286	2.42
8/21/2015	2:00	1.943	2.42
8/21/2015	3:00	1.637	2.42
8/21/2015	4:00	1.492	2.42
8/21/2015	5:00	1.601	2.42
8/21/2015	6:00	1.384	2.42
8/21/2015	7:00	1.181	2.42
8/21/2015	8:00	1.128	2.42
8/21/2015	9:00	1.086	2.42
8/21/2015	10:00	1.089	2.42
8/21/2015	11:00	0.814	2.42
8/21/2015	12:00	0.798	2.43
8/21/2015	13:00	0.971	2.43
8/21/2015	14:00	0.936	2.43
8/21/2015	15:00	0.784	2.43
8/21/2015	16:00	0.851	2.43
8/21/2015	17:00	0.894	2.43
8/21/2015	18:00	0.806	2.43
8/21/2015	19:00	0.824	2.43
8/21/2015	20:00	0.873	2.43
8/21/2015	21:00	0.724	2.43
8/21/2015	22:00	0.722	2.43
8/21/2015	23:00	0.778	2.43
8/22/2015	0:00	0.624	2.43


Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) August 2015
Total Flow (mgal)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
8/1/2015
8/7/2015
8/13/2015
8/19/2015
8/25/2015
8/31/2015

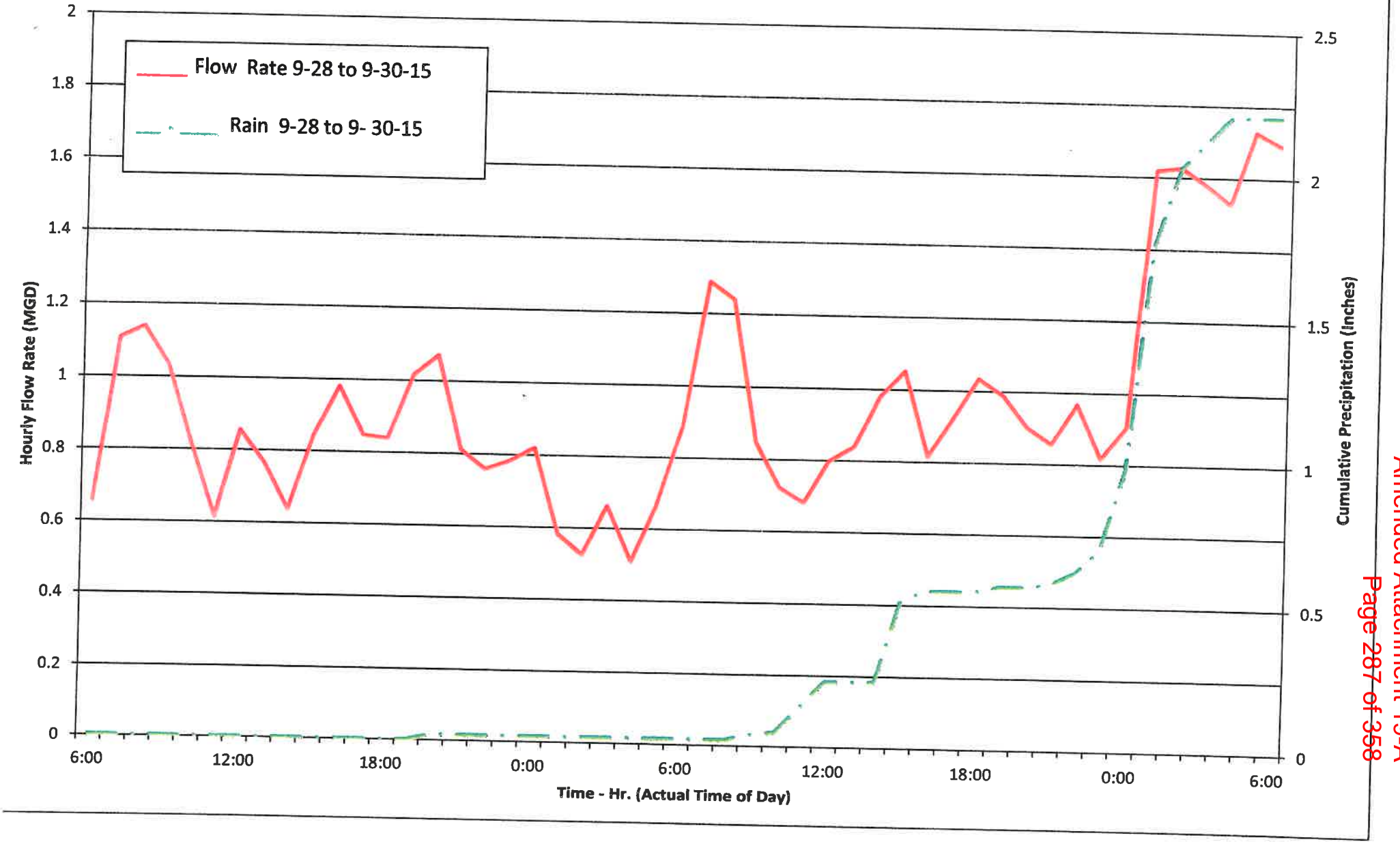
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

August 1 to 31, 2015

Date	Total Flow (mgal)
8/1/2015	0.683
8/2/2015	0.646
8/3/2015	0.579
8/4/2015	0.614
8/5/2015	0.759
8/6/2015	0.608
8/7/2015	0.61
8/8/2015	0.725
8/9/2015	0.651
8/10/2015	0.599
8/11/2015	0.604
8/12/2015	0.789
8/13/2015	0.7
8/14/2015	0.639
8/15/2015	0.711
8/16/2015	0.67
8/17/2015	0.608
8/18/2015	0.641
8/19/2015	0.696
8/20/2015	0.684
8/21/2015	0.626
8/22/2015	1.184
8/23/2015	0.751
8/24/2015	0.782
8/25/2015	0.792
8/26/2015	0.837
8/27/2015	0.775
8/28/2015	0.765
8/29/2015	0.832
8/30/2015	0.837
8/31/2015	0.728

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A in TMA on the KRI - September 28 to 30, 2015



Amended Attachment 19-A
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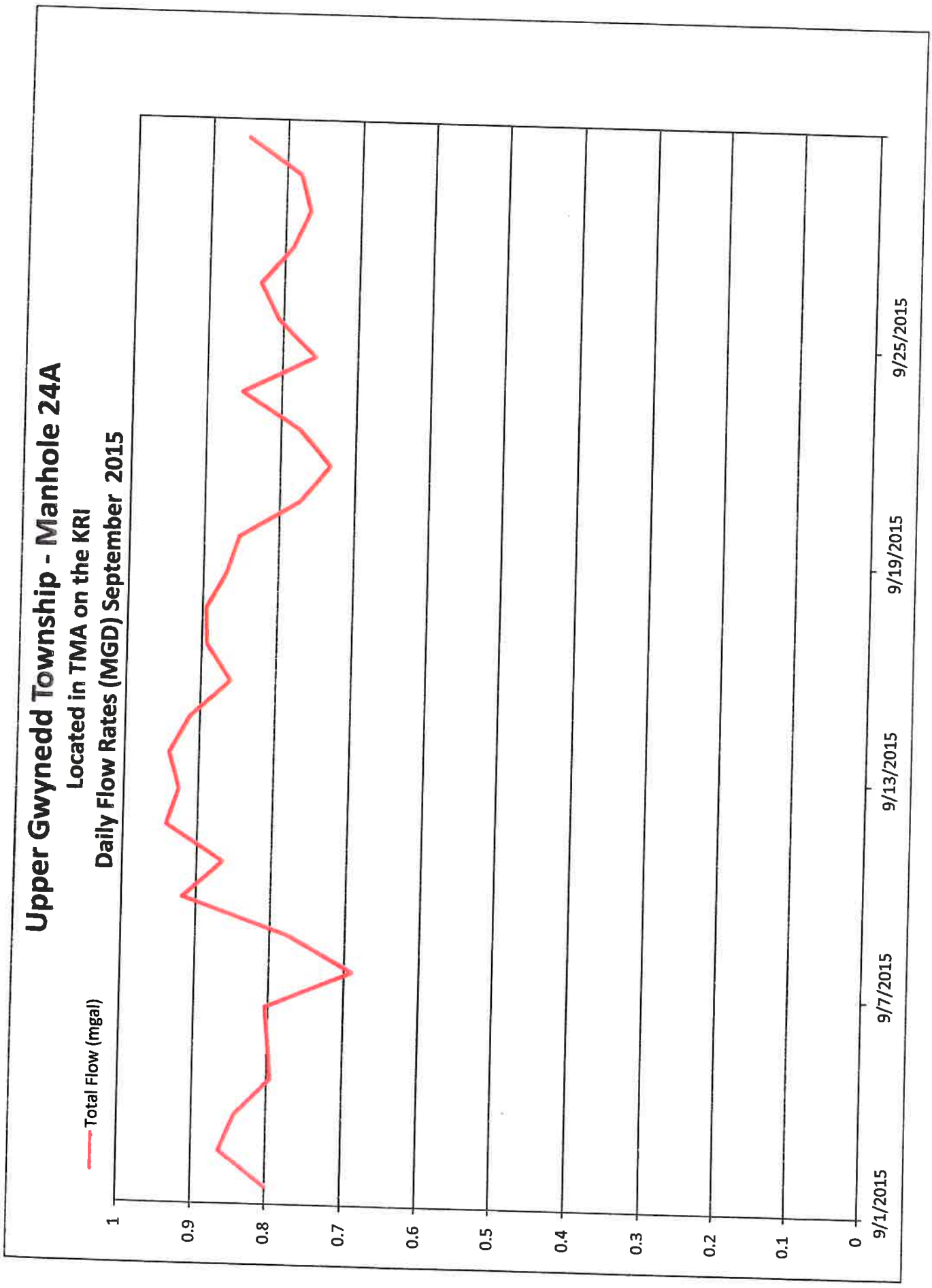
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: September 28 to 30, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.655	0
9/28/2015 7:00	7:00	1.106	0
9/28/2015 8:00	8:00	1.137	0
9/28/2015 9:00	9:00	1.033	0
9/28/2015 10:00	10:00	0.819	0
9/28/2015 11:00	11:00	0.614	0
9/28/2015 12:00	12:00	0.856	0
9/28/2015 13:00	13:00	0.766	0
9/28/2015 14:00	14:00	0.638	0
9/28/2015 15:00	15:00	0.846	0
9/28/2015 16:00	16:00	0.982	0
9/28/2015 17:00	17:00	0.848	0
9/28/2015 18:00	18:00	0.84	0
9/28/2015 19:00	19:00	1.016	0
9/28/2015 20:00	20:00	1.071	0.02
9/28/2015 21:00	21:00	0.813	0.02
9/28/2015 22:00	22:00	0.759	0.02
9/28/2015 23:00	23:00	0.784	0.02
9/29/2015 0:00	0:00	0.821	0.02
9/29/2015 1:00	1:00	0.583	0.02
9/29/2015 2:00	2:00	0.526	0.02
9/29/2015 3:00	3:00	0.664	0.02
9/29/2015 4:00	4:00	0.509	0.02
9/29/2015 5:00	5:00	0.666	0.02
9/29/2015 6:00	6:00	0.886	0.02
9/29/2015 7:00	7:00	1.288	0.02
9/29/2015 8:00	8:00	1.24	0.02
9/29/2015 9:00	9:00	0.849	0.04
9/29/2015 10:00	10:00	0.723	0.05
9/29/2015 11:00	11:00	0.682	0.14
9/29/2015 12:00	12:00	0.8	0.23
9/29/2015 13:00	13:00	0.84	0.23
9/29/2015 14:00	14:00	0.98	0.23
9/29/2015 15:00	15:00	1.053	0.51
9/29/2015 16:00	16:00	0.817	0.55
9/29/2015 17:00	17:00	0.926	0.55
9/29/2015 18:00	18:00	1.035	0.55
9/29/2015 19:00	19:00	0.989	0.57
9/29/2015 20:00	20:00	0.903	0.57
9/29/2015 21:00	21:00	0.858	0.58
9/29/2015 22:00	22:00	0.969	0.62
9/29/2015 23:00	23:00	0.818	0.7
9/30/2015 0:00	0:00	0.907	0.98
9/30/2015 1:00	1:00	1.619	1.77
9/30/2015 2:00	2:00	1.627	2.03
9/30/2015 3:00	3:00	1.581	2.12
9/30/2015 4:00	4:00	1.527	2.21
9/30/2015 5:00	5:00	1.728	2.21
9/30/2015 6:00	6:00	1.691	2.21

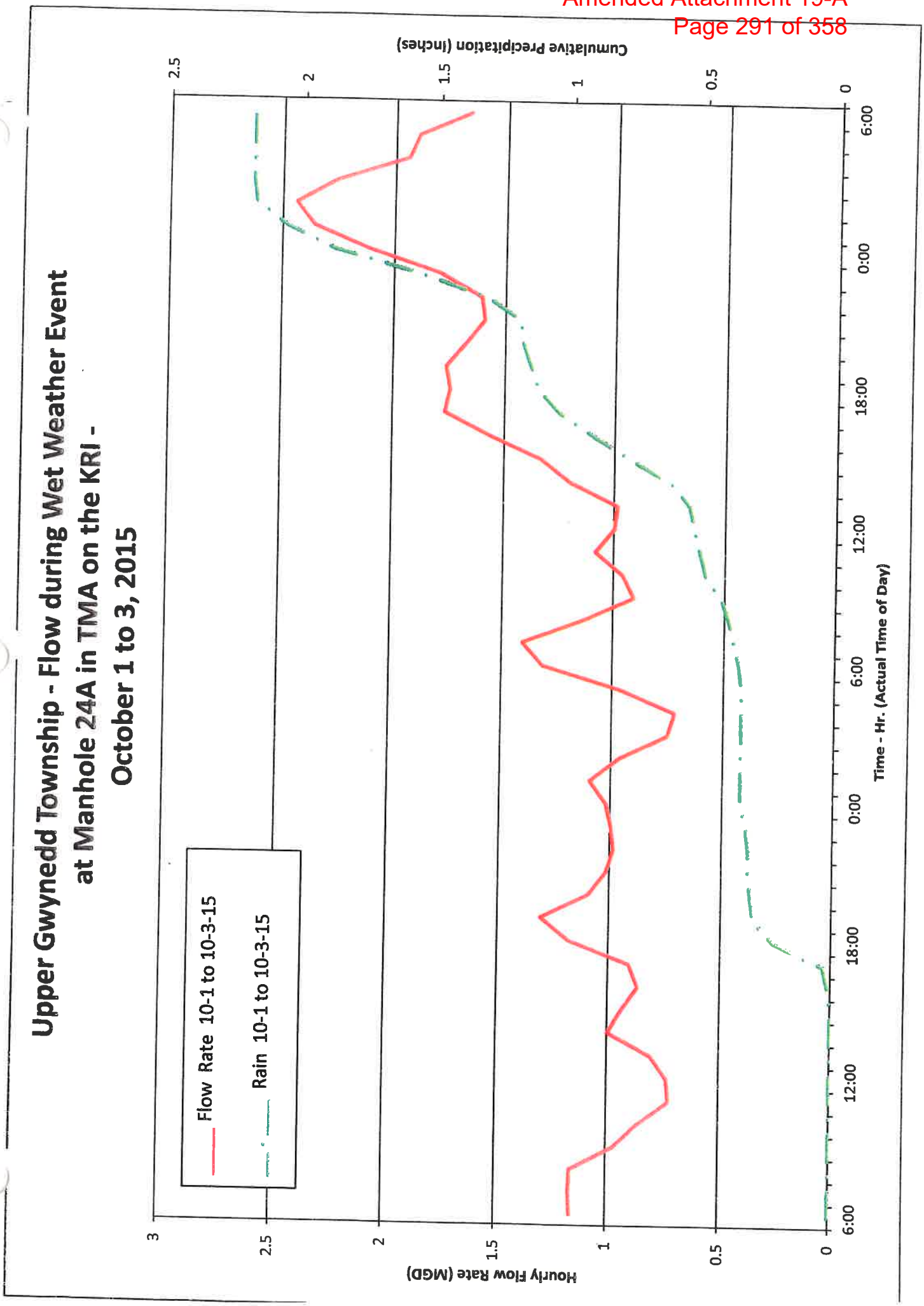

Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) September 2015
Total Flow (mgal)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
9/1/2015
9/7/2015
9/13/2015
9/19/2015
9/25/2015

Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

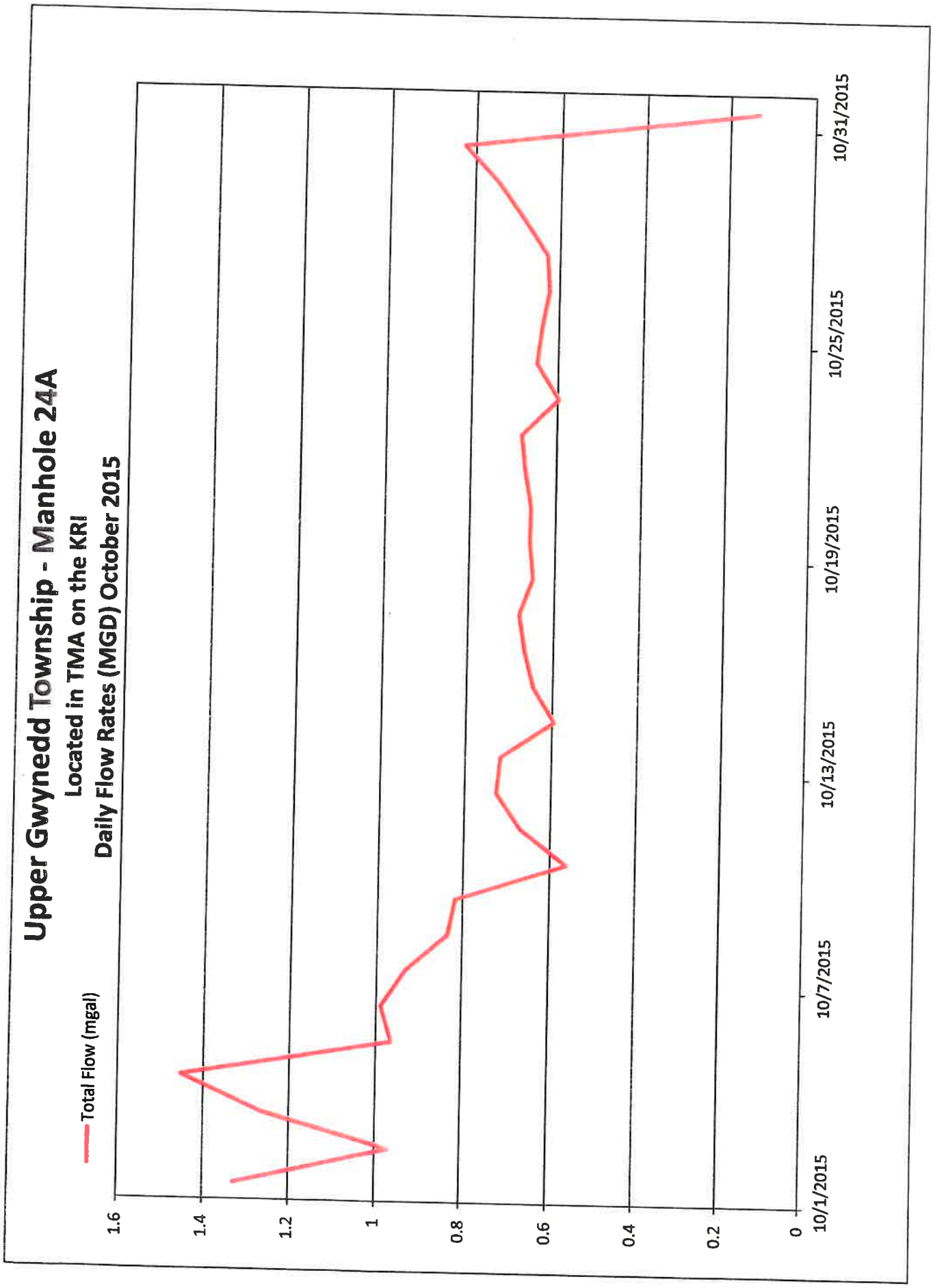
September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.799
9/2/2015	0.862
9/3/2015	0.842
9/4/2015	0.795
9/5/2015	0.799
9/6/2015	0.804
9/7/2015	0.689
9/8/2015	0.776
9/9/2015	0.918
9/10/2015	0.865
9/11/2015	0.942
9/12/2015	0.926
9/13/2015	0.94
9/14/2015	0.913
9/15/2015	0.86
9/16/2015	0.893
9/17/2015	0.895
9/18/2015	0.868
9/19/2015	0.853
9/20/2015	0.773
9/21/2015	0.733
9/22/2015	0.775
9/23/2015	0.853
9/24/2015	0.756
9/25/2015	0.806
9/26/2015	0.831
9/27/2015	0.789
9/28/2015	0.767
9/29/2015	0.78
9/30/2015	0.851


Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole 24A in TMA on the KRI -
October 1 to 3, 2015
Flow Rate 10-1 to 10-3-15
Rain 10-1 to 10-3-15
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0
0.5
1
1.5
2
2.5
3
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
6:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: October 1 to 3, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
10/1/2015	6:00	1.157	0
10/1/2015	7:00	1.163	0
10/1/2015	8:00	1.159	0
10/1/2015	9:00	0.966	0
10/1/2015	10:00	0.862	0
10/1/2015	11:00	0.724	0
10/1/2015	12:00	0.733	0
10/1/2015	13:00	0.806	0
10/1/2015	14:00	0.998	0
10/1/2015	15:00	0.938	0
10/1/2015	16:00	0.867	0.01
10/1/2015	17:00	0.908	0.03
10/1/2015	18:00	1.177	0.22
10/1/2015	19:00	1.307	0.3
10/1/2015	20:00	1.096	0.31
10/1/2015	21:00	1.016	0.32
10/1/2015	22:00	0.983	0.32
10/1/2015	23:00	0.996	0.33
10/2/2015	0:00	1.019	0.35
10/2/2015	1:00	1.095	0.35
10/2/2015	2:00	0.962	0.35
10/2/2015	3:00	0.752	0.35
10/2/2015	4:00	0.72	0.35
10/2/2015	5:00	0.967	0.35
10/2/2015	6:00	1.315	0.36
10/2/2015	7:00	1.406	0.38
10/2/2015	8:00	1.133	0.4
10/2/2015	9:00	0.908	0.43
10/2/2015	10:00	0.96	0.49
10/2/2015	11:00	1.083	0.51
10/2/2015	12:00	0.998	0.53
10/2/2015	13:00	0.984	0.55
10/2/2015	14:00	1.199	0.62
10/2/2015	15:00	1.333	0.77
10/2/2015	16:00	1.566	0.91
10/2/2015	17:00	1.769	1.04
10/2/2015	18:00	1.746	1.12
10/2/2015	19:00	1.765	1.15
10/2/2015	20:00	1.677	1.18
10/2/2015	21:00	1.595	1.19
10/2/2015	22:00	1.608	1.32
10/2/2015	23:00	1.794	1.58
10/3/2015	0:00	2.109	1.89
10/3/2015	1:00	2.355	2.07
10/3/2015	2:00	2.437	2.18
10/3/2015	3:00	2.253	2.19
10/3/2015	4:00	1.941	2.19
10/3/2015	5:00	1.896	2.19
10/3/2015	6:00	1.663	2.19


Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

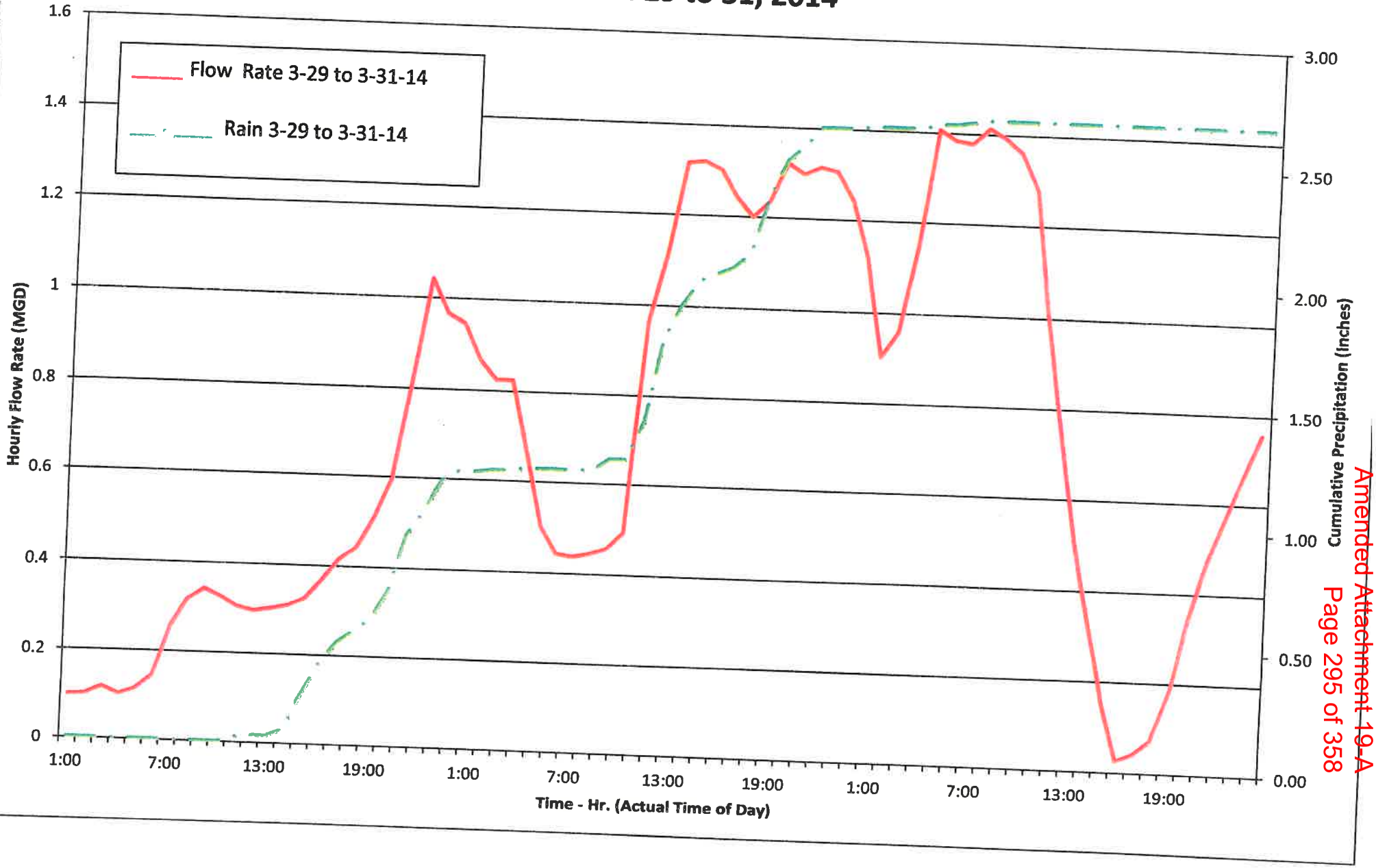
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

October 1 to 31, 2015

Date	Total Flow (mgal)
10/1/2015	1.327
10/2/2015	0.967
10/3/2015	1.265
10/4/2015	1.452
10/5/2015	0.963
10/6/2015	0.989
10/7/2015	0.933
10/8/2015	0.835
10/9/2015	0.818
10/10/2015	0.561
10/11/2015	0.67
10/12/2015	0.727
10/13/2015	0.718
10/14/2015	0.595
10/15/2015	0.646
10/16/2015	0.667
10/17/2015	0.681
10/18/2015	0.65
10/19/2015	0.659
10/20/2015	0.658
10/21/2015	0.672
10/22/2015	0.682
10/23/2015	0.597
10/24/2015	0.649
10/25/2015	0.639
10/26/2015	0.623
10/27/2015	0.628
10/28/2015	0.685
10/29/2015	0.746
10/30/2015	0.825
10/31/2015	0.132

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35- Located in TMA on the KRI - March 29 to 31, 2014

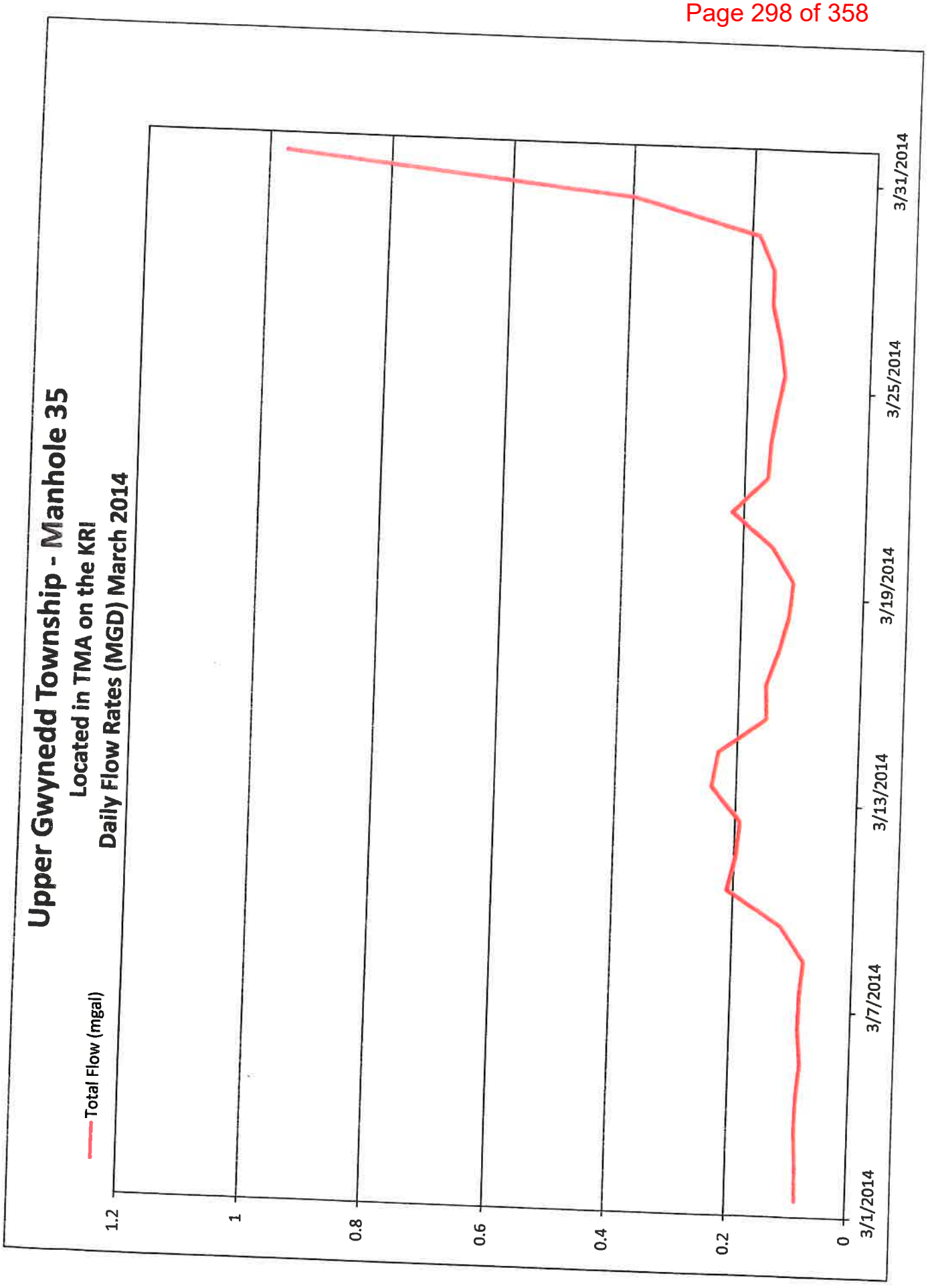


Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/29/2014	1:00	0.097	0.00
3/29/2014	2:00	0.099	0.00
3/29/2014	3:00	0.117	0.00
3/29/2014	4:00	0.1	0.00
3/29/2014	5:00	0.113	0.00
3/29/2014	6:00	0.145	0.00
3/29/2014	7:00	0.255	0.00
3/29/2014	8:00	0.318	0.00
3/29/2014	9:00	0.343	0.00
3/29/2014	10:00	0.326	0.00
3/29/2014	11:00	0.304	0.02
3/29/2014	12:00	0.296	0.03
3/29/2014	13:00	0.302	0.03
3/29/2014	14:00	0.31	0.06
3/29/2014	15:00	0.326	0.21
3/29/2014	16:00	0.368	0.34
3/29/2014	17:00	0.417	0.43
3/29/2014	18:00	0.442	0.48
3/29/2014	19:00	0.509	0.53
3/29/2014	20:00	0.596	0.65
3/29/2014	21:00	0.818	0.89
3/29/2014	22:00	1.042	0.99
3/29/2014	23:00	0.967	1.12
3/30/2014	0:00	0.947	1.16
3/30/2014	1:00	0.867	1.16
3/30/2014	2:00	0.825	1.17
3/30/2014	3:00	0.825	1.17
3/30/2014	4:00	0.669	1.18
3/30/2014	5:00	0.504	1.18
3/30/2014	6:00	0.445	1.18
3/30/2014	7:00	0.439	1.18
3/30/2014	8:00	0.447	1.18
3/30/2014	9:00	0.459	1.23
3/30/2014	10:00	0.495	1.23
3/30/2014	11:00	0.962	1.39
3/30/2014	12:00	1.113	1.74
3/30/2014	13:00	1.317	1.88
3/30/2014	14:00	1.321	1.98
3/30/2014	15:00	1.304	2.01
3/30/2014	16:00	1.243	2.04
3/30/2014	17:00	1.201	2.10
3/30/2014	18:00	1.236	2.33
3/30/2014	19:00	1.324	2.49
3/30/2014	20:00	1.299	2.55
3/30/2014	21:00	1.316	2.63
3/30/2014	22:00	1.307	2.63
3/30/2014	23:00	1.244	2.63
3/31/2014	0:00	1.12	2.64

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/31/2014	1:00	0.903	2.64
3/31/2014	2:00	0.96	2.64
3/31/2014	3:00	1.148	2.64
3/31/2014	4:00	1.408	2.66
3/31/2014	5:00	1.385	2.66
3/31/2014	6:00	1.379	2.67
3/31/2014	7:00	1.414	2.68
3/31/2014	8:00	1.392	2.68
3/31/2014	9:00	1.361	2.68
3/31/2014	10:00	1.28	2.68
3/31/2014	11:00	0.988	2.68
3/31/2014	12:00	0.743	2.68
3/31/2014	13:00	0.505	2.68
3/31/2014	14:00	0.325	2.68
3/31/2014	15:00	0.152	2.68
3/31/2014	16:00	0.026	2.68
3/31/2014	17:00	0.041	2.68
3/31/2014	18:00	0.072	2.68
3/31/2014	19:00	0.179	2.68
3/31/2014	20:00	0.342	2.68
3/31/2014	21:00	0.474	2.68
3/31/2014	22:00	0.57	2.68
3/31/2014	23:00	0.664	2.68
4/1/2014	0:00	0.757	2.68


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
1.2
1
0.8
0.6
0.4
0.2
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

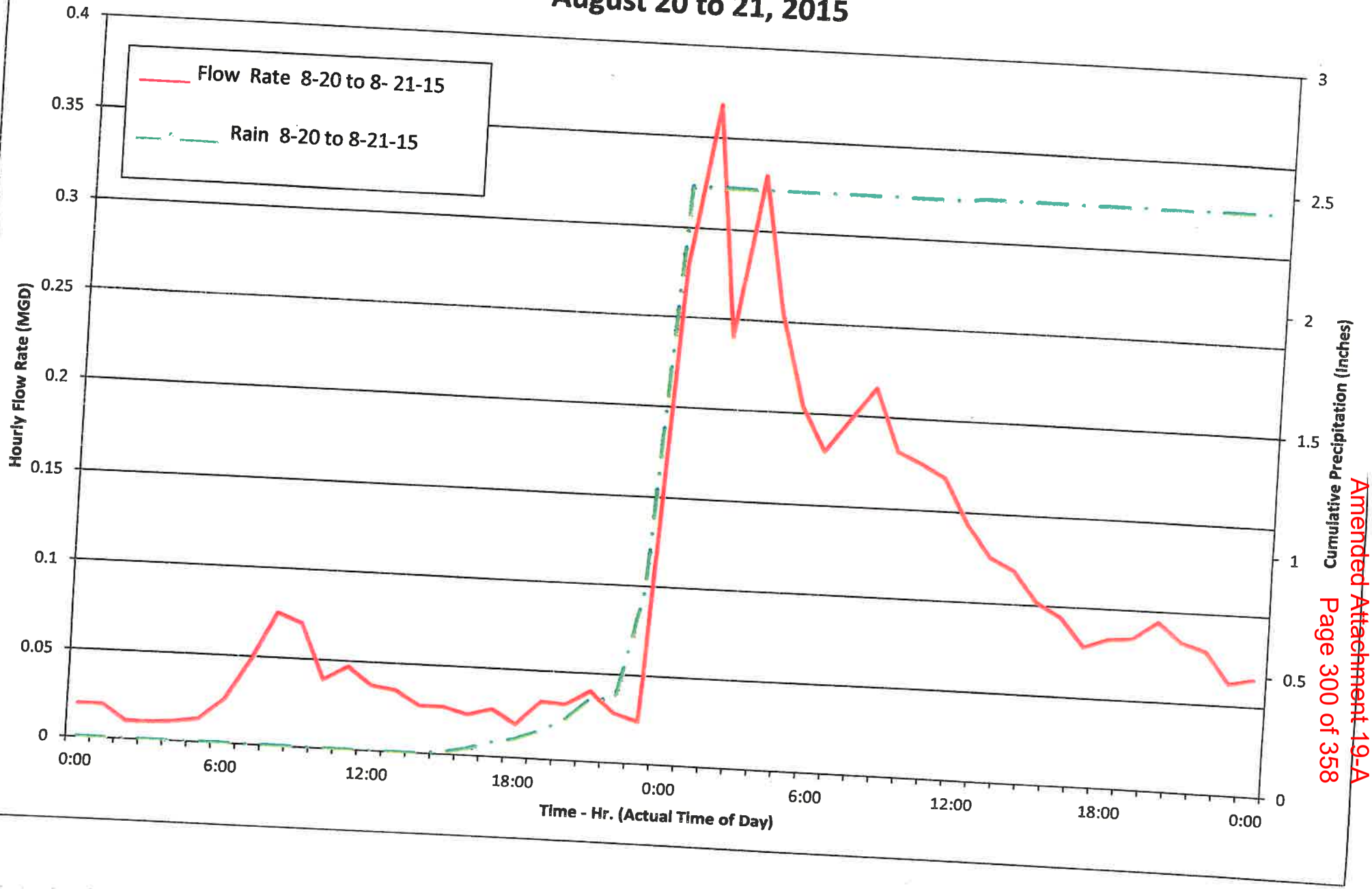
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

March 1 to March 31, 2014

Date	Total Flow (mgal)
3/1/2014	0.081
3/2/2014	0.082
3/3/2014	0.085
3/4/2014	0.084
3/5/2014	0.079
3/6/2014	0.084
3/7/2014	0.083
3/8/2014	0.078
3/9/2014	0.119
3/10/2014	0.21
3/11/2014	0.197
3/12/2014	0.192
3/13/2014	0.241
3/14/2014	0.231
3/15/2014	0.153
3/16/2014	0.155
3/17/2014	0.135
3/18/2014	0.12
3/19/2014	0.114
3/20/2014	0.151
3/21/2014	0.22
3/22/2014	0.162
3/23/2014	0.159
3/24/2014	0.15
3/25/2014	0.139
3/26/2014	0.148
3/27/2014	0.162
3/28/2014	0.162
3/29/2014	0.188
3/30/2014	0.398
3/31/2014	0.97

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35- Located in TMA on the KRI - August 20 to 21, 2015



Amended Attachment 19-A
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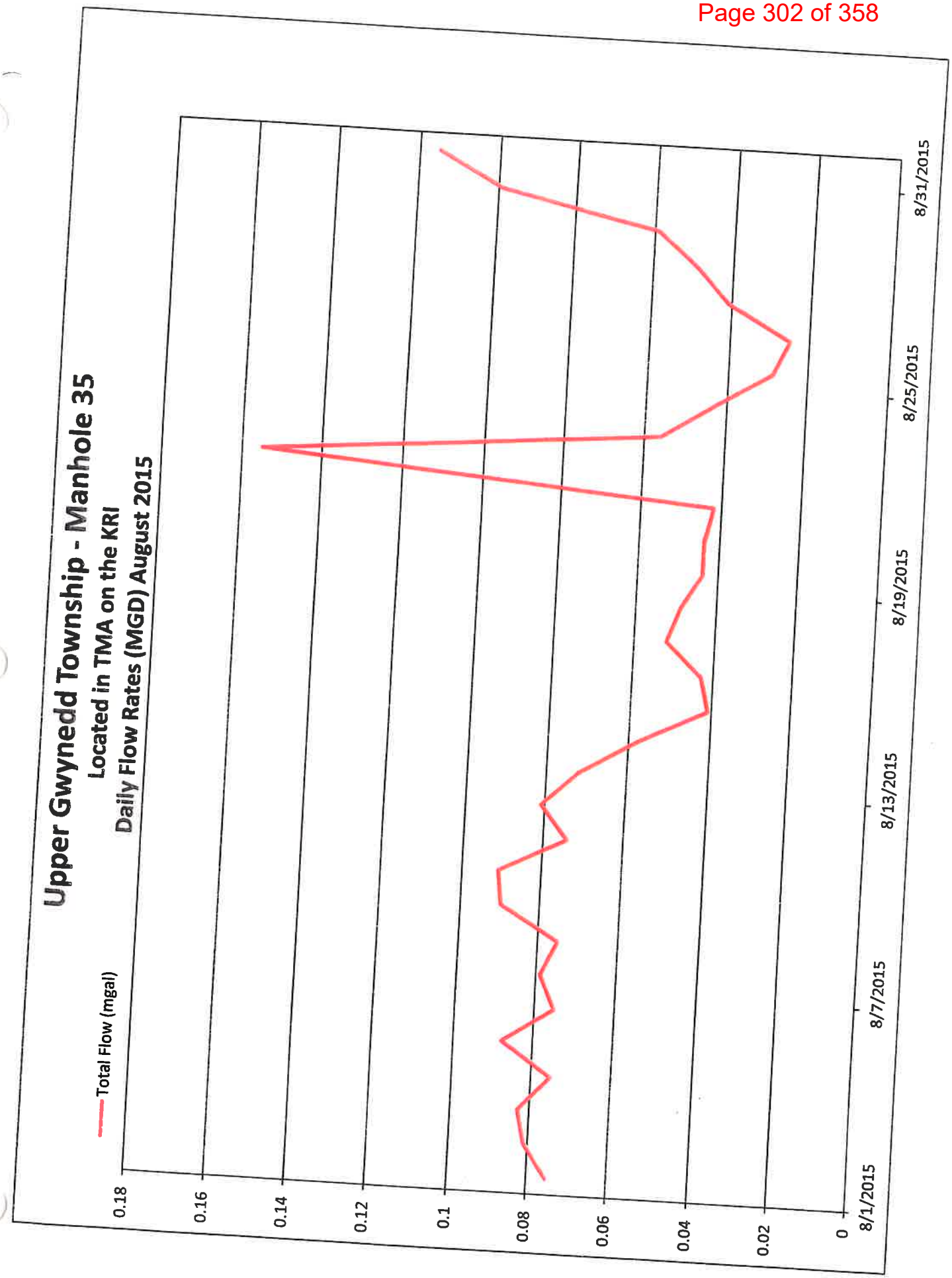
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 & 37
Rain Event: August 20 to 21, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
8/20/2015	0:00	0.019	0
8/20/2015	1:00	0.019	0
8/20/2015	2:00	0.01	0
8/20/2015	3:00	0.01	0
8/20/2015	4:00	0.011	0
8/20/2015	5:00	0.013	0
8/20/2015	6:00	0.025	0
8/20/2015	7:00	0.048	0
8/20/2015	8:00	0.075	0
8/20/2015	9:00	0.07	0
8/20/2015	10:00	0.039	0
8/20/2015	11:00	0.047	0
8/20/2015	12:00	0.037	0
8/20/2015	13:00	0.035	0
8/20/2015	14:00	0.027	0
8/20/2015	15:00	0.027	0.01
8/20/2015	16:00	0.023	0.03
8/20/2015	17:00	0.027	0.06
8/20/2015	18:00	0.019	0.08
8/20/2015	19:00	0.033	0.12
8/20/2015	20:00	0.032	0.17
8/20/2015	21:00	0.04	0.27
8/20/2015	22:00	0.028	0.27
8/20/2015	23:00	0.024	0.73
8/21/2015	0:00	0.28	2.42
8/21/2015	1:00	0.368	2.42
8/21/2015	2:00	0.24	2.42
8/21/2015	3:00	0.331	2.42
8/21/2015	4:00	0.254	2.42
8/21/2015	5:00	0.204	2.42
8/21/2015	6:00	0.18	2.42
8/21/2015	7:00	0.198	2.42
8/21/2015	8:00	0.216	2.42
8/21/2015	9:00	0.182	2.42
8/21/2015	10:00	0.176	2.42
8/21/2015	11:00	0.169	2.42
8/21/2015	12:00	0.144	2.43
8/21/2015	13:00	0.126	2.43
8/21/2015	14:00	0.119	2.43
8/21/2015	15:00	0.102	2.43
8/21/2015	16:00	0.094	2.43
8/21/2015	17:00	0.078	2.43
8/21/2015	18:00	0.083	2.43
8/21/2015	19:00	0.084	2.43
8/21/2015	20:00	0.094	2.43
8/21/2015	21:00	0.083	2.43
8/21/2015	22:00	0.079	2.43
8/21/2015	23:00	0.062	2.43
8/22/2015	0:00	0.065	2.43


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) August 2015
Total Flow (mgal)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
8/1/2015
8/7/2015
8/13/2015
8/19/2015
8/25/2015
8/31/2015

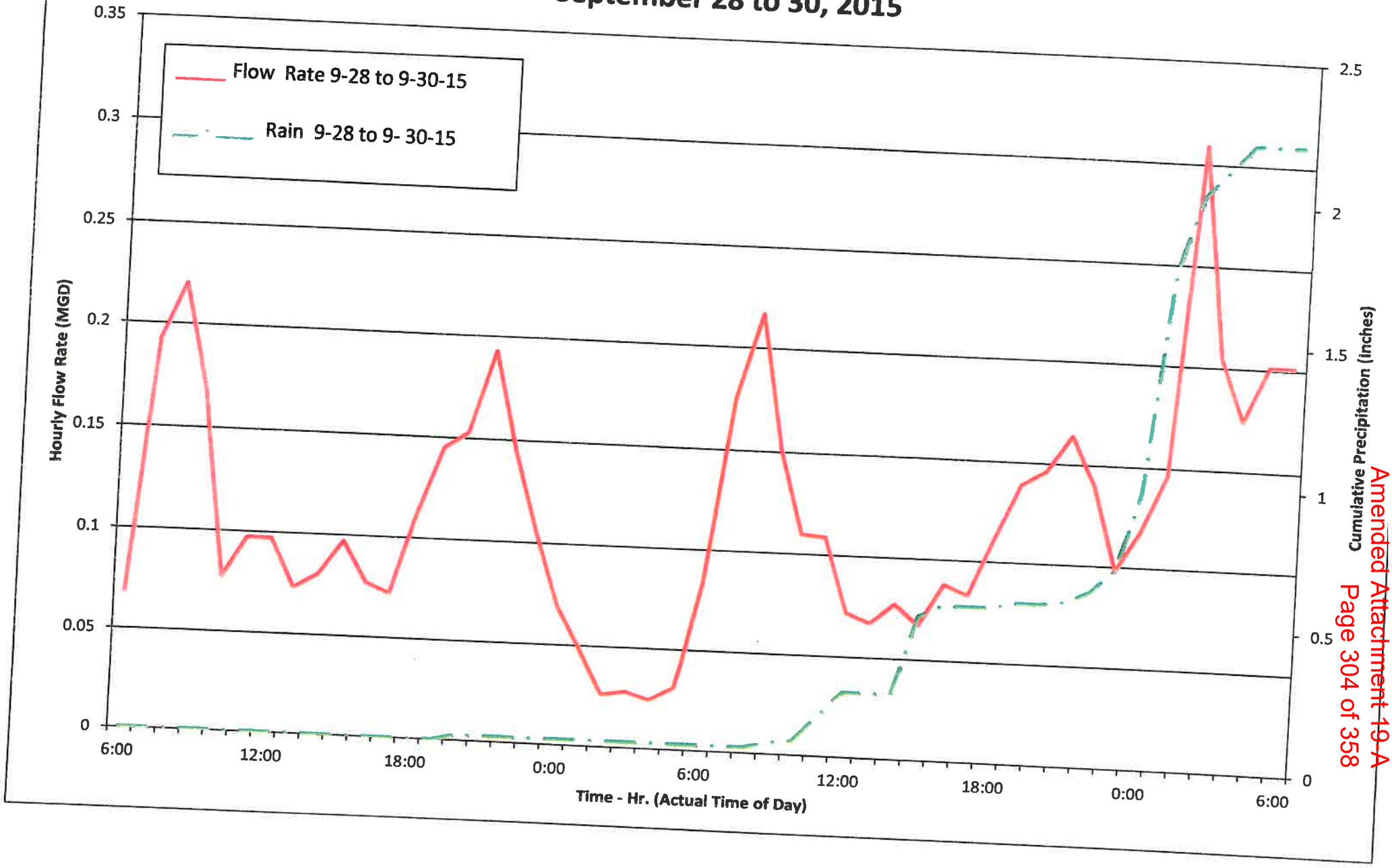
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

August 1 to 31, 2015

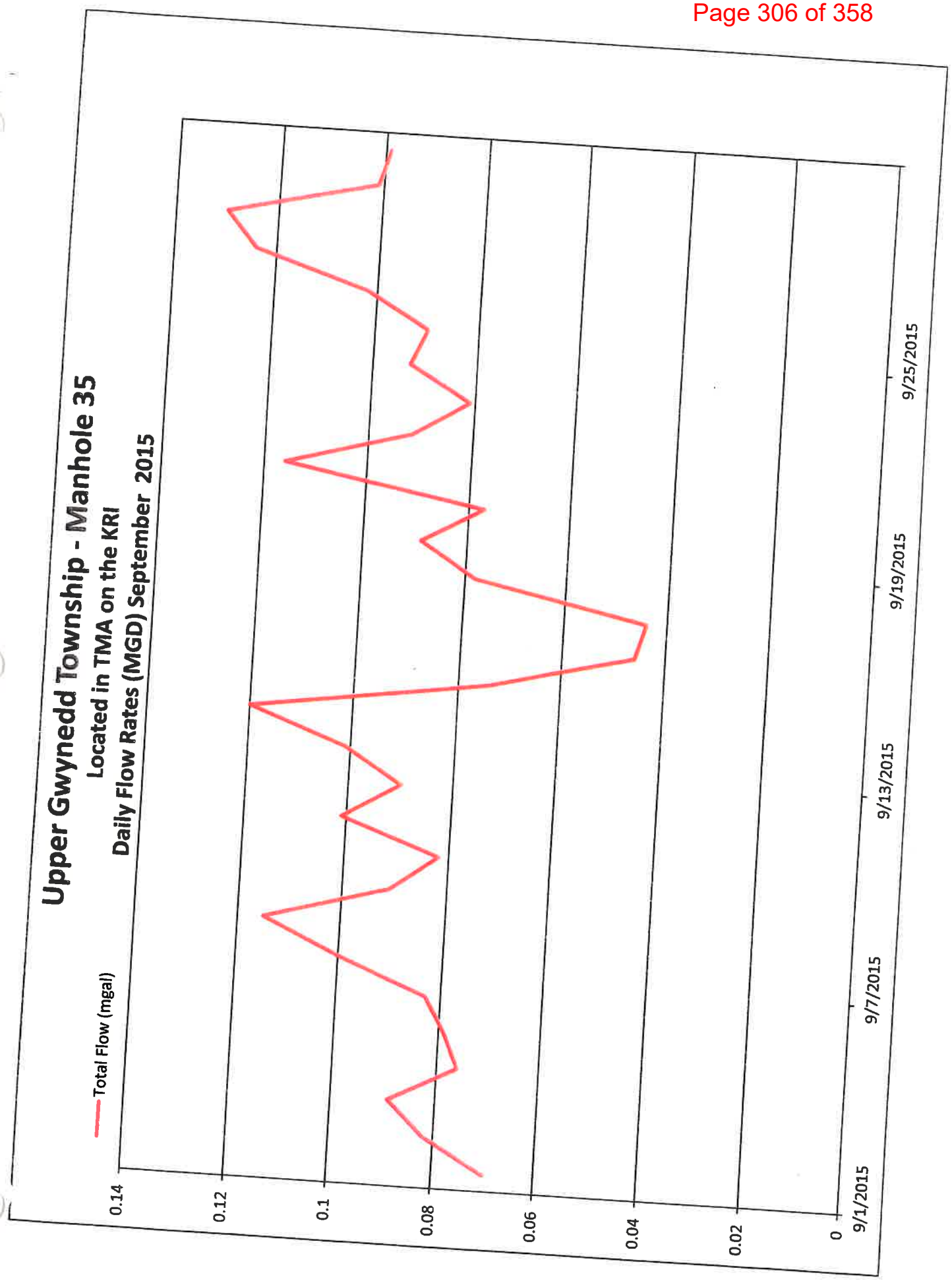
Date	Total Flow (mgal)
8/1/2015	0.075
8/2/2015	0.081
8/3/2015	0.083
8/4/2015	0.075
8/5/2015	0.088
8/6/2015	0.075
8/7/2015	0.079
8/8/2015	0.075
8/9/2015	0.09
8/10/2015	0.091
8/11/2015	0.074
8/12/2015	0.081
8/13/2015	0.072
8/14/2015	0.058
8/15/2015	0.041
8/16/2015	0.043
8/17/2015	0.052
8/18/2015	0.049
8/19/2015	0.044
8/20/2015	0.044
8/21/2015	0.042
8/22/2015	0.155
8/23/2015	0.056
8/24/2015	0.043
8/25/2015	0.029
8/26/2015	0.025
8/27/2015	0.041
8/28/2015	0.049
8/29/2015	0.059
8/30/2015	0.099
8/31/2015	0.115

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35 in TMA on the KRI - September 28 to 30, 2015



Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: September 28 to 30, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.068	0
9/28/2015 7:00	7:00	0.192	0
9/28/2015 8:00	8:00	0.22	0
9/28/2015 9:00	9:00	0.168	0
9/28/2015 10:00	10:00	0.077	0
9/28/2015 11:00	11:00	0.097	0
9/28/2015 12:00	12:00	0.097	0
9/28/2015 13:00	13:00	0.073	0
9/28/2015 14:00	14:00	0.08	0
9/28/2015 15:00	15:00	0.097	0
9/28/2015 16:00	16:00	0.077	0
9/28/2015 17:00	17:00	0.072	0
9/28/2015 18:00	18:00	0.112	0
9/28/2015 19:00	19:00	0.145	0
9/28/2015 20:00	20:00	0.153	0.02
9/28/2015 21:00	21:00	0.193	0.02
9/28/2015 22:00	22:00	0.145	0.02
9/28/2015 23:00	23:00	0.105	0.02
9/29/2015 0:00	0:00	0.069	0.02
9/29/2015 1:00	1:00	0.048	0.02
9/29/2015 2:00	2:00	0.026	0.02
9/29/2015 3:00	3:00	0.028	0.02
9/29/2015 4:00	4:00	0.024	0.02
9/29/2015 5:00	5:00	0.031	0.02
9/29/2015 6:00	6:00	0.084	0.02
9/29/2015 7:00	7:00	0.175	0.02
9/29/2015 8:00	8:00	0.217	0.02
9/29/2015 9:00	9:00	0.152	0.04
9/29/2015 10:00	10:00	0.11	0.05
9/29/2015 11:00	11:00	0.109	0.14
9/29/2015 12:00	12:00	0.072	0.23
9/29/2015 13:00	13:00	0.067	0.23
9/29/2015 14:00	14:00	0.077	0.23
9/29/2015 15:00	15:00	0.067	0.51
9/29/2015 16:00	16:00	0.088	0.55
9/29/2015 17:00	17:00	0.083	0.55
9/29/2015 18:00	18:00	0.112	0.55
9/29/2015 19:00	19:00	0.139	0.57
9/29/2015 20:00	20:00	0.146	0.57
9/29/2015 21:00	21:00	0.164	0.58
9/29/2015 22:00	22:00	0.14	0.62
9/29/2015 23:00	23:00	0.098	0.7
9/30/2015 0:00	0:00	0.118	0.98
9/30/2015 1:00	1:00	0.146	1.77
9/30/2015 2:00	2:00	0.309	2.03
9/30/2015 3:00	3:00	0.205	2.12
9/30/2015 4:00	4:00	0.174	2.21
9/30/2015 5:00	5:00	0.201	2.21
9/30/2015 6:00	6:00	0.201	2.21


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) September 2015
Total Flow (mgal)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
9/1/2015
9/7/2015
9/13/2015
9/19/2015
9/25/2015

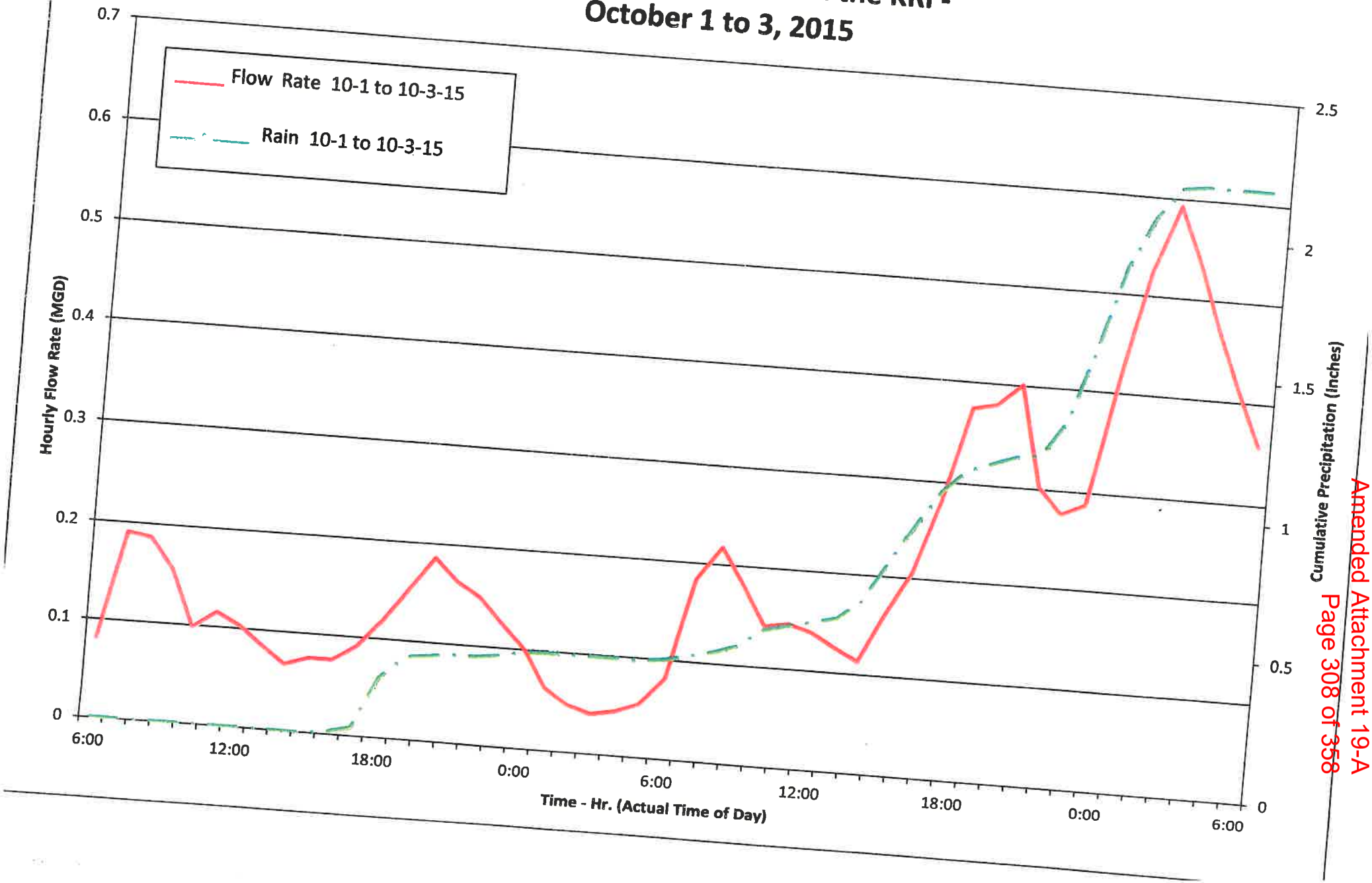
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.07
9/2/2015	0.082
9/3/2015	0.089
9/4/2015	0.076
9/5/2015	0.079
9/6/2015	0.083
9/7/2015	0.1
9/8/2015	0.115
9/9/2015	0.091
9/10/2015	0.082
9/11/2015	0.101
9/12/2015	0.09
9/13/2015	0.101
9/14/2015	0.12
9/15/2015	0.074
9/16/2015	0.046
9/17/2015	0.044
9/18/2015	0.078
9/19/2015	0.089
9/20/2015	0.077
9/21/2015	0.116
9/22/2015	0.092
9/23/2015	0.081
9/24/2015	0.093
9/25/2015	0.09
9/26/2015	0.102
9/27/2015	0.124
9/28/2015	0.13
9/29/2015	0.101
9/30/2015	0.099

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35 in TMA on the KRI - October 1 to 3, 2015



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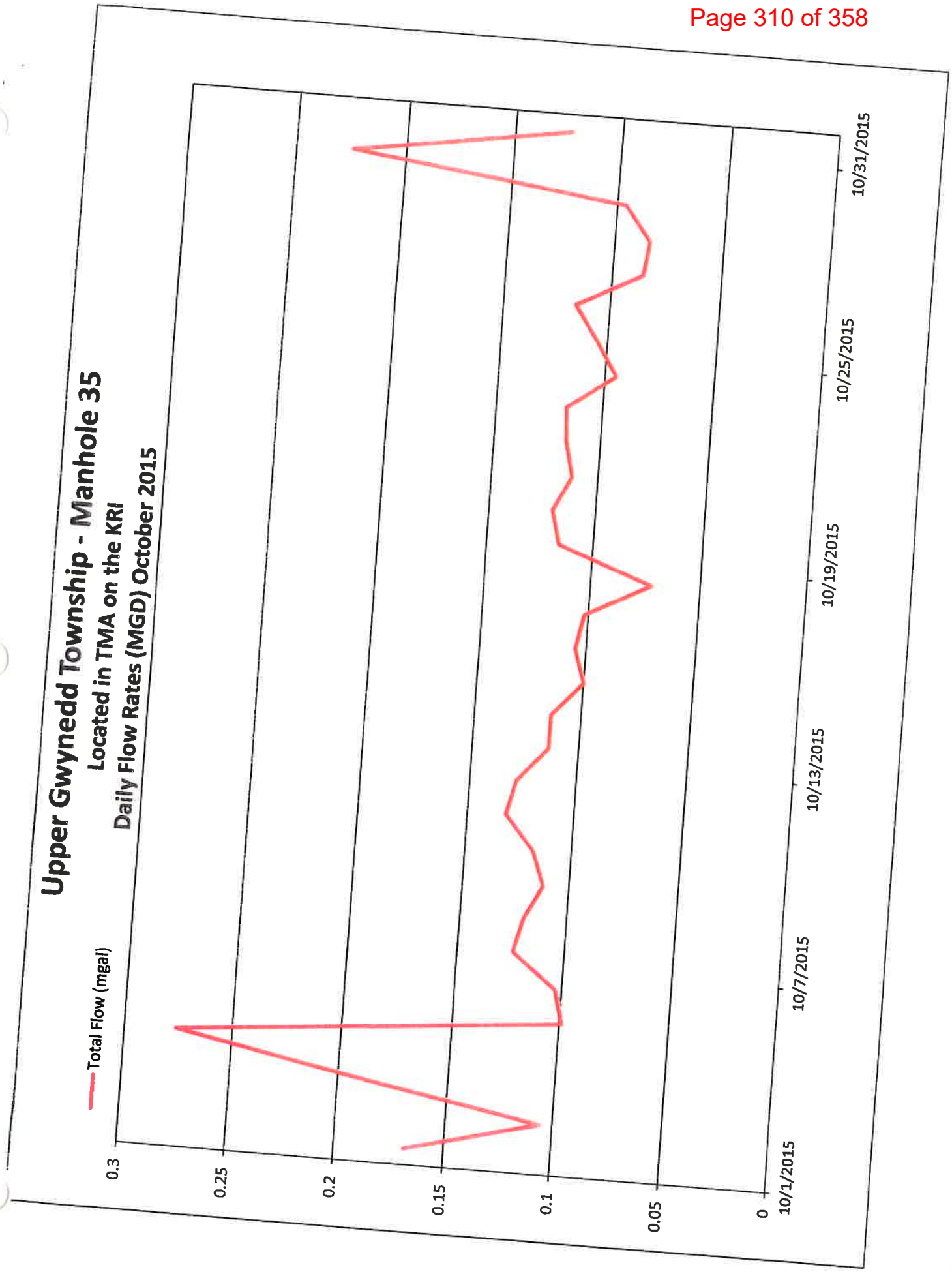
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: October 1 to 3, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
10/1/2015	6:00	0.081	0
10/1/2015	7:00	0.19	0
10/1/2015	8:00	0.186	0
10/1/2015	9:00	0.155	0
10/1/2015	10:00	0.098	0
10/1/2015	11:00	0.115	0
10/1/2015	12:00	0.103	0
10/1/2015	13:00	0.085	0
10/1/2015	14:00	0.068	0
10/1/2015	15:00	0.076	0
10/1/2015	16:00	0.076	0.01
10/1/2015	17:00	0.092	0.03
10/1/2015	18:00	0.119	0.22
10/1/2015	19:00	0.152	0.3
10/1/2015	20:00	0.186	0.31
10/1/2015	21:00	0.163	0.32
10/1/2015	22:00	0.149	0.32
10/1/2015	23:00	0.124	0.33
10/2/2015	0:00	0.101	0.35
10/2/2015	1:00	0.064	0.35
10/2/2015	2:00	0.048	0.35
10/2/2015	3:00	0.041	0.35
10/2/2015	4:00	0.045	0.35
10/2/2015	5:00	0.054	0.35
10/2/2015	6:00	0.082	0.36
10/2/2015	7:00	0.184	0.38
10/2/2015	8:00	0.218	0.4
10/2/2015	9:00	0.181	0.43
10/2/2015	10:00	0.141	0.49
10/2/2015	11:00	0.145	0.51
10/2/2015	12:00	0.138	0.53
10/2/2015	13:00	0.125	0.55
10/2/2015	14:00	0.113	0.62
10/2/2015	15:00	0.162	0.77
10/2/2015	16:00	0.206	0.91
10/2/2015	17:00	0.282	1.04
10/2/2015	18:00	0.375	1.12
10/2/2015	19:00	0.38	1.15
10/2/2015	20:00	0.401	1.18
10/2/2015	21:00	0.303	1.19
10/2/2015	22:00	0.277	1.32
10/2/2015	23:00	0.288	1.58
10/3/2015	0:00	0.412	1.89
10/3/2015	1:00	0.525	2.07
10/3/2015	2:00	0.593	2.18
10/3/2015	3:00	0.536	2.19
10/3/2015	4:00	0.469	2.19
10/3/2015	5:00	0.41	2.19
10/3/2015	6:00	0.358	2.19


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
0.3
0.25
0.2
0.15
0.1
0.05
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

Upper Gwynedd Township
Towamencin Municipal Authority - Manhole 35
October 1 to 31, 2015

Date	Total Flow (mgal)
10/1/2015	0.168
10/2/2015	0.106
10/3/2015	0.194
10/4/2015	0.276
10/5/2015	0.099
10/6/2015	0.103
10/7/2015	0.124
10/8/2015	0.12
10/9/2015	0.112
10/10/2015	0.118
10/11/2015	0.132
10/12/2015	0.128
10/13/2015	0.114
10/14/2015	0.114
10/15/2015	0.1
10/16/2015	0.105
10/17/2015	0.102
10/18/2015	0.072
10/19/2015	0.116
10/20/2015	0.12
10/21/2015	0.112
10/22/2015	0.116
10/23/2015	0.117
10/24/2015	0.095
10/25/2015	0.105
10/26/2015	0.116
10/27/2015	0.086
10/28/2015	0.084
10/29/2015	0.096
10/30/2015	0.224
10/31/2015	0.123

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A- Located in TMA on the KRI - March 29 to 31, 2014

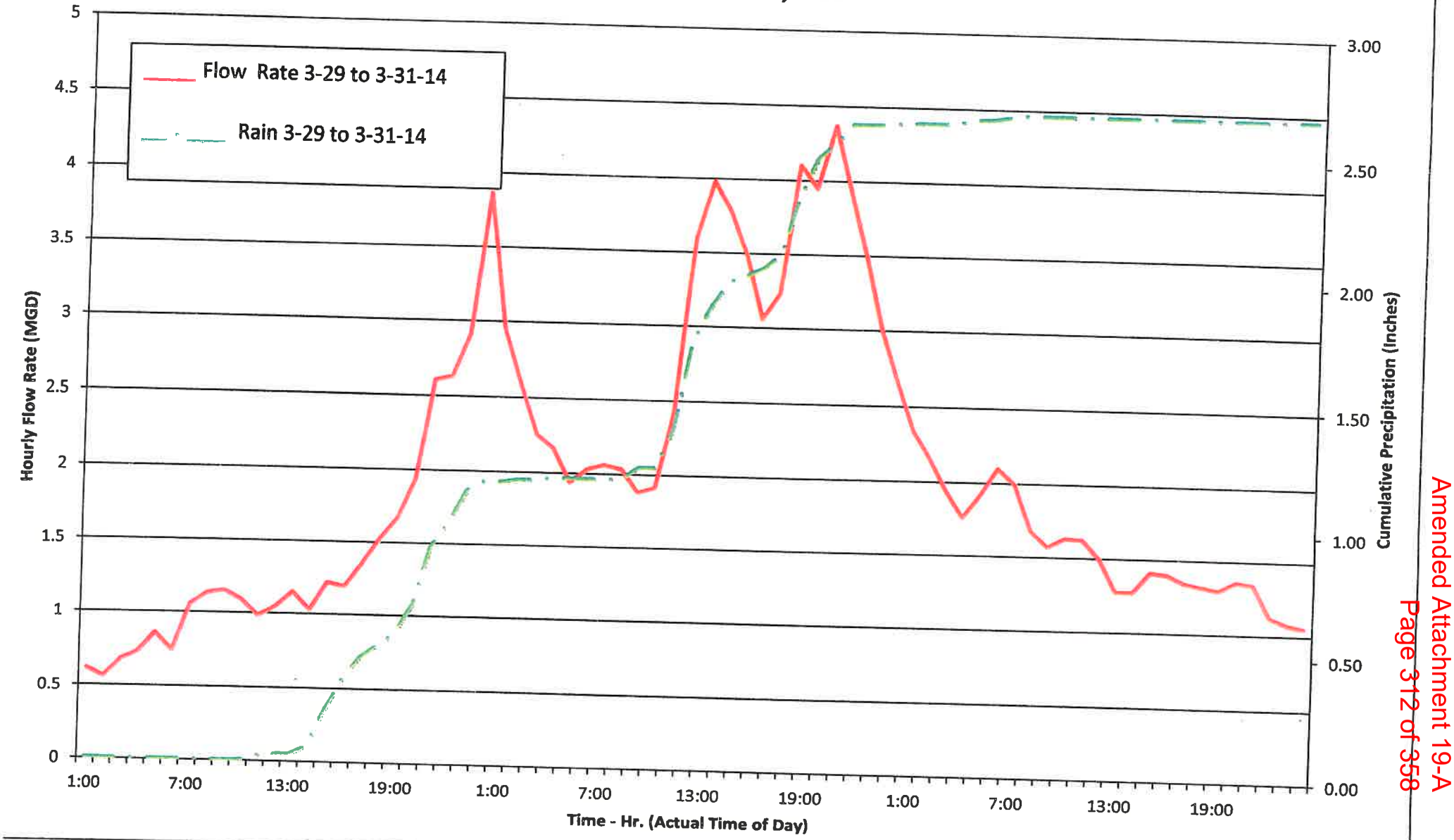


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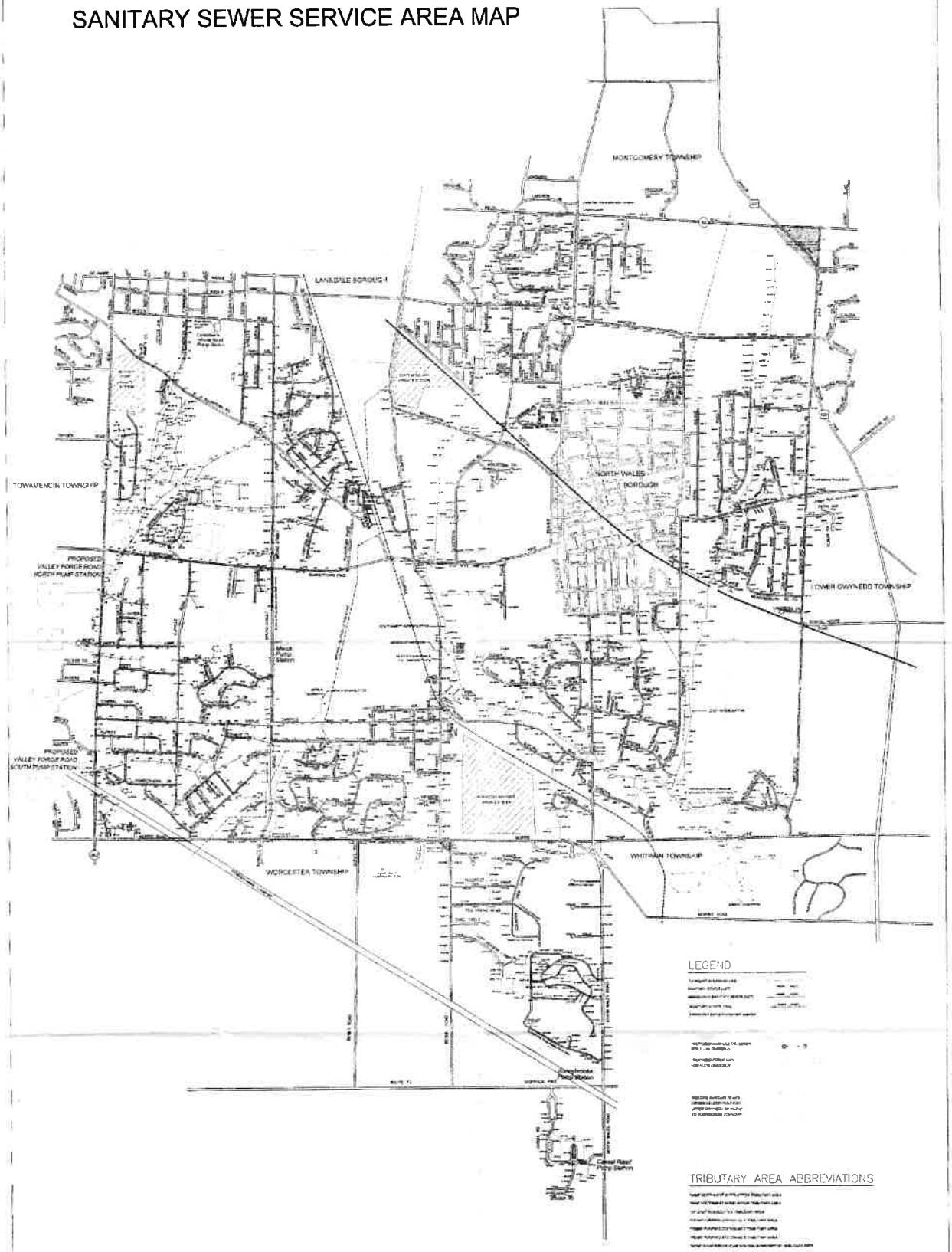
FIGURE 1

UPPER GWYNEDD TOWNSHIP
SANITARY SEWER SERVICE AREA MAP

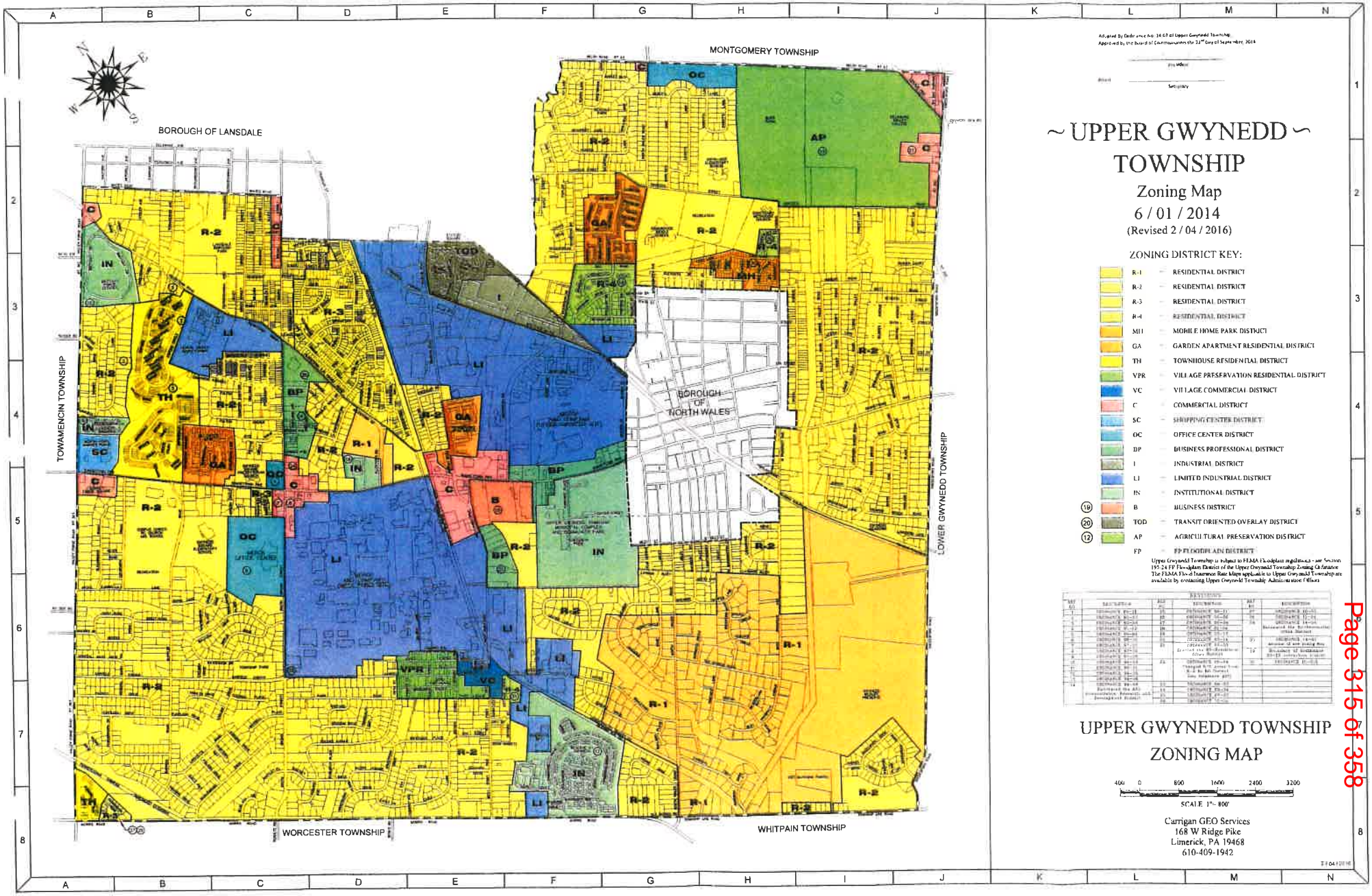


SCALE 1"=1000'

JULY 2016

APPENDIX N

UPPER GWYNEDD TOWNSHIP
ZONING MAP



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APPENDIX O

UPPER GWYNEDD TOWNSHIP
CONNECTION MANAGEMENT PLAN

CONNECTION MANAGEMENT PLAN

UPDATED: 08/2[illegible]

UGT WWTP

	DEP Code No	Flow Approved gpd	Date Approved by DEP	EDUs Approved	EDUs Connected	EDUs Remaining	Remaining gpd	2015	2016	2017	2018	Tributary to SSO
Upper Gwynedd Township												
EAST INTERCEPTOR												
Angatiay	1-469-53139-E	3,510	4/23/2008	13	13	0	711					
Foulkeways	1-46934-162-X	3,640	7/17/2008	13	10	3	1,680		3			MH E 3000
445 Prospect Ave. (Ciriacausa)	1-46953-146-E	237	11/8/2013	1	0	1	237		1			MH E3000
501 Prospect Ave. (Ciriacausa)	1-46953-147-E	474	11/8/2013	2	0	2	474		2			None
0 Royal Avenue	1-46953-148-X	237	11/8/2013	1	1	0	0	1				None
417 W. Prospect Avenue	1-46953-153-X	237	8/15/2004	1	0	0	0					MH E3000
407 W. Prospect Avenue	1-46953-154-X	237	10/2/2014	1	0	0	237	1				None
2nd Summerhill Drive	1-46953-156-XJ	237	4/15/2016	1	0	1			1			
Foulkeways Expansion	1-46934-205-3J					30	7,110		30			MH E3000
Gwynedd Friends		237							1			
Gwynedd Manor On-Lot Systems						3	711		3			MH E1700
Misc. On-Lot Systems						10	2,370		5	5		
SOUTHWEST INTERCEPTOR												
JA JOPE	1-46962-168-E	948	3/31/2010	4	3	1	237	1	1			None
Preserve at Worcester	1-46962-159-3J	10,238	5/16/2012	39	26	13	10,238	26	13			None
Subway (Montgomery Township)			12/7/2012									
1034 Dickerson Road (Jay)	1-46953-145-E	711	7/11/2013	3	0	3	711		3			None
The Little Pod (Montgomery	1-46940-327-3J		11/26/2013	2		2	474					None
Enclave at Maple Green	1-46953-155-3J	1185	3/22/2016	5	0	5	1,185		5			
514 Washington Avenue	1-46953-157-X	237	5/28/2015	1	0	1	237		1			
Cottage Avenue Realty L.P.	1-46953-162-E	5214	2/2/2016	22	0	22	5,214			22		
715 East Walnut Street		474								2		
116 Old Church Road						1	237					None
Hancock Road						50	11,850				30	None
Worcester Township						490	116,130				385	None
Montgomery Township						10	2,370				5	None
Misc. On Lot Systems						9	2,133		3	3	3	
Merck-Phase 5						652	154,524				352	
70 1711 Dickerson Road						3	711					None
												None
TMA SERVICE AREA												
871 Flintlock Drive			pre-1980									
Newtech Dental Lab	1-46953-101-E	1,660		8	8	0	0					MH 237A
Bella Casa	1-46953-115-E	4,480		16	14	2	560		2			None
Providence Reserve (Clemens)	1-46953-138-E	11,856	9/15/2007	52	52	0	0	1				None
810 Rosemont Ave	1-46953-140-X	237	11/15/2013	1	0	0	0	1				None
Den Dion	1-46953-151-3J	5,214	3/11/2014	22	21	1	237	27	1			None
Samantha Court	1-46953-150-3J	5451	4/29/2014	23	0	23	5,451		20	3		None
1830 Supplee Road (Schiele)	1-46953-152-3J	237	4/8/2014	1	0	1	237		1			None
925 Lexington Avenue	1-46953-158-X	237	8/25/2015	1	0	1	237		1			None
720 S. Broad St. (NP AP)	1-46953-159-3J	474	8/31/2015	2	0	2				2		
1678 Supplee Road	1-46953-163-X	260	9/15/2015	1	1	0	0					
Lehigh Valley Dairy	1-46953-160-3J	13642							60			
719 S. Broad St. (Carney)	1-46953-161-3J	237										
Misc. On Lot Systems						10	2,370		2	2		
Martin I Green Street							9,480		20	20		None
Martin II Allentown Rd							4,740		10	10		None
Martin III S. Broad St							2,844		6	6		None

1. 237 Gal/EDU is used in accordance with Act 57 calculations
2. There is one connection for Clemrock that is part of the Providence Reserve development.
3. Where "None" is shown in the last column, "Tributary to SSO", this means that the project is not tributary to any SSO within UGT. We recognize that there are SSO on the KRI & that all UGT flow goes to the KRI.
4. Note that EDUs included for the Preserve at Worcester are included in the total allocation for Worcester Township.

Ready to go. Subject to filing Building Permit and buying EDU's.

Need Planning Module approval

On lot Septic System with problems

No approval pending or applied for and working on lot systems

Amended Attachment 19-A
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APPENDIX P

PENNSYLVANIA NATURAL DIVERSITY INVENTORY

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
County(s): **Montgomery**
Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
ZIP Code: **19422; 19446; 19454**
Quadrangle Name(s): **LANSDALE**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **Skippack Creek; Upper Wissahickon Creek**
Decimal Degrees: **40.207926, -75.304236**
Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" 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

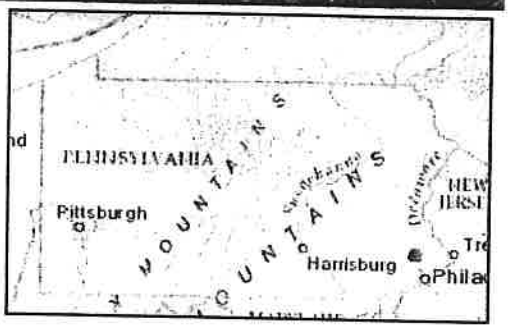
As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with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

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

Upper Gwynedd Sewer Diversion

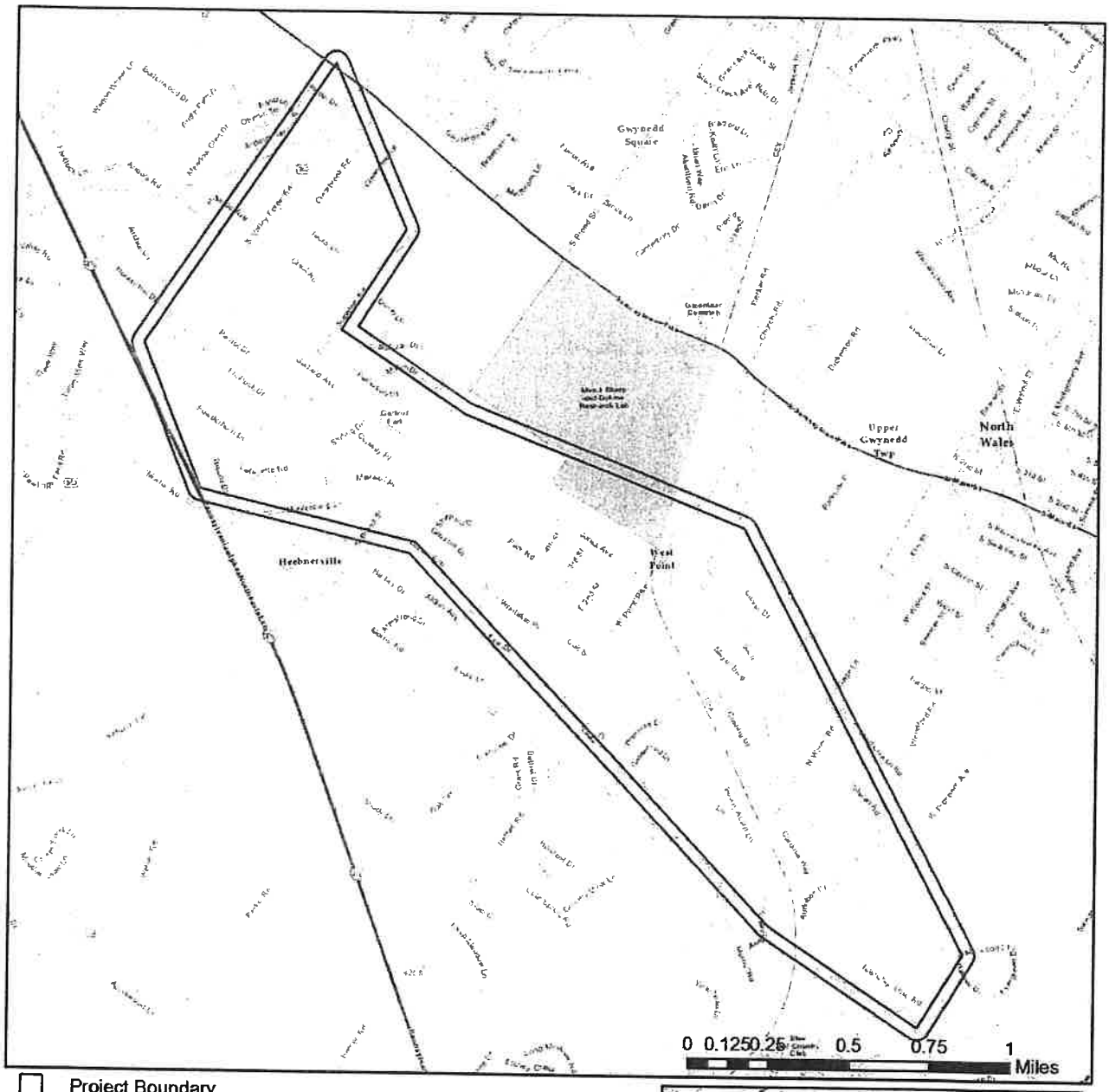
☐ Project Boundary

☐ Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

Upper Gwynedd Sewer Diversion



☐ Project Boundary

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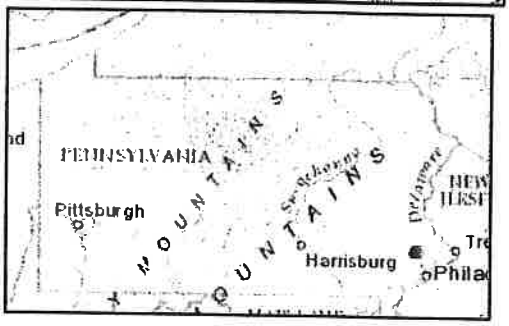

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PA Department of Conservation and Natural Resources
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Address: P.O. Box 232
City, State, Zip: Kulpsville, PA 19443
Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.com

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William A Brown II
applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
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Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
ZIP Code: **19422; 19446; 19454**
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Watersheds HUC 8: **Schuylkill**
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Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" W**

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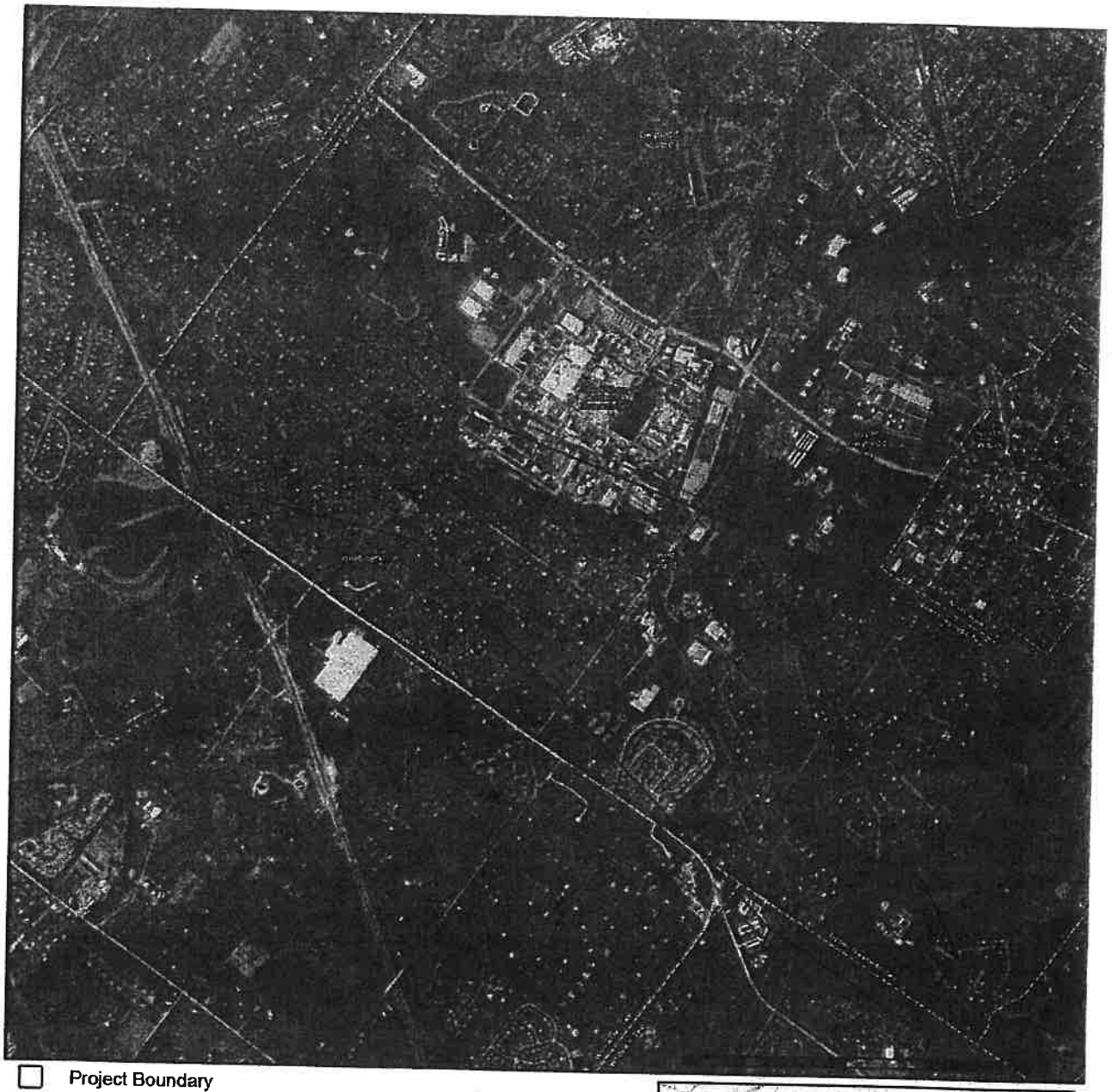

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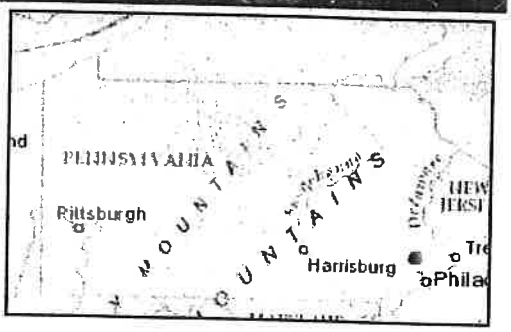

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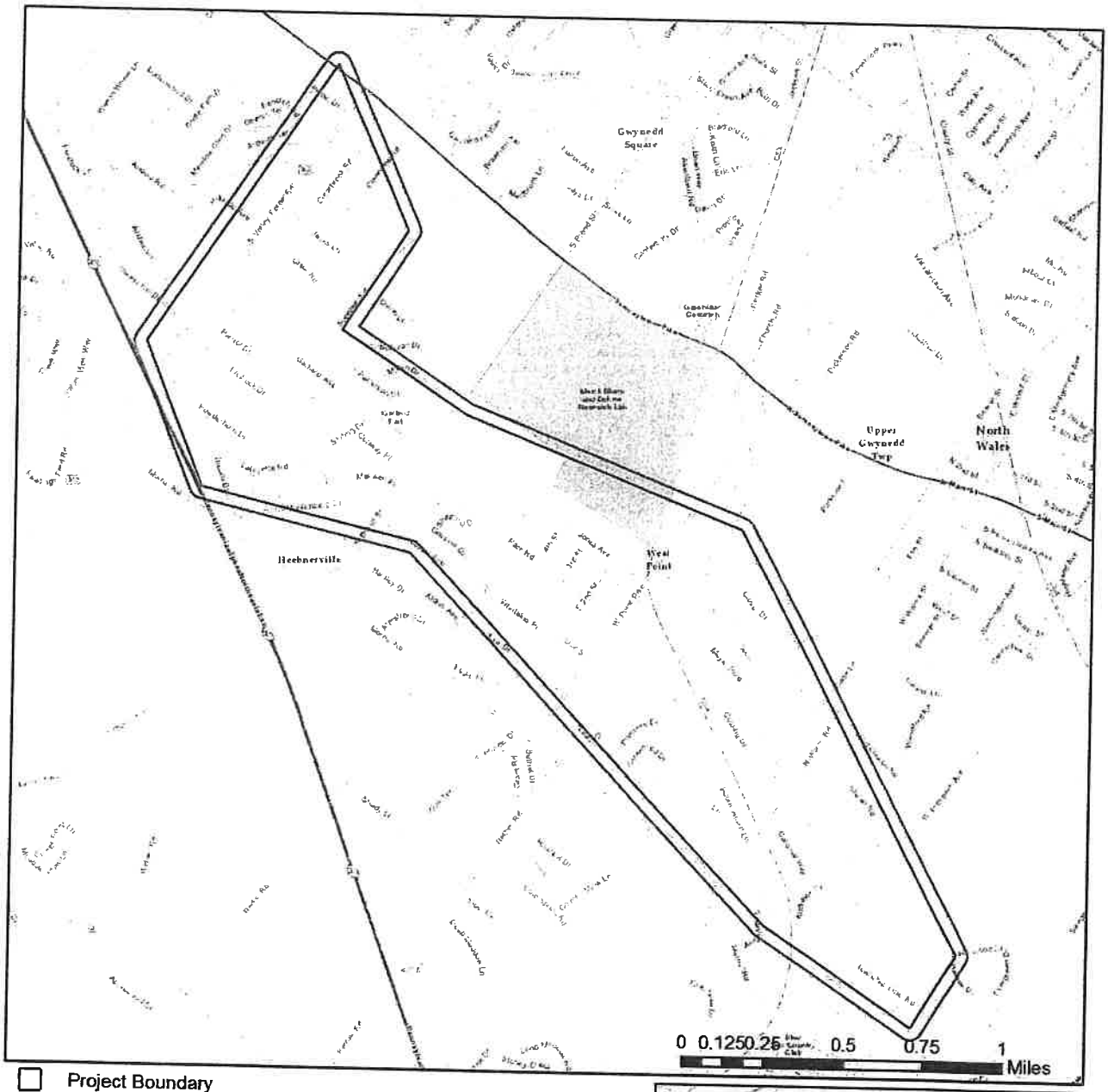

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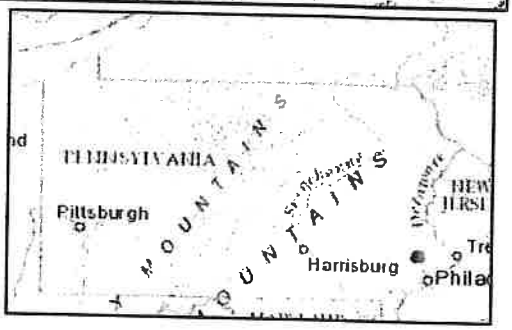

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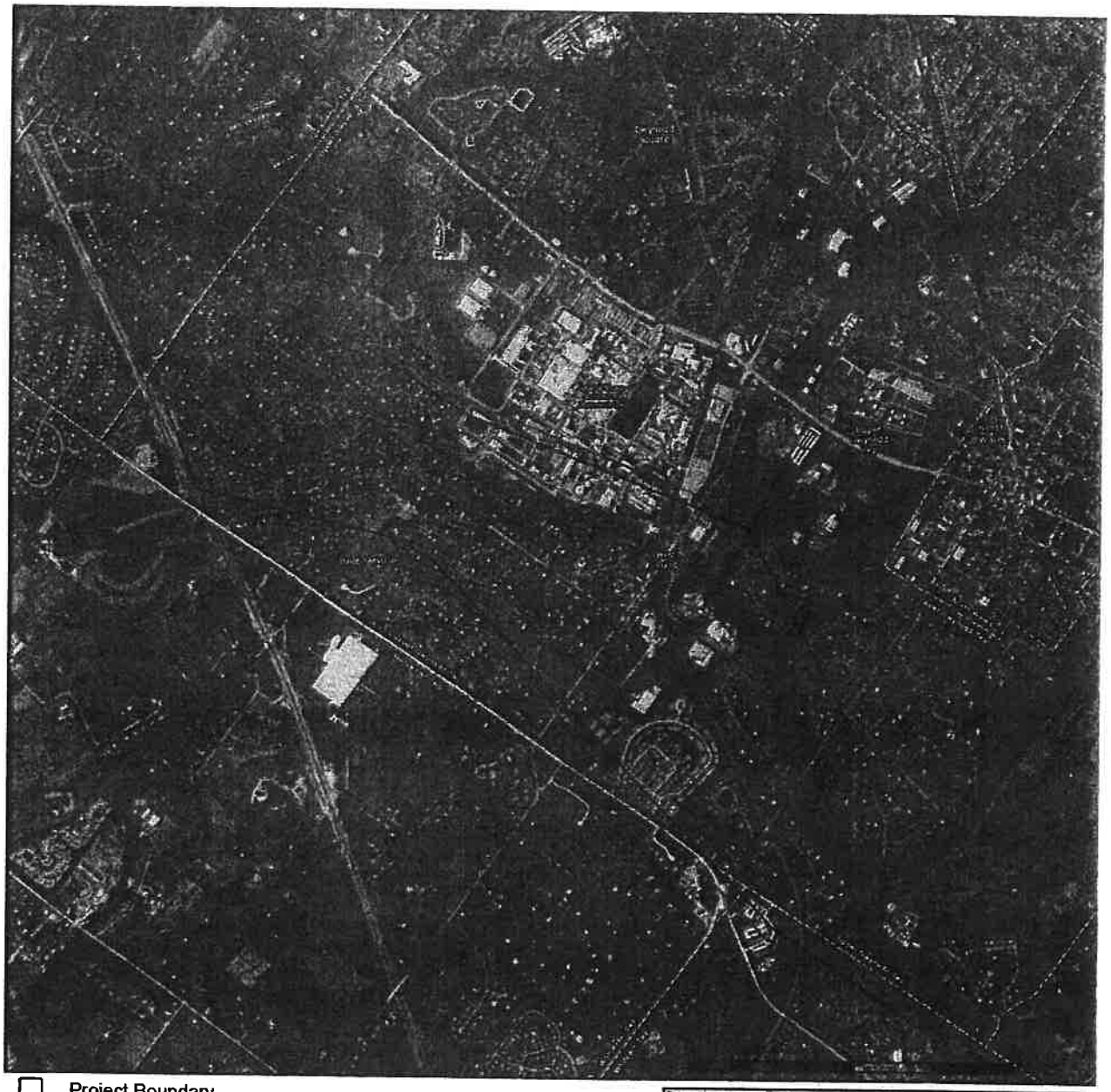

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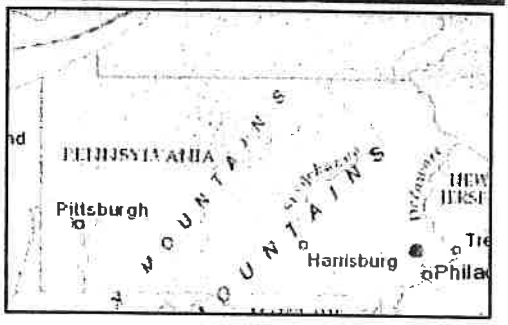

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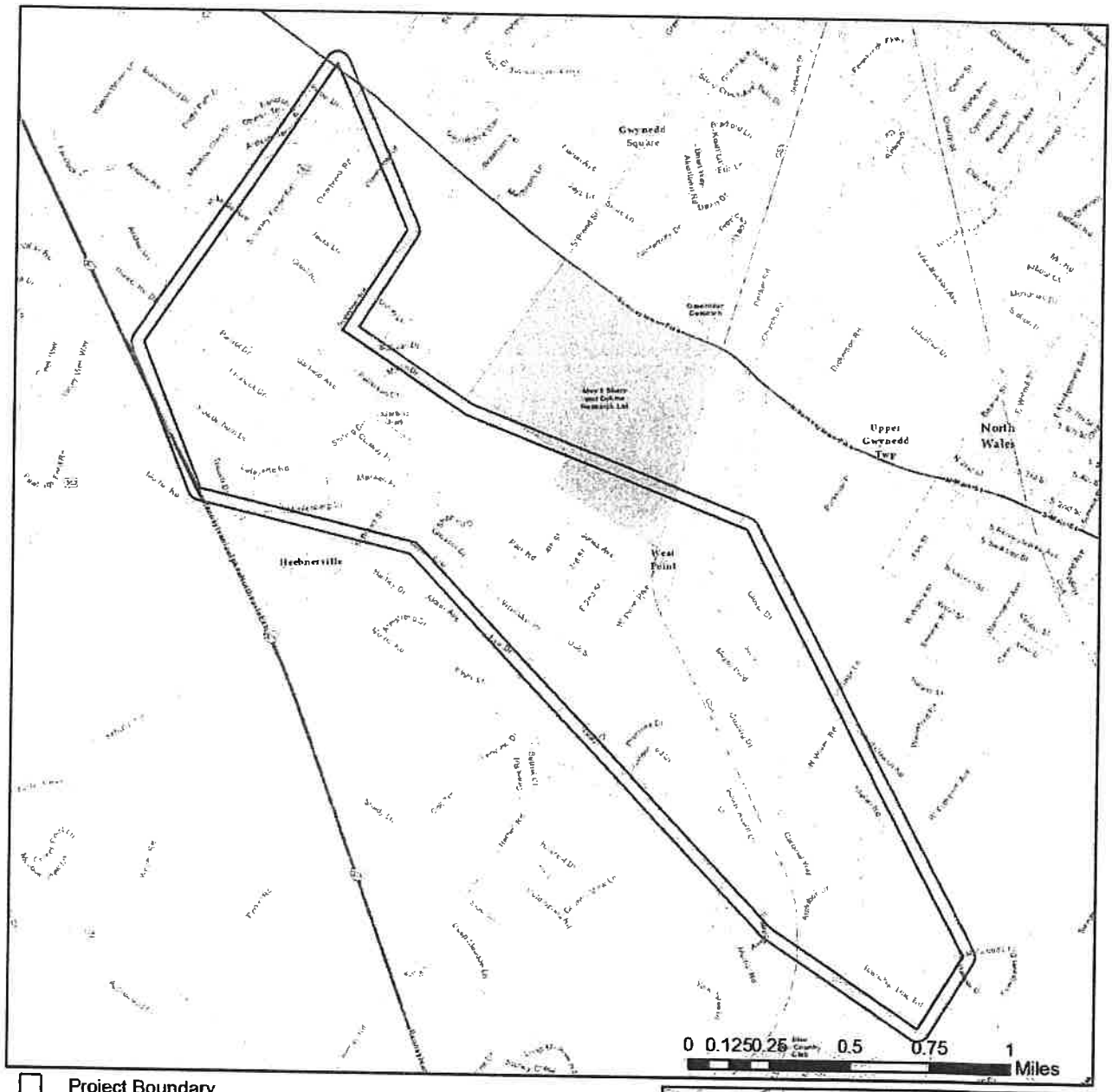

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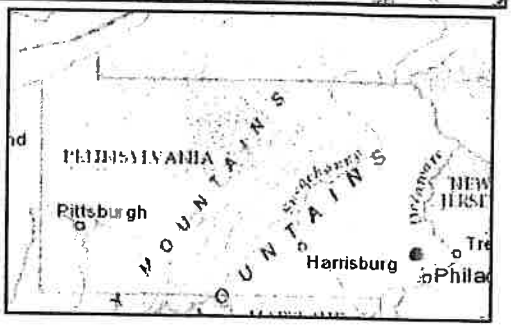

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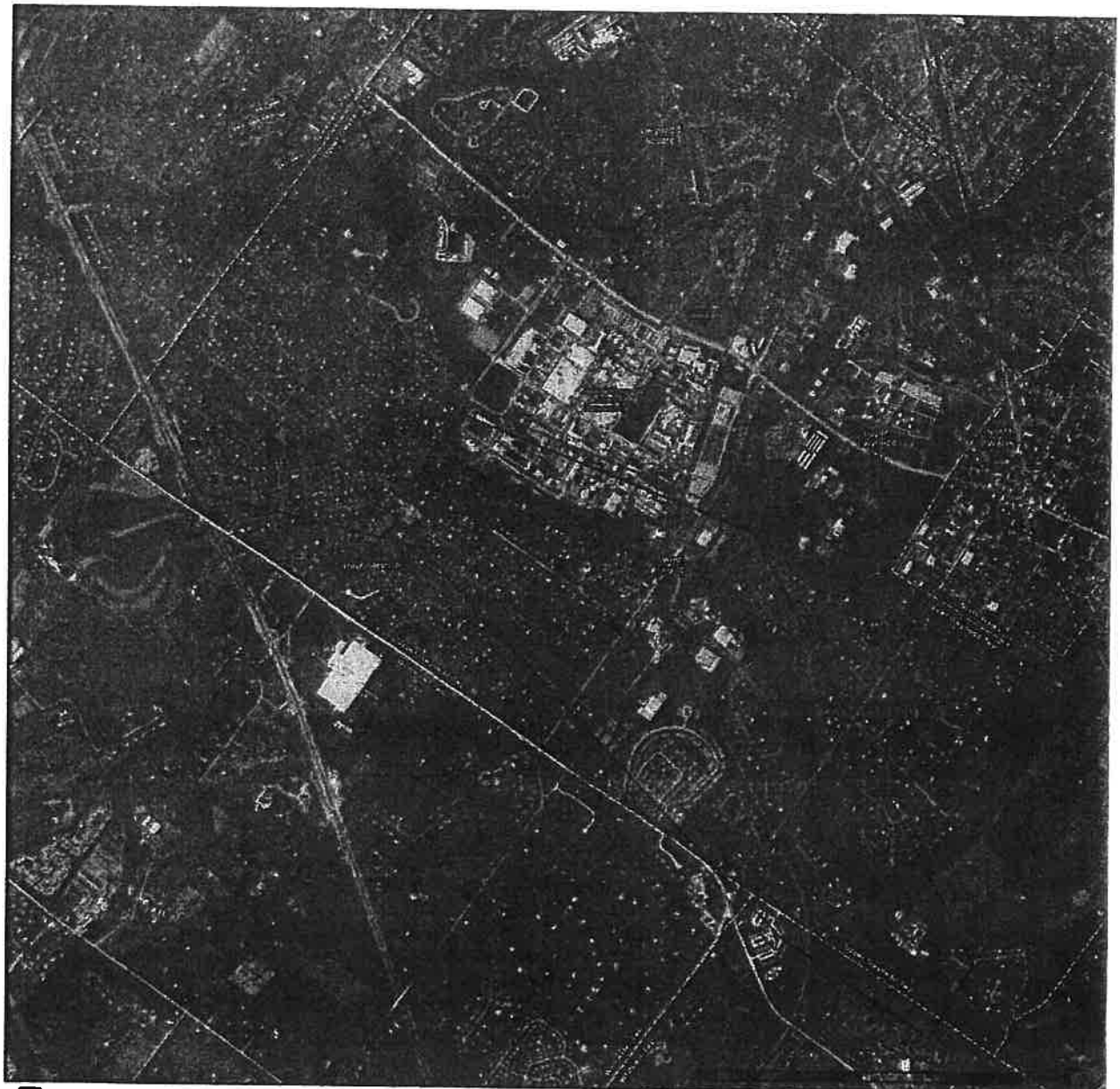

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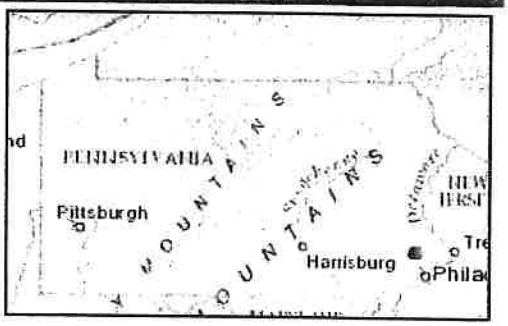

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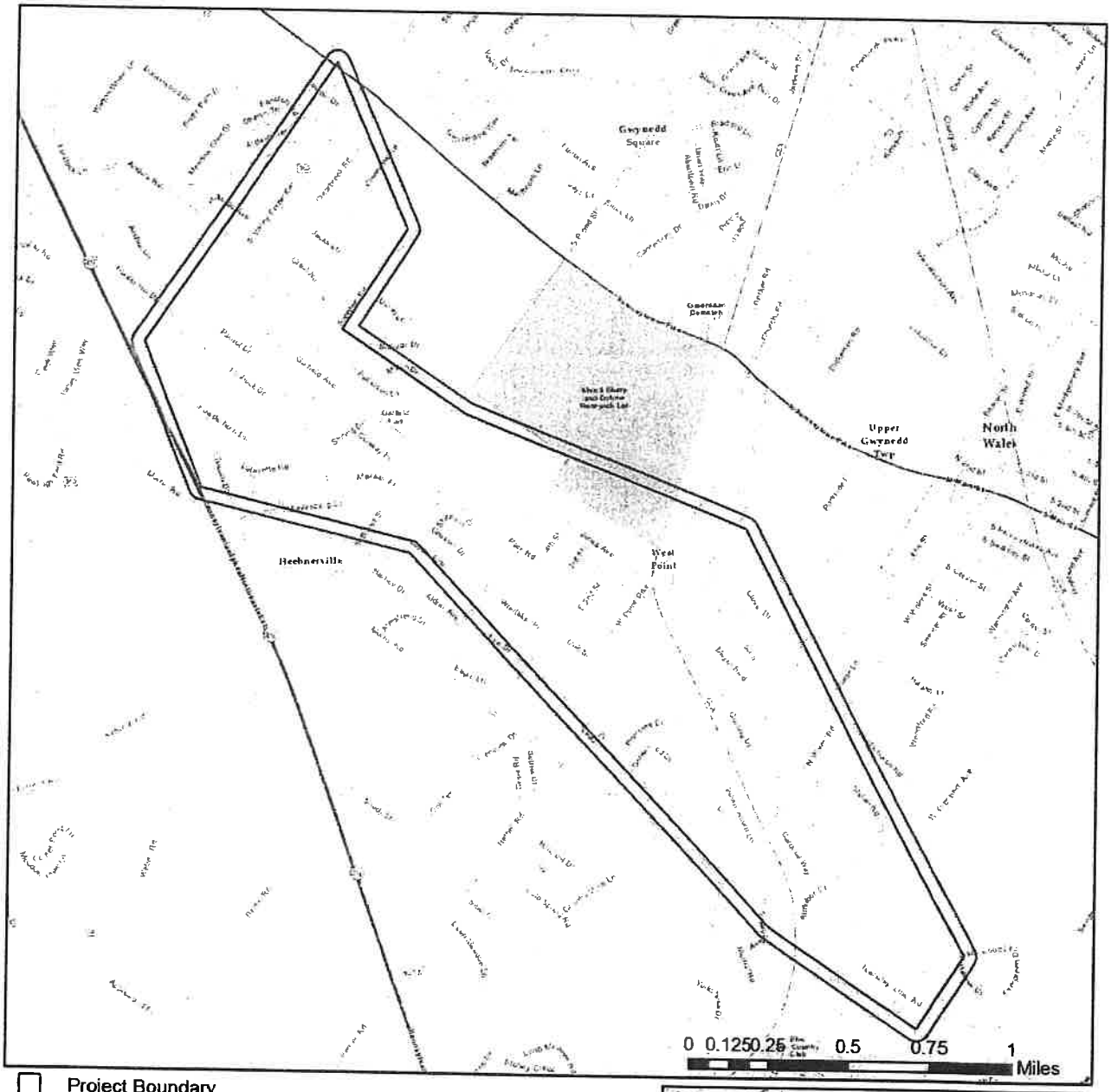
Upper Gwynedd Sewer Diversion



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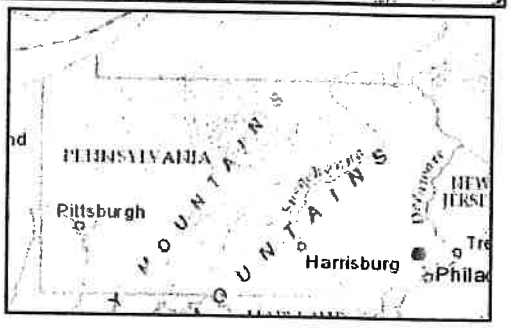

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RESPONSE:
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PA Department of Conservation and Natural Resources
RESPONSE:
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PA Fish and Boat Commission
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State College, PA 16801
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Company/Business Name: EEMA
Address: P.O. Box 232
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Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.com

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William A Brown II
applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
County(s): **Montgomery**
Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
ZIP Code: **19422; 19446; 19454**
Quadrangle Name(s): **LANSDALE**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **Skippack Creek; Upper Wissahickon Creek**
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Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" W**

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Agency	Results	Response
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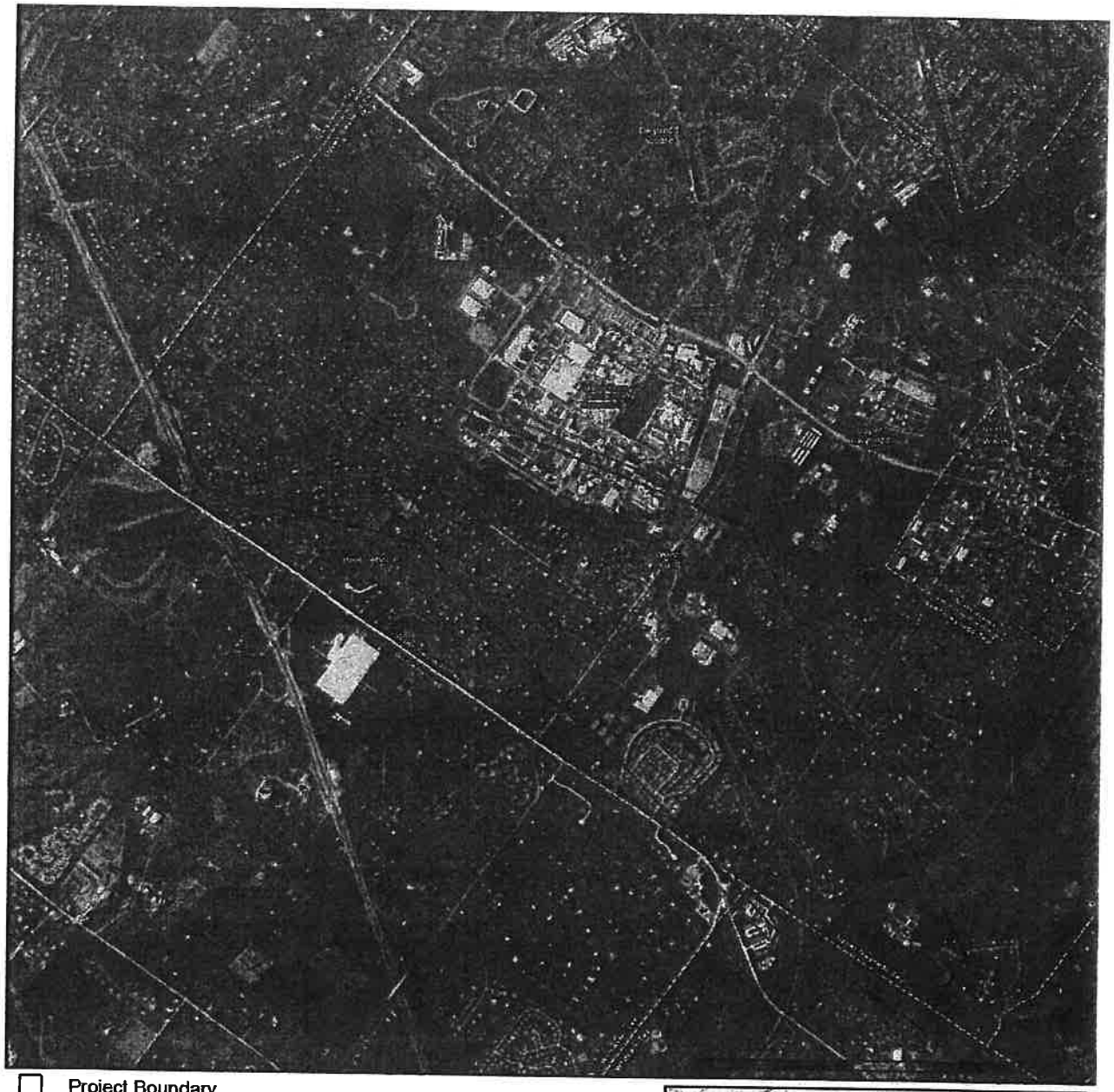

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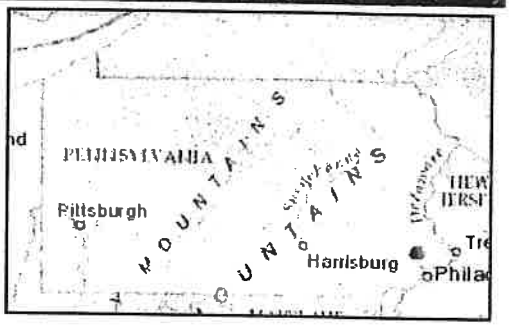

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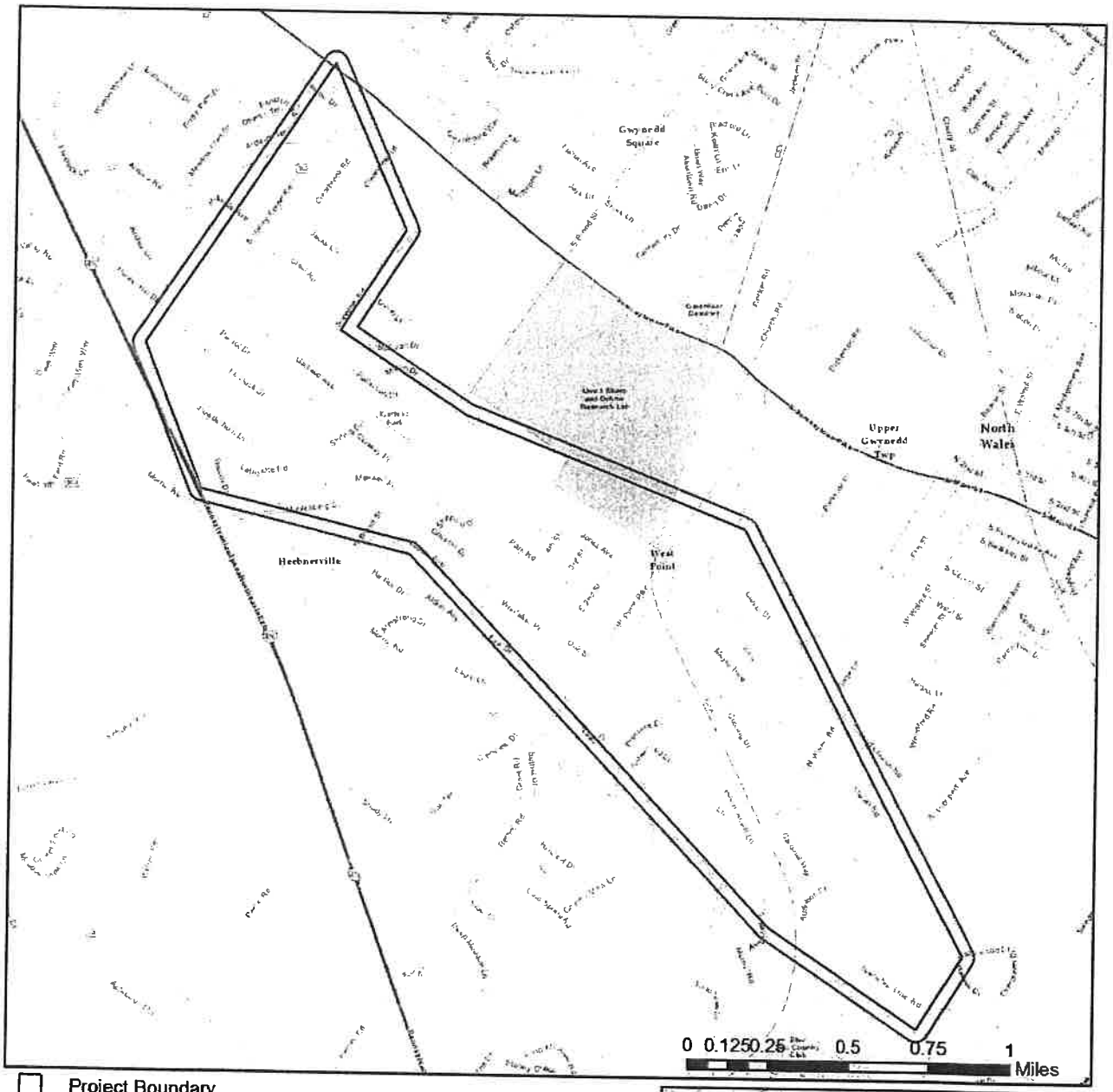

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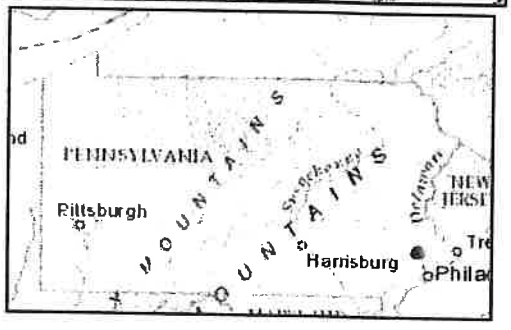

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William A Brown II
applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

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Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
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Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
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Upper Gwynedd Sewer Diversion

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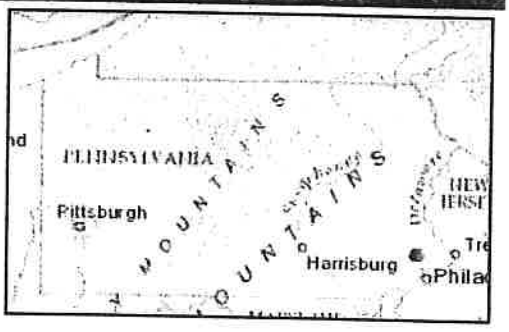

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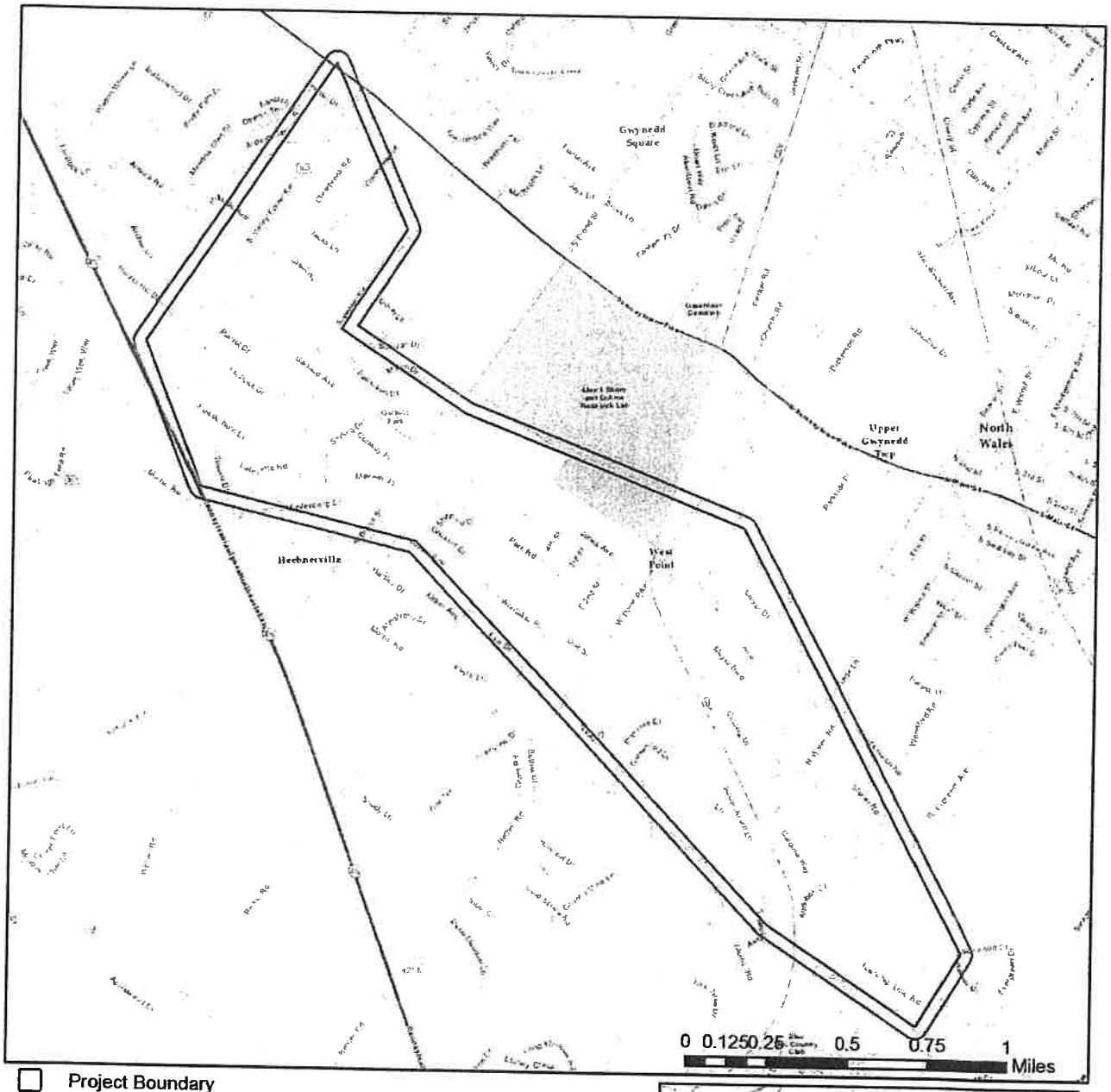

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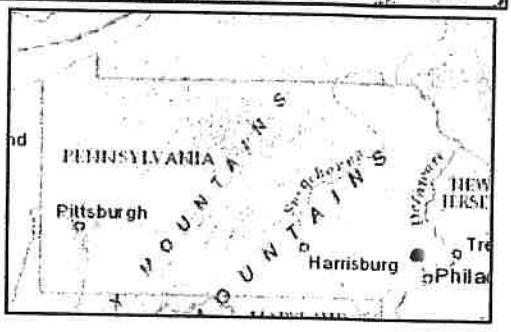

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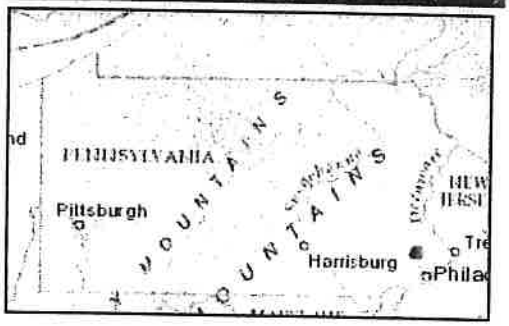

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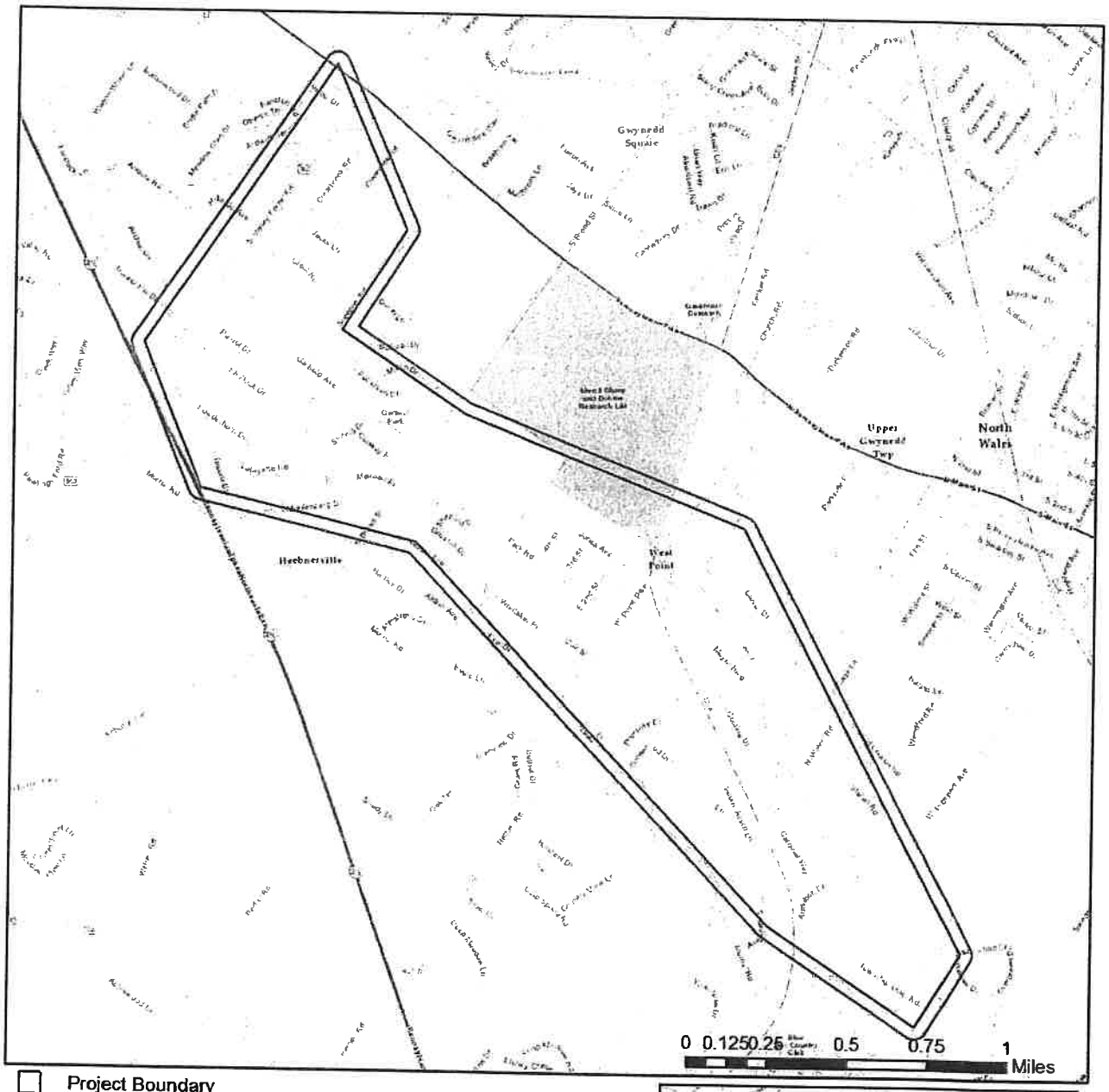
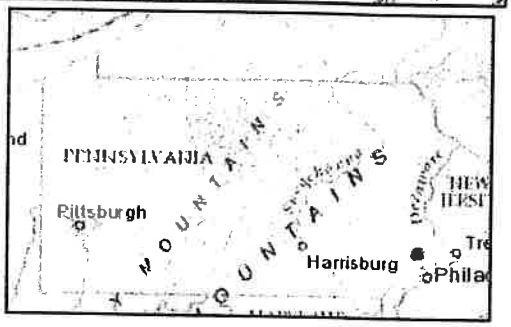
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

Upper Gwynedd Sewer Diversion



☐ Project Boundary

☐ Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

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
Email: RA-HeritageReview@pa.gov
Fax:(717) 772-0271

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
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
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: William A. Brown II, P.E.
Company/Business Name: EEMA
Address: P.O. Box 232
City, State, Zip: Kulpsville, PA 19443
Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.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.

William A Brown II
applicant/project proponent signature

6/27/16
date

APPENDIX Q

CAPITAL COST ANALYSIS

FLOW DIVERSION CAPITAL COST ANALYSIS

FLOW DIVERSION ALTERANTIVE

1. COST TO DIVERT FLOW = $27,000,000

2. PAYMENT RECEIVED FROM TOWAMENCIN TOWNSHIP = $7,100,000

3. RESERVE FUNDS HELD BY UGT = $4,900,000

4. COST TO BE FINANCED BY UGT = $15,000,000

COST TO NOT DIVERT FLOW

1. LONG TERM UGT SHARE OF COST AT TMA WWTP = $33,800,000[1]

COST SUMMARY

NET LONG TERM CAPITAL COST SAVINGS TO UGT = $6,800,000[2]

1. BASED ON HAZEN & SAWYER INDEPENDENT STUDY APPROVED BY UGT AND TT.
2. $33,800,000 MINUS $27,000,000.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SEP 13 2017

Mr. Michael Lapinski
Assistant Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Act 537 Plan Update
Upper Gwynedd Township Sewage Flow Diversion
APS ID No. 593641, AUTH ID No. 1195962
Upper Gwynedd Township
Montgomery County

Dear Mr. Lapinski:

The Department of Environmental Protection (DEP) has reviewed the proposed Official Sewage Facilities Plan Update (Plan) titled *Upper Gwynedd Township Sewage Flow Diversion,* as prepared by Environmental Engineering & Management Associates, Inc. (EEMA), dated October 2016. The Plan proposes the diversion of sewage flow in portions of Upper Gwynedd Township (UGT) from the Towamencin Municipal Authority's Kriebel Road Interceptor (TMA KRI) to the Upper Gwynedd Township Wastewater Treatment Facility (UGT WWTP), the construction of two new pumping stations, associated force mains and upgrades to the UGT WWTP. The submission is consistent with the planning requirements in Chapter 71 of DEP's regulations.

This Plan is approved and provides for the following:

1. The diversion of 0.95 MGD from the TMA KRI. The portions of Upper Gwynedd Township that will be diverted are the areas tributary to the Sumney Forge Shopping Center and the PA Turnpike bridge (on Valley Forge Road) crossing points. These areas are shown on Figure 2 in Appendix A of the January 27, 2017, submission. The specific properties are listed in the Valley Forge Road North Pump Station (VFRNPS) and Valley Forge Road South Pump Station (VFRSPS) tables in the May 9, 2017, resubmission.

2. Five properties in Towamencin Township will also be diverted to the UGT WWTP. Those properties are listed in the Towamencin Township Valley Forge Road South Pump Station table in the May 9, 2017, resubmission.

3. The construction of the VFRNPS and VFRSPS and associated force mains. The approved sewage flows are as follows:

SEP 13 2017

a. The annual average sewage flow for the VFRNPS will be 0.96 MGD. Its peak capacity will be 6.0 MGD. The associated proposed force main leaving the pump station will be a combination of 20" and 24" sized pipe. The force main will also have an annual average capacity of 0.96 MGD.

b. The annual average sewage flow for the VFRSPS is 0.14 MGD. Its peak capacity will be 1.5 MGD. The associated proposed force main will be an 8" sewer line with an annual average capacity of 0.14 MGD.

These annual average sewage flows identified above include the sewage flow being diverted from the TMA KRI and anticipated future sewage flows in the respective drainage area of each pump station. The specific locations of the pump stations and routes of the force mains are illustrated in the figures in Appendix J of the January 27, 2017, submission.

4. The new force mains will combine on Garfield Avenue near Sterling Drive and a new force main will be constructed. The new 20"/24" force main will have an annual average capacity of 1.1 MGD. Its peak capacity will be 7.5 MGD.

The new force main will connect directly to the UGT WWTP, as illustrated on the *Pump Station Locations and Pipe Routes* map in Appendix J of the January 27, 2017, submission.

5. The UGT WWTP will be upgraded from 5.7 MGD to 6.4 MGD annual average flow. Per the e-mail from EEMA, dated August 30, 2017, modifications at the UGT WWTP will be made to accommodate peak sewage flows realized by the sewage flow diversion.

Upper Gwynedd Township must secure a Water Quality Management (Part II) permit(s) for the construction and operation of the proposed sewage facilities and WWTP upgrades. Issuance of a Part II permit will be based upon a technical evaluation of the permit application and supporting documentation. Starting construction prior to obtaining a permit is a violation of the Clean Streams Law.

Please note that the permitted annual average capacity of sewage facilities is the number upon which Act 537 sewage facilities planning capacity is based. No capacity may be used for new connections to these facilities beyond their permitted annual average capacities without first obtaining additional sewage facilities planning approvals for the rerate/upgrade of these facilities.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa. C.S.

SEP 13 2017

Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800.654.5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717.787.3483) FOR MORE INFORMATION.

If you have any questions or concerns, please contact Ms. Stefanie Rittenhouse at 484.250.5186.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Montgomery County Health Department
Montgomery County Planning Department
Mr. Ford - Towamencin Township
TMA
Environmental Engineering and Management Associates, Inc
Planning Section
Re 30 (GJE17CLW)250-7

66 Pa. C.S. Section 1329 Application Completeness Review
Pennsylvania-American Water Company – Wastewater Division
Acquisition of Township of Towamencin Wastewater System Assets
at Docket No. A-2023-3039900

35. Checklist Item No. 22.b. – Application Completeness Review Item No. 20 requested that PAWC-WD provide copies of the most recent DEP-approved Act 537 Plans for Lower Salford, Worchester and Franconia Townships, and the Borough of Lansdale. PAWC-WD responded in Amended Appendix A-22-b indicating that the DEP-approved Act 537 Plans for Towamencin and the aforementioned affected municipalities were provided in Appendices A-22-b.1 through A-22-b.5 (A-22-b Appendices). However, PAWC-WD did not provide copies of the A-22-b Appendices. Please provide copies of the most recent DEP-approved Act 537 Plans for Lower Salford, Worchester and Franconia Townships, and the Borough of Lansdale.

Response: Please see **Amended Appendix A-22-b**.

36. Checklist Item No. 22.b. – Application Completeness Review Item No. 21 requested that PAWC-WD provide a copy of the Montgomery County 1972 Sewage Facilities Plan for Towamencin Township and to provide copies of the most recent DEP-approved Act 537 Plans for both Hatfield and Upper Gwynedd Townships. In response, PAWC-WD provided Attachments 21-A, 21-B.1, and 21-B.2. Please provide responses to the following:

a. The Montgomery County 1972 Sewage Facilities Plan for Towamencin Township provided as Attachment 21-A is missing pages VIII-7 and VIII-8. Additionally, page IX-3 appears to be a partial scan of a foldout map and is incomplete and illegible. Please provide a complete and legible copy of the Montgomery County 1972 Sewage Facilities Plan for Towamencin Township.

Response: Please see updated **Amended Attachment 21-A**. Note that PAWC confirmed that pages VIII-7 and VIII-8 do not exist in the original document.

b. The DEP-approved Act 537 Plan for Hatfield Township, dated November 2010 and approved November 2013 (2013 Hatfield Act 537 Plan), provided as part of Attachment 21-B.1 appears to be missing every other page. Additionally, the DEP review letters included in Attachment 21-B.1 are incomplete and appear to be missing certain pages. Provide a complete copy of the 2013 Hatfield Act 537 Plan along with the DEP review and approval letters.

Response: Please see updated **Amended Attachment 21.B.1**.

c. The DEP-approved Act 537 Plan for Upper Gwynedd Township provided as Attachment 21-B.2 is the same Act 537 Plan submitted to the Commission as Attachment 19-A, referenced above at the 2017 Upper Gwynedd Act 537 Special Study, and is missing appendices A, B, D, E, F, G, H, L, M, N, and P. Provide a complete copy the 2017 Upper Gwynedd Act 537 Special Study with all referenced appendices.

Response: Please see updated **Amended Attachment 21.B.2**.

Amended Attachment 21-A
Page 1 of 80

MCPC OFFICE COPY
NOT TO BE REMOVED

25.

MONTGOMERY COUNTY, PENNSYLVANIA

SEWAGE FACILITIES PLAN

MONTGOMERY COUNTY, PENNSYLVANIA

BOARD OF COUNTY COMMISSIONERS

A. Russell Parkhouse, *Chairman*
Frank W. Jenkins — Lawrence H. Curry

COUNTY PLANNING COMMISSION

Charles Tornetta, *Chairman*
Robert G. Werden, *Vice-Chairman*
Philip L. Corson — George D. McKeon
Feodor U. Pitcairn — Frank D. Morgan
John M. Wright — Steve A. Stavrou
Willard S. Detweiler, Jr.

Arthur F. Loeben, Director

Prepared March 1971; Revised May 1972

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December 1972

Board of County Commissioners
Department of Environmental Resources
Governing Bodies and Planning Commissions
of Montgomery County Municipalities

Gentlemen:

The Montgomery County Planning Commission is pleased to hereby transmit the sewage facilities plan for the county, prepared in compliance with the provisions of the Pennsylvania Sewage Facilities Act (Act 537 of 1966) and the Pennsylvania Municipalities Planning Code (Act 247 of 1968).

On October 26, 1972, the County Commissioners passed a formal resolution adopting this plan. In accordance with that resolution, the plan has been published and is hereby being distributed to all governing bodies and planning commissions, in addition to appropriate state officials.

The sewage facilities plan includes reference to long-range sewer programs, but emphasizes the 10-year period from 1969-1979 in accordance with the requirements of the act. The plan is a joint effort of our engineering consultant, Albright and Friel, and the staff of this commission.

The plan meets the planning requirements of state law and, with adoption, insures the flow of state and federal grants-in-aid which are so essential for construction of the facilities. Recommendations on the development of public sewer facilities are included, as well as the disposition of all existing sewer treatment plants in the county.

The plan has received widespread acceptance by the governing bodies of local municipalities. As of September 1972, 60 municipalities reviewed and adopted the plan. The municipal review has resulted in several revisions to the original text, all of which have been incorporated herein.

The county planning commission has approved and accepted the plan as the official 10-year plan for sewage facilities and as the first element of the county comprehensive plan. Additional elements will follow as they are completed.

Through the initiative of the County Commissioners, the local municipalities were offered aid in fulfilling their Act 537 requirements. We are pleased to receive their resolutions adopting the plan which has brought to culmination the first element of the Montgomery County Comprehensive Plan.

Sincerely yours,

Charles Tornetta

Charles Tornetta
Chairman

MONTGOMERY COUNTY PLANNING COMMISSION
court house ▪ norristown, pennsylvania 19404 ▪ 215-275-5000

ACKNOWLEDGEMENTS

This report was prepared by the Montgomery County Planning Commission and the firm of Albright & Friel, Inc. who served as engineering consultants. The assistance provided by various staff representatives in the Pennsylvania Department of Health is gratefully acknowledged. While many members of the department contributed in some way to the preparation of this report, the following deserve special note: Harry Frey - Supervising Sanitarian, Montgomery County Health Office (until May of 1969); Joseph Hayes, Supervising Sanitarian, Montgomery County Health Office (since August of 1969); and John Burton, Regional Coordinator. The preparation of this report was financed in part by the Pennsylvania Department of Environmental Resources as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Both the Montgomery County Planning Commission and Albright & Friel note with appreciation the particularly valuable assistance provided by municipal governing bodies and planning commissions, sewer authorities, sewer plant operators and various consulting sewer engineers who have aided in the preparation of this plan by freely giving of their time for interviews and providing helpful information and reports.

The firm of Albright & Friel is primarily responsible for the gathering of engineering data, its evaluation and the formulation of recommendations for the provision of needed sewage facilities. The following staff members of Albright & Friel contributed to the production of this report: Robert P. Heurich-P.E., Vice-President; Albert H. Petersen-P.E., Project Manager.

The staff of the Montgomery County Planning Commission was primarily responsible for the gathering of data and the formulation of projections including population and land development, analysis of various sewer-associated factors, report writing, graphics and reproduction. The following staff members took an active role in the development of this plan: Frederic T. Dannerth, Deputy Director; Kent R. Miller, Principal Planner (since July 1970); James W. Tethers, Community Planner (until July 1970); and Michael A. Wolf, Assistant Planner.

The Montgomery County Planning Commission hereby extends its appreciation to all groups and persons who contributed their time and knowledge to the development of this plan.

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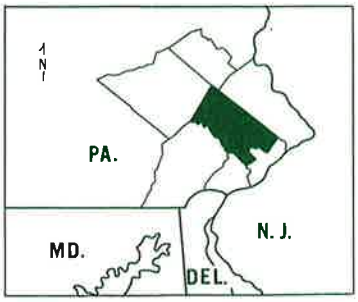
AN ELEMENT OF THE
MONTGOMERY COUNTY
COMPREHENSIVE PLAN

SEWAGE FACILITIES PLAN
1972



MONTGOMERY COUNTY PLANNING COMMISSION court house ■ norristown, pennsylvania

MONTGOMERY COUNTY PLANNING COMMISSION

Court House, Norristown, Pennsylvania

The Montgomery County Planning Commission was established in 1950 by the county commissioners as a research and service unit to the county government, the municipalities, and the citizens of the county. Major functions of the commission include: preparing a county comprehensive plan; furnishing technical assistance to the municipalities of the county; assisting municipalities to complete and implement comprehensive plans in accordance with Act 247, the "Pennsylvania Municipalities Planning Code"; mapping the county and its municipalities; reviewing all land subdivisions of two or more lots; rendering information about the county; stimulating local planning groups; conducting planning research; cooperating with other planning groups; assisting the coordination of land development within the county; and representing the county in the coordination of metropolitan, state, and federal projects, programs, and problems which affect Montgomery County.

DEVELOPMENT FACTORS RELATED TO SEWAGE FACILITIES PLANNING

It is necessary to consider various aspects of land development and community growth when undertaking the preparation of a county-wide sewage facilities plan. Such information reveals the magnitude of present conditions and provides a base from which to extrapolate future needs. Valuable background information that influences plans for the disposal of wastewater in Montgomery County includes the spatial arrangement of land uses, the distribution of population and the pattern of employment.

Through the systematic assembling of this type of information, a valuable overview can be obtained that provides valuable perspective not only on a county-wide basis, but for each of the 62 municipalities of the county as well. In addition to determining past, present and anticipated characteristics in the broad sense, this data serves to provide the necessary "in depth" input which permits the formulation of specific planning recommendations involving sewage facilities. The information contained in this chapter has been used extensively in the preparation of the subsequent sections of the county-wide sewage facilities plan.

PATTERNS OF LAND USE

1. High density and compact development typifies many of the older settlements in Montgomery County. Because of the pattern of land use prevailing prior to World War II, public sewer service was relatively easy to provide either at the time of development or more recently, and much developed land in the county was served by a public sewer system as well as by other urban amenities.

2. With the popularization of the automobile and the subsequent dispersal of lower density land developments following World War II, the provision of public sewer service became more difficult.

3. The historic pattern of small towns amid open country is still very prevalent in the western portions of the county despite inroads by scattered development. In the eastern portion of the county the historic pattern has been virtually obliterated by suburban development. The suburban development has presented a major challenge in the provision of public sewer service since World War II and is expected to pose a major problem during the 10-year period of the county sewage facilities plan.

4. From a county-wide perspective, the tremendous impact of land development occurring on the landscape can be recognized when one considers that between the earliest settlement and 1930 only 6.9% of the county's landscape had been developed; by 1960 the figure "jumped" to 20% and by 1985 estimates indicate that approximately 36% of the county's landscape will be classified as developed. In absolute terms this means approximately 51,000 acres (or 80 square miles) of land will be developed within the 25-year period between 1960 and 1985, or about 16% of all land in Montgomery County.

5. Of the 10 planning areas delineated for purposes of county-wide analysis (figure i-2), the areas demonstrating the greatest increase in land development between 1960 and 1985 are the North Penn Area (number 8),

Figure i-1

COUNTY-WIDE LAND USE, POPULATION AND EMPLOYMENT DATA
FOR 1930, 1960 AND 1985

	1930	1960	1985
Developed Lands - Total			
Acres	21,410	61,405	112,399
% of Total Land	6.9	19.9	36.4
Residential Land Development			
Acres	Not Available	49,250	87,494
% of Total Land	--	15.9	28.3
Population			
Persons	265,804	516,682	933,400
% of Increase	--	94.38	80.65
Total Employment			
Persons	107,218	165,334	330,000
% of Increase	--	54.20	99.59
Industrial Employment			
Persons	33,118	76,684	167,148
% of Increase	--	131.54	117.96

Sources: U.S. Census Data (1930 and 1960); Delaware Valley Regional Planning Commission Estimates; and Montgomery County Planning Commission Estimates.

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the Lower Perkiomen Valley (number 7), the Ambler Area (number 2) and Upper Eastern Montgomery County (number 1). This observation is based on viewing land development both on an absolute and percentage bases. The four planning areas above show the greatest growth in terms of land development presently on the "suburban fringe."

The areas that will experience the least growth in developed lands during the same 25-year period are Lower Eastern Montgomery County (number 3), the Pottstown Area (number 10) and the Upper Perkiomen Valley (number 9). Two of the areas are largely developed and consequently show lower proportions of growth while the third area is mostly rural and is not expected to experience much growth in either absolute or percentage terms.

POPULATION GROWTH AND PROJECTIONS

1. Since 1910, Montgomery County has been growing at a rate exceeding that of both the nation and the state. Between 1950 and 1960 the county's growth rate was more than twice that of the nation and six times that of the state.

2. The county's population has approximately doubled in size every 40 years since 1800. By comparison it is expected that the county's population will double in the 30-year period beginning with 1960. The total county population is expected to pass the one million mark around the year 1990.

3. In the 30 years between 1930 and 1960 the county's population "jumped" one quarter of a million to 516,682. In the 25-year period ending in 1985 the county-wide population increases are expected to be approximately 417,000.

4. Planning areas (delineated in figure i-2) that are expected to experience the greatest population increase based on a combination of absolute and percentage increases are the Lower Perkiomen Valley (number 7), Ambler Area (number 2), North Penn (number 8) and Upper Eastern Montgomery County (number 1).

These four planning areas are on the suburban fringe and are the same four that are expected to experience the greatest increase in developed land.

5. The planning area showing the least population increase in Montgomery County during this 25-year period is the Pottstown Area (number 10). It also stands out as one of the three planning areas experiencing the least increase in developed land.

6. On a municipal basis, four communities (Upper Dublin, Plymouth, Lower Merion and Upper Merion townships) can expect an absolute increase in excess of 20,000 persons between 1960 and 1985. At the other end of the spectrum, Upper Frederick Township and the eight boroughs of Pennsburg, Red Hill, Green Lane, East Greenville, Schwenksville, Rockledge, Bryn Athyn and West Conshohocken can each expect a population increase of less than 1,000 persons during this same time period.

7. On a county-wide basis, estimates indicate that 491,000 persons reside in areas now served by public sewer systems. This represents approximately 74% of the county's population.

8. Population estimates and projections have also been prepared by 15 drainage basins or major stream reaches in Montgomery County. The drainage basins expected to experience the greatest population increase are Wissahickon, Neshaminy, Stony, Skippack and Pennypack. Those drainage basins with the least population growth during the same 25-year period are Indian, Schuylkill-central, Upper Perkiomen and Tookany. There is a direct bearing between population increase by drainage basins and sewage facilities planning.

DISTRIBUTION OF EMPLOYMENT

1. Between 1930 and 1960, the number of persons gainfully employed within Montgomery County increased by 58,000 to a total of 165,000. By 1985 this figure is expected to double with another 165,000 people being gainfully employed within the county boundaries.

2. Industrial employment shows even more impressive increases county-wide than does general employment of all types. Between 1930 and 1960

DEVELOPMENT TRENDS IN MONTGOMERY COUNTY PLANNING AREAS, 1960-1985

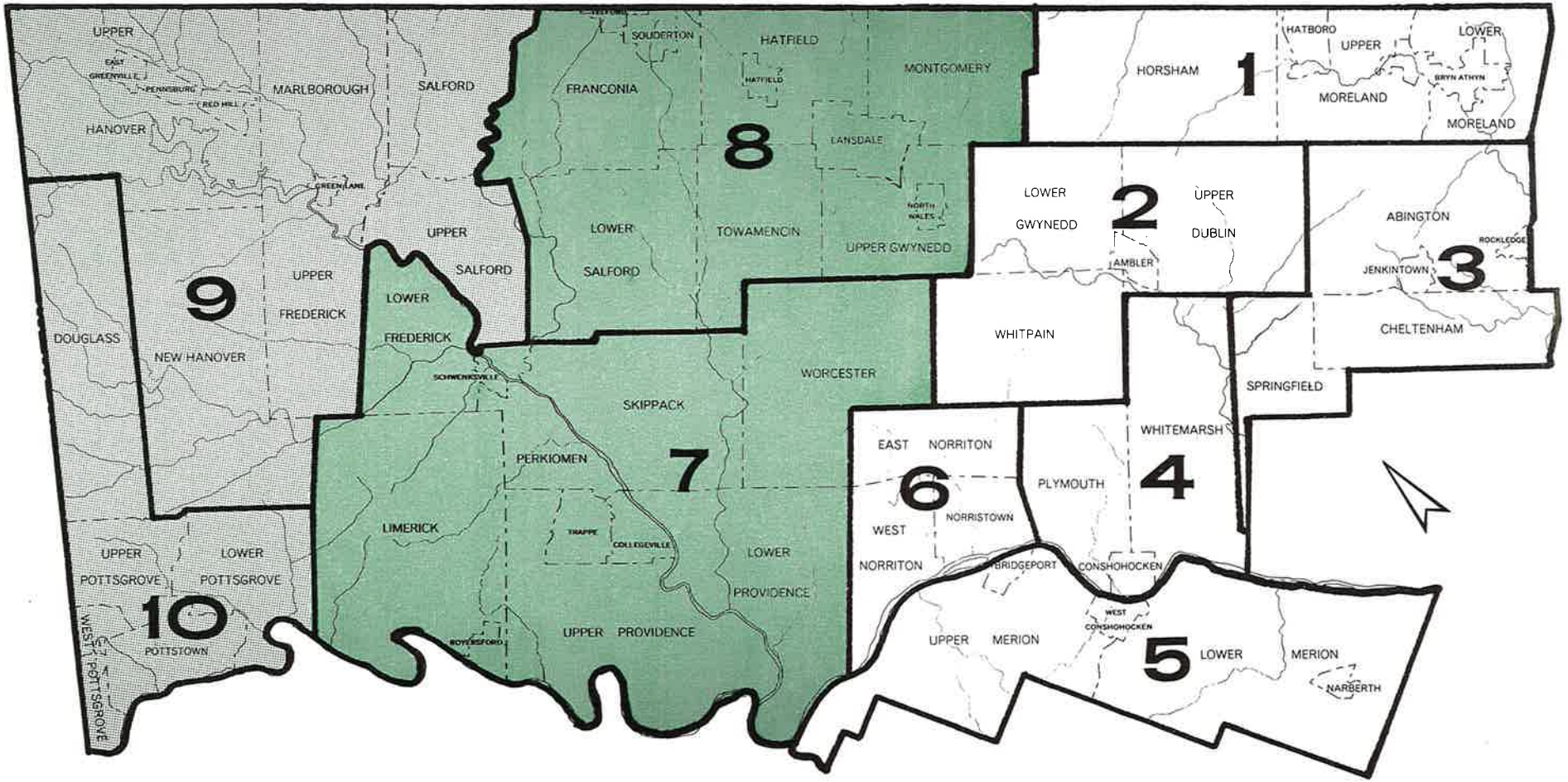

Figure i-2

Planning Areas of Greatest Growth

Planning Areas of Least Growth

Planning Areas of Average Growth

0 1 2 4 Miles 6

MONTGOMERY COUNTY PLANNING COMMISSION

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Note: Numbers Indicate Planning Areas Prior to January, 1972.

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industrial employment increased by 43,600 persons to a 1960 level of 76,700. Between 1960 and 1985 it is anticipated that industrial employment will increase by 90,000 persons or by 118%.

3. Approximately one-fourth of the county's employment base is engaged in commercial activity and one-eighth is engaged in institutional employment. The balance of employees represents a variety of types including agricultural and domestic workers.

4. The North Penn Area (number 8 on figure i-2) and Lower Perkiomen Valley (number 7 on figure i-2) are expected to exhibit the greatest increase of employment of the 10 planning areas between 1960 and 1985. Both of these planning areas will also probably experience the greatest growth in terms of increased developed land and increased population in the same time period.

5. The Conshohocken (area 4), Norristown (area 6) and Pottstown (area 10) areas are the three planning areas expected to experience the least growth in terms of employment between 1960 and 1985.

Figure i-2 represents graphically those planning areas of greatest and least growth. These areas of growth were judged according to all three of the parameters previously mentioned, including land development, population and employment. These three parameters of growth were measured both absolutely and in terms of percentage increase. The results were then combined in such a way as to demonstrate planning areas of greatest and least "overall" growth.

In view of the tremendous growth that Montgomery County's municipalities have experienced since the end of World War II and the even greater growth that can be expected within the next 10 to 15 years, new ways must be found to resolve the problems associated with public sewage facilities. The development of a county-wide sewage facilities plan is believed to be the first step in that direction.

II

NATURAL FEATURES AND THEIR EFFECT ON SEWER PLANNING

The physical features of Montgomery County are significant from the standpoints of guiding the future growth of the county in general and in county-wide sewage facilities planning in particular. Topographic considerations, soils and natural drainage have a direct bearing on the historic as well as the projected distribution of various types of land use, circulation systems, population growth, community facilities and a wide spectrum of those ingredients required to make a viable community.

Included in this chapter of the report are the physiographic considerations (drainage basins, slopes and layer relief) which have a direct bearing on sewage facilities planning. Because of the interrelationship of soils and the use of on-site sewage disposal systems, the chapter includes a discussion of the distribution and effectiveness of on-site sewage disposal systems. The primary thrust of the chapter is to survey these natural features from a county-wide standpoint and to note the interrelationship between them and sewage facilities planning.

DRAINAGE BASINS OF MONTGOMERY COUNTY

1. All of Montgomery County lies within the Delaware River Drainage Basin and most of the county lies within the Schuylkill River Sub-basin.

2. Of the seven major regional sub-basins in Montgomery County, two (the Perkiomen and the Wissahickon) drain into the Schuylkill River which in turn drains into the Delaware River. The remaining five drain into the Delaware River and are the Pennypack, Poquessing, Neshaminy, Tookany (Tacony) and Darby (the Indian Creek tributary).

3. For the purposes of county-wide sewage facilities planning, 15 watersheds or major stream reaches have been identified, population estimates for each have been prepared and each of the 90 treatment plants located within Montgomery County has been identified as being located within its appropriate watershed (see figure ii-1).

4. The availability of public sewer services varies widely within these 15 drainage basins. Virtually all of the Tookany and Indian and portions of the Pennypack, Wissahickon and Schuylkill-south watersheds are served by treatment facilities located within Philadelphia. One is in Northeast Philadelphia and the other is in Southwest Philadelphia.

5. All 15 watersheds are served in part by public sewerage systems. Most also contain additional non-municipal and industrial wastewater treatment plants.

6. Two of the 15 watersheds have no sewage treatment plants at all (Stony and Indian), while at the other end of the spectrum the Wissahickon drainage basin has 18 treatment plants, the Lower Perkiomen, 12, and the Neshaminy, 10.

SLOPES AND LAYER RELIEF

1. The provision of public sewage facilities is rendered difficult in areas which either have extremely steep slopes or are nearly level.

Figure ii-1

POPULATION AND SEWAGE TREATMENT PLANTS BY WATERSHEDS IN MONTGOMERY COUNTY

Watersheds	1960 Population	Sewage Treatment Plants			
		Municipal	Non-Municipal	Industrial	Total
Perkiomen-Upper	13,010	3	4	1	8
Swamp	7,010	2	3	0	5
Perkiomen-East Branch	7,520	2	1	0	3
Perkiomen-Lower	16,300	1	9	2	12
Schuylkill-North	47,220	2	2	2	6
Skippack	24,970	2	1	2	5
Neshaminy	18,590	3	4	3	10
Wissahickon	74,350	6	3	9	18
Pennypack	63,220	1	7	0	8
Tookany	61,370	0	0	1	1
Schuylkill-East	47,180	4	0	2	6
Schuylkill-South	63,360	3	0	3	6
Stony	33,740	0	0	0	0
Schuylkill-Central	12,990	0	1	1	2
Indian	25,850	0	0	0	0
Totals	516,680	29	35	26	90

Source: Montgomery County Planning Commission Population Estimates and data compiled from records of Department of Health and Albright & Friel.

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2. Throughout Montgomery County's landscape slopes are relatively gentle and the provision of sewer service is, therefore, not generally inhibited by topographic considerations.

3. Montgomery County's elevation ranges from approximately 15 to 750 feet above sea level. The three lowest elevations are found where the Schuylkill, Tookany and Pennypack meet the Philadelphia County line. The highest elevations are found in the horseshoe area surrounding East Greenville, Pennsburg and Red Hill boroughs.

SOILS OF MONTGOMERY COUNTY

1. For planning purposes, a knowledge of soils can be used to ascertain areas of frequent flooding, areas where there is a high water table and areas where there is difficulty in establishing and/or maintaining properly functioning on-site sewage disposal systems.

2. By relying upon the "Soil Survey of Montgomery County, Pennsylvania," prepared by the Soil Conservation Service of the United States

Department of Agriculture in 1967, the various characteristics of soils can be determined with a high degree of accuracy and can be reliably mapped on a county-wide base.

3. The presence of a soil with those characteristics which hinder the proper absorption and filtration of on-site wastewater may create health hazards as well as public nuisance situations. Soil characteristics affecting the operation of on-site systems include permeability, depth to bedrock, depth to seasonal high water table, slope, stoniness and flood hazards.

4. The Pennsylvania Sewage Facilities Act indicates that on-site disposal systems should not be installed in areas where soil characteristics and certain other qualifying factors reveal that malfunctioning systems are to be expected.

5. For purposes of the act, the Pennsylvania Department of Health has established four categories of limitations for on-site sewage disposal. The four categories and a brief description of each are as follows:

a. Hazardous Limitations - These soils are generally not suitable for on-site disposal of sewage due to the possibility of ground water pollution or contamination. Most of these soils in Montgomery County are underlain by limestone formations.

b. Severe Limitations - These soils are not satisfactory for on-site disposal of sewage due to the presence of impervious water restricting layers, high water tables, flooding, steep slope, shallowness, etc.

c. Moderate Limitations - These soils may be suitable for on-site disposal of sewage provided the subsoil is permeable. They also include "man-made" soils as well as soils in their natural state.

d. Slight Limitations - These soils are generally suitable for on-site disposal of sewage.

6. The spatial distribution and areal extent of these four types of soils in Montgomery County is graphically presented in figure ii-2.

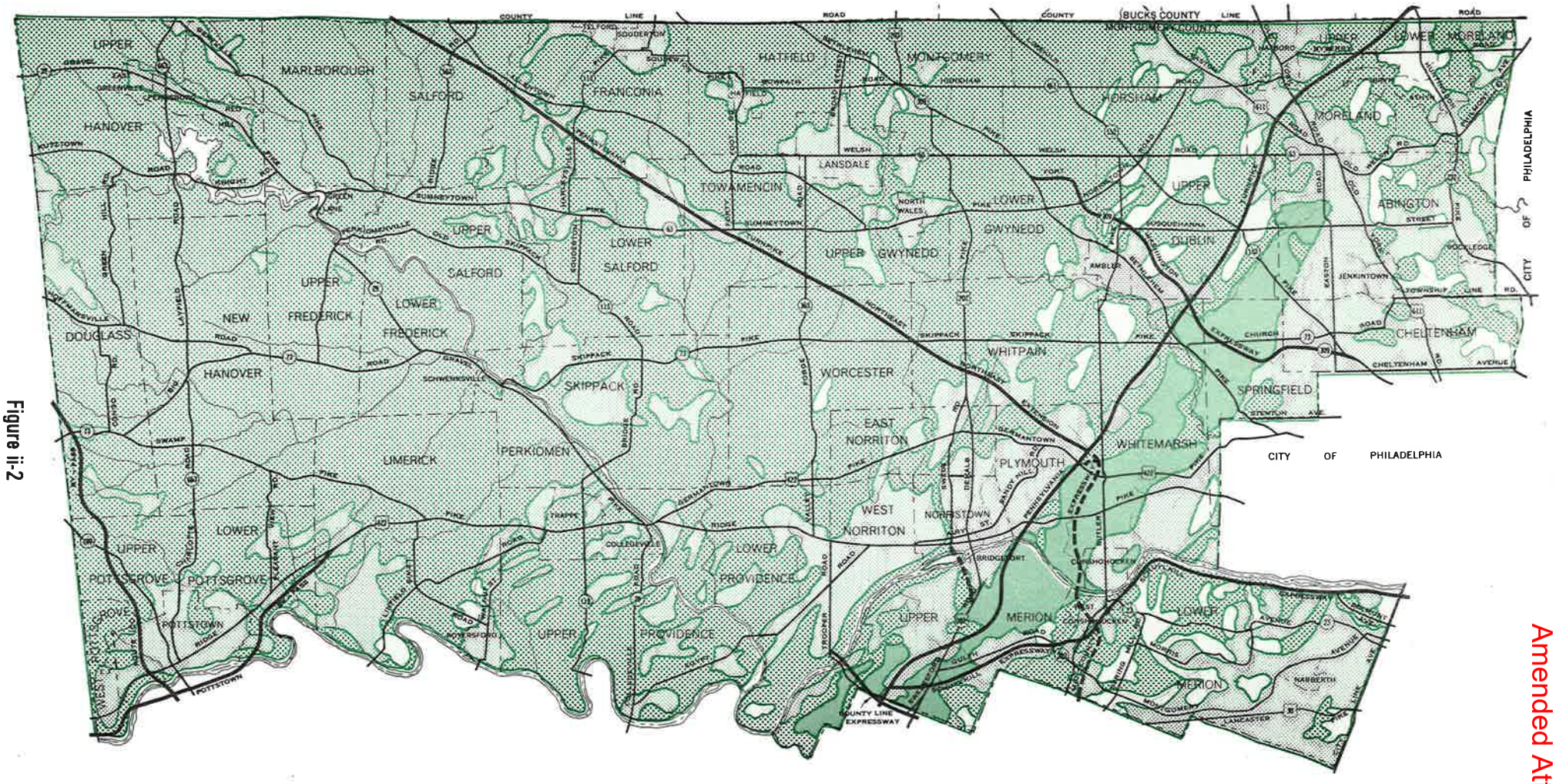
7. Examination of the soil suitability map reveals that the overwhelming predominance of soils in Montgomery County contains severe limitations for on-site disposal of sewage.

8. Virtually all soils in the hazardous limitation category are found in the Chester-Whitemarsh Valley to the Chester County line.

9. Generally speaking land development with on-site disposal systems should not be permitted on severe and hazardous soils unless public sewer service is to be provided within a reasonably short period of time. Municipalities should take appropriate steps to discourage development in this regard.

10. At the other end of the spectrum, soils designated as having slight limitations for on-site disposal facilities are not plentiful in Montgomery County and are widely dispersed. Comparatively little of the

SOIL SUITABILITY FOR ON-SITE SEWAGE DISPOSAL



Hazardous

Moderate (Including Man-Made Soils)

Severe

Slight

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania 1972

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Interpretation of Montgomery County Soil Survey by F. Glade Loughty, Soil Technologist, Pennsylvania Department of Health. Revised May 1972

Figure ii-2

county's landscape can be allocated to land use types which will rely upon on-site disposal systems as a permanent means of disposing of wastewater.

11. Soils in the moderate limitations category consist of basically two types of conditions - "man-made" soils and natural soils in rural areas. Most soils in the moderate limitation category consist of the "man-made" type of soil and can serve to represent a rough index to the degree of urbanization in Montgomery County. The moderate limitation soils that are in their natural state are widely scattered and do not encompass a significant portion of the county.

12. The relationship between soil conditions, public sewage facilities planning, community planning and land development patterns is an extremely important one and must be recognized as such.

13. Public sewer service is a necessity for most of the anticipated development that will occur in the county. It is evident that municipal officials must take positive steps to provide public sewers to those developed areas of the county that are not now served as well as to those undeveloped areas of the county that are expected to develop in the future.

THE USE OF ON-SITE SEWAGE DISPOSAL SYSTEMS

1. Over the years an ever increasing number of residents of Montgomery County have been served by public sewage facilities. Estimates indicate that 490,700 persons (or 74% of the estimated 1969 population) are connected to a public system. However, this means approximately 170,300 residents in Montgomery County are served by on-site disposal systems. Based upon the recommendations of the Montgomery County Sewage Facilities Plan, it is estimated that the number of county residents relying upon on-site systems will be dramatically reduced to approximately 38,000 through the implementation of an ambitious sewage facilities program. Thus it is estimated that 132,000 fewer persons will rely upon on-site systems in 1979 than in 1969 despite a county-wide population increase of approximately 168,000.

2. Evidence indicates that even apparently reliable on-site wastewater disposal systems may prove unreliable in the future. Increasing per capita water consumption overloads the capacity of on-site disposal systems. In the days when household water was pumped by hand from a well, the volume of wastewater was quite minimal and the disposal of wastewater was comparatively quite simple and safe. The electric pump facilitated obtaining household water in greater volume and led to such modern conveniences as flush toilets, washing machines, automatic washers, dishwashers and garbage disposal units. These various conveniences, which are so often viewed as essential to the homeowner, have caused many problems for on-lot disposal systems.

3. The ineffectiveness of on-site systems is difficult to measure statistically because the Pennsylvania Department of Health's records are kept on a "complaint basis" rather than as a result of a systematic surveillance. Many county residents are unaware of the Department of Health's role in questions affecting public sanitation, while others are reluctant to report malfunctioning for fear of costs resulting from remedial measures.

4. Many newly installed on-site sewer disposal systems appear to function satisfactorily for a period of time and possible health hazards are not recognized until they become quite severe. Based on past experience it can be concluded that many newly installed systems will malfunction after soils become saturated with effluent and can no longer dispose of wastewater. The inability to pinpoint a time period or to document the number of malfunctioning systems should not be viewed as an excuse for minimizing the problems.

5. On-site disposal systems are found throughout those portions of Montgomery County where public sewer service is not available. They are found in direct proportion to the density of development in such areas and are related to the magnitude of the potential problems encountered.

Because of the importance of relating sewage facilities planning to various physiographic considerations, a major thrust of the Montgomery County Sewage Facilities Plan places emphasis on watershed-wide considerations. Drainage basins, slopes and layer relief have been considered since they involve decisions and recommendations of the sewage facilities plan. This chapter has also included a discussion on the relationship between soils and the use of on-site sewage disposal systems in the county. Because of the prevalence of generally unfavorable soils for on-site disposal systems, their use in Montgomery County should be curtailed and greater reliance must be placed upon providing public sewage facilities wherever they can be economically justified and especially to new developments of significant proportions.

III

WATER SUPPLY AND THE QUALITY OF SURFACE WATER IN MONTGOMERY COUNTY

In recognition of the interrelationship between sewer planning and the sources and distribution of potable water as well as the quality of surface water, attention has been directed in this chapter to these subjects. The satisfactory disposition of sanitary wastewater has a direct bearing on both the ground water and the surface water of Montgomery County, and both are utilized in the county as sources of water supply. Insufficiently treated wastewater is a major cause of surface water pollution in Montgomery County and contributes to the contamination of ground water supplies as well. Malfunctioning on-site disposal systems can directly lead to the contamination of both surface and ground water. Sewage treatment plant discharges that "overwhelm" the natural capacities of receiving streams directly lead to the contamination of surface water supply.

The first portion of this chapter considers the relationship between sewage disposal and water supply facilities, while the second portion is devoted to the subject of surface water quality. Background information has been assembled and analyzed to determine the impact and the extent of the interrelationship between matters involving water supply and quality of surface water as it affects and is affected by sewage facilities planning.

RELATIONSHIP BETWEEN SEWAGE AND WATER FACILITIES

1. Potential waterborne hazards to community health are virtually nonexistent where both public sewage and central water facilities have been provided. Conversely, community health hazards are potentially greatest where on-site sewage disposal systems and on-site water supply facilities are utilized.

2. There are many areas of the county where neither centralized water nor public sewage facilities are available; while in other areas one of these utilities is provided but not the other.

3. As long as on-site waste disposal is practiced in parts of Montgomery County and on-site water supply facilities are used in other parts, a potential but distinct health hazard exists.

4. Water pollution does not necessarily result from the disposal of wastewater only. Contamination of surface and ground water can and does result from the use of agricultural chemicals and fertilizers, animal wastes, industrial dusts and many other agricultural and urban activities.

5. Most of the county's population (72% according to current estimates) is served by centralized water supply systems, but this utility is available to only a relatively small portion of the county's land area.

6. One of the greatest challenges facing the county from a developmental standpoint is to insure the orderly provision of centralized water facilities and public sewage facilities to those areas now needing it as well as to all significant new development.

7. Every effort must be expended to insure coordination in the provision of centralized water and public sewage facilities with topographic

considerations (i.e. soil characteristics and geological formations especially), population densities and realistic zoning and other land use controls.

8. Approximately 195,000 Montgomery County residents presently depend upon on-site facilities for their water supply. This represents about 28% of the resident population, and they are widely distributed over two-thirds of Montgomery County's 500 square miles.

FACTORS INFLUENCING AVAILABILITY OF WATER

1. The two main sources from which water can be drawn for domestic, industrial and agricultural uses are: (1) surface water, and (2) ground water.

2. Surface water refers to water which flows over or rests upon the earth's surface. Surface water supplies are currently used on a very limited basis in the county. The Schuylkill River and the Perkiomen Creek (Green Lane Reservoir of the Philadelphia Suburban Water Company especially) are the largest of the two surface water supplies.

3. Virtually all other sources of water in the county involve ground water supplies. Geologic formations are the key to the availability of potable water from underground sources.

4. Ground water supplies vary from excellent in the case of the Stockton and Wissahickon formations to the Sunderland and Bryn Mawr formations where little or no water is found. Unfortunately most of the 18 bedrock formations found underlying Montgomery County's landscape are not good aquifers. Water supplies relying on such formations usually will not prove satisfactory. Of the 18 bedrock formations, those which are poor aquifers underlay the vast majority of the county's landscape.

5. Greater reliance will have to be placed on surface water supplies in the future as the county continues to develop because of the generally poor water bearing characteristics of the bedrock geology. Because of this expected reliance on surface water, the quality of the county's surface water is of major practical significance and this has a direct bearing on the county-wide sewage facilities plan.

CENTRALIZED WATER SUPPLY FACILITIES

1. In 1969, 24 water utility companies operated within Montgomery County and provided service to approximately 72% of the county residents (or 466,000 persons). These water utilities include municipal water departments, governmental water authorities, institutional water agencies and private water utility companies.

2. Information concerning the areas serviced, the primary and secondary sources of water utilized, the number of customers serviced and the estimated population served for each of these 24 water companies is embodied in figure iii-1.

3. Based upon information available, it would appear to be an entirely desirable objective to provide all future large-scale developments with both public sewer facilities and centralized water distribution systems.

Figure iii-1

CENTRAL WATER SUPPLY FACILITIES DATA FOR MONTGOMERY COUNTY

Municipality Served and/or Water Company-Authority	Other Areas Served	Sources and Impoundments (Primary Sources Listed First)	Customers Served	1969 Estimated Population Served
1. Ambler	Part of U. Dublin, Whitpain, L. Gwynedd and Whitemarsh	6 wells and springs	4,902	17,000
2. Collegeville-Trappe Joint Water Works	--	4 wells	725	5,500[a]
3. E. Greenville Water Works	--	Perkiomen Creek and 2 wells	600	2,000[a]
4. E. Norriton Water Co.	--	2 wells	80	240[a]
5. Hatboro Auth.	Part of Horsham and U. Moreland	9 wells	4,100	14,300
6. Hatfield Boro. Water Auth.	--	6 wells	N.A.	2,200[b]
7. Lansdale--North Penn Water Auth.	Souderton Boro., Franconia, Hatfield, Towamencin, L. Salford, U. Gwynedd and Montgomery Twps.	23 wells and bulk water from North Wales Water Auth.	8,000	28,000
8. L. Providence--Audubon Water Co.	--	3 wells	500	1,750
9. L. Providence--St. Gabriel's Hall	--	2 wells	--	210[a]
10. L. Providence--Valley Forge Industrial Park Water Co.	--	3 wells	--	N.A.
11. Norristown State Hospital	--	6 wells	--	7,000[a]
12. Norristown Water Co.	Bridgeport, part of E. Norriton, W. Norriton, L. Providence, Plymouth, U. Merion and Whitpain	Schuylkill River	18,738	65,500
13. North Wales Water Auth.	U. Gwynedd and L. Gwynedd, bulk water to North Penn Water Auth., Montgomery, Worcester, and Hatfield Twps., and bulk water to New Britain, Bucks County	9 wells	4,000	14,000
14. Pennsburg Water Co.	Part of U. Hanover, Montgomery County, and part of Hereford, Berks County	2 wells	700	2,400[a]
15. Philadelphia Suburban Water Co.	Bryn Athyn, Conshohocken, Jenkintown, Narberth, Rockledge and W. Conshohocken; Abington, Cheltenham, L. Merion, L. Moreland, Plymouth, Springfield, U. Dublin, U. Merion and Whitemarsh	Pickering Creek Reservoir; Perkiomen Creek: Green Lane Reservoir; Schuylkill River; 9 wells	71,576	250,500
16. Pottstown Boro. Water Dept.	W. Pottsgrove; part of U. Pottsgrove and L. Pottsgrove in Montgomery County, and N. Coventry in Chester County	Schuylkill River	9,300	35,000
17. Red Hill Water Auth.	--	spring	350	1,100[b]
18. Royersford Home Water Co.	Spring City and part of E. Vincent, both in Chester County, and part of Limerick and U. Providence in Montgomery County	Schuylkill River	2,557	9,000
19. Schwenksville Water Co.	Part of L. Frederick and Perkiomen	4 wells	370	1,500[a]
20. Skippack Twp. State Correctional Inst.	--	8 wells	--	2,000[a]
21. Telford Water	Souderton and part of Franconia in Montgomery County; part of Hilltown and W. Rockhill in Bucks County	3 wells	950	3,300
22. U. Dublin Twp. Delaware Valley Ind. Water Co.	Fort Washington Ind. Park	2 wells	25[a]	N.A.
23. U. Dublin--Dublin Water Co.	--	1 well	250	1,000[a]
24. Whitpain Twp.-Blue Bell Water Works Co.	--	3 wells	700	2,400
TOTALS			128,423	465,900

Notes: [a] "Water Resources Bulletin No. 3, Water Resources of the Schuylkill River Basin," Commonwealth of Pennsylvania Department of Forests and Waters, Harrisburg, May, 1968.

[b] "Comprehensive Plan Volume III, North Penn Area, Montgomery County, Pennsylvania," Montgomery County Planning Commission, Norristown, Pa., 1969.

Source: Interviews with utility representatives September 1969 unless otherwise indicated.

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Failure to accomplish this objective can only serve to create potential community health hazards in addition to those that now exist.

4. Every effort should be made to provide centralized water service to those developed areas of the county where such service is not now available in order to relieve the existing and/or potential health hazards.

QUALITY OF STREAM WATER IN MONTGOMERY COUNTY

1. Surface water is used by agricultural, industrial and public uses for many purposes including irrigation, industrial cooling and the assimilation of treated as well as untreated waste effluent. In addition to these consumer uses, surface water provides an environment for plant and animal life, is an important factor in active recreation and has aesthetic qualities which are important for passive recreation. Surface water adds to enjoyment in both urban and rural areas, but pollution reduces both the economic and social value of water.

2. The cause of water pollution varies. In rural areas waters are contaminated through agricultural activities (fertilizers, animal wastes, pesticides, erosion and sedimentation). The most common source of water pollution in urban areas is from municipal and industrial sewage and includes such other items as debris and oil spills.

3. Surface water pollution is measured by a number of criteria including fecal coliform, pH factor, Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), water temperature, turbidity and various other factors.

4. Both the federal and state governments have established standards for recreational water and for water supply purposes. These standards refer to the criteria measured in paragraph #3 above and are quite complex because of the many interrelationships involved in the question of water quality.

5. The federal standards refer to interstate waters and the state standards refer to other streams. Both sets of standards have been prepared with their own goals and conditions in mind and are not entirely consistent.

6. State standards apply to Montgomery County waters. These are set according to the uses desired for streams on a watershed basis. They are utilized by the technicians involved in sewage plant design and serve to establish guidelines for county-wide sewage facilities planning.

7. The quality of water reflected in the standards should be compared with existing conditions to determine the degree of water pollution prevalent in Montgomery County. Unfortunately not much information exists for determining the quality of the waters in the county. Most information comes from three relatively recent sources: (a) the Wissahickon Creek Study - beginning in 1958; (b) the Perkiomen Creek Study - summer of 1966; and (c) the Skippack Creek Study - 1970.

8. The Pennsylvania Department of Health provides additional sources of information. Three sampling stations are maintained by the department,

and supplemental information is available from the sampling stations maintained by the U.S. Geological Survey.

9. Not enough information is available from these various sources to draw county-wide conclusions. However, based upon information available, it would appear that stream degradation has advanced to severe levels in parts of Montgomery County. Presently available information provides significant warning signs.

10. More information is needed and appropriate agencies should increase not only the number of sampling stations but also the frequency of sample collection and analysis.

11. The Department of Health has undertaken the task of upgrading stream quality. The department has revised its requirements concerning the quality of the effluent by various watersheds in Montgomery County. Individual dischargers (both public and private) have been given notice of a time schedule to which they must conform for upgrading to the revised requirements. Within Montgomery County, revised requirements have been issued in the Neshaminy, Wissahickon and Perkiomen watersheds.

12. The Pennsylvania Department of Health conducts periodic inspections of sewage treatment and industrial effluents on a regular basis. According to the results of these inspections (June 1970), 73% of the dischargers are in compliance with state standards and 27% are not. Of the 27% not in compliance, approximately half are considered by the department to be making satisfactory progress toward upgrading, but the other half are not. Apparently greater pressure must be brought to bear upon those dischargers who are not in conformance with state standards to bring about compliance.

13. Even assuming complete compliance with current standards, the quality of surface water in Montgomery County would likely still be unsatisfactory.

Given the ever increasing demand for the adequate supplies of potable water from centralized sources, much more attention must be devoted in the future to safeguarding the quality of water supplies and to providing distribution systems. The quality of sewage treatment in Montgomery County has a direct bearing on the quality of surface water and an indirect bearing on the quality of ground water. The interrelationship between the provision of sewage collection systems and water distribution facilities must also be more clearly recognized. The provision of water supply distribution systems and the quality of water sources are recognized in the development of the county-wide sewage facilities plan.

IV

GATHERING DATA CONCERNING EXISTING FACILITIES

Preparation of a county-wide sewage facilities plan cannot be undertaken without obtaining and analyzing information concerning the existing collection systems and treatment facilities throughout the county. Because the existing facilities represent a tremendous capital investment, they must be recognized and considered as the basis upon which all subsequent sewer planning is predicated. Unfortunately it appears that some decisions reached in the past have not been reached with the type of overall guidance which comprehensive data would provide. Decisions have all too often been made on a piece-meal basis because of the independent and uncoordinated role of the multitude of governmental agencies and private organizations involved in the decision-making process.

The assembling of pertinent data concerning the existing sewage facilities in Montgomery County into a unified and cohesive format can rightfully be viewed as a major step forward that has been accomplished through Act 537 activities. For the first time, extensive information has been gathered concerning existing sewage facilities throughout Montgomery County. Moreover, it has been organized in a manner which permits its acquisition by a wide variety of potential users.

METHODS UTILIZED TO GATHER DATA

1. Two questionnaires were utilized as a first step in gathering data. One questionnaire concerned municipal zoning regulations and was addressed to the chief administrative officer of each of the county's 38 townships and 24 boroughs. The second questionnaire was concerned with sewage treatment and collection facilities and was addressed to the operators of the various treatment facilities.

2. Personal interviews were utilized as a follow up to the questionnaires. The planning staff visited municipal officials to elicit zoning information while the engineering consultants visited plant operators.

3. Visual inspection of the treatment plant sites was made by the engineering consultant.

4. Records of the Pennsylvania Department of Health, the Delaware Valley Regional Planning Commission and the Delaware River Basin Commission were used to supplement other information obtained.

ESTABLISHMENT OF WORKING FILES

1. Information assembled has been placed in working files that have been established for each sewage treatment plant. A typical working file consists of: a) engineering data, b) analysis and evaluation of all components of the treatment facility, c) plot plan of the site, d) aerial photo of the area, and e) tax plat.

2. In addition to providing necessary background information for the development of a county-wide sewage facilities plan, the working files contain information which should prove useful to: a) municipalities and their engineering consultants, b) representatives of county, region, state and basin commissions in their review of applications for proposed

facilities, c) the Montgomery County Sewer Coordinator (a proposal endorsed by this report), and d) numerous private individuals and organizations desirous of obtaining information concerning sewage facilities in the county.

3. Once established, the information in the working files should be kept current by periodic and systematic surveys, interviews and orderly record keeping.

4. The working files should facilitate the establishment of a centralized data collection system which provides the systematic gathering of important data and which facilitates its analysis and use by a wide variety of users for various purposes.

CENTRALIZED DATA COLLECTION SYSTEM

1. For each sewer treatment plant the following information should be maintained: an identification number, location (by watershed, municipal jurisdiction and street system), area served, characteristics of receiving stream and characteristics of the physical plant (including treatment processes, difficulties encountered in treatment and land use characteristics, for example).

2. For pumping stations and force mains the following information should be maintained: facility identification number, location (by sewer treatment plant, watershed, municipal jurisdiction and street system) and physical characteristics of the station or force main (including age, capacity and limitations, for example).

MAPPING THE DATA GATHERED

1. The spatial distribution of treatment plants, pumping stations, force mains, interceptors and other significant components of a given sewage collection and treatment system was best accomplished through mapping techniques.

2. Mapping of existing sewage facilities was accomplished on a municipality-by-municipality basis on 1"=800 foot maps for townships and 1"=200 foot maps for boroughs (see sample - figure iv-1).

3. All facilities which were either operational, under construction or under contract for construction were mapped.

4. These specimen maps prepared for the county-wide sewage facilities plan represent the first comprehensive compilation of existing sewer lines within Montgomery County. Surprisingly they represent the first compilation of this information for certain municipalities.

5. The systematic plotting of existing sewer facilities can justifiably be viewed as a significant by-product of the county sewer plan.

DIFFICULTIES ENCOUNTERED IN GATHERING DATA

1. The data gathering process proved much more complex and time consuming than had been anticipated. Many municipalities had no comprehensive data available.

LOWER MORELAND TOWNSHIP – BRYN ATHYN BOROUGH

Montgomery County, Pennsylvania

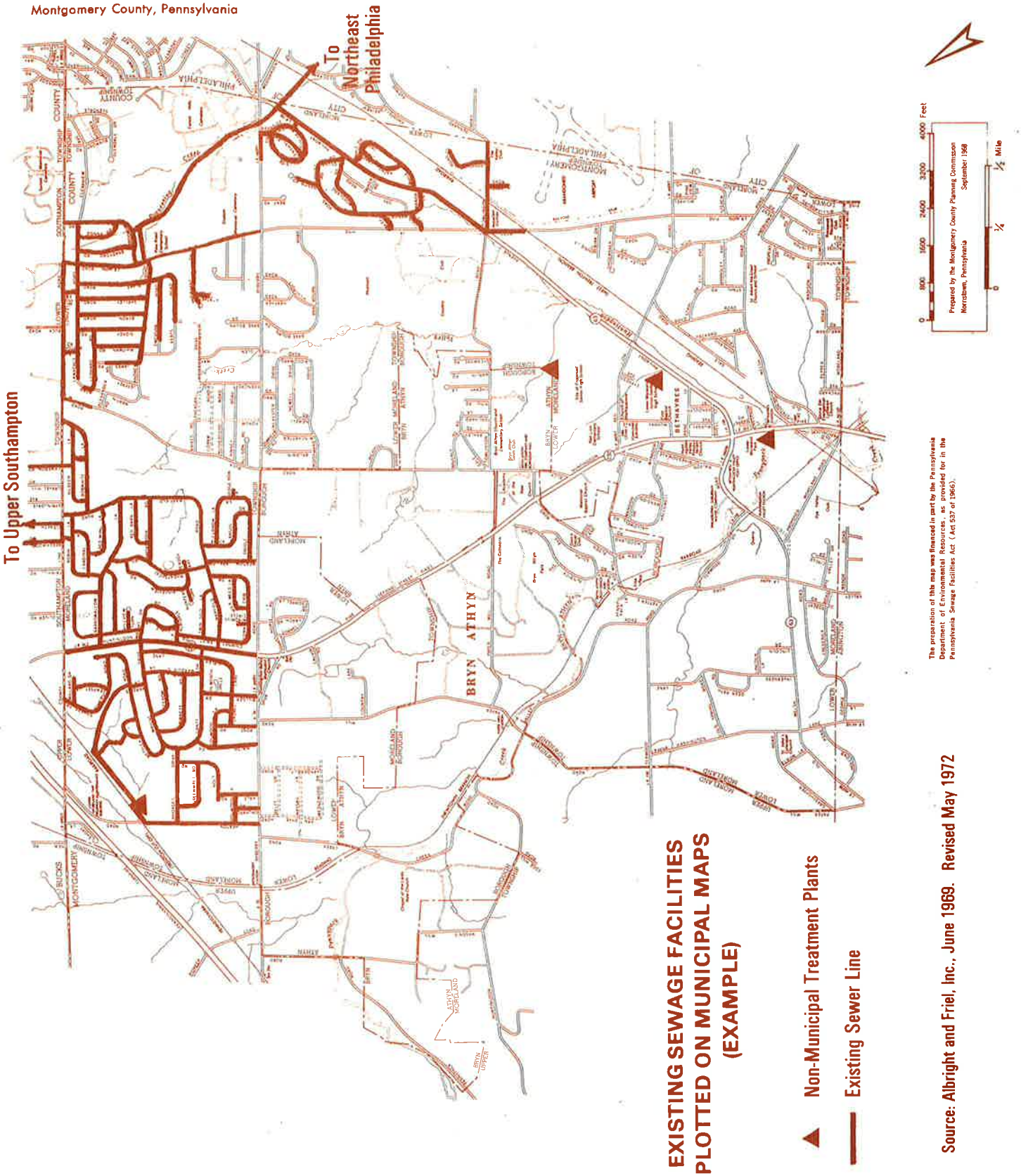

Figure iv-1

2. Municipalities often tend to rely upon their engineering consultants for maintenance of basic information. This proves to be an undesirable and impractical method since a given engineering consultant is not a permanent part of the local government scene and many different firms are employed.

3. Apparently no information is now available on some of the older systems in the county. (Some are over 50 years of age so this lack of data is understandable.)

4. Municipalities tend to place heavy reliance upon the personal knowledge of key people. When plotting information on a systematic basis, this personal knowledge results in the discovery of many gaps in information.

ROLE OF THE COUNTY SEWER COORDINATOR

1. Because of the difficulties encountered in gathering the data and the importance of the data now that it has been gathered, it is strongly recommended that Montgomery County establish the position of a county sewer coordinator and that he be charged with the responsibility of maintaining and periodically updating this plan.

2. In addition, responsibilities of the sewer coordinator should include establishing close working relationships with: (a) each of the county's 62 municipalities, and (b) representatives of the Delaware River Basin Commission, the Delaware Valley Regional Planning Commission, Pennsylvania Department of Health and its counterpart in neighboring counties (Berks, Bucks, Chester, Delaware, Lehigh and Philadelphia).

3. To insure adequate internal communications the sewer coordinator should maintain contacts with the county Sewer Authority, the county planning commission and the county Department of Public Facilities so as to: (a) facilitate and assist in expediting the receipt of federal and state grants-in-aid for the needed sewage facilities, (b) assist local agencies' building and operating facilities in every possible way, and (c) assure full implementation of this plan.

4. Within the private sector of the economy the sewer coordinator should contact engineering consultants who are active in sewer work as well as with large land developers, builders and others directly involved with activities affecting the sewer facilities program so as to exert a positive influence and thereby facilitate and expedite implementation of the plan.

5. The county sewer coordinator should develop a sophisticated system to facilitate the retrieval of data from the working files, the centralized data collection system and the maps of existing sewage facilities for all of the above referenced organizations and individuals.

6. The major role of the sewer coordinator would be to coordinate activities involving both private and public facilities in and near Montgomery County so as to insure that both effective long-term and short-run solutions to day-to-day problems are developed.

One of the major by-products of the Montgomery County Sewage Facilities Plan has been the assembling of essential background information. The systematic inventory and presentation of this material should be viewed as a major accomplishment of Act 537 activities. The value of the data that has been assembled will henceforth depend partly on its periodical updating, which is an important ingredient of ongoing sewage facilities planning. A major recommendation of this plan, therefore, is to immediately establish the appropriate mechanism for maintaining, refining and updating the data that has been gathered. Future decisions to be reached concerning sewage facilities in the county should be thereby facilitated.

V

EXISTING SEWAGE FACILITIES IN AND AFFECTING MONTGOMERY COUNTY

Collection systems had no doubt been known in the county before the twentieth century. However, it appears that these systems afforded no treatment prior to disposal. Hence, raw sewage was deposited into rivers and watercourses for many years. Around the turn of the twentieth century population increases and technological advances rendered the "primitive" form of wastewater disposal unacceptable in certain Montgomery County communities. The first sewage collection system that was constructed in Montgomery County with treatment facilities provided as an integral part of collection was accomplished by Lower Merion Township in 1904. The next "benchmark" for sewage collection and treatment occurred in 1915 when North Wales constructed the first modern sewage treatment facility in the county.

Today it is estimated that approximately 74% of all the county's residents, or 490,000 persons, are served by some type of centralized collection and treatment system.

This chapter will consider the various types of existing sewage treatment facilities that are distributed both in Montgomery County and in watersheds adjacent to Montgomery County. In addition to sewage treatment plants, various aspects of the sewage collection systems will also be considered. The growth of sewage facilities in the county will also be placed in historic perspective.

TYPES OF EXISTING WASTEWATER TREATMENT FACILITIES

1. The county-wide inventory has revealed that within the political boundaries of Montgomery County there are a total of 90 sewage treatment facilities as of October 1969.

2. These 90 treatment facilities have been grouped into three separate categories: (a) municipal treatment plants; (b) industrial treatment plants; and (c) non-municipal treatment plants.

3. The county-wide inventory indicates that there are 29 municipal plants. These are owned and operated by municipalities and generally provide service to all types of land uses. They are normally considered as public facilities in the full sense of the phrase.

4. The survey indicates that there are 26 industrial wastewater treatment plants. Many of these are designed to treat combined sanitary and industrial wastes, while others are designed specifically to treat only those harsh industrial wastes that are unacceptable to conventional sanitary treatment processes.

5. The 35 non-municipal treatment plants accommodate a wide variety of uses including apartment complexes, military installations, nursing homes, hospitals, motels, mobile home parks, camp sites, commercial establishments, schools, residential subdivisions and a correctional institution.

6. Although the Pennsylvania Sewage Facilities Act did not specifically require an inventory of industrial and non-municipal plants, it is obvious that information concerning these facilities is a necessary input to the development of a meaningful county-wide sewage facilities plan.

Figure v-1

LIST OF WASTEWATER TREATMENT PLANTS IN MONTGOMERY COUNTY
BY TYPE, MUNICIPALITY AND RECEIVING STREAM

● MUNICIPAL TREATMENT PLANTS

Map No.	Municipality	Identification	Receiving Stream
1	Conshohocken	Conshohocken Municipal Authority	Schuylkill River
2	Douglass	Berks-Montgomery Joint Municipal Authority	West Swamp Creek
3	Douglass	Boyertown Sewage Treatment Plant	West Swamp Creek
4	Franconia	Souderton Municipal Sewer Authority	Little Skippack Creek
5	Franconia	Telford Municipal Sewer Authority	Indian Creek
6	Green Lane	Green Lane-Marlborough Joint Authority	Perkiomen Creek
7	Hatfield Boro.	Hatfield Boro. Municipal Sewer Authority	Neshaminy Creek (West Branch)
8	Hatfield Twp.	Hatfield Twp. Municipal Authority	Neshaminy Creek (West Branch)
9	Lansdale	Lansdale Municipal Sewer Authority	Neshaminy Creek (West Branch)
10	Lower Salford	Lower Salford Twp. Authority	Tributary of Indian Creek
11	Norristown	Norristown Municipal Sewer System	Schuylkill River
12	Plymouth	East Norriton/Plymouth Joint Sewer Authority	Schuylkill River
13	Pottstown	Pottstown Municipal Sewer Authority	Schuylkill River
14	Schwenksville	Schwenksville Boro. Authority	Perkiomen Creek
15	Towamencin	Upper Gwynedd-Towamencin Municipal Sewer Authority	Towamencin Creek
16	Upper Dublin	Abington Twp. Municipal Sewer Authority	Sandy Run
17	Upper Dublin	Aiden Lair Treatment Plant	Pine Run
18	Upper Dublin	Ambler Municipal Sewer System (North)	Wissahickon Creek
19	Upper Dublin	Ambler Municipal Sewer System (South)	Wissahickon Creek
20	Upper Gwynedd	North Wales Municipal Sewer System	Wissahickon Creek
21	Upper Gwynedd	Upper Gwynedd Twp. Authority	Wissahickon Creek
22	Upper Hanover	Upper Montgomery Joint Authority	Perkiomen Creek (Green Lane Reservoir)
23	Upper Merion	Bridgeport Municipal Sewer System	Schuylkill River
24	Upper Merion	Upper Merion Twp. Municipal Sewer Authority (Matsunk Wastewater Control Center)	Schuylkill River
25	Upper Merion	Upper Merion Twp. Municipal Sewer Authority (Trout Run Plant)	Schuylkill River
26	Upper Moreland	Upper Moreland-Hatboro Joint Authority	Pennypack Creek
27	Upper Providence	Montgomery County Sewer Authority	Perkiomen Creek
28	Upper Providence	Royersford Municipal Sewer Authority	Schuylkill River
29	Whitemarsh	Whitemarsh Twp.Municipal Sewer Authority	Tributary of Schuylkill River

▲ NON-MUNICIPAL TREATMENT PLANTS

Map No.	Municipality	Identification	Receiving Stream
1	Abington	Holy Redeemer Hospital	Tributary of Pennypack Creek
2	Abington	Meadowbrook Apartments	Tributary of Pennypack Creek
3	Bryn Athyn	Academy of the New Church	Tributary of Huntington Valley Creek
4	Collegeville	College Arms Apartment	Perkiomen Creek
5	Collegeville	Ursinus College	Perkiomen Creek
6	Horsham	English Village Apartments	Tributary of Park Creek
7	Horsham	St. Catherine of Sienna	Tributary of Pennypack Creek
8	Horsham	U.S. Naval Air Station at Willow Grove	Tributary of Little Neshaminy
9	Limerick	Limerick Township Elementary School	Tributary of Perkiomen Creek (Landis Brook)
10	Limerick	Limerick Trailer Park	Tributary of Perkiomen Creek
11	Limerick	Ridge View Terrace Mobile Home Park	Subsurface
12	Limerick	Western Montgomery County Vocational-Technical School	Tributary of Perkiomen Creek
13	Lower Gwynedd	Gwynedd Mercy College	Tributary of Wissahickon Creek
14	Lower Gwynedd	Silver Stream Nursing Home	Tributary of Wissahickon Creek
15	Lower Moreland	BethAyres Estate	Pennypack Creek
16	Lower Moreland	Chapel Hill Sewage Co.	Tributary of Southampton Creek
17	Lower Moreland	Lower Moreland School District Authority	Huntington Valley Creek
18	Lower Pottsgrove	Arlan's Department Store	Tributary of Sprogels Run
19	Lower Pottsgrove	North End Shopping Center	Tributary of Sprogels Run
20	Lower Providence	Collegeville Inn	Perkiomen Creek
21	Lower Providence	Valley Forge Terrace Mobile Home Park	Schuylkill River
22	Lower Salford	New Life Boys' Ranch	Tributary of East Branch Perkiomen Creek
23	Marlborough	Northeast Bible Inst.	Green Lane Reservoir
24	Marlborough	Candlewick Inn	Tributary of Perkiomen Creek
25	Montgomery Twp.	Golden Chariot Motel	Little Neshaminy Creek
26	Montgomery Twp.	Montgomery Elementary School	Tributary of Little Neshaminy Creek
27	New Hanover	New Hanover-Upper Frederick Joint Elementary School	Tributary of Swamp Creek
28	Salford	Camp Green Lane	Ridge Valley Creek
29	Skippack	Skippack Elementary School	Tributary of Perkiomen Creek
30	Skippack	State Correctional Institution	Tributary of Perkiomen Creek
31	Upper Frederick	Camp Laughing Waters	Swamp Creek
32	Upper Frederick	Mennonite Home for the Aged	Tributary of Swamp Creek
33	Whitemarsh	Sheraton-Penn Pike Motor Inn	Sandy Run
34	Worcester	Lower Providence-Worcester Joint School Authority	Tributary of Skippack Creek
35	Marlborough	Green Lane Trailer Park	Perkiomen Creek

■ INDUSTRIAL TREATMENT PLANTS

Map No.	Municipality	Identification	Receiving Stream
1	Ambler	Nicolet Industries	Wissahickon Creek
2	Bridgeport	Daring Paper Co.	Schuylkill River
3	Bridgeport	Poly-Chem Div. of Budd	Schuylkill River
4	Franconia	North Penn Hide Co.	Skippack Creek
5	Hatfield Twp.	Hunter Spring Co.	Tributary of W. Branch of Neshaminy Creek
6	Hatfield Twp.	Link Belt Co.	West Branch of Neshaminy Creek
7	Lansdale	American Olean Tile Co.	Tributary of W. Branch of Neshaminy Creek
8	Lansdale	Philco-Ford Co.	Towamencin Creek
9	Lower Providence	Ajax Stamping Co.	Tributary of Perkiomen Creek
10	Lower Providence	Superior Tube Co.	Tributary of Perkiomen Creek
11	Norristown	Nicolet Industries	Schuylkill River
12	Towamencin	Nyce Ball Bearing Co.	Tributary of Skippack Creek
13	Upper Dublin	Delaware Valley Industrial Sewage Co.	Pine Run
14	Upper Dublin	Selas Corporation	Tributary of Pine Run
15	Upper Gwynedd	Leeds & Northrup	Tributary of Wissahickon Creek
16	Upper Gwynedd	Merck, Sharpe & Dohme	Tributary of Wissahickon Creek
17	Upper Gwynedd	Precision Tube Co.	Wissahickon Creek
18	Upper Hanover	Pillsbury Co.	Tributary of Perkiomen Creek
19	Upper Providence	B.F. Goodrich Co.	Schuylkill River
20	West Conshohocken	Westfield Paper Co.	Gulph Creek
21	West Norriton	Taylor Corporation	Subsurface
22	West Pottsgrove	Doehler-Jarvis Div. of National Lead Corp.	Subsurface
23	Whitemarsh	McNeil Laboratories, Inc.	Sandy Run
24	Whitemarsh	Weyerhauser Co.	Schuylkill River
25	Abington	Standard Pressed Steel	Tookany Creek
26	Ambler	Certain-Teed Pipe Co.	Wissahickon Creek

Note: Map Numbers refer to Figure v-2.

Source: Records of Pennsylvania Department of Health and refined from field checks by Montgomery County Planning Commission and Albright & Friel.

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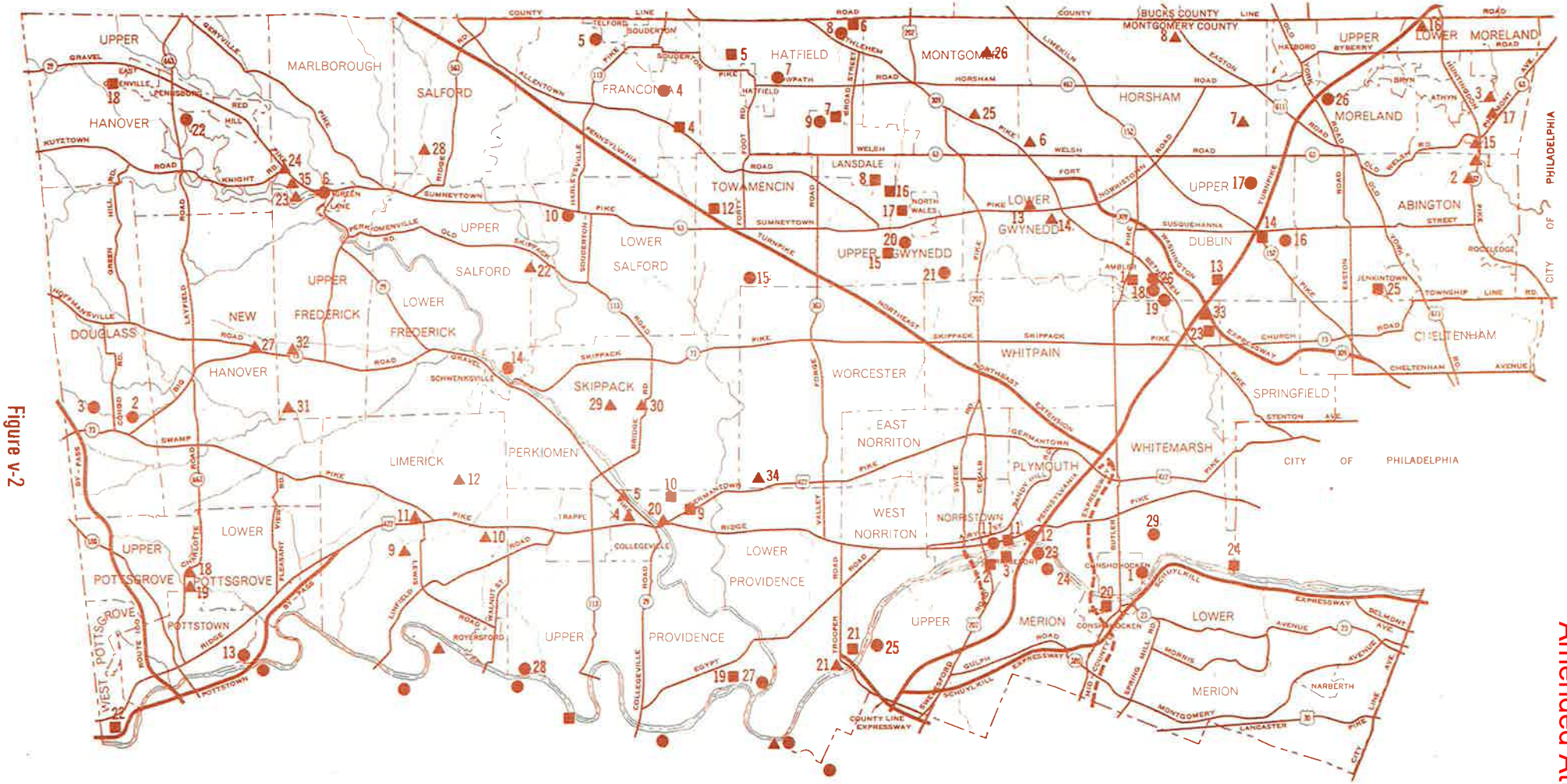
MUNICIPAL, NON-MUNICIPAL, AND INDUSTRIAL WASTEWATER TREATMENT PLANTS IN MONTGOMERY COUNTY



- Municipal Plants
- Non-Municipal Plants
- Industrial Plants

Note: Numbers refer to Figure v-1

Note: For greater detail refer to Figure v-6

0 1 2 3 4 5 6 Miles

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania March 1967

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Montgomery County Planning Commission, 1970.
Revised May 1972

Figure v-2

Other methods of disposing wastewater in Montgomery County are provided by lagoons, holding tanks and spray irrigation as well as illegal direct discharges. For the purposes of this report they have not been considered although a more detailed study and analysis should be undertaken in the future. The Department of Health has recently undertaken a program of reevaluating its policies toward these methods of disposal.

DISTRIBUTION OF SEWAGE TREATMENT FACILITIES IN MONTGOMERY COUNTY

1. A complete list of the 90 treatment plants according to their type (municipal, industrial and non-municipal), the municipalities in which they are located and their receiving streams is summarized in figure v-1.

2. The spatial distribution of the 90 wastewater treatment plants in operation in Montgomery County has been summarized in graphic form in figure v-2.

3. Much of Eastern Montgomery County (Cheltenham, Abington, Jenkintown and Rockledge) have extensive collection systems with treatment afforded on the Delaware River in Northeast Philadelphia.

4. Springfield, Narberth and much of Lower Merion are afforded service through extensive collection systems, and treatment is provided on the Schuylkill River in Southwest Philadelphia.

5. Many Montgomery County residents are afforded sewer service well beyond the county's boundaries. Interestingly enough, most of these cooperative efforts in solving sewer problems are longstanding and demonstrate a desirable degree of farsighted watershed-wide planning by responsible municipal officials.

6. The balance of Montgomery County's residents that are provided with public sewer service find municipal treatment facilities scattered over most of the county's landscape generally in a direct relationship to population concentrations. However, both industrial and non-municipal treatment plants are located in a much more random pattern and, therefore, do not display a direct relationship to population centers.

SEWAGE TREATMENT PLANTS IN WATERSHEDS ADJACENT TO MONTGOMERY COUNTY

1. Sewer planning for Montgomery County cannot realistically stop at the county boundary. Therefore, it was necessary to delineate drainage basins that have a direct bearing on the county sewage facilities plan and to survey both existing and proposed treatment facilities in these drainage basins.

2. Twenty-three drainage basins have been identified in Berks, Bucks, Chester, Delaware and Lehigh counties as well as in the city of Philadelphia that have a direct bearing on Montgomery County sewer planning. Some of these drainage basins lie astride the county boundary (for example, the Neshaminy Watershed is in both Montgomery and Bucks counties), while some of them are solely in neighboring counties (for example, the French Creek Watershed is solely in Chester County).

3. Based on material assembled, it is now evident that at least 36 existing and proposed municipal, non-municipal and industrial wastewater treatment plants are located in those portions of neighboring counties which have a direct effect on Montgomery County's sewer planning.

4. The watershed, county, type, identifying name and both the present status and the 10-year plan status of each of these 36 wastewater treatment plants are summarized in figure v-3.

5. The location of these 36 sewer treatment plants is graphically summarized in figure v-4. This graphic also serves to delineate the 23 drainage basins previously discussed.

6. Of the 36 plants, 32 now exist and four are proposed.

7. Of the 36 plants, eight are located (or proposed) in Bucks County, eight in Berks County, 18 in Chester County, two in Philadelphia and none in Delaware or Lehigh counties.

8. Twelve of the 32 existing plants are municipal, two are industrial and 18 are non-municipal. Of the four proposed treatment plants, three are proposed as municipal facilities, while one is proposed as a non-municipal plant.

9. Of the 32 existing plants, 17 are recommended for phasing out, six municipal plants are to be expanded and the remaining nine plants are to be unchanged.

AREAS WHERE SEWAGE TREATMENT PLANTS ARE CLUSTERED

1. The proliferation of sewage treatment plants is an undesirable feature since it compounds problems of wastewater management, makes the maintenance of stream quality a major problem of coordination, fosters duplication and overlapping of services and facilities and renders both the construction and operation of sewer systems more expensive.

2. Fourteen areas have been identified where treatment plants are proliferated. Ten of these 14 clusters are located solely within Montgomery County, three involve Montgomery County and one other county and one involves Montgomery and two other counties.

3. Figure v-5 graphically summarizes the location and areal extent of each of the 14 clusters.

4. Municipal, industrial and non-municipal treatment plants are all included in the delineation of clusters.

5. The cluster with the most treatment plants encompasses a 13-mile stretch of the Schuylkill River from Port Kennedy to Linfield. In this stretch there are 12 treatment plants, six of which are in Montgomery County and six in Chester County. Of the 12, five are municipal, four are industrial and three are non-municipal. In addition, two new treatment plants have been proposed within this proliferated stretch and both are in Chester County.

6. The cluster solely within Montgomery County with the most treatment plants is also found along the Schuylkill River. In the six-mile stretch between Miquon and Norristown, there are 11 treatment plants.

Figure v-3

LIST OF SELECTED WASTEWATER TREATMENT PLANTS LOCATED IN WATERSHEDS ADJACENT TO MONTGOMERY COUNTY

Number	Watershed	Name	County	Type	Existing Status 1970	Future Status 1979
1	Neshaminy	Chalfont-New Britain	Bucks	Municipal	Existing	Keep
2	Neshaminy	Doylestown (Harvey Street Plant)	Bucks	Municipal	Existing	Phase out
3	Neshaminy-Little Branch	Warminster Township	Bucks	Municipal	Existing	Keep
4	Neshaminy-Little Branch	Warrington Sewer Company	Bucks	Non-municipal	Existing	Phase out
5	Neshaminy-Little Branch	Palomino Sewer Company	Bucks	Non-municipal	Existing	Phase out
6	Neshaminy-Little Branch	Paul Valley	Bucks	Non-municipal	Existing	Phase out
7	Perkiomen-East Branch	Perkasie-Sellersville Boroughs	Bucks	Municipal	Existing	Keep
8	Perkiomen-Unami Creek	Finland	Bucks	Proposed municipal	Proposed	Keep
9	Perkiomen-West Branch	Bally	Berks	Municipal	Existing	Keep
10	Manatawny	Morysville	Berks	Municipal	Existing	Keep
11	Manatawny	Pleasantville	Berks	Proposed municipal	Proposed	Keep
12	Manatawny	Oley Valley School	Berks	Non-municipal	Existing	Phase out
13	Manatawny	East Vocational-Technical High School	Berks	Non-municipal	Existing	Phase out
14	Manatawny	Pine Forge Institute	Berks	Non-municipal	Existing	Keep
15	Upper Schuylkill	Amity Gardens	Berks	Non-municipal	Existing	Phase out
16	Upper Schuylkill	Mobile Parks Development, Inc.	Berks	Non-municipal	Existing	Phase out
17	Upper Schuylkill	North Coventry Township	Chester	Municipal	Existing	Keep
18	Upper Schuylkill-Pigeon	Turner's Trailer Grove	Chester	Proposed non-municipal	Proposed	Phase out
19	Upper Schuylkill	Pennhurst School	Chester	Non-municipal	Existing	Keep
20	Upper Schuylkill	Spring City Borough	Chester	Municipal	Existing	Keep
21	French	Owen J. Roberts School	Chester	Municipal	Existing	Keep
22	French	Oakleigh Mobile Homes Park	Chester	Non-municipal	Existing	Keep
23	French	French Creek Valley Joint School	Chester	Non-municipal	Existing	Keep
24	French	Phoenixville Borough	Chester	Municipal	Existing	Keep
25	French	Philadelphia Electric Company	Chester	Industrial	Existing	Phase out
26	Lower Schuylkill	Valley Forge Sewer Authority	Chester	Proposed municipal	Proposed	Keep
27	Lower Schuylkill	Freedoms Foundation	Chester	Non-municipal	Existing	Phase out
28	Lower Schuylkill-Valley	Paoli Industrial Park	Chester	Non-municipal	Existing	Phase out
29	Lower Schuylkill-Valley	Burroughs Corporation	Chester	Non-municipal	Existing	Phase out
30	Lower Schuylkill-Valley	Wyeth Laboratories	Chester	Non-municipal	Existing	Phase out
31	Lower Schuylkill-Valley	Camilla Hall	Chester	Non-municipal	Existing	Phase out
32	Lower Schuylkill-Valley	Immaculata College	Chester	Non-municipal	Existing	Phase out
33	Lower Schuylkill-Trout	Gulf Oil Turnpike Station #7	Chester	Industrial	Existing	Keep
34	Lower Schuylkill-Pickering	Great Valley High School	Chester	Non-municipal	Existing	Phase out
35	Delaware River	Southwest Philadelphia	Philadelphia	Municipal	Existing	Keep
36	Delaware River	Northeast Philadelphia	Philadelphia	Municipal	Existing	Keep

Source: Interviews and/or Act 537 Plan for neighboring counties.

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SELECTED TREATMENT PLANTS BY WATERSHED OUTSIDE MONTGOMERY COUNTY WITH RELATION TO COUNTY PLANTS

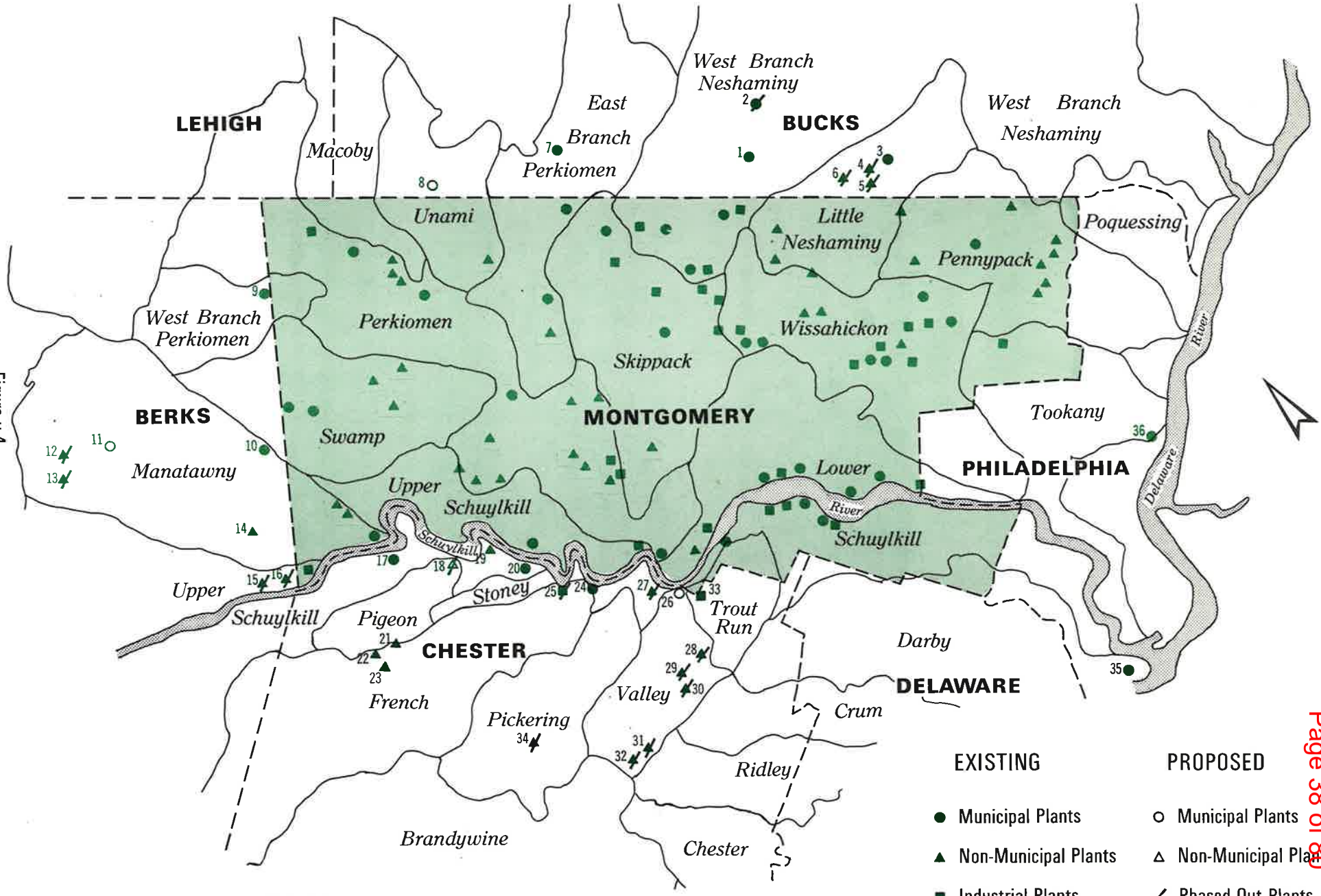

Figure v-4

EXISTING

- ● Municipal Plants
- ▲ Non-Municipal Plants
- ■ Industrial Plants

PROPOSED

- ○ Municipal Plants
- △ Non-Municipal Plants
- / Phased Out Plants

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania 1972

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Montgomery County Planning Commission, 1970. Revised May 1972

Note: Numbers refer to Figure v-3.

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CLUSTERS OF SEWAGE TREATMENT PLANTS IN MONTGOMERY COUNTY AND ADJOINING WATERSHEDS

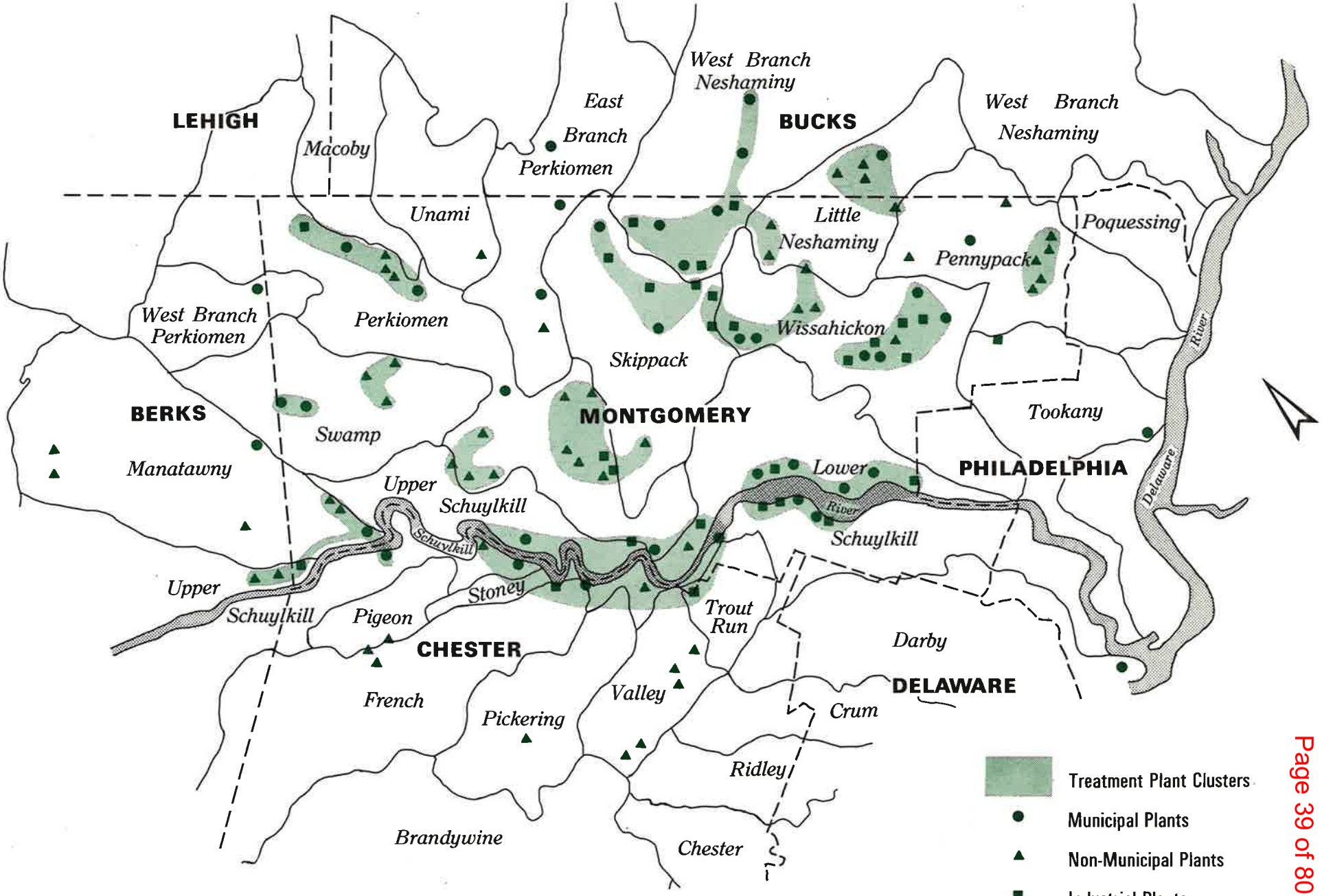

Figure v-5

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania 1972

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Montgomery County Planning Commission, 1970. Revised May 1972

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7. One of the primary goals of the county-wide sewage facilities plan is to reduce the problems inherent in areas where treatment plants have been clustered. This would be accomplished by eliminating as many of the treatment plants within the cluster as possible and by avoiding the addition of new facilities in close proximity to the existing plants.

SEWAGE COLLECTION SYSTEMS

1. Information concerning collection systems was gathered as part of the data collection phase by the consulting engineers. Information concerning the location and characteristics of trunk lines, pumping stations and force mains was gathered and plotted on municipal base maps.

2. Information plotted on these municipal maps was generalized into a county-wide map which summarizes the geographic distribution of major collection system components. This information is embodied in figure v-6.

3. This information graphically portrays for the first time the spatial distribution of significant components of sewage collection systems within Montgomery County. The compilation of this important information should be considered an important by-product of the county-wide sewage facilities plan.

4. In order to easily identify those land areas which readily can be served by the various components of sanitary sewage collection systems, generalized sewer service areas have also been defined and delineated.

5. Delineation of existing sewer service areas provides an important county-wide perspective or "overview" for an area of the size and complexity of Montgomery County. Existing sewer service areas have been delineated on figure v-6.

6. Approximately 30% of Montgomery County's landscape is now served by public sewage facilities based upon analysis of the sewer service area delineation. The geographic distribution of the sewer services areas is an almost direct index of the densities of population and intensity of land use.

HISTORIC GROWTH OF EXISTING SEWAGE FACILITIES IN MONTGOMERY COUNTY

1. Apparently many communities had collection systems which "dumped" raw sewage into the watercourses of Montgomery County for many years. The first modern treatment facilities were provided to a Montgomery County municipality when Lower Merion began the construction of a public sanitary sewage collection system in 1904. Treatment was afforded by the Southwest Philadelphia Sewer Plant on the Schuylkill River.

2. The first Montgomery County community which provided both a collection and wastewater treatment facility within the county was the Borough of North Wales in 1915.

3. The first three municipal treatment plants to become operational in the county served a combined 1920 population of 14,629 persons, all in the North Penn Area.

4. During the 1920's Abington, Cheltenham, Rockledge and Jenkintown began to develop sanitary collection systems with treatment afforded by the Northeast Treatment Plant in Philadelphia on the Delaware River. Major interceptor lines were located in both the Pennypack and Tookany watersheds.

5. During the 1930's the number of treatment plants in Montgomery County jumped from three to 10 with the construction of plants serving Norristown, Pottstown, Upper Moreland/Hatboro, Ambler, Conshohocken, Royersford and Telford.

6. Springfield Township, late in the 1930's, began the construction of a collection system with treatment afforded at the Southwest Treatment Plant in Philadelphia by way of the Wissahickon Creek interceptor. Unfortunately the execution of this inter-county agreement was the last in which significant land areas in Montgomery County were to be provided with public sewer service which found treatment facilities located in Philadelphia.

7. Between 1940 and 1960 only one municipal treatment plant was built - the Abington Township plant.

8. In the past decade no less than 18 municipal plants were constructed. This is compared to the construction of 11 municipal plants in the previous 44 years.

9. Such rapid sewage plant construction is an indication of a general awareness prevailing in Montgomery County concerning the need for public sewage facilities. It is also an indication that many pivotal decisions have been made within a short period of time by many independent organizations. These are conditions which are not generally conducive to reaching sound long-range solutions.

The 29 municipal treatment plants located in Montgomery County serve about 475,000 persons. This is contrasted with the three municipal treatment plants in Philadelphia which serve two million persons. These figures alone represent important indications concerning the vastly different approach to solving sewer treatment conditions. On the one hand, the regionalized or watershed-wide approach has been implemented, while on the other hand, many independent decisions have been reached. The county sewage facilities plan is the first attempt to provide overall guidance to sewer decisions in Montgomery County. This plan will hopefully facilitate the implementation of needed sewage facilities which will meet a short-term need and be the basis of meeting long-term requirements on a watershed-wide basis.

VI

EVALUATION OF EXISTING SEWAGE FACILITIES

In developing a county-wide sewage facilities plan, there is a need to evaluate the adequacies of the existing sewerage systems throughout the county. The evaluation process will facilitate the formulation of recommendations concerning the role that the various treatment plants and collector system components will play in both the long-term as well as short-term future. The evaluation process makes it possible to clearly identify those parts of the present systems that, for one reason or another, should not be relied upon to play a significant role in the establishment of a comprehensive and cohesive county-wide system of sewage facilities. Conversely, those components of the existing systems which do "score well" in an objective evaluation process represent the "building blocks" upon which the expansion of sewer service can be based.

In addition to identifying the existing components which should be "phased out of" or "planned in to" the county-wide sewage facilities plan, the results of the evaluation process will materially facilitate the decision-making process in terms of resource allocation. Since there are limited public funds available for the construction, expansion and/or updating of treatment plants and collection system components, it is necessary that the county-wide sewage facilities plan reflect the manner in which these limited funds can best be directed. Therefore, the evaluation process will help identify those facilities which, because they rate high, should be the recipients of scarce public funds, while those facilities which rate low would not be assigned a high priority in receiving the funds. Proposed new facilities can also be measured and compared to existing facilities in terms of resources allocated as well as in terms of evolving a county-wide facilities plan.

The evaluation process can best be accomplished in an orderly fashion by considering municipal treatment plants, non-municipal and industrial treatment plants and collection system components in three separate categories.

MUNICIPAL TREATMENT PLANT EVALUATION

1. Engineering considerations have been stressed, but note has been made of various pertinent administrative and planning factors.

2. Engineering evaluation techniques developed by the county's sewer consultants, Albright & Friel, Inc., involved choosing 10 factors, each weighed according to its relative importance to each other factor, and evaluating all 29 municipal plants for each factor. The sum of the 10 assigned factor weights gives each plant's score.

3. The 10 factors in order of relative importance are summarized on figure vi-1.

4. A total "weighted" score was developed for each plant on the scale of 0 to 10. On this scale 10 points represent a theoretically perfect plant while the worst possible plant would score 0.

5. The summary results of the municipal sewer treatment plant evaluation process have been graphically portrayed in bargraph form (see figure vi-2).

Figure vi-1

FACTORS AND WEIGHTS UTILIZED IN MUNICIPAL TREATMENT PLANT EVALUATION PROCESS

Factor Number	Scoring Factor Description	Percent
1.	Assimilative capacity of receiving stream	20.0
2.	Geographical location	16.2
3.	Expansion potential at plant site	15.0
4.	Availability of alternative treatment sites	13.2
5.	Present design capacity compared to potential loading	8.0
6.	Zoning in vicinity of plant site	7.2
7.	Optimum efficiency of treatment process	6.0
8.	Flexibility of process	5.6
9.	Physical condition of plant	4.4
10.	Sludge treatment and disposal	4.4
	Total	100.0

Source: Albright & Friel staff work.

6. The lowest of the 27 plants scored 3.75 (Souderton) while the highest is 6.89 (Pottstown).

7. All municipal sewage treatment plants scoring above 6.0 points are located on the Schuylkill River. This suggests the overall importance accorded the assimilative capacity of the receiving stream in treatment plant evaluations.

8. In addition to the engineering factors considered in the evaluation process, other factors should be considered in evaluating treatment plants. Unfortunately it is beyond the scope of this study to actually evaluate the facilities because of the general lack of data. In following up county-wide sewer planning activities, these other factors should be considered as the evaluation process becomes more refined.

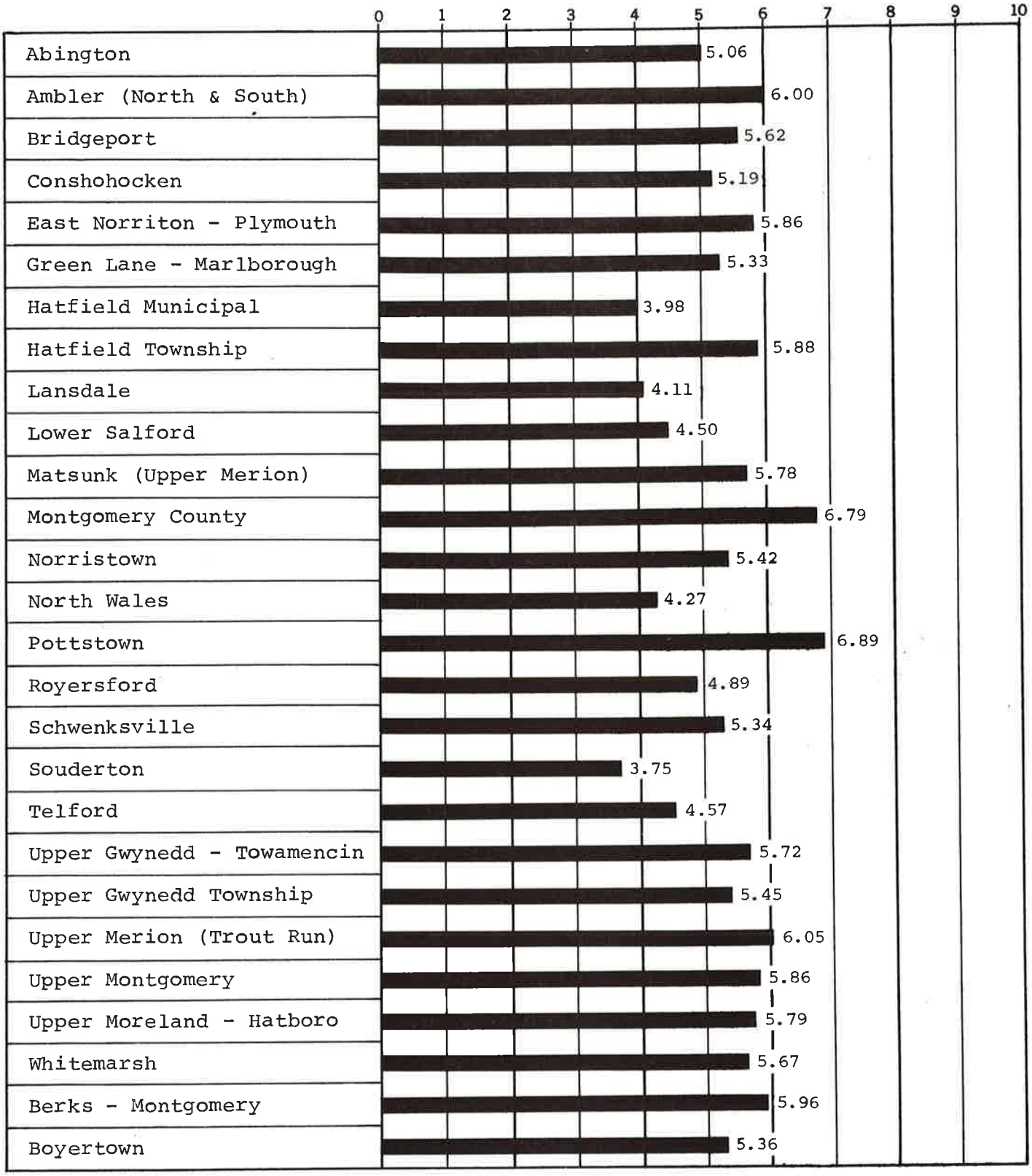
9. Such factors to be considered in subsequent studies include financial aspects (unamortized debt, rate of repayment and schedule of service costs), water management planning (emphasis on low flow in county streams and recreational use of water), plant management and plant aesthetics.

NON-MUNICIPAL AND INDUSTRIAL TREATMENT PLANT EVALUATION

1. No detailed evaluation of these types of treatment plants was possible because it was outside the scope of the report. However, in subsequent county-wide sewer planning activities, evaluation of all non-municipal and industrial treatment plants should be undertaken.

Figure vi-2

RESULTS OF MUNICIPAL
SEWAGE TREATMENT PLANT EVALUATION



Note: The Aiden Lair Sewage Treatment Plant in Upper Dublin has been excluded.
Source: Albright and Friel staff compilation.

2. For purposes of this plan, a basic goal was established that all non-municipal and industrial treatment plants would be phased out if they are located within a 10-year growth area and if their effluent were amenable to treatment processes at the municipal facility. This goal is based on the premise that a higher quality of treatment at less cost with better control is more possible through municipal sewer service than through non-municipal and industrial operations.

3. It is recognized that further technical study is required concerning the quality of industrial wastes. Some are probably not amenable to treatment in municipal plants without extensive pretreatment. Where this is the case the basic goal (refer to previous paragraph) must be adjusted accordingly.

4. All non-municipal and industrial treatment plants that lie beyond a 10-year growth area have been assumed to remain in operation for the term of the 10-year sewer plan regardless of their efficiency and effectiveness. These decisions are based on lack of reasonable alternatives rather than intrinsic desirability.

5. The future in-depth evaluation of non-municipal and industrial treatment plants should include consideration of the following: quality of wastes (especially for industrial plants), cost considerations, effect of effluent on receiving stream, coordinating and managing wastewater treatment and municipal land use plans and land development regulations.

COLLECTOR SYSTEMS EVALUATION

1. Whereas sewage treatment plants can usually be expanded to meet growth conditions, collector system components must be planned and constructed with the ultimate capacities in mind to the extent possible. Hydraulic capacity is the main variable for major interceptor lines, and the evaluation of a collector system should contrast capacity with projected demands. This is perhaps the most important single criteria in evaluating the role of interceptor lines in developing a county-wide sewage facilities plan.

2. Other elements to consider in evaluating collector system components are the ownership (private versus municipal), extent of storm water and ground water infiltration, original construction costs, age, condition and extent of reliance on force mains and pumping stations. Data gathered does not permit a detailed evaluation based on these various factors. However, subsequent county-wide sewage facilities planning activities should consider these facilities as part of its refined data gathering and planning process.

3. Limitations inherent in existing collector system components have been considered to the extent possible in both the delineation of 10-year growth areas and in the assignment of growth areas for treatment in specified municipal systems.

4. Land use types and densities are directly related to collector system components, especially when considering financial aspects. This interrelationship between land use and collector systems has been recognized as quite direct in the preparation of this plan. The relationship between land use and treatment facilities is much less direct.

5. Where evaluation shows that the existing collection systems cannot be adapted easily to handle flows from the outlying areas, the evolution of an orderly sewer system is adversely affected, the timing of service is modified and the costs are escalated. These practical realities have been recognized in developing the sewer plan.

Until recently the 27 public sewer systems in the county had not been viewed as being a major tool for combating stream pollution. They had been viewed essentially as disposing of wastes at minimum costs. In view of the new perspective it has been necessary to evaluate the existing systems so that subsequent public investments in sewer treatment plants and collection systems can more directly be applied to the dual purpose of handling sanitary wastewater in an economic manner and in combating stream pollution. This chapter has been concerned with the evaluation of existing sewage facilities so as to facilitate a more intelligent decision-making process concerning the allocation of scarce public funds.

VII

SEWER FEASIBILITY STUDIES UNDERTAKEN IN MONTGOMERY COUNTY SINCE 1960

In developing 10-year sewage facilities plans for Montgomery County, it is important to have a working knowledge of "current sewer thinking" throughout the county. Many sewer decisions are reached by townships and boroughs working independently, and the nature and status of local sewer activities can only be ascertained by relying upon virtually all readily available sources. One of these sources is the municipal and/or area comprehensive plan which is prepared by planning organizations for communities throughout the county; the other source of current sewer thinking is embodied in studies collectively known as sewer feasibility studies.

The purposes of this chapter are to consider and evaluate the thinking reflected in sewer feasibility studies that have been undertaken by Montgomery County municipalities in the past decade in recognition of the fact that they lay the foundations upon which the plans for the next decade could be based. Sanitary sewer feasibility reports represent important reference points in county-wide sewage facilities planning since they are necessary prerequisites to implementing municipal sewer programs. These feasibility reports include background information and advance recommendations to meet the sewer problems of a community in light of its financial or economic capacity. Many of the sewer feasibility studies present alternative means for providing sewer service to a given community.

A number of revisions are frequently required in the interval between the preparation of a sewer feasibility report and the implementation of a given proposal. A wide variety of engineering consultants have been called upon by the townships and boroughs of Montgomery County to develop sewer feasibility studies. Unfortunately some of the sewer feasibility studies that have been prepared have failed to relate the sewer solutions in one community to the sewer conditions in neighboring communities. In some cases the studies were conducted without the benefit of guidance by comprehensive plans and in all cases they were prepared without the assistance of a county-wide sewage facilities plan.

This chapter serves to summarize sewer feasibility studies prepared throughout Montgomery County since 1960, to evaluate the various alternatives that have been proposed and to examine the relationship of the proposals to the emerging county-wide sewage facilities plan.

COMPILATION OF DATA

1. Information has been obtained from those sewer feasibility studies which are on file in the offices of the supervising sanitarian of the Pennsylvania Department of Health. If the feasibility study was completed but not filed with the department, no reference has been noted and it has not influenced the formulation of the county-wide sewage facilities plan. However, all information gained through the various local contacts made as part of this study was explored to the extent practical.

2. Twenty-seven feasibility studies have been prepared for Montgomery County municipalities since 1960. The county planning staff and the engineering consultants have utilized these reports. The material they contain has been evaluated and incorporated into the sewage facilities plan for Montgomery County wherever practical.

Figure vii-1

INVENTORY OF SEWER FEASIBILITY REPORTS PREPARED SINCE 1960 FOR MONTGOMERY COUNTY MUNICIPALITIES

Community	Year of Study	Sewage Treatment Proposed	Area Covered by Recommended Sewer Lines	Status of Study	Comments
1. Lower Salford	1960	New sewage treatment plant	Harleysville Area	Essentially implemented	Sewage treatment plant built
2. West Norriton	1961	Treatment in existing Norristown Sewage Plant with alternative for new plant	Virtually all of the Township	Essentially implemented	Utilized Norristown Sewage Treatment Plant
3. Lower Providence	1961	Two alternate treatment plants	Trooper and Audubon	Essentially implemented	Abandon 2 proposed plants, utilized county facility
4. Lower Gwynedd	1962	Treatment in Ambler Sewage Plant	Penllyn and Spring House	Generally implemented	Utilized Ambler Sewage Treatment Plant
5. Towamencin	1962	New sewage treatment plant (joint with Upper Gwynedd)	Kulpsville	Essentially implemented	Sewage treatment plant built (joint with U. Gwynedd Township)
6. Upper Gwynedd	1962	New sewage treatment plant in Towamencin, and new plant in Upper Gwynedd	Most of Upper Gwynedd Township	Essentially implemented	Sewage treatment plants built (1 in Towamencin & 1 in U. Gwynedd)
7. Green Lane	1963	New sewage treatment plant (joint with Marlborough)	Entire Borough	Essentially implemented	Sewage treatment plant built (joint with Marlborough)
8. Marlborough	1963	New sewage treatment plant in Green Lane	Sumneytown	Essentially implemented	Sewage treatment plant in Green Lane
9. Hatfield Township	1963	Utilize existing sewage treatment plant	All but western Hatfield Township	Essentially implemented	Existing Sewage treatment plant utilized
10. Montgomery Township	1963	Utilize existing sewage treatment plant in Hatfield Township	Entire Township	Partially implemented	Utilized Hatfield Township Sewage Plant
11. Lower Moreland	1963	New sewage treatment plant proposed as alternate to tie in with Abington/Philadelphia system	Eastern portion of Township plus southern portion of Bryn Athyn	Partially implemented	Utilized Philadelphia system
12. Horsham	1963	Treatment in Upper Moreland/Hatboro plant as alternative for new plant	Eastern portion of Township	Partially implemented	New treatment plant not built - utilized U. Moreland-Hatboro Sewage Treatment Plant for portion implemented
13. East Norriton	1964	Two new plants proposed as alternative to treatment in Plymouth plant	All of Township	Generally implemented	Utilized Plymouth Treatment Plant as jointure
14. Montgomery County Sewer Authority	1964	New treatment plant	Lower Perkiomen Valley	Generally implemented	Sewage treatment plant built
15. Upper Providence	1965	Treatment in Montgomery County sewage plant	All of Upper Providence	Partially implemented	Utilizing County sewage treatment plant
16. Lower Pottsgrove	1963	Treatment in existing Pottstown plant with alternative as construction of new plant	Southern portion of the Township	Not yet implemented	--
17. Worcester	1963	New treatment plant proposed	Entire Township	Not yet implemented	--
18. Limerick	1964	Connection with other treatment plants and provision of new plants both considered	Entire Township	Not yet implemented	--
19. Upper Pottsgrove	1964	Treatment in existing Borough of Pottstown plant	All but northern portion of the Township	Not yet implemented	--
20. West Conshohocken	1965	New treatment plant proposed with treatment in existing Conshohocken plant as an alternative	Entire Borough	Not yet implemented	--
21. Lower Frederick	1966	New treatment plant proposed as alternative for utilizing Montgomery County plant	Entire Township	Not yet implemented	--
22. Collegeville	1966	Connection with Montgomery County plant	Central portion of Collegeville	Not yet implemented	--
23. Trappe	1966	Connection with Montgomery County Plant with alternative providing a new plant	Entire Borough	Not yet implemented	--
24. Franconia	1965-67	New treatment plant as one of many alternatives, some of which utilize existing facility	Franconia, Earlington to Telford/Souderton	Generally not yet implemented	--
25. New Hanover	1967	New sewage treatment plant	Southern half of Township is to be served	Not yet implemented	--
26. Skippack	1968	New treatment plant as an alternative to connecting into Montgomery County's plant	Entire Township	Not yet implemented	--
27. Perkiomen	1968	Connection into Montgomery County Plant	Entire Township	Generally not yet implemented	--

Sources: Sewer Feasibility Reports for identified communities--As filed with Montgomery County Supervising Sanitarian, Pennsylvania Department of Health.

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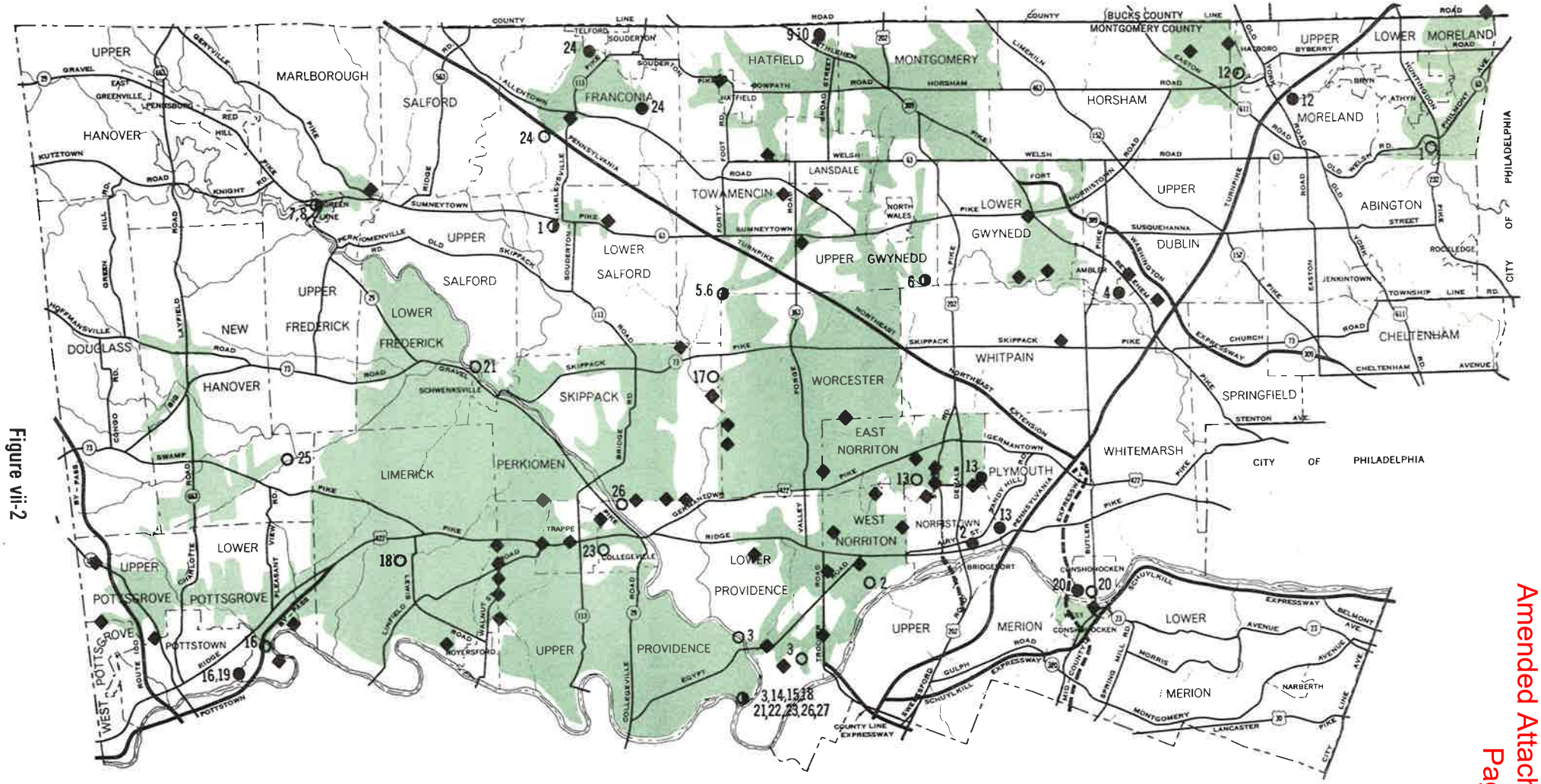
SEWAGE FACILITIES PROPOSED IN FEASIBILITY REPORTS FOR MONTGOMERY COUNTY MUNICIPALITIES SINCE 1960



- ● Existing Plants-Recommended, in feasibility reports, to be used for providing sewer service to new areas
- ◐ New Plants-Recommended, in feasibility reports, for construction and subsequently been built
- ○ Proposed Plants-Recommended, in feasibility reports, for construction but have not been built.

Service Areas as Proposed in Feasibility Reports

◆ Pumping Station

0 1 2 3 4 5 6 Miles

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania 1972

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Notes: (1) Map numbers refer to plants listed in Figure vii-1. (2) More than one number refers to alternative solution. (3) Plants with no direct bearing on recommendations not included.

Source: Pennsylvania Department of Health Sewer Feasibility Studies

Figure vii-2

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3. Information extracted from the feasibility studies has been summarized in tabular form in figure vii-1. This chart brings the status of the feasibility studies up-to-date by indicating the approximate extent that each study has been implemented.

4. Various information was extracted from each of the 27 feasibility studies. The geographic areas proposed to be served by the sewer feasibility studies have been graphically summarized in figure vii-2 and represent the "most representative" set of recommendations or alternatives that have been embodied in the various feasibility studies.

5. Fifteen of the 27 studies completed since 1960 have been partially or completely implemented. It is estimated that public sewerage service has been provided for approximately 25,000 persons.

6. Of those studies which have not been implemented to a significant degree, some propose the construction of new sewage plants, some recommend the utilization of an existing plant and, in some instances, the studies suggest both courses of action as alternatives. In view of the numerous advantages inherent in utilizing existing facilities as opposed to the construction of new treatment plants, the county-wide sewage facilities plan hereby encourages those communities to pursue the alternative which does not require the construction of a new sewage treatment plant but instead favors the expansion of existing facilities.

DESCRIPTION OF CONTEMPLATED FACILITIES

1. Most sewer feasibility studies were undertaken by communities located in the central third of Montgomery County. This represents primarily the "urban fringe area" and generally reflects the impact of developmental activity.

2. Eight of the 10 communities in the Lower Perkiomen Valley undertook feasibility studies between 1960 and 1968.

3. Most other feasibility studies were undertaken by communities in areas adjacent to existing sewer service areas. These communities include Upper and Lower Pottsgrove, Towamencin, Upper Gwynedd, Montgomery, Hatfield (T), Franconia, East Norriton, West Norriton, Lower Providence, Lower Gwynedd and Horsham.

4. Those municipalities whose feasibility studies were completed and at least partially implemented since 1960 (in chronological order) are as follows: Lower Salford, West Norriton, Lower Providence, Lower Gwynedd, Towamencin-Upper Gwynedd townships, Green Lane Borough-Marlborough Township, Hatfield-Montgomery townships, Lower Moreland, Horsham, East Norriton townships, Montgomery County Sewer Authority and Upper Providence Township.

5. Those municipalities whose feasibility studies have been completed since 1960 but have not as yet been implemented to a significant extent are as follows: Bryn Athyn Borough, Lower Pottsgrove, Worcester, Limerick and Upper Pottsgrove townships, West Conshohocken Borough, Lower Frederick Township, Collegeville and Trappe boroughs, and Franconia, New Hanover, Skippack and Perkiomen townships.

6. It is interesting to note that many of those feasibility studies that have not been implemented were undertaken in the latter part of the 1960's. The fact that they have not yet been implemented is partly due to the normal time lag between the undertaking of a sewer feasibility study and its implementation. It is noted that some of the communities are now in various stages of implementing their sewer feasibility plans.

7. Some of the 12 feasibility studies that have not as yet been implemented are as much as seven years old. Many of them would have to be updated prior to implementation so as to reflect growth that has taken place in the interim as well as changing financial conditions. Any such updating should make reference to the county-wide sewage facilities plan.

8. If all 12 of the feasibility studies were implemented, it is estimated that approximately 40,000 persons would be provided with public sewer service.

9. It is recognized that the implementation of many of these feasibility studies is dependent upon the willingness and ability of municipal governments and sewer authorities to cooperate with one another. This is true in both the multi-municipal programs involving sewage treatment plants as well as the expansion of major interceptor lines. Unless the appropriate level of coordination is achieved, the orderly expansion of existing systems will be frustrated and sewage treatment plants will be built that could have been avoided.

SUMMARY OF IMPLICATIONS

Information embodied in the feasibility studies referred to in this chapter will be evaluated for incorporation into the Sewage Facilities Plan of Montgomery County. Those recommendations found in the feasibility studies that have been implemented will, of course, be evaluated as existing facilities. However, those recommendations concerning the construction of major interceptor lines and new sewage treatment plants (or the major expansion of existing treatment plants) have been considered to ascertain their incompatibility with the emerging county-wide sewage facilities plan.

Wherever appropriate, recommendations formulated in municipal sewer feasibility studies are incorporated into the county-wide sewage facilities plan. Where recommendations for municipal sewer feasibility studies are not found to be appropriate from the county-wide viewpoint, revisions to the municipal feasibility studies are suggested.

The challenge of the county-wide sewage facilities plan, therefore, is to evaluate all locally prepared proposals and to accept those which are valid and consistent with county-wide objectives and to recommend better solutions in those instances where the proposals are inadequate.

VIII

RECOMMENDED SEWAGE FACILITIES

The primary purpose of this chapter is to present recommendations concerning both the collection and treatment of wastewater in Montgomery County. These will be referenced to the time period of the next 10 years because of the emphasis of the Pennsylvania Sewage Facilities Act. However, they will also consider, in a general way, longer term sewerage requirements.

Prior to developing specific recommendations concerning sewage collection and treatment facilities, consideration must be given to the growth that is to be expected in Montgomery County in the next decade. This growth must be identified as to its magnitude, location and the type of development expected. Previous chapters of this report have provided the background information needed to discuss these questions. The identification of 10-year growth areas is outlined below.

TEN-YEAR GROWTH AREAS

1. For purposes of county-wide sewage facilities planning, 10-year growth areas have been defined as being those portions of the county that can reasonably be expected to have developed by 1980 to such an extent that public sewers apparently can economically be provided.

2. Ten-year growth areas include two basically different types of conditions:

   a. those involving existing developed areas that are not presently served by sewer systems and which have at the present time, or will have by 1980, population densities that apparently support such a system;

   b. those involving presently undeveloped areas that are expected to experience development at sufficient density and magnitude within the planning period to be able to support a public sewer system.

3. The delineation of 10-year growth areas provides the basis for the coordination and the implementation of sewage facilities. In such a manner, decisions influencing either or both collection system components or treatment facilities can be made with a degree of reliability that is otherwise unattainable.

4. The Montgomery County Planning Commission staff prepared "preliminary 10-year growth areas" for purposes of local review and approval. The staff relied upon the following information in delineating the growth areas: population estimates, forecasts of land use development, employment statistics, comprehensive plans, personal knowledge of portions of the county, data from its land development review function, the areal distribution of existing sewage and water facilities, the sewer feasibility reports that have yet to be implemented, the location of significant highway improvements and existing as well as planned open space areas.

5. The preliminary growth areas, as delineated by the Montgomery County Planning Commission staff, were then reviewed by the municipalities of Montgomery County. At a series of area-wide meetings, municipal representatives were presented with the preliminary growth areas and were

requested to review them with local governing bodies, sewer authorities and planning commissions. They were specifically asked to suggest changes to the growth areas they felt appropriate and forward them to the planning staff.

6. At the 11 area meetings with municipal representatives, information was distributed which included the following: (a) graphic summarizations of the existing sewer systems, and (b) delineation of the preliminary growth areas. A status report was presented at these meetings and the municipalities were provided with the opportunity to comment upon the emerging sewage facilities plan.

7. Upon receipt of locally suggested revisions to the 10-year growth areas, the staff made adjustments and the 10 year growth areas were finalized so as to serve as a guide for subsequent sewer planning decisions. It is to be noted that minor deviations between the 10-year growth areas delineated and actual development will not generally affect the recommendations. Moreover they are unavoidable because of the nature of the task of projecting growth areas accurately.

8. The finalized 10-year growth areas are graphically summarized in figure viii-1. The county-wide map also shows the relationship between 10-year growth areas and existing sewer service areas.

9. The interplay between land use development and the factors which influence the timing, the character and the location of development must be considered in the delineation of 10-year growth areas.

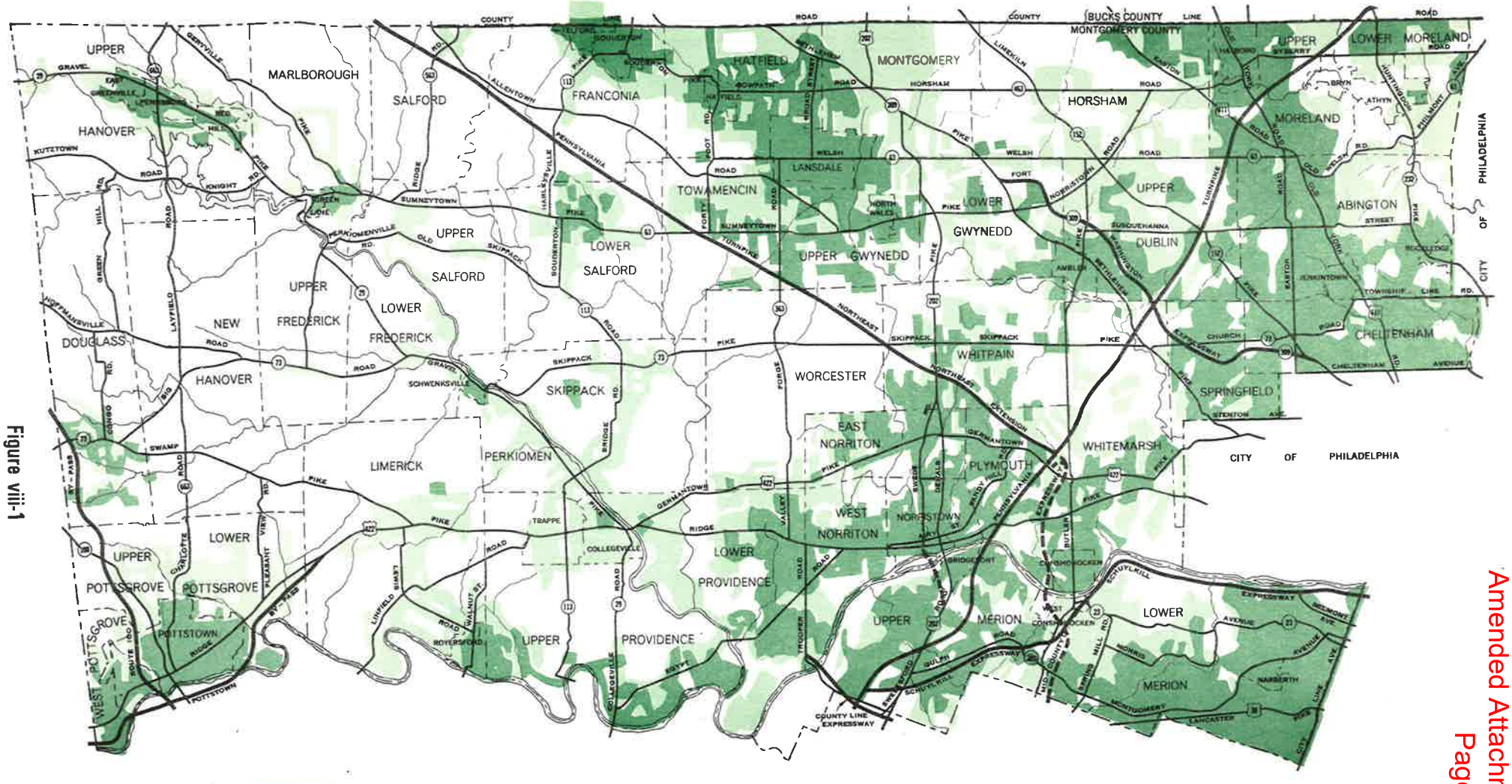
10. Comprehensive planning and municipal zoning regulations have a direct effect on the timing and type of land development. The interaction between community planning, zoning, growth areas and sewage facilities must be recognized. For example, certain mimimum land development densities must be provided in order to facilitate the economic provision of public sewer service. There are numerous areas of the county where existing zoning requirements provide for densities which impede rather than facilitate the provision of public sewers. This is an undesirable feature in areas that have been designated as 10-year growth areas.

11. On the other hand, there are certain areas of the county which lie outside projected 10-year growth areas but have a zoning density so great as to virtually require the provision of sanitary sewer facilities. In such instances, relatively high density land development may occur in areas removed from public sewer service and on soils unsuited for on-site disposal. In such instances it is apparent that the zoning requirements should be altered, or sewer planning revised, if the establishment of communities with sanitary conditions is to be fostered.

RECOMMENDATIONS FOR ADDITIONAL SEWAGE FACILITIES

1. In developing a county-wide sewage facilities plan, a fundamental decision had to be made concerning which existing sewage treatment plants should be phased out, which existing sewage treatment plants should continue to operate and which should receive additional flows from subsequent growth. It was of paramount importance here to avoid placing emphasis on those facilities which, in the long term, would not appear to be in the best location for Montgomery County and adjacent areas.

TEN-YEAR GROWTH AREAS SHOWING RELATIONSHIP WITH EXISTING SEWER SERVICE AREAS



Presently Served Areas

Ten-Year Growth Areas

0 1 2 3 4 5 6 Miles

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania March 1967

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Montgomery County Planning Commission, 1970. Revised May 1972

Figure viii-1

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Figure viii-2

DISPOSITION OF WASTEWATER TREATMENT PLANTS BY WATERSHED

WATERSHED	Name of Wastewater Treatment Plant	1969 Average Flow (MGD)	Design Capacity (MGD)	1979 Average Flow (MGD)	Recommendations
PENNYPACK Including Poquessing Creek	**Municipal Plants**				
	1. U. Moreland-Hatboro	4.23	3.60	6.16	Expand
	2. City of Philadelphia Northeast Plant	169.	175.	4.5[a]	No Change
	Non-Municipal Plants				
	3. Chapel Hill	.07	.12	.07	No Change
	4. Bethayr's Estates	.02	.02	--	Phased out with flows to Phila. NE STP
	5. L. Moreland School	N.A.	N.A.	--	"
	6. Holy Redeemer Hospital	N.A.	N.A.	--	"
	7. Meadowbrook Apts.	.04	.11	--	"
	8. Academy of the New Church	.035	.065	--	"
	9. St. Catherine of Sienna	N.A.	.015	--	Phased out with flows to U. Moreland STP
TOOKANY	**Municipal Plants**				
	1. City of Philadelphia. Northeast Plant	165.	175.	8.5[a]	No Change
	2. Standard Pressed Steel	.15	N.A.	--	Phased out with flows to Phil NE STP
NESHAMINY	**Municipal Plants**				
	1. Hatfield Twp.	.62	.90	2.09	Expand
	2. Hatfield Boro.	.28	.38	--	Phased out with flows to Hatfield Twp. STP
	3. Lansdale	3.37	5.00	3.93	No Change
	4. Warminster	--	N.A.	1.1[a]	No Change
	Non-Municipal Plants				
	5. Golden Chariot Motel	N.A.	.01	--	Phased out with flows to Hatfield Twp. STP
	6. Montgomery School	N.A.	.006	--	"
	7. English Village Apts.	N.A.	.12	--	Phased out with flows to Warminster STP
	8. U.S. Naval Air Station	.22	1.00	--	"
	Industrial Plants				
	9. Hunter Spring Co.	N.A.	N.A.	--	Phased out with flows to Hatfield STP
	10. Link Belt Co.	.04	.13	--	"
	11. American Olean Tile Co.	.017	N.A.	--	Phased out with flows to Lansdale STP
	12. Philco-Ford Co.	.36	N.A.	--	"
WISSAHICKON	**Municipal Plants**				
	1. Abington Township	3.00	4.60	3.15[b]	No Change
	2. Ambler (North & South)	1.65	2.26	2.28[b]	Expand
	3. U. Gwynedd Twp.	.42	.58	1.19	Expand
	4. North Wales Boro.	.40	.65	--	Phased out with flows to U. Gwynedd STP
	5. U. Dublin-Aiden Lair	N.A.	N.A.	--	Phased out with flows to Abington STP
	6. City of Philadelphia Southwest Plant	130.	136.	2.9[a]	No Change
	Non-Municipal Plants				
	7. Gwynedd Mercy College	.031	.06	--	Phased out with flows to Ambler STP
	8. Silver Stream Nursing Home	.008	.02	--	Phased out with flows to Ambler STP
	9. Penn Pike Motor Inn	N.A.	.09	--	"
	Industrial Plants				
	10. Merck, Sharp, & Dohme	N.A.	.44	--	Phased out with flows to U. Gwynedd STP
	11. Precision Tube Co.	N.A.	N.A.	--	"
	12. Leeds & Northrup	.05	.07	--	"
	13. Selas Corp.	.015	.009	--	Phased out with flows to Abington STP
	14. Delaware Valley	.60	.45	--	Phased out with flows to Ambler STP
	15. McNeil Laboratories	.09	.035	--	Phased out with flows to Phila. Southwest STP
	16. Nicolet Industries	.3	N.A.	N.A.	Phased out with flows to Ambler STP
	17. Certain Teed Pipe Co.	.29	.29	--	Phased out with flows to Ambler STP
LOWER SCHUYLKILL Including Indian Creek	**Municipal Plants**				
	1. Bridgeport	.50	1.25	.57	No Change
	2. Conshohocken	1.02	1.36	2.09	Expand
	3. E. Norriton-Plymouth	2.90	4.40	6.90	Expand
	4. Matsunk	.60	1.50	1.09	No Change
	5. Norristown	7.00	9.75	7.82	No Change
	6. U. Merion	3.00	5.00	4.48	No Change
	7. Whitemarsh	1.20	2.00	2.38	Expand
	8. City of Philadelphia Southwest Plant	130.	136.	8.55[a]	No Change
	Industrial Plants				
	9. Darling Paper Co.	.14	.30	N.A.	No Change
	10. Polychem Co.	2.2	3.00	N.A.	No Change
	11. Nicolet Industries	N.A.	N.A.	N.A.	Phased out with flows to Norristown STP
	12. Taylor Corp.	N.A.	N.A.	N.A.	"
	13. Westfield Paper Co.	.36	.425	N.A.	No Change
	14. Weyerhauser	3.2	4.5	N.A.	No Change

Figure viii-2

DISPOSITION OF WASTEWATER TREATMENT PLANTS BY WATERSHED
(Continued)

WATERSHED	Name of Wastewater Treatment Plant	1969 Average Flow (MGD)	Design Capacity (MGD)	1979 Average Flow (MGD)	Recommendations
LOWER PERKIOMEN	**Municipal Plants**				
	1. Montgomery County Municipal Auth.	1.0	2.0	6.54	Expand
	Non-Municipal Plants				
	2. Ridgeview Terrace	N.A.	.016	--	Phased out with flows to Montco. STP
	3. Limerick Trailer Park	N.A.	N.A.	--	"
	4. Western Montco. Vocational School	.009	.022	--	"
	5. Limerick Twp. Elementary School	.015	.011	--	No Change
	6. Collegeville Arms Apts.	N.A.	.02	--	Phased out with flows to Montco. STP
	7. Ursinus College	N.A.	N.A.	--	"
	8. Collegeville Inn	.004	.011	--	"
	9. Valley Forge Terrace	.18	.35	--	"
	10. Skippack Elementary School	.004	N.A.	--	"
	11. L. Providence-Worcester Joint School	.018	.04	--	"
	12. Eastern State Penitentiary	.415	.5	--	No Change
	Industrial Plants				
	13. Ajax Stamping & Manufacturing Co.	.025	.043	--	Phased out with flows to Montco. STP
	14. Superior Tube	.02	.03	--	"
	15. B. F. Goodrich	(no longer in operation)			
UPPER PERKIOMEN	**Municipal Plants**				
	1. U. Montgomery	.25	.72	.53	No Change
	2. Green Lane-Marlborough	.06	.25	.23	No Change
	3. Schwenksville	.04	.21	.06	No Change
	4. Montgomery County Municipal Auth. (Oaks)	--	2.0	.49[c]	Expand
	Non-Municipal Plants				
	5. Northeast Bible Inst.	.009	.03	N.A.	No Change
	6. Candlewick Inn	N.A.	.005	N.A.	No Change
	7. Camp Green Lane	N.A.	N.A.	N.A.	No Change
	8. Green Hill Trailer Park Industrial Park	N.A.	N.A.	N.A.	No Change
	Industrial Plant				
	9. Pillsbury Co.	.01	.02	N.A.	Phased out with flows to U. Montco. STP
SWAMP CREEK	**Municipal Plants**				
	1. Boyertown	.48	.75	.60	No Change
	2. Berks-Montgomery	.37	.31	.88	Expand
	3. Frederick-Obelisk	--	--	.09	Recommended for construction
	Non-Municipal Plants				
	4. Mennonite Home	.015	.025	--	Phased out with flows to proposed Obelisk STP
	5. New Hanover School	.007	N.A.	N.A.	No Change
	6. Camp Laughing Waters	N.A.	.03	--	No Change
UPPER SCHUYLKILL	**Municipal Plants**				
	1. Pottstown	5.65	5.90	7.72	Expand
	2. Royersford	.28	.50	--	Phased out with flows to Montco. STP
	Non-Municipal Plants				
	3. Arlen's Dept. Store	N.A.	N.A.	--	Phased out with flows to Pottstown STP
	4. North End Shopping Center	N.A.	N.A.	--	"
	Industrial Plants				
	5. Doehler-Jarvis	.075	.12	--	"
SKIPPACK	**Municipal Plants**				
	1. Souderton	.50	.68	.80	Expand
	2. U. Gwynedd-Towamencin	.88	1.00	1.6	Expand
	Industrial Plants				
	3. North Penn Hide Co.	.007	.01	N.A.	No Change
	4. Nice Ball Bearing Co.	.008	.01	--	Phased out with flows to Towamencin STP
EAST BRANCH PERKIOMEN	**Municipal Plants**				
	1. Lower Salford	.15	.28	.65	Expand
	2. Telford	.23	1.00	.65	No Change
	3. Tylersport	--	--	.12	Recommended for construction
	Non-Municipal Plants				
	4. New Life Boys Ranch	.005	.015	N.A.	No Change

Notes: [a]Loadings from Montgomery County only.
[b]Not adjusted for possible flows from U. Dublin growth areas.
[c]Loadings from U. Perkiomen Area only.
N.A.: Not available.

Source: Albright & Friel recommendations.

2. In reaching that decision, emphasis was placed on the evaluation of existing treatment plants which was discussed in Chapter VI. Moreover, various alternatives were considered which included constructing long interceptors, constructing major pumping stations, abandoning whole groups of plants, phasing out certain plants and expanding nearby facilities, and constructing new facilities.

3. The primary consideration in studying the recommendations of the county-wide sewage facilities plan was providing the best service to the most people at a reasonable cost not only for the 10-year horizon but for the long-range horizon as well.

4. It is recommended that three municipal treatment plants be phased out, pending more detailed economic feasibility study, that one new plant be added and that many of the present plants be expanded to handle additional flows and upgraded so as to produce a higher quality of effluent. Stressing the utilization of existing municipal plants and placing them in a watershed planning context results in greater long-term emphasis on the establishment of collection systems. This is true both in terms of designing collection systems to include larger service areas than has been the practice in the past and in building interceptors to carry wastewater loads from the new service areas to the nearest existing sewage treatment plant.

5. The acceptance of the regionalization concept when applied to Montgomery County leads to the formulation of recommendations that all industrial and non-municipal treatment plants that can be phased out, should be phased out. Hence, all industrial and non-municipal treatment plants lying within existing sewer service areas or within projected 10-year growth areas are recommended for phasing out in the 10-year horizon. The only exception to this principle is in the case of industrial treatment plants where wastewaters are not amenable to treatment at a municipal facility. In such instances pre-treatment should be considered.

6. Conversely, industrial and non-municipal plants located outside 10-year growth areas have been categorically recommended to continue operations for the coming decade. Major effort, however, should be made to avoid the creation of new facilities of this type, especially those which would tend to lead to their proliferation in any given area.

7. The disposition of all 90 treatment plants (municipal and industrial as well as non-municipal) is summarized in chart form in figure viii-2. Information includes 1969 average daily flow, design capacity and the average flow in 1979, as well as recommendations concerning the future of each plant in terms of whether there will be no change in design capacity, if expansion is necessary, if phase-out is proposed and where flow will be sent for treatment.

8. The recommendations of the sewage facilities plan involving both treatment plants and collection system components are graphically summarized in figure viii-3. Existing sewer service areas, 10-year growth areas, existing collection system components and proposed collection system components are shown as are those treatment plants which are recommended to be operational within Montgomery County by the year 1979.

9. While figures viii-2 and viii-3 summarize the recommendations of the sewage facilities plan, a brief discussion of the more salient features on a watershed-by-watershed basis is presented in the following section.

SEWAGE FACILITY RECOMMENDATIONS BY WATERSHED

1. Pennypack Watershed

   a. The Upper Moreland-Hatboro municipal plant is recommended for expansion. The Chapel Hill non-municipal plant will continue to serve a residential area in this watershed with no change in anticipated flow.

   b. The other six non-municipal plants should be phased out within the 10-year planning period and flows from them diverted to the Philadelphia system. These six plants are: Bethayres Estates, Lower Moreland School Authority, Holy Redeemer Hospital, Meadowbrook Apartments, the Academy of the New Church and St. Catherine of Sienna.

   c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Pennypack Creek from Moredon Road to Bryn Athyn Borough; in Meadowbrook from Washington Lane to Pennypack Creek; and along the Pennypack Creek from the Hatboro-Upper Moreland Township line to Witmer Road. A force main paralleling the Pennsylvania Railroad from Davisville Road to Byberry Road is of major significance in serving a portion of Upper Moreland Township.

   d. For purposes of this report, the Poquessing Watershed has been treated as a part of the Pennypack Watershed.

2. Tookany Watershed

   a. It is recommended that all future growth will be provided with public sewer service through the city of Philadelphia system.

   b. It is recommended that the Standard Pressed Steel Sewage Treatment Plant be phased out and its flows treated at the Philadelphia plant.

   c. There are no major interceptor lines of significance recommended to further the orderly growth of sewer service in this area, but several existing major lines will need to be replaced and capacity expanded.

3. Neshaminy Watershed

   a. Three of the four municipal treatment plants are recommended for continued operation. The Hatfield Township plant is recommended for expansion. The fourth municipal plant in this watershed, the Hatfield Borough plant, is recommended for phasing out with treatment afforded by the Hatfield Township plant.

   b. Six industrial and non-municipal plants which lie within this watershed should be phased out. The Hunter Spring, Link Belt, Golden Chariot Motel and Montgomery School facilities should be connected to the Hatfield Township sewage treatment plant, while the American Olean Tile Company and Philco-Ford Corporation plants should be connected to the Lansdale plant.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Park Creek from Welsh Road to County Line Road in Horsham Township (the economic feasibility of this alternative is presently under study); along an unnamed tributary of the Neshaminy Creek generally paralleling Route 309 from the Neshaminy Creek to County Line Road in Hatfield Township; along the Neshaminy Creek from the existing Hatfield Borough sewage treatment plant downstream to Trewigtown Road; along Bethlehem Pike and Lansdale Avenue from Colmar to the Lansdale-Montgomery Township line; and along an unnamed tributary parallel to and between County Line Road and Horsham Road from Colmar to the vicinity of Stump Road. These latter two interceptor lines also involve significant lengths of force mains, the one providing service to portions of Montgomery Township adjacent to Lansdale and the other providing service to extensive portions of Montgomery Township in the Little Neshaminy Watershed.

4. Wissahickon Watershed

a. Five municipal treatment plants serve this watershed plus the Philadelphia Southwest Plant. The Aiden Lair plant is recommended for phasing out by 1979; the North Wales plant is also recommended for phasing out, subject to a feasibility study. Two plants (the Ambler and Upper Gwynedd plants) are recommended for expansion by 1979; the Abington plant is recommended to continue operations at essentially its present capacity.

b. The following industrial plants should be phased out and connected to the Upper Gwynedd plant: Merck, Sharp & Dohme; Precision Tube and Leeds & Northrup. In addition, the following non-municipal and industrial treatment facilities should be phased out and incorporated into the Ambler treatment plant: Delaware Valley, Gwynedd Mercy College, Silver Stream Nursing Home, Nicolet Industries, Penn Pike Motor Inn and Certain-Teed Pipe Co. The McNeil Laboratories and Selas Corporation plants should be phased out with treatment afforded by the Philadelphia sewer system and the Abington Township system, respectively.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Wissahickon Creek from Ambler to Penllyn Pike and from the Lower Gwynedd-Whitpain Township line to an unnamed tributary just short of Route 202, along a branch of the Trewellyn Creek to Sumneytown Pike with a force main to Spring House in the first phase to be replaced by a gravity line down the Trewellyn Creek to the Wissahickon interceptor at a later date, along Hancock Street to Dodsworth Run to serve parts of Upper Gwynedd; through the Hamilton Park section of Lower Gwynedd Township between Bethlehem Pike and Norristown Road; along the Sandy Run and Wissahickon Creek from the Fort Washington Interchange to the Ambler treatment plant; and along the Lorraine Run, complete with a force main crossing Stenton Avenue, to serve central portions of Whitemarsh Township; a gravity intercepting sewer following the Wissahickon Creek from below Stenton Avenue to connect with the city of Philadelphia. Wissahickon Low Level Collection Sewer is recommended to replace an existing sewer and pumping station that parallels and eventually meets Stenton Avenue at a point just west of Northwestern Avenue.

5. Lower Schuylkill Watershed

a. Four of the seven municipal treatment plants within the Montgomery County section of the watershed are recommended to continue operations at essentially their present level (Bridgeport, Matsunk, Norristown and Upper Merion (Trout Run)). Further study of the Whitemarsh plant will be needed to determine if expansion is necessary due to an increased service area. The Conshohocken and East Norriton-Plymouth municipal plants are recommended for expansion before 1979. No municipal treatment plants are recommended for phasing out in this watershed.

b. The Daring Paper and Polychem plants both have industrial treatment plants in Bridgeport Borough lying within 10-year growth areas and should be phased out, if possible. At this time it is not certain whether either the Bridgeport or Matsunk facility could be modified to accept the types of waste presently treated by these plants. The Nicolet Industries and Taylor Corporation plants should be phased out with treatment diverted to the Norristown treatment plant, while the Westfield Paper Corporation plant in West Conshohocken and Weyerhauser Paper plant in Whitemarsh should continue to operate in the next 10-year period.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: a new system serving West Conshohocken and a part of Lower Merion, with treatment to be provided in the Conshohocken STP. The major lines would parallel the Schuylkill River from the Conshohocken Bridge to Saw Mill Run; along Mill Run to Route 23; along Arrowmink Run to New Gulph Road; and parallel Matsonford Road to serve West Conshohocken; along the Gulph Creek, upstream from Gulph Mills, to provide service to portions of Upper Merion Township; in the upper portions of Abrams Run to provide service to portions of Upper Merion Township; along the Pennsylvania Turnpike between Germantown Pike and Butler Pike to provide service to portions of Plymouth and Whitemarsh townships; and along an unnamed tributary of the Schuylkill River to provide service to the Barren Hill Road section of Whitemarsh Township.

6. Lower Perkiomen Watershed

a. Montgomery County's treatment plant is the only operational municipal plant within this stream reach, and it is recommended for continued operation. It will be necessary to more than triple its capacity within the next 10 years.

b. Eleven industrial and non-municipal plants are recommended for phasing out in the next 10 years with connections to the Montgomery County plant at Oaks for treatment. These 11 plants are: Ridge View Terrace Mobile Home Park, Collegeville Inn, College Arms Apartments, Ursinus College, Valley Forge Terrace Mobile Home Park, Ajax Stamping and Manufacturing, Superior Tube, Skippack Elementary School, Lower Providence-Worcester Joint School, Limerick Trailer Park and Western Montgomery County Vocational-Technical School.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along Route 113, Creamery Road, Evansburg Road and Skippack Pike to provide service to the Skippack and Creamery portions of Skippack Township; along the Perkiomen Creek from Graterford to Schwenksville (and upstream); along the Lodal Creek to provide service to portions of Perkiomen Township; along School House Run to provide service to Trappe Borough; paralleling Main Street to provide service to Collegeville and portions of Trappe; and paralleling Germantown Pike to provide service to Evansburg in Lower Providence.

7. Upper Perkiomen Watershed

a. All three municipal plants in this watershed are recommended for continued operation within the next 10 years. No major expansion is contemplated for these plants. Flows from the proposed service areas in Lower Frederick and Upper Salford will be carried in an interceptor past Schwenksville with connection made to the Montgomery County Sewer Authority interceptor above Graterford. Treatment will be at the county plant at Oaks.

b. The Pillsbury Company treatment plant should be phased out and its flow treated at the Upper Montgomery treatment plant. That is the only non-municipal/industrial plant within this watershed to be recommended for phasing out.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Perkiomen Creek to provide service to portions of Lower Frederick and Upper Salford townships; along the Macoby Creek to provide service to portions of Marlborough Township and along the Perkiomen Creek upstream from the Green Lane Reservoir to provide service to the Palm area of Upper Hanover Township.

8. Swamp Creek Watershed

a. The Boyertown treatment plant should continue to operate up to its design capacity and as such no major changes are recommended in the coming 10 years. It is recommended, however, that the other municipal plant in this watershed (the Berks-Montgomery facility) be expanded by 1979. In order to provide sewer service in the Frederick-Obelisk area a new municipal interim treatment plant is recommended.

b. The non-municipal treatment facility of the Mennonite Home for the Aged is to be phased out with flows to the proposed Frederick-Obelisk plant. The other two plants in this watershed are not recommended for phasing out within the next 10 years because they are far removed from any existing service areas and/or 10-year growth areas.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the lower reaches of Swamp and Goschenhoppen creeks to provide service to Lower Frederick Township.

9. Upper Schuylkill Watershed

a. Of the two municipal treatment plants now operating in the watershed, one (the Royersford plant) is recommended for phasing out by 1979, subject to a feasibility study, while the other (the Pottstown plant) is recommended for expansion by 1979.

b. The following industrial and/or non-municipal treatment plants are recommended for phasing out within the coming 10-year period (Arlan's Department Store, North End Shopping Center and the Doehler-Jarvis plant). Effluent from all should be treated in the Pottstown sewage treatment plant.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Manatawny Creek to provide service to West Pottsgrove and portions of Berks County; along an unnamed creek paralleling Farmington Avenue to provide service to Upper Pottsgrove Township; along the Sprogels Run and Sanatoga Creek to provide service to Upper and Lower Pottsgrove townships; along Mingo Creek, Limerick Road and Ridge Pike to provide service to the central portions of Limerick Township; and along Lewis Road to provide service to western portions of Limerick Township.

10. Skippack Watershed

a. At the present time, there are two treatment plants within this watershed, the Souderton Borough plant and the Upper Gwynedd-Towamencin plant, both of which are recommended for expansion by 1979.

b. The Nice Ball Bearing plant is the only non-municipal/industrial plant that is recommended for phasing out in this watershed in the coming 10 years. Their wastewater should be treated in the Upper Gwynedd-Towamencin plant.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: along the Skippack Creek and Grange Avenue and Germantown Pike to provide service to the Eagleville section of Lower Providence Township and the Fairview Village section of Worcester Township; along Evansburg Road and Skippack Pike to provide service to the upper portions of Skippack Township (this is the upper portion of a previously referred to interceptor line); and along the Skippack Creek in Franconia Township to provide service to areas adjacent to Souderton. In addition a line is recommended along Route 113 west of Souderton with treatment at either the Souderton or Telford plant, depending on the outcome of additional feasibility studies.

11. East Branch of the Perkiomen Creek Watershed

a. The Lower Salford Township treatment plant is recommended for expansion before 1979 and the only other municipal treatment plant in this watershed - the Telford Borough facility - is recommended to continue its operations at essentially its current level. Moreover, a new municipal interim package plant is recommended to serve the Tylersport area of Salford Township.

b. The New Life Boys Ranch treatment plant is the only operating non-municipal treatment plant in the watershed and is recommended to continue its operation because it is far removed from any probable 10-year growth area.

c. Major interceptor lines of most significance to the orderly growth of sewer service in this area are: paralleling Route 113 to provide service to the Lederach area of Lower Salford Township; paralleling Route 113 and Telford Pike to provide service to the central portions of Franconia Township (see comment at end of subsection C, Skippack Watershed) and along Old Sumneytown Road and Bergey Road to provide service to the Woxall, Bergey and Salfordville portions of Upper Salford Township (this is the upper portion of a previously mentioned interceptor).

SCALE OF RECOMMENDATIONS

1. Since this report is not an economic feasibility study, it is difficult to measure the recommendations in monetary terms. However, based upon preliminary estimates, it would appear that the cost of implementing the recommendations of the sewer facilities plan is $66 million.

2. It is estimated that the total residential population to be served by municipal wastewater treatment facilities by 1979 is 754,000 persons. This represents an increase of 263,000 persons from the 1969 figure of 491,000. The 1979 estimate of 754,000 people is 92% of the estimated total population at that time.

3. It is anticipated that by 1979, 42 of the 60 municipalities participating in this study will be providing public sewer service to more than 90% of their respective populations. This is compared with only 23 municipalities which provided public sewer service to more than 90% of their respective populations in 1969.

4. Data also shows that, at present, 15 municipalities provide public sewer service for 10% of their population or less. By 1979, it is anticipated that every municipality will provide at least 10% of their population with some type of public sewer service. In fact only five municipalities will probably provide less than half of their population with public sewer service by 1979. Only those persons living in a truly rural environment would not be provided with such services.

5. Of the 29 municipal treatment plants existing in 1969, three have been recommended for phasing out, 15 will require expansion by 1979 and two new municipal package plants have been recommended. Eleven municipal plants would continue their present operation with no significant change.

6. Of the 35 non-municipal plants in Montgomery County at the present time, it is anticipated that 25 would be phased out by 1979 and the other 10 would continue to operate with no significant change through 1979.

7. Of the 26 industrial plants five are visualized to continue at their present operation with no significant change by 1979, while the other 21 are recommended for phasing out. That recommendation is predicated on their waste being amenable to treatment at municipal plants.

Figure viii-4

STATUS OF WASTEWATER TREATMENT PLANTS
ASSUMING IMPLEMENTATION OF PLAN RECOMMENDATIONS

Type of Plant and Status	Number of Plants 1969	Status of Plants 1979
Municipal Plants	29	
Continue present operation-no change		11
Phase out		3
Expand		15
Construct new facility		2
Non-Municipal Plants	35	
Continue present operation-no change		10
Phase out		25
Industrial Plants	26	
Continue present operation-no change		5
Phase out		21
Final Status after Plan Implementation		
Continue present operation-no change		26
Phase out		49
Expand		15
New		2

Note: 49 plants are to be phased out, 2 new plants provided. This results in a net reduction of 47 plants.

Source: Albright & Friel recommendations, 1970.

8. While in 1979 there will be only one less municipal sewage treatment plant in the county, the total number of all types of sewage treatment plants has been recommended for significant reduction. The number of plants operating in 1979 would be 43. The net elimination of 47 plants should be viewed as a significant stride forward in wastewater management of Montgomery County. The elimination of these plants is accomplished through the orderly extension of existing systems into the 10-year growth areas that have been delineated. The disposition of the sewer treatment plants in accordance with the recommendations of the 10-year county sewage facilities plan is summarized in figure viii-4. This information is a summary of the more detailed recommendations found in figure viii-2.

9. The county-wide sewage facilities plan has recognized the value of regionalized facilities. For a plan of this nature to be implemented, it must now be supplemented in many cases by detailed engineering studies to verify that the solutions herein recommended are workable from an economic standpoint.

10. A county-wide sewage facilities plan is intended to assist and guide in the orderly development of needed wastewater facilities so as to meet the growing needs of Montgomery County. Until now no such comprehensive sewer planning existed on a county-wide basis. In the long run, combining sound planning principles with good engineering judgment will, it is hoped, produce a new trend in meeting Montgomery County's sewage problems. This report is intended to be the first basic step in establishing that trend.

11. In order for this plan to be a proper and useful guide, it must be periodically updated to conform with the inevitable changes in land development, population growth, technological improvements and economic considerations.

IX

CRITICAL SEWER PROBLEM AREAS

In recognition of the health hazards posed to the community's welfare in certain areas of the county by problems associated with wastewater disposal, an inventory of such areas was prepared, critical sewer problem areas were identified and background information was assembled and analyzed. The amelioration of conditions adversely affecting community health in these critical sewer problem areas becomes a "top priority" thrust of the county-wide sewage facilities plan. In-depth studies leading to the timely implementation of the plan recommendations are needed for those critical sewer problem areas which fall within the 10-year growth areas. For areas outside the 10-year growth areas, programs must be developed to minimize the existing and potential hazards. Every effort should be made to avoid the creation of new critical problem areas through the repetition of past mistakes.

Therefore, the primary purposes of this chapter are to:

1. Define what a critical sewer problem is and prepare a county-wide inventory of these areas;

2. Facilitate general awareness of the nature and the scale of the problems involved;

3. Develop recommendations for corrective action (as such the chapter should be viewed as a basic input of the plan itself); and

4. Fulfill the intent of the Pennsylvania Sewage Facilities Act concerning the identification of community health hazards involving sanitary wastewater disposal.

THE TWO TYPES OF CRITICAL SEWER PROBLEM AREAS

1. Malfunctioning On-site Disposal Systems

   a. This type of problem area includes those portions of the county where on-site systems are known to malfunction as well as those areas of the county where malfunctioning on-site systems can be expected because of existing conditions.

   b. Only areas where existing (or potential) malfunctioning on-site disposal systems are "clustered" have been included in the inventory.

   c. Malfunctioning on-site systems can cause ground water pollution, surface seepage and/or stream pollution.

2. Areas Where Sewage Treatment Plants are Proliferated

   a. This type of problem area includes those portions of the county where sewage treatment plants are clustered (refer to Chapter V).

   b. Proliferation of plants causes difficulties in stream quality management and often results in stream pollution.

METHODS USED TO DELINEATE CRITICAL SEWER PROBLEM AREAS

1. The planning staff prepared a preliminary inventory based on meetings with local officials, reports available and general knowledge of the county.

2. Preliminary inventory was given in-depth review by the Montgomery County supervising sanitarian's office (Pennsylvania Department of Health).

3. Field checks were conducted by planning staff to verify conditions prevalent and to finalize identification and delineation of problem areas.

AREAS WITH MALFUNCTIONING ON-SITE SYSTEMS

1. The inventory identifies 73 areas which are summarized in figure ix-1 and includes background information. The areas are graphically summarized in figure ix-2.

2. Fifty-four of the 73 identified problem areas are located within 10-year growth areas. Assuming implementation of the plan, the health hazards in these 54 areas would be eliminated by 1979.

3. Virtually all of the critical sewer problem areas involve residential land uses that pose hazards to county residents.

4. Only one-third of the problem areas are now served by central water facilities. In 48 of the 73 areas, therefore, the distinct possibility exists that residents are relying upon a water supply that is or can easily become contaminated.

5. Sixty-one of the 73 problem areas are located on soils which pose severe limitations to on-site systems.

6. Many of the problem areas consist of relatively new developments. This is an indication that land development and the provision of community facilities (i.e. public sewer service) are not adequately coordinated in Montgomery County.

7. Some of the problem areas are quite old and are now experiencing difficulties because of inherent soil limitations such that on-site systems are not capable of handling the increasing volume of wastewater created by the typical resident.

8. In some of the problem areas containing housing of marginal value, the provision of public sewers (as well as other public facilities normally paid by front foot-type assessments) poses an economic situation that requires a new financial approach.

AREAS INVOLVING PROLIFERATED SEWAGE TREATMENT PLANTS

1. The inventory identifies 14 areas which are summarized in figure ix-3 and graphically delineated in figure ix-4.

2. Assuming implementation of the sewer plan, eight of the 14 areas identified will no longer constitute a problem area by 1979 because of the plan's recommendation to eliminate most, if not all, of the treatment plants involved.

Figure ix-1

CRITICAL PROBLEM AREAS AS DEFINED BY MALFUNCTIONING ON-SITE SEWAGE SYSTEMS

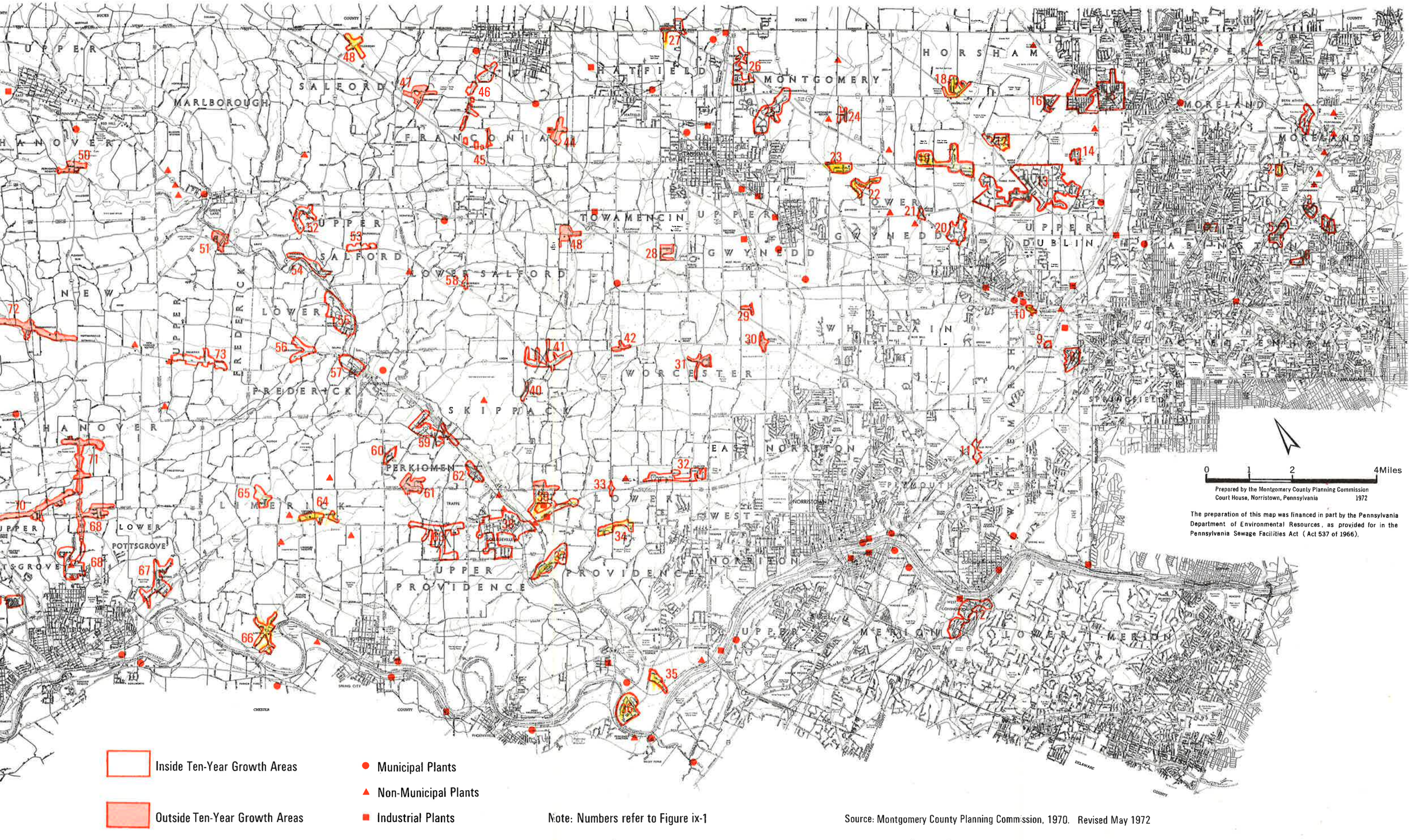
Map Number	Identifying Name	Municipality	In A Ten-Year Growth Area	Geographic Isolation[1]	Topographic Impediments	Land Use Type	Character of Development	Water Supply Character-istics	Soil Suitability for On-Site Disposal
1	Bryn Athyn	Bryn Athyn	Yes	Abington-Phila., 2 Miles	None	Res./Inst.	Med. Density/ Contiguous	Central	Mostly mod., some severe & slight
2	Meadowbrook	Abington	Yes	Abington-Phila., 1 Mile	None	Residential	Med. Density/ Contiguous	Central	Moderate
3	Meadowbrook	Abington	Yes	Abington-Phila., Adjacent	None	Residential	Med. Density/ Contiguous	Central	Moderate
4	Meadowbrook	Abington	Yes	Abington-Phila., Adjacent	None	Residential	Med. Density/ Contiguous	Central	Moderate
5	Rydal	Abington	Yes	Abington-Phila., Adjacent	None	Residential	Low Density/ Intermittent	Central	Moderate
6	Crosswicks	Abington	Yes	Abington-Phila., Adjacent	None	Residential	Med. Density/ Contiguous	Central	Moderate and slight
7	Roslyn	Abington	Yes	Abington-Adjacent	None	Residential	High Density/ Contiguous	Central	Moderate
8	Arlingham	Whitemarsh	Yes	Springfield-Phila., Adjacent	None	Residential	High Density/ Contiguous	Central	Mostly hazardous & some moderate
9	Whitemarsh	Whitemarsh	Yes	Springfield-Phila., 1 Mile	None	Res./Comm. & Inst. mixed	Low Density/ Intermittent	Central	Hazardous
10	Fort Washington	Whitemarsh	Yes	Ambler-1/2 Mile	Downstream	Res. & Comm.	Med. Density/ Intermittent	Central	Moderate
11	Cold Point	Whitemarsh & Plymouth	Yes	Whitemarsh Twp.-1/2 Mile	On ridge top	Residential	Med. Density/ Intermittent	Central	Mostly moderate some severe
12	West Conshohocken	West Conshohocken & Upper Merion	Yes	Conshohocken-1/2 Mile	Schuylkill River	Res., Comm. & Ind.	High Density/ Contiguous	Central	Moderate
13	Maple Glenn	Upper Dublin	Yes	Ambler Adj. Warminster -4 Miles	Traversed Ridge	Residential	Med. Density/ Contiguous	Central	Mostly severe mod. & slight
14	Hillside Estates	Horsham	Yes	Upper Moreland Hatboro-1 Mile	None	Residential	Med. Density/ Contiguous	Central	Severe & mod.
15	Horsham	Horsham	Yes	U. Moreland/ Hatboro Adjacent	None	Res./Comm. Intermixed	High Density/ Contiguous	Wells & Central	Mostly mod. & some severe
16	Horsham Gardens	Horsham	Yes	U. Moreland/Hatboro-1-1/2 Miles	None	Residential	Med. Density/ Intermittent	Wells	Severe
17	Maple Glen	Horsham	Yes	Warminster 3-1/2 Miles	None	Residential	Med. Density/ Contiguous	Central	Severe, some mod.
18	Prospectville	Horsham	Yes	Warminster 2-1/2 Miles	None	Res. & Some Comm.	Low Density/ Intermittent	Wells	Some severe, some slight
19	Oak Terrace	Horsham/Lower Gwynedd	Yes	Warminster 4 Miles	None	Residential	Med. Density/ Contiguous	Mostly Wells/ Some Central	Some mod., some severe
20	Hamilton Park	Lower Gwynedd	Yes	Ambler-Adjacent	None	Residential	Med. Density/ Contiguous	Central	Moderate
21	Spring House	Lower Gwynedd	Yes	Ambler-1 Mile	None	Comm./Res.	Low Density/ Scattered	Central	Severe & some mod.
22	Candlelight Farm	Lower Gwynedd	Yes	Ambler-2 Miles	None	Residential	Low Density/ Contiguous	Wells	Severe
23	Gwynedd View	Lower Gwynedd	Yes	Ambler-3 Miles	None	Residential	Med. Density/ Contiguous	Wells	Moderate
24	Montgomery Square	Montgomery Twp.	Yes	Hatfield Twp. 2 Miles	None	Ind., some Res.	Low Density/ Contiguous	Central	Severe
25	Montgomeryville	Montgomery Twp.	Yes	Hatfield Twp. Adjacent	None	Res./Comm.	Med. Density/ Contiguous	Central	Moderate, some severe
26	Colmar	Montgomery Twp.	Yes	Hatfield Twp. Adjacent	None	Residential	Low Density/ Intermittent	Central	Severe
27	Line Lexington	Hatfield Twp. & New Britain Twp. (Bucks County)	Yes	Hatfield Twp. 1/2 Mile	None	Comm./Res.	Low Density/ Intermittent	Wells	Severe
28	Vicinity of Chatham Village	Towamencin	No	Upper Gwynedd/ Towamencin-Adjacent	None	Residential	Low Density/ Contiguous	Wells	Severe
29	Worcester Estates	Worcester	No	Upper Gwynedd 1/2 Mile	Must cross ridge	Residential	Low Density/ Contiguous	Wells	Some severe, mostly mod.
30	Bethel Hill	Worcester	No	East Norriton/ Plymouth-1 Mile	On ridge top	Res./Inst.	Low Density/ Intermittent	Wells	Severe
31	Worcester Acres	Worcester	No	East Norriton/ Plymouth-1-1/2 Miles	Must cross ridge	Residential	Low Density/ Contiguous	Wells	Severe & some moderate
32	Fairview Village	Worcester	Yes	Montgomery County-1/2 Mile	On ridge top	Res./Comm.	Low Density/ Intermittent	Wells	Moderate & some severe
33	Provident Square	Worcester, Lower Providence, Skippack	Yes	Montgomery County-1 Mile	None	Residential	Low Density/ Scattered	Wells	Severe & some moderate
34	Eagleville	Lower Providence	Yes	Montgomery County-Adjacent	None	Res./ some Comm.	Med. Density/ Intermittent	Central	Severe
35	Wetherill's Corner	Lower Providence	Yes	Montgomery County-1/2 Mile	Must cross ridge	Residential	Med. Density/ Contiguous	Wells	Severe
36	Pawling Road	Lower Providence	Yes	Montgomery County-1/2 Mile	Must cross ridge & downstream	Residential	Low Density/ Scattered	Wells	Severe, some mod. & some slight
37	Yerkes	Lower Providence	Yes	Montgomery County-2 Miles	None	Residential	Low Density/ Scattered	Central	Severe & some moderate
38	Collegeville	Collegeville	Yes	Montgomery County-2-1/2 Miles	None	Res./Comm.	High Density/ Contiguous	Central	Moderate & severe
39	Evansburg	Lower Providence & Skippack	Yes/ No	Montgomery County-2 Miles	On ridge top	Res./Comm.	Low Density/ Scattered	Wells	Severe & mod.
40	Creamery	Skippack	Yes	Montgomery County-4 Miles	On ridge top	Residential	Med. Density/ Intermittent	Wells	Severe
41	Skippack	Skippack	Yes	Montgomery County-4-1/2 Miles	Must cross ridge	Res./Comm.	Med. Density/ Intermittent	Wells	Severe & some moderate
42	Cedars	Worcester	No	U. Gwynedd/ Towamencin 1-1/2 Miles	None	Res./Comm.	Low Density/ Scattered	Wells	Severe & some moderate
43	Mainland	Lower Salford/ Towamencin	No/ Yes	U. Gwynedd/ Towamencin-1 Mile	None	Res./Comm./ Inst.	Med. Density/ Intermittent	Wells	Severe & some moderate
44	Elroy	Franconia	No	Hatfield Boro. 1 Mile	Must cross ridge	Residential	Low Density/ Scattered	Wells	Severe & some moderate
45	Franconia Square	Franconia	No	L. Salford-1 Mile	None	Residential	Low Density/ Widely Scattered	Wells	Severe & some moderate
46	Franconia Square	Franconia	Mostly Yes	Telford-1 Mile	Lies astride a ridge top	Res./Comm.	Low Density/ Scattered	Wells	Severe & some moderate
47	Earlington	Franconia	No	Telford-1-1/2 Miles	None	Residential	Low Density/ Widely Scattered	Wells	Severe & some moderate
48	Tylersport	Salford	Yes	Proposed package plant	On ridge top	Res./Comm.	Low Density/ Intermittent	Wells	Moderate & some severe
49	Palm	Upper Hanover	Yes	U. Montgomery County-1-1/2 Miles	None	Res./Comm.	Low Density/ Scattered	Wells	Moderate & severe
50	Perkiomen Heights	Upper Hanover	No	U. Montgomery County-1-1/2 Miles	Must cross Green Lane Reservoir	Residential	Low Density/ Intermittent	Wells	Severe
51	Perkiomenville	Upper Frederick/ Marlborough	No	Green Lane/ Marlborough 1 Mile	Downstream	Res./Comm.	Low Density/ Intermittent	Wells	Severe
52	Woxall	Upper Salford	Yes	Schwenksville-3-1/2 Miles	On ridge top	Residential	Low Density/ Intermittent	Wells	Severe and some mod.
53	Salfordville	Upper Salford	Yes	Schwenksville-3 Miles	On ridge top	Residential	Low Density/ Scattered	Wells	Severe and some mod.
54	Hendricks-Salford	Upper Salford	Yes	Schwenksville-3 Miles	None	Residential	Low Density/ Widely Scattered	Wells	Severe
55	Spring Mount	Lower Frederick	Yes	Schwenksville 1-1/2 Miles	None	Residential	Low Density/ Intermittent	Wells	Moderate, some severe & slight
56	Zieglersville	Lower Frederick	Yes	Schwenksville 1-1/2 Miles	None	Res./Comm.	Low Density/ Scattered	Wells	Moderate, some severe
57	Delphi	Lower Frederick	Yes	Schwenksville Adjacent	None	Residential	Med. Density/ Intermittent	Central	Severe
58	Lederach	Lower Salford	Yes	Lower Salford 1 Mile	On ridge top	Residential	Low Density/ Intermittent	Wells	Severe, some moderate
59	Graterford	Perkiomen	Yes	Montgomery County-4-1/2 Miles	None	Residential	Low Density/ Intermittent	Wells	Moderate
60	Pamenpinto Drive Area	Perkiomen	Yes	Montgomery County-4 Miles	None	Residential	Med. Density/ Contiguous	Wells	Moderate
61	Acoma Lane Area	Perkiomen/Upper Providence	No	Montgomery County-3 Miles	None	Residential	Low Density/ Contiguous	Wells	Severe
62	Rahns	Perkiomen	Yes	Montgomery County-3-1/2 Miles	None	Res./Comm.	Med. Density/ Intermittent	Wells	Moderate & some severe
63	Trappe	Trappe	Yes	Montgomery County-2-1/2 Miles	None	Residential	Med. Density/ Intermittent	Central	Severe, some moderate
64	Limerick Center	Limerick	Yes	Montgomery County-2-1/2 Miles	Must cross ridge	Res./Comm.	Med. Density/ Intermittent	Wells	Severe
65	Limerick Center	Limerick	Yes	Montgomery County-3-1/2 Miles	Must cross ridge	Residential	Med. Density/ Intermittent	Wells	Moderate & some severe
66	Linfield	Limerick	Yes	Montgomery County 3 miles	None	Res./Comm.	Med. Density/ Intermittent	Wells	Moderate & some severe
67	Sanatoga	Lower Pottsgrove	Yes	Pottstown-1 Mile	Downstream	Res./Comm.	Low Density/ Intermittent	Wells	Severe & moderate
68	Route 663	New Hanover & Lower and Upper Pottsgroves	No/ Yes	Pottstown-Adjacent	On ridge top	Residential	Low Density/ Scattered	Wells	Severe & some moderate
69	Oakview	West Pottsgrove	Yes	Pottstown-1/2 Mile	None	Residential	Med. Density/ Contiguous	Wells	Severe
70	Moyer	Upper Pottsgrove, New Hanover & Douglass	No	Berks-Montgomery County-1/2 Mile	Major ridge traverses problem area	Residential	Very Low Density/ Scattered	Wells	Severe & some moderate
71	New Hanover Square	New Hanover	No	Berks-Montgomery County-1/2 Mile	Downstream	Res./Comm.	Low Density/ Scattered	Wells	Severe
72	Congo-Sassamansville-Hoffmansville	Douglass & New Hanover	No	Berks-Montgomery County-2 Miles	None	Res./Inst.	Low Density/ Scattered	Wells	Severe
73	Frederick & Obelisk	Upper Frederick	Yes	Proposed package plant	None	Res./Inst.	Low Density/ Scattered	Wells	Severe

NOTE: [1]"Geographic Isolation" is measured in straightline distance to nearest public sewer system.

Source: Montgomery County Planning Commission staff compilation based upon meetings with staff of Supervising Sanitarian, Pennsylvania Department of Health, Fall 1970.

Figure ix-2

DISTRIBUTION OF CRITICAL PROBLEM AREAS AS DEFINED BY MALFUNCTIONING ON-SITE SEWAGE SYSTEMS



Note: Numbers refer to Figure ix-1

Source: Montgomery County Planning Commission, 1970. Revised May 1972

3. Six of the 14 problem areas are expected to remain as problem areas in 1979 - three of somewhat reduced proportions, two of increased proportions and one of approximately the same proportions.

OVERALL OBSERVATIONS

The elimination of the problem areas should be viewed as a "top priority" of the plan and its implementing program.

More detailed studies are needed to implement the above recommendations. These further studies should consider economic feasibility and engineering details.

Some of the existing problem areas remain unresolved by this plan. They must be further studied as part of the on-going planning process. At the very least, effort must be made to prevent the worsening of the health hazards in these areas. The provision of public water service, the cessation of new building activity, accelerated surveillance of treatment plant operations and upgrading the quality of effluent are means to accomplish this objective.

It is essential that appropriate levels of government take the necessary steps to avoid the creation of new problem areas. Progress that can be made to improve the environmental health of the community through the implementation of the county-wide sewage facilities plan can be "undone" if new problem areas are created by the failure of proper authorities to exercise their leadership and regulatory roles.

Some new residential developments must rely upon on-site sewage systems which are potentially hazardous, especially when occurring on certain soil types. Such problems could be avoided if land development and the provision of public sewers were more closely coordinated.

Figure ix-3

PROLIFERATED SEWAGE TREATMENT PLANT TYPE OF CRITICAL SEWER PROBLEM AREA

Cluster Identification	Watershed and Stream	Municipalities	Number of Plants Involved				Relation of S.T.P. to 10-Year Recommendations	Status of Critical Sewer Problem Area (as of 1979)
			Total	Municipal	Non-municipal	Industrial		
A	Pennypack/Pennypack and Huntingdon Valley Creek tributaries, Robin Hood Brook	Lower Moreland and Abington	5	--	5	--	All 5 of these plants are eliminated	No longer a problem area
B	Lower Wissahickon Creek/ Sandy Run, Pine Run	Upper Dublin, Whitemarsh and Ambler	10	4	1	5	7 of the 10 plants are eliminated; 2 expand; 1 uncertain	No longer a problem area
C	Lower Schuylkill/Schuylkill River and Spring Mill Creek	Whitemarsh, Plymouth, Conshohocken, Upper Merion, Bridgeport, Norristown	11	6	--	5	Only 1 of the 11 plants is eliminated; 2 expanded	Remains a problem area but of increased proportions
D	Middle Schuylkill/ main stem of Schuylkill River	Upper Merion, West Norriton, Lower Providence, Upper Providence, Royersford and Chester County	12	5	3	4	5 are to be phased out; 4 are to be expanded; 2 are uncertain, and 3 new plants proposed	Remains a problem area but of reduced proportions
E	Perkiomen, Skippack/Perkiomen Creek and unnamed tributary thereof	Worcester, Lower Providence, Skippack and Collegeville	8	--	6	2	7 of the 8 are to be eliminated	No longer a problem area
F	Perkiomen Creek/Landis Brook	Limerick	4	--	4		3 of the 4 are to be eliminated	No longer a problem area
G	Upper Schuylkill Watershed/ Schuylkill and tributaries thereof	Pottstown, Lower Pottsgrove, West Pottsgrove, Berks and Chester counties	7	2	4	1	5 of the 7 to be eliminated; expand 1; and 1 is uncertain and may be replaced with a new plant	No longer a problem area
H	Swamp Drainage Basin/Swamp Creek, tributaries of the Scioto	Upper Frederick and New Hanover	3	--	3	--	1 of the 3 to be eliminated; 1 new plant proposed	Remains a problem of same magnitude
I	Swamp Creek/main stem of Swamp Creek	Douglass	2	2	--	--	1 is to expand	Remains a problem of increased proportion
J	Upper Perkiomen/main stem of Perkiomen Creek	Green Lane, Marlborough, Upper Hanover and East Greenville	6	2	3	1	Only 1 of the 6 plants is to be phased out	Remains a problem area but of reduced proportions
K	Skippack/Skippack and Towamencin Creeks and tributary thereof	Towamencin, Upper Gwynedd and Franconia	5	2	--	3	Only 2 of the 5 plants are to be eliminated; 1 to be expanded	Remains a problem area but of reduced proportions
L	Neshaminy/West Branch of Neshaminy Creek and its tributary	Montgomery, Hatfield Boro. and Twp., Lansdale and Bucks County	10	5	2	3	Only 6 of the 10 plants are to be eliminated; 2 to be expanded; 1 uncertain	No longer a problem area
M	Upper Wissahickon/main stem of Wissahickon Creek, Trewellyn Creek, and tributary thereof	North Wales, Upper Gwynedd, Horsham and Lower Gwynedd	8	2	3	3	7 of the 8 plants are to be eliminated; 1 is to be expanded	No longer a problem area
N	Neshaminy/Little Neshaminy Creek and tributary thereof	Horsham and Bucks County	5	1	4	--	4 of the 5 plants are to be eliminated; 1 is to be expanded	No longer a problem area

Source: Montgomery County Planning Commission Staff Compilation, Fall 1970.

RESOLVED AND UNRESOLVED PROBLEM AREAS OF SEWAGE TREATMENT PLANT CLUSTERS IN FACILITIES PLAN

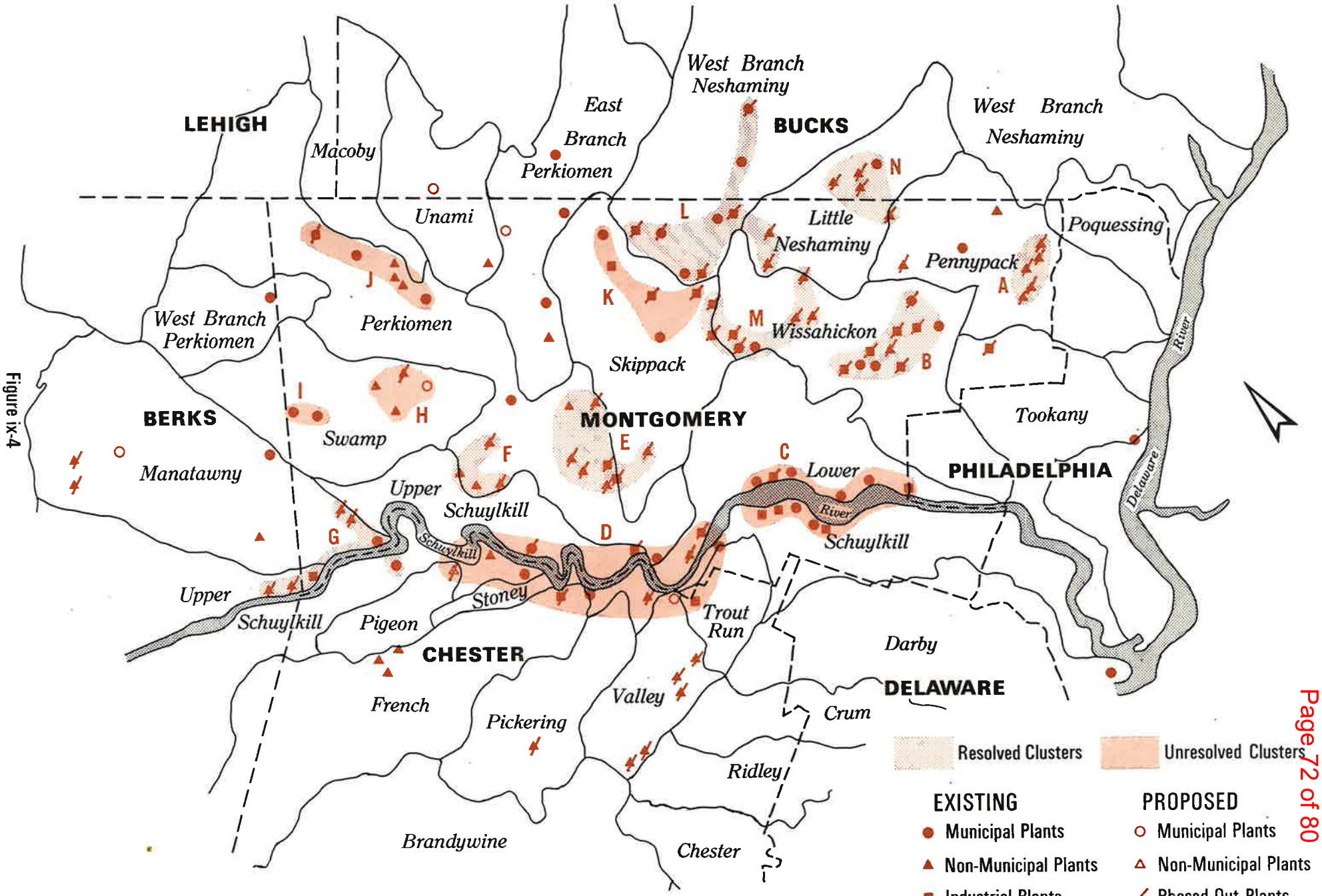


Figure ix-4

Prepared by the Montgomery County Planning Commission
Court House, Norristown, Pennsylvania 1972

The preparation of this map was financed in part by the Pennsylvania Department of Environmental Resources, as provided for in the Pennsylvania Sewage Facilities Act (Act 537 of 1966).

Source: Montgomery County Planning Commission, 1970. Revised May 1972

Note: Letters refer to Figure ix-3.

Amended Attachment 21-A
Page 72 of 80

X

PROBLEMS OF IMPLEMENTATION AND RECOMMENDATIONS FOR PLAN EFFECTUATION

The Montgomery County Sewage Facilities Plan rests on the basic premise that optimum and economic wastewater collection and treatment is achieved when drainage basins are viewed as the basic planning units. The foundation of this concept is that physiographic, rather than political, boundaries are most appropriate for sewage facilities planning. This, in turn, implies a change in the manner in which sewer programs are conceived, planned and executed in Montgomery County.

The principles of implementation of watershed-wide sewer planning present challenges to Montgomery County and the municipalities. No mechanism now exists to coordinate policy formation and program development or to allocate resources among those organizations responsible for the municipal sewage plants, the 61 non-municipal and industrial plant operators and the six adjacent counties. The voluntary cooperation that has been practiced in the past simply has not been sufficient to prevent the proliferation of plants that has occurred in the past decade.

This chapter is concerned with identifying the essential principles that tend to impede the implementation of the recommendations of this report and the spirit of watershed-wide planning upon which it is based. The key issues raised in the report will be summarized. Those factors which tend to inhibit watershed-wide solutions to sewer problems will be discussed, and recommendations for resolving these factors will be advanced.

REVIEW OF FINDINGS

1. The Montgomery County Sewage Facilities Plan has two important aspects. They are as follows:

   a. The plan inventories and analyzes many facts related to sewage planning which had not heretofore been systematically compiled and organized in a single county-wide report.

   b. The plan draws basic conclusions from the above information concerning the best way to approach wastewater disposal in the future.

2. It is estimated that 74% of Montgomery County residents are now served by municipal collection and treatment plants. Of the 170,000 residents that now depend upon on-site disposal systems in the county, all but 30,000 reside in locations relatively close to existing sewer service areas. One of the goals of the sewage facilities plan is to provide public sewer service to most of these 170,000 people.

3. Seventy-three problem areas characterized by malfunctioning on-site disposal systems have been identified in Montgomery County. The provision of public sewer service to as many of these critical sewer problem areas as feasible is also a basic plan goal.

4. Available evidence suggests that Montgomery County's streams are seriously polluted. Both sewage treatment plant effluent and malfunctioning on-site disposal systems contribute significantly to the pollution. Another fundamental goal of the sewage facilities plan is to minimize the stream pollution caused by sewage-related problems to the extent practical.

5. It is estimated that an additional 168,000 persons will live in Montgomery County by 1979. Because of generally poor soil conditions for on-site disposal facilities, a goal of the plan is to provide public sewer service to as many of these "new residents" as feasible.

REVIEW OF RECOMMENDATIONS

1. The county-wide sewage facilities plan recommends the extension of public sewer service to 56 of the 73 critical sewer problem areas where malfunctioning on-site disposal systems exist or where a public health hazard is a clear potential.

2. Recommendations have been advanced which would provide sewer service to over 75% of the county's presently unserved population and which would provide public sewer service to 91% of the county's anticipated 1979 population of 829,000.

3. The plan also strongly recommends discouraging construction of new sewage treatment plants, phasing out of three municipal treatment plants (Hatfield Borough, North Wales and Royersford), reducing the number of industrial plants from 26 to 5 and the number of non-municipal plants from 35 to 10.

4. Only two small interim municipal package-type sewage treatment plants have been proposed to provide sewer service in Frederick-Obelisk and Tylersport.

5. The plan recommends more detailed study to explore further consolidation of existing municipal, industrial and non-municipal treatment plants.

6. Further studies are also recommended for those 25 critical sewer problem areas which have not been recommended for public sewer service within 10 years.

7. On a county-wide basis the sewage facilities plan recommends the following:

a. Additional sewage treatment plant capacity of approximately 18.6 million gallons per day.

b. Additional length of major interceptor lines - 152¼ miles.

c. Additional length of force mains - 27½ miles.

d. Additional pumping stations - 46.

This information is presented in figure x-1 for each of the municipal sewerage systems in the county.

8. It is estimated that construction costs of the items listed above would represent approximately $51 million. This is broken down as follows:

a. Additional sewage treatment plant capacity - $25.3 million.

b. Interceptors - $22.3 million.

APPENDIX A

EVOLVEMENT OF MONTGOMERY COUNTY SEWAGE FACILITIES PLAN ADOPTION

A series of meetings were held to familiarize the county municipalities with the basic concepts of the Montgomery County Sewage Facilities Plan. Using these discussions as a guide, the original report was compiled and distributed to the governing body of each municipality. A letter was included asking for their review and comment of the report. Approval and acceptance of the plan was encouraged.

In an appendix to the original report, a sample resolution adopting the sewage facilities plan in accordance with Pennsylvania Act 537 was provided as a guide for municipal adoption.

Since its transmittal in May 1971, 60 municipalities adopted the plan by formal resolution of their governing body. Some municipalities made revisions and adopted the plan with the condition that these revisions would be incorporated into the final sewage facilities plan.

The sewage facilities plan was revised and edited to conform to the conditions articulated by the various municipalities in their process of formal adoption. The Montgomery County Planning Commission accepted this final plan as an element of the county comprehensive plan and the official 10-year plan for sewage facilities by formal resolution and recommended its formal adoption by the Montgomery County Board of Commissioners.

The County Commissioners scheduled a public hearing to consider the adoption of the county sewage facilities plan as: (1) the official 10-year plan for sewage facilities (in compliance with Act 537), and (2) the first element of the Montgomery County Comprehensive Plan (pursuant to Act 247 as amended). The public hearing was held on Thursday, October 26, 1972 and was legally advertised in various newspapers in the county.

The Board of County Commissioners formally adopted the Montgomery County Sewage Facilities Plan as the first element of the county comprehensive plan and a plan to meet Act 537 requirements at this public hearing. A formal resolution adopting the plan was prepared and approved, to be effective as of the date of the public hearing.

Copies of the original letter introducing the plan and formal resolutions affecting the final adoption of the Montgomery County Sewage Facilities Plan are found in the following pages of this appendix.

MONTGOMERY COUNTY
PLANNING COMMISSION

COUNTY OF MONTGOMERY
COURT HOUSE
NORRISTOWN, PENNSYLVANIA

To: Governing Bodies of the Municipalities
of Montgomery County

Gentlemen:

We are pleased to transmit herewith the Sewage Facilities Plan for Montgomery County, prepared in compliance with the provisions of the Pennsylvania Sewage Facilities Act (Act 537 of 1966). It is submitted for your review, approval and acceptance.

The Sewage Facilities Plan includes reference to long range sewer programs, but emphasizes the ten-year period 1969-1979 in accordance with the requirements of the Act. The plan is a joint effort of our engineering consultant, Albright and Friel, and the staff of this Commission. It will meet the planning requirements of the State law and when adopted, insure the flow of State and Federal Grants-in-Aid so essential for construction of the facilities. The plan includes recommendations on the development of public sewer facilities, as well as the disposition of all existing sewer treatment plants in the county.

You are requested to review and approve this plan and to officially adopt it, in accordance with the Pennsylvania Sewage Facilities Act. Your action should be by formal resolution and a suggested resolution is found in Appendix A of this report, for your convenience.

The preparation of this plan has taken more than two years since you accepted the offer of the County Commissioners. You and your officials have helped us a great deal and we appreciate your support. We look forward to receiving your resolution.

Sincerely yours,

Charles Tornetta

Charles Tornetta
Chairman

APPENDIX A

RESOLUTION ADOPTING THE MONTGOMERY COUNTY SEWAGE FACILITIES PLAN IN ACCORDANCE WITH PENNSYLVANIA ACT 537

WHEREAS, Pennsylvania Act 537 (the Sewage Facilities Act) was enacted by the General Assembly of Pennsylvania in 1966; and

WHEREAS, the act requires each township and borough in the County to prepare a ten-year plan for sewage facilities, which must be submitted to the Pennsylvania Department of Health for approval; and

WHEREAS, the Pennsylvania Department of Health has recommended that the act's requirements can best be accomplished on a county-wide basis; and

WHEREAS, the Montgomery County Commissioners acting upon the recommendation of the Pennsylvania Department of Health, the Montgomery County Sewer Authority, and the Montgomery County Planning Commission did offer assistance to the municipalities in meeting their Act 537 requirements on a county-wide basis; and

WHEREAS, _____ did by formal resolution
(Township/Borough)
dated _____, authorize the County of Montgomery to prepare the sewage facilities plan on its behalf; and

WHEREAS, Montgomery County, through the staff of the Montgomery County Planning Commission and the consulting engineering firm of Albright and Friel, Inc. did prepare a ten-year plan for sewage facilities; and

WHEREAS, the appropriate municipal officials of this community have reviewed the findings and recommendations of that plan, as it affects this municipality and have found the plan acceptable and have recommended that the plan be adopted.

NOW THEREFORE BE IT RESOLVED THAT THE _____
(Board of Commissioners/Board of Supervisors/Borough Council)
of _____ hereby accepts and adopts the
(Township/Borough)
"Montgomery County Sewage Facilities Plan", prepared by the Montgomery County Planning Commission and Albright and Friel, Inc., March, 1971 as the official ten-year plan for sewage facilities in compliance with the Pennsylvania Sewage Facilities Act of 1966; and

BE IT FURTHER RESOLVED THAT:

(1) the Montgomery County Planning Commission is hereby authorized to submit the plan to the Pennsylvania Department of Health for review and approval with the understanding that if any changes are necessary they will be submitted to this municipality for our concurrences, and that a process will be established whereby the complete plan or any part thereof may be amended at any time upon request by this municipality; and,

(2) the municipality agrees that information concerning changes (for example, any extension of service, construction or expansion of sewer treatment plants), to the sewerage system of this municipality will be transmitted by the appropriate municipal official(s) to the Montgomery County Planning Commission on or about the first of June of each year so that the county-wide inventory of existing sewage systems can be properly maintained and in turn it is understood that the county will keep this municipality fully informed of all amendments to the plan that may affect us.

RESOLUTION OF THE
MONTGOMERY COUNTY PLANNING COMMISSION
ACCEPTING THE
MONTGOMERY COUNTY SEWAGE FACILITIES PLAN
AS AN ELEMENT OF THE COUNTY COMPREHENSIVE PLAN AND
RECOMMENDING ITS FORMAL ADOPTION
AS AN ELEMENT OF THE COUNTY COMPREHENSIVE PLAN
BY THE MONTGOMERY COUNTY BOARD OF COMMISSIONERS

WHEREAS, Pennsylvania Act 537 (the Sewage Facilities Act) was enacted by the General Assembly of Pennsylvania in 1966; and

WHEREAS, the act requires each township and borough in the County to prepare a 10-year plan for sewage facilities, which must be submitted to the Pennsylvania Department of Health for approval; and

WHEREAS, the Pennsylvania Department of Health had recommended that the act's requirements can best be accomplished on a county-wide basis; and

WHEREAS, the Montgomery County Commissioners acting upon the recommendation of the Pennsylvania Department of Health, the Montgomery County Sewer Authority, and the Montgomery County Planning Commission did offer assistance to the municipalities in meeting their Act 537 requirements on a county-wide basis; and

WHEREAS, 60 of the 62 municipalities located in Montgomery County did, by individually enacted formal resolutions passed in 1966 to 1968, authorize the County of Montgomery to prepare the Sewage Facilities Plan on their behalf; and

WHEREAS, Montgomery County, through the staff of the Montgomery County Planning Commission did prepare a 10-year plan for sewage facilities; and

WHEREAS, the staff of the Montgomery County Planning Commission did distribute copies of the Sewage Facilities Plan of March 1971 to representatives of each of the 60 municipalities for their review, comment and adoption by their respective governing body in May of 1971; and

WHEREAS, the staff of the Montgomery County Planning Commission has followed up that distribution with various contacts in the intervening period to offer assistance in the local review and adoption process; and

WHEREAS, the duly elected governing bodies of 56 municipalities, following review of the findings and recommendations of that Plan, did find the plan acceptable and did by formal resolution accept and adopt the Montgomery County Sewage Facilities Plan as the official 10-year plan for sewage facilities in compliance with the Pennsylvania Sewage Facilities Act of 1966; and

WHEREAS, the population residing in these 56 townships and boroughs totals 571,588 persons which represents 95.2% of the applicable county total of 600,139 persons (residing in the 60 townships and boroughs included in the Plan according to the 1970 Census of Population); and

WHEREAS, the Sewage Facilities Plan of March 1971 has been revised and edited to conform to the conditions articulated by the various municipalities in their process of formal adoption, thereby reflecting local refinements and said revisions have been embodied in the updated report known hereafter as the Montgomery County Sewage Facilities Plan of May 1972; and

WHEREAS, the Citizens Advisory Committee on County Planning (CitAC) did review and accept the plan as submitted with the recommendation that it be accepted by the Planning Commission and adopted by the Board of County Commissioners as an element of the County Comprehensive Plan; and

WHEREAS, Montgomery County Planning Commission board has carefully reviewed the findings and recommendations of the plan as it affects the county and the municipalities in the county and have found the plan to be an acceptable guide; and

WHEREAS, the Montgomery County Planning Commission has directly related the findings and recommendations of the Sewage Facilities Plan to the overall County-wide Comprehensive Plan (which is currently in the third year of preparation with financial assistance provided in part through urban planning assistance grants from the Federal Department of Housing and Urban Development under the provisions of Section 701 of the Housing Act of 1954 as amended and as administered by the Bureau of Planning, Pennsylvania Department of Community Affairs); and

WHEREAS, the Montgomery County Planning Commission board hereby finds that the Montgomery County Sewage Facilities Plan of May 1972 to be an integral element of the County Comprehensive Plan.

NOW THEREFORE BE IT RESOLVED THAT:

(1) the Board of the Montgomery County Planning Commission hereby accepts the Montgomery County Sewage Facilities Plan of May 1972 prepared by the Montgomery County Planning Commission as the official 10-year plan for sewage facilities in compliance with the Pennsylvania Sewage Facilities Act of 1966, (Act 537) and as the first element of the Montgomery County Comprehensive Plan pursuant to Section 209 of the Pennsylvania Municipal Planning Code (Act 247); and

(2) the Board of the Montgomery County Planning Commission hereby recommends the Board of the County Commissioners to formally adopt the Montgomery County Sewage Facilities Plan, which is attached hereto and made a part hereof, in accordance with Pennsylvania Act 537 (the Sewage Facilities Act) and Pennsylvania Act 247, (Section 209 of the Municipal Planning Code); and

(3) a copy of this resolution be sent to the Board of the County Commissioners for their action; and

(4) when and if the Sewage Facilities Plan of May 1972 is adopted by the Board of County Commissioners, the staff is directed to publish and distribute the Plan to all municipal governing bodies and planning commissions in the county, and the staff is further directed to prepare a brochure summarizing the salient points of the Sewage Facilities Plan for widespread distribution to the general public.

The above is hereby certified to being a true and accurate copy of a resolution adopted by the Board of the Montgomery County Planning Commission on

Charles J. Tornetta
Chairman

Arthur L. Loeben
Secretary

RESOLUTION OF THE
BOARD OF COMMISSIONERS
ADOPTING THE
MONTGOMERY COUNTY SEWAGE FACILITIES PLAN
AS THE OFFICIAL TEN-YEAR PLAN FOR SEWAGE FACILITIES
AND AS AN ELEMENT OF THE
COUNTY COMPREHENSIVE PLAN
October 26, 1972 72 - C. 323

WHEREAS, the Montgomery County Board of Commissioners acting upon the recommendation of the Pennsylvania Department of Health, the Montgomery County Sewer Authority and the Montgomery County Planning Commission, did offer assistance to the 62 municipalities in Montgomery County in meeting their requirements under the Pennsylvania Sewage Facilities Act (Act 537) on a county-wide basis; and

WHEREAS, 60 of the municipalities located in Montgomery County did by individually enacted resolutions authorize the County of Montgomery to prepare the Sewage Facilities Plan on their behalf; and

WHEREAS, Montgomery County through the county planning commission did prepare a ten-year plan for sewage facilities; and

WHEREAS, the duly elected governing bodies of the 60 municipalities, following review of the plan, did find the plan acceptable and did by resolution adopt the Montgomery County Sewage Facilities Plan as the official ten-year plan for sewage facilities; and

WHEREAS, the Montgomery County Planning Commission, at the June 1972 regular monthly meeting approved and accepted the Sewage Facilities Plan of May 1972 by resolution, and did recommend to the Board of County Commissioners formal adoption of the Plan as:

(a) the official ten-year plan for sewage facilities (in compliance with Act 537), and

(b) the first element of the Montgomery County Comprehensive Plan pursuant to Section 209 of the Pennsylvania Municipal Planning Code (Act 247 as amended), and

WHEREAS, a public hearing was duly held by the Montgomery County Board of Commissioners pursuant to Section 302 of the Pennsylvania Municipal Planning Code on October 26, 1972; and

WHEREAS, the documents and matters which form the Montgomery County Sewage Facilities Plan of May 1972 are hereby incorporated by reference and are made a part of this resolution, and are available at the offices of the county planning commission;

NOW THEREFORE BE IT RESOLVED THAT: the Board of Commissioners of Montgomery County hereby accepts and adopts the Montgomery County Sewage Facilities Plan of May 1972 as:

(a) an element of the County Comprehensive Plan in accordance with (Act 247 of 1968), the Pennsylvania Municipalities Planning Code; and

(b) the official ten-year plan for sewage facilities in accordance with the Pennsylvania Sewage Facilities Act (Act 537 of 1966); and

NOW THEREFORE BE IT FURTHER RESOLVED THAT: the county planning commission is directed to transmit the Sewage Facilities Plan of May 1972, copies of the municipal resolutions adopting the plan and a copy of this resolution to appropriate state officials for their review and approval pursuant to Act 537; and

BE IT FURTHER RESOLVED THAT: the Montgomery County Planning Commission is directed to publish and distribute the plan to all municipal governing bodies and planning commissions in the county and is further directed to prepare a brochure summarizing the salient points of the Sewage Facilities Plan for widespread distribution to the general public; and

BE IT FURTHER RESOLVED THAT: certified copies of this resolution are to be lodged with the proper official of this Board, with the Montgomery County Planning Commission and be sent to the municipal governing bodies and planning commissions in the county.

This resolution shall be effective as of October 26, 1972.

The above resolution is adopted on motion of Mr. Jenkins, seconded by Mr. Curry, and unanimously carried on this day of October 1972, at 11:40 o'clock prevailing time.

Chairman

Secretary

COMMISSIONERS OF MONTGOMERY COUNTY PENNA

RECEIVED
GHD Inc.
NOV 12 2013

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

NOV 05 2013

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

We have completed our review of your municipality's updated official sewage facilities plan (Plan) titled *Hatfield Township Act 537 Sewage Facilities Plan,* as prepared by CET Engineering Services, dated November 2010 and revised October 16, 2013. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the Plan is hereby granted. The Plan provides for the following:

1. Hatfield Township Municipal Authority (HTMA) will apply for a rerate of the wastewater treatment facility from an annual average flow of 6.98 MGD to 7.55 MGD.

2. Hatfield Township and HTMA will use 250 gpd/EDU for sewage facilities planning.

3. Hatfield Township will implement a township-wide on-lot sewage management ordinance, Ordinance 608, enacted September 29, 2010, and supplemented by Ordinance 627, enacted July 13, 2011.

4. Hatfield Township will negotiate and coordinate with Towamencin Township to enter into an agreement for the sanitary sewer service for the Derstine Road Sewer Area, portions of Basins 14 and 16 and the Derstine Run development.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE; HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717.787.3483) FOR MORE INFORMATION.

If you have any questions, please contact Ms. Stefanie Yosmanovich of this office.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Towamencin Township
Ms. Seimes - Hilltown Township
Mr. Definis - Hatfield Borough
Mr. Gregan - Montgomery Township
Mr. Baver - Franconia Township
Ms. Vollero - RCSOB, 11th Floor, Sewage Facilities
Ms. Yosmanovich
Ms. Maisey
Planning Section
Re 30 (GJE13CLW)301-2

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

May 16, 2012

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Request for Flow Determination
Hatfield Township Act 537 Plan
Hatfield Township
Montgomery County

Dear Mr. Haines:

The Southeast Regional Office (SERO) is in receipt of the February 9, 2012, correspondence from Ms. Jodi Reese of CET Engineering Services, requesting that the Department of Environmental Protection (Department) allow the use of 216 GPD/EDU in reviewing Hatfield Township's (Township) pending Act 537 Plan Update. The Hatfield Township Municipal Authority (HTMA) would prefer to use a single per EDU flow figure for both Act 537 planning and tapping fee calculation purposes. The flow figure currently used for tapping fee calculation is 216 GPD/EDU, which was presented as the flow figure for new connections in the Act 537 plan update.

In its letters of January 25, 2011 and August 31, 2011, SERO asked that HTMA provide justification for its use of 216 GPD/EDU as a planning flow figure. SERO had expressed concerns that the flow per EDU in HTMA's sewer system is actually 326 GPD/EDU, based on data included with the Act 537 plan update, and further urged HTMA to use a flow figure of 262.6 GPD/EDU for new connections. Representatives of SERO met with Hatfield Township and HTMA representatives on November 30, 2011, to discuss the matter further, but no resolution was reached.

Ms. Reese's February 9, 2011, letter bases the use of 216 GPD/EDU for new connections on the use of improved modern materials for pipe construction, the requirement that all new construction be equipped with water conservation plumbing fixtures, and on the basis of metered flows from a force main serving 125 homes. Upon consideration of this information, we cannot agree to your request to use 216 GPD/EDU for planning purposes for the following reasons:

1. The flow data cited was obtained from a force main connection. Force mains and low pressure sewers tend to be less prone to infiltration and inflow (I/I) over time and thus may not provide an accurate long-term estimate of future flows.

2. The flow data does not account for the demographic shift in household size that can occur as community's age.

3. The flow number does not meet the criteria set forth in the Domestic Wastewater Facilities Manual.

4. The Municipal Authorities Act and the Sewage Facilities Act are two separate statutes with different purposes. While the regulatory frameworks for one statute may result in the use of different flow number, that should not create any conflicts in the creation of tapping fees or in sound sewage planning.

We recognize that HTMA may not wish to expand its wastewater treatment facility beyond a capacity that it feels is appropriate. In order to offer a resolution to this situation, the Department is willing to approve the wastewater treatment plant capacity proposed in the Act 537 plan update, if Hatfield Township and HTMA commit to use a flow figure of at least 250 GPD/EDU for planning and if HTMA commits to conduct a comprehensive I/I removal program as part of the Act 537 plan. By committing to a comprehensive I/I removal program, Hatfield could expect to realize additional capacity in the treatment plant, and the Department is willing to consider this work in the planning evaluation of flows.

I hope this addresses your concerns.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Adam Bram, Esq.
Ms. Mahoney
Ms. Yosmanovich
Re 30 (GJE12CLW)136-10

Joel Kostelac

From: Tom Whittle
Sent: Thursday, August 15, 2013 2:56 PM
To: Joel Kostelac
Subject: FW: Hatfield Township's Pending 537 Plan
Attachments: 20130815102935095.pdf

CompleteRepository: 8910075
Description: 00592.660000-00 Hatfield Township Municipal Authority-537 Plan
JobNo: 10075
OperatingCentre: 89
RepoEmail: 8910075@ghd.com
RepoType: Job

-----Original Message-----
From: Peter Dorney [mailto:pdorneyhtma@verizon.net]
Sent: Thursday, August 15, 2013 2:34 PM
To: 'Paul Mullin'; 'Steve Hann'
Cc: Jodi Reese; Tom Whittle
Subject: FW: Hatfield Township's Pending 537 Plan

Here is the first email today from DEP.

-----Original Message-----
From: Yosmanovich, Stefanie [mailto:syosmanovi@pa.gov]
Sent: Thursday, August 15, 2013 11:30 AM
To: Peter Dorney (pdorneyhtma@verizon.net)
Cc: Abibro@hatfield-township.org
Subject: Hatfield Township's Pending 537 Plan

Pete, Aaron,

Beth Mahoney and I were contacting you both this morning regarding Hatfield Township's pending 537 Plan. The 2012 Chapter 94 (Municipal Wasteload
Management) states that Hatfield is awaiting a response from the Department regarding the letter sent to us on February 9, 2012 from CET Engineering Services.

Attached is the Department's response to the February 9, 2012 letter.

Please inform the Department the status of a resubmission.

Thank you,

Stefanie

Stefanie Yosmanovich | Sewage Planning Specialist 2 Department of Environmental Protection|Clean Water Program Southeast Regional Office

October 16, 2013

Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401-4915

Attn: Ms. Jenifer Fields, P.E.
Regional Manager, Clean Water

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Fields,

In response to your letter dated May 16, 2012, and subsequent August 15, 2013 correspondence from Stefanie Yosmanovich in regard to the Hatfield Township Act 537 Plan Revision, the Township and Authority have agreed to utilize 250 gpd/EDU for planning, as suggested. The appropriate areas of the plan have been revised and are attached.

Should you have any questions, please don't hesitate to contact me. Thanks very much.

Sincerely,

GHD INC.

Joel Kostelac, PE
Project Manager

Enclosures

Cc: Peter Dorney, Executive Director, HTMA
Andrew Haines, Township Manager, Hatfield Township
GHD File 89/10075

GHD
1240 North Mountain Road Harrisburg PA 17112 USA
T 1 717 541 0622 F 1 717 541 8004 E harrisburg@ghd.com W www.ghd.com

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

August 31, 2011

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

On August 1, 2011, this office received a resubmission of your Proposed Official Sewage Facilities Plan Update for Hatfield Township, Montgomery County titled *Hatfield Township Act 537 Plan,* as prepared by CET Engineering Services dated November 2010 and revised July 2011. This plan is being submitted to the Department of Environmental Protection (Department) in accordance with the provisions set forth by Section 5 of the Pennsylvania Sewage Facilities Act and Chapter 71, the Administration of Sewage Facilities Program.

We have now completed our technical review of the plan and have identified the following deficiencies that must be resolved before the Department can approve the plan:

1. Item 3 in the Department's January 25, 2011, letter recommended that HTMA reevaluate their use of 216 gpd/equivalent dwelling unit (EDU) and provide a justification for the use of 216 gpd/EDU. The justification provided is not adequate. The Department agrees that new sewer construction material is superior to the material used in 1960, which is when sewers were first constructed in Hatfield Township. However, the justification does not take into account for new flow going through older sewers in Hatfield Township. Flows for new sewer connections should take into account I/I from older portions of the sewer system. If Hatfield Township has a low percentage of old sewers in the Hatfield Township or has retrofitted the older sewers, please provide that information to the Department. Further, on pages 3–6, Hatfield Township has demonstrated that the 5-year average flow per EDU in Hatfield Township is 326 gpd which is significantly higher than the 216 gpd/EDU that Hatfield Township is currently using. The flow figure 216 gpd/EDU is lower than what the Department's Domestic Wastewater Facilities Manual recommends for new sewer systems which is 262.5 gpd/EDU. The Department strongly recommends that Hatfield Township reevaluate its use of 216 gpd/EDU.

2. In the resubmission received on August 1, 2011, the information on pages 4–5 has changed. The flow per proposed EDU has changed from 275 gpd/EDU to 216 gpd/EDU. However, the Chapter 94 projected connections flow did not change in Table IV-5. Please provide an explanation for the change.

3. Table IV-5 utilizes the flow figure of 275 gpd/EDU and shows that at build-out of Hatfield Township, connection of all on-lot systems, the 5-year projected connections combined with the current annual average flow, the estimated daily average flow is 7.640 MGD. Utilizing the flow of 326 gpd/EDU, which Hatfield Township has demonstrated is their current and actual flow per EDU, the total estimated average daily flow would be 7.911 MGD. The Department recommends Hatfield Township reevaluated its use of 216 gpd/EDU and the proposed annual average rerate of 7.55 MGD to accommodate a higher flow per EDU and the resulting higher annual average rerate flow.

4. The Department did not receive a full revised sewage management ordinance. Please submit to the Department a copy of the full revised ordinance or identify if Ordinance No. 627 is an addendum to Ordinance No. 608.

5. The Department recommends that the implementation schedule be revised to include an estimated completion date. The estimated completion date can be stated in terms of "immediately after approval of Department permits is received" or "number of months after approval of Department permits is received."

The municipality must resubmit all deficiency items together. The municipal secretary's signature will be accepted by the Department as documentation that the municipality has determined the resubmission to be consistent with Act 537 sewage planning requirements. If the information requested below is not received by September 30, 2011, we will be obligated to return the submission in its entirety.

Please note that per Pa. Code, Title 25, Chapter 71, Section 71.32(b), the Department will either approve or disapprove an Official Sewage Facilities Plan within 120 days after our receipt of a complete submission. The Department's 120-day review terminates on November 29, 2011.

If there are any questions concerning the information required, please contact me at 484.250.5186.

Sincerely,

Stefanie Kosmanovich
Sewage Planning Specialist 2
Water Management

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Planning Section
Re 30 (joh11wqm)243-5

CET ENGINEERING SERVICES

September 27, 2011

Stefanie Yosmanovich
Water Department
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision
Response to Review Comments

Dear Ms. Yosmanovich,

In response to your August 31, 2011 letter and on behalf of Hatfield Township and the Hatfield Township Municipal Authority we offer the following responses.

1. Infiltration occurs when groundwater enters into the collection system through cracks in pipes, loose or poorly constructed fittings, or variety of other entry points. Some level of infiltration exists in collection systems regardless of sewage flow in these areas. Older sewers do not experience more infiltration simply when wastewater flows increase. In older areas of the system a greater volume of groundwater can enter as compared to tighter, newer areas of the system and this existing volume of infiltration is captured and accounted for in the existing plant flows used in the projections provided. Flow from new connections does not experience additional infiltration as it is conveyed to the WWTP. 326 gpd/EDU is the current average daily flow for existing connections, and includes accurate levels of infiltration and inflow from these connections. 216 gpd/EDU was selected to be consistent with the 2010 Chapter 94 submission as well as current tapping fee law. As demonstrated in our July 27, 2011 letter (attached for reference), this value is conservative and does include some allowance for I/I in new connections beyond what is metered now in the areas indicated in points 3 and 4. This I/I occurs at these connections and does not increase as the flow continues.

   HTMA and Hatfield Township is utilizing 216 gpd/EDU to provide a realistic expectation of how much additional capacity may be necessary and to avoid placing an undue burden on the ratepayer. Understanding that there may be some uncertainty in the buildout flow projections, preliminary treatment limits and the Selected Alternative were based on a required flow of 7.55 MGD, above the 7.35 MGD required as indicated in Table IV-5.

   Also, as can be seen by the two attached charts, plant flow is affected significantly more by precipitation than it is by new connections. Flow and precipitation generally follow the same trend, while flow does not respond in the same manner when new connections are added. This is due to inflow and infiltration in the older portions of the existing collection system. HTMA has performed significant inspection of old and new sewer lines within its system, and the overriding conclusion is that areas with newer construction materials such as PVC pipe as opposed to clay and concrete pipe, have in general only minor I/I. Furthermore, as HTMA's

I/I program continues to address the areas of concern in the older areas of the system, assuming similar precipitation, it is highly probable that the gpd/EDU will decrease over time. HTMA also provides a much more significant level of testing and inspection today of new lines and connections than that which occurred 20 years ago, when the use of PVC became prevalent, assuring less chance for infiltration.

HTMA would like to point out that any projection that evaluates final flow through the complete build-out of the system is a rough estimate of what will actually occur. Plant flows will continue to be evaluated through the Chapter 94 process. Should a shortfall be anticipated, HTMA would likely be required to re-evaluate their flows. Conversely, should the use of exaggerated flows be required, it is improbable that DEP would allow HTMA to decrease its permitted flow.

2. The value on page 4-5 was changed so that the flow values for all future connections discussed in the plan revision were consistent. The total flow number listed for Chapter 94 Projected Connections on Table IV-5 is incorrect and should match the value of 0.331 MGD stated in the first paragraph on page 4-5. The Total Estimated Average Daily Flow is correctly listed as 7.35 MGD.

3. Table IV-5 was revised with the revised submission in July and utilizes 216 gpd/EDU for all future EDUs. Current EDUs are based on existing flows to the WWTP and include the 326 gpd/EDU value. The Total Estimated Average Daily Flow is 7.35 MGD and as stated, the proposed annual average flow is 7.55 MGD.

4. Ordinance No. 627 supplements Ordinance No. 608.

5. This has been revised and is attached. However, since final treatment limits will dictate the scope of any potential upgrades to the WWTP a range is still indicated for these milestones.

Due to the extreme importance of this issue for HTMA and Hatfield Township, both now and in the future, HTMA believes it would be prudent to participate in a meeting with DEP to further explain and defend its position.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Cc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

Table 1. Plant Flow vs. Preciptation

	Year	Annual Avg. Flow (MGD)	Annual Total Rainfall	Total Rainfall[1]	Flow:Rain Ratio
1	2002	4.87	39.93	3.99	1.22
2	2003	6.73	57.47	5.75	1.17
3	2004	5.92	52.44	5.24	1.13
4	2005	5.86	43.40	4.34	1.35
5	2006	6.62	55.41	5.54	1.20
6	2007	5.80	47.82	4.78	1.21
7	2008	5.98	50.30	5.03	1.19
8	2009	6.35	52.31	5.23	1.21
9	2010	5.74	43.57	4.36	1.32
	AVG	5.99	49.18	4.92	1.22

(1) Total Rainfall was divided by 10 to normalize the data, as shown flow to rainfall ratios are consistent

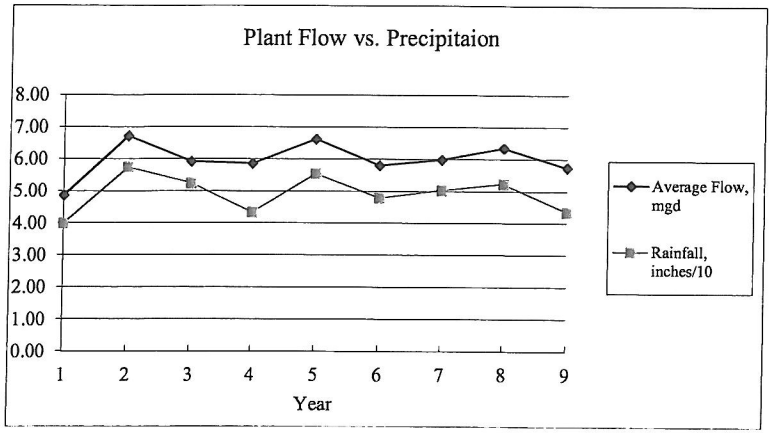
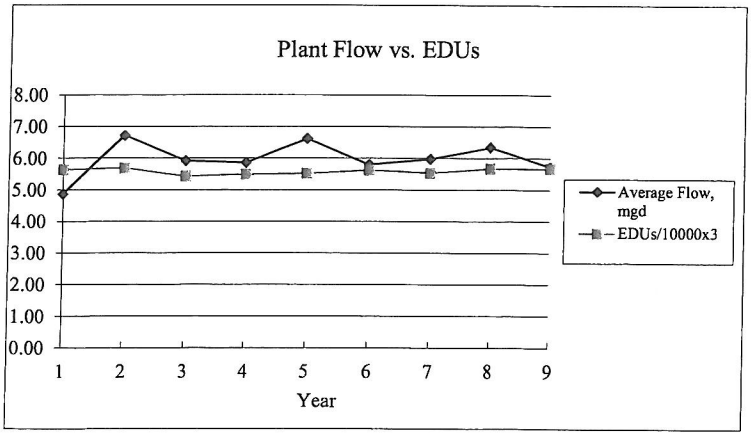


Table 2. Plant Flow vs. EDUs

	Year	Annual Avg. Flow (MGD)	EDUs[1]
1	2002	4.87	5.637
2	2003	6.73	5.688
3	2004	5.92	5.430
4	2005	5.86	5.490
5	2006	6.62	5.517
6	2007	5.80	5.625
7	2008	5.98	5.535
8	2009	6.35	5.676
9	2010	5.74	5.676
	AVG	5.99	5.59

(1) Similar to above, an arithmatic change was made to normalize the values; and to clearly illustrate trending



C. IMPLEMENTATION SCHEDULE

The Township intends to implement both selected alternatives upon approval of this plan revision by DEP. The anticipated schedule is listed below:

- Act 537 Plan Comment and External Review Period: March – April 2010
- Address Comments as necessary: April 2010
- Draft On-lot Management Ordinance: April – August 2010
- Adoption of On-lot Management Ordinance: September 2010
- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Receipt of DEP Comments to Act 537 Revision: January 2011
- Submission of Revisions to Act 537 Plan Revision: May 2011
- Receipt of DEP Approval to Act 537 Revision: Time Zero (T)
- Implementation of Alternative 2: T+3 months
- Submission of Water Quality Management (WQM) Permit Pt. I Application: T+9 months
- Submission of WQM Pt. II Application: 1 to 6 months following DEP approval of Pt. I Application[12]
- Implementation of Alternative 1: 1 to 6 months following DEP approval of Pt. II Application[3]

[1] Based on DEP timing for review, approval, and issuance of new limits. Required to determine actual toxic limits since they are not available through the PTR process
[2] Timing of this submission is dependent on final limits received and the scope of the application. This could range from a Design Engineers report only to a preliminary design for a process upgrade (necessitated by lower limits)
[3] Depends on (2) and the scope of any required project

ORDINANCE NO. 627

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, Article IV, On-Lot Sewage Management Program is hereby amended as follows:

i. Section 224-38, Subsection A is hereby amended to read as follows:

A. Upon adoption of this Ordinance, The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped within 90 days of receipt of notification or provide notification to the Township that the on-lot system had been pumped within the previous three (3) years. Thereafter, the Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every three (3) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

ii. Section 224-38, Subsection B is hereby amended to read as follows:

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every three (3) years thereafter or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

iii. Section 224-38, Subsection C is hereby amended to read as follows:

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every three (3) years. In no case shall such period extend beyond six (6) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

iv. Section 224-38, Subsection G is hereby amended to read as follows:

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks. The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. Failure to Enforce not a Waiver.

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. Effective Date.

This ordinance shall take effect within five (5) days of passage.

§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 13 day of July 2011.

Attest: _____

HATFIELD TOWNSHIP

By: _____

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION #11-22

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities and dates are detailed in Section VIII-C of the 537 Plan.

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

Andrew S. Haines, Manager

HATFIELD TOWNSHIP
BOARD OF COMMISSIONERS

BY: Thomas C. Zipfel

Thomas C. Zipfel, President

HATFIELD
TOWNSHIP

PRINTED WITH SOY INK

October 28, 2011

Beth Mahoney
Water Management
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Mahoney,

As requested in your telecon with Joel Kostelac, P.E., CET Engineering Services, on October 27, 2011 Hatfield Township will not pursue a "deemed approval" of our 537 Plan submittal currently under review by your office. Please contact CET at (717) 541-0622 to schedule a meeting to discuss the important issues affecting the plan approval.

Thanks very much.

Sincerely,

Andrew S. Haines
Township Manager

Cc: Joel Kostelac, P.E., CET Engineering Services
Peter Dorney, Hatfield Township Municipal Authority

CET ENGINEERING SERVICES

A Subsidiary of

GHD CLIENTS | PEOPLE | PERFORMANCE

February 9, 2012

Jenifer Fields, P.E.
Clean Water Department, Program Manager
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision

Dear Ms. Fields:

The Hatfield Township Municipal Authority (HTMA) met and discussed the impact of having two different flow rates per EDU: one for tapping fee calculations as required by the Municipal Authorities Act (Act 57) and one for Act 537 Planning as discussed during the November 30, 2011 meeting with SERO.

Hatfield Township and the HTMA would like the SERO to forward this letter to DEP Central Office for their review of using **216 gpd/EDU for the Annual Average Flow Rate** from new connections for Act 537 planning purposes. This flow rate is considered to be a conservative value. The justification of that flow rate is provided below.

1. Sewers were first constructed in Hatfield beginning in 1960. During that time, pipe material, pipe joints, and installation practices were significantly inferior as compared to today. HTMA has "STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM EXTENSIONS" that must be followed for new construction which include use of superior pipe material, inspection during construction, and testing of all sewer mains and laterals (air testing) and manholes (vacuum testing). These specifications have been in place since the year 2000.

2. In 2004, Pennsylvania adopted the Uniform Construction Code (UCC) which requires water conservation plumbing fixtures in new home construction.

3. A force main sewer to HTMA from Chalfont – New Britton is metered. The sewered area initially had 124 residential EDUs with construction of the homes completed in 2009 using PVC sewers. All flow is pumped and metered into the HTMA sewer system.

   The total flow for 2010 was 7,900,730. With 124 EDUs, the flow per EDU is **175 gpd/EDU**.

   In 2011, there were 125 residential EDUs with a total flow of 7,142,986. The weekly average flows ranged from 136 to 182 gpd/EDU and the annual average flow rate was **158 gpd/EDU**.

4. The Township is about 85% built-out. The projected flows will be applied only to the remaining 15%.

5. The projected flow is added to the current flows to the WWTP. The current flows take into account all the existing I/I in the older portions of the sewer system (calculated at 326 gpd/EDU by Chapter 94).

6. In a quick review of projected flows used by the CET-GHD office for other approved Act 537 Plans, I find that approved flows for future projections ranges from 170 to 250 gpd/EDU.

HTMA and Hatfield Township are utilizing 216 gpd/EDU in order to provide a realistic expectation of how much additional treatment capacity may be necessary in order to be consistent with Pennsylvania requirements, including the Municipal Authorities Act.

HTMA would like to point out that any projection that evaluates final flow through the complete build-out of the system is a rough estimate of what will actually occur. The HTMA will evaluate the potential for exceedance of these flows prior to any such occurrence through annual Chapter 94 reporting.

Sincerely,
CET engineering - GHD

Jodi L. Reese, P.E.
Project Manager

xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority
Steven Hann, Hamburg, Rubin, Mullin, Maxwell & Lupin

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

May 16, 2012

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Request for Flow Determination
Hatfield Township Act 537 Plan
Hatfield Township
Montgomery County

Dear Mr. Haines:

The Southeast Regional Office (SERO) is in receipt of the February 9, 2012, correspondence from Ms. Jodi Reese of CET Engineering Services, requesting that the Department of Environmental Protection (Department) allow the use of 216 GPD/EDU in reviewing Hatfield Township's (Township) pending Act 537 Plan Update. The Hatfield Township Municipal Authority (HTMA) would prefer to use a single per EDU flow figure for both Act 537 planning and tapping fee calculation purposes. The flow figure currently used for tapping fee calculation is 216 GPD/EDU, which was presented as the flow figure for new connections in the Act 537 plan update.

In its letters of January 25, 2011 and August 31, 2011, SERO asked that HTMA provide justification for its use of 216 GPD/EDU as a planning flow figure. SERO had expressed concerns that the flow per EDU in HTMA's sewer system is actually 326 GPD/EDU, based on data included with the Act 537 plan update, and further urged HTMA to use a flow figure of 262.6 GPD/EDU for new connections. Representatives of SERO met with Hatfield Township and HTMA representatives on November 30, 2011, to discuss the matter further, but no resolution was reached.

Ms. Reese's February 9, 2011, letter bases the use of 216 GPD/EDU for new connections on the use of improved modern materials for pipe construction, the requirement that all new construction be equipped with water conservation plumbing fixtures, and on the basis of metered flows from a force main serving 125 homes. Upon consideration of this information, we cannot agree to your request to use 216 GPD/EDU for planning purposes for the following reasons:

1. The flow data cited was obtained from a force main connection. Force mains and low pressure sewers tend to be less prone to infiltration and inflow (I/I) over time and thus may not provide an accurate long-term estimate of future flows.

2. The flow data does not account for the demographic shift in household size that can occur as community's age.

3. The flow number does not meet the criteria set forth in the Domestic Wastewater Facilities Manual.

4. The Municipal Authorities Act and the Sewage Facilities Act are two separate statutes with different purposes. While the regulatory frameworks for one statute may result in the use of different flow number, that should not create any conflicts in the creation of tapping fees or in sound sewage planning.

We recognize that HTMA may not wish to expand its wastewater treatment facility beyond a capacity that it feels is appropriate. In order to offer a resolution to this situation, the Department is willing to approve the wastewater treatment plant capacity proposed in the Act 537 plan update, if Hatfield Township and HTMA commit to use a flow figure of at least 250 GPD/EDU for planning and if HTMA commits to conduct a comprehensive I/I removal program as part of the Act 537 plan. By committing to a comprehensive I/I removal program, Hatfield could expect to realize additional capacity in the treatment plant, and the Department is willing to consider this work in the planning evaluation of flows.

I hope this addresses your concerns.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Adam Bram, Esq.
Ms. Mahoney
Ms. Yosmanovich
Re 30 (GJE12CLW)136-10

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE

RECEIVED
JAN 31 2011
CET, INC.
HARRISBURG, PA

January 25, 2011

Mr. Andrew Haines, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 Plan Update
APS ID 642877, AUTH ID 862201
Hatfield Township
Montgomery County

Dear Mr. Haines:

On November 24, 2011, this office received your Proposed Official Sewage Facilities Plan Update (Plan) for Hatfield Township (Township), Montgomery County, titled *Hatfield Township Act 537 Plan,* as prepared by CET Engineering Services, dated November 2010. This Plan is being submitted to this Department of Environmental Protection (Department) in accordance with the provisions set forth by Section 5 of the Pennsylvania Sewage Facilities Act and Chapter 71, the Administration of Sewage Facilities Program.

A preliminary review has indicated that the plan update is incomplete for the following reasons:

1. Please provide a site plan showing the service areas in the adjacent municipalities that are served by the Hatfield Township Municipal Authority (HTMA).

2. Please clarify the following for Table III-1 on page 3-3:

   a. Please identify what the acronyms PHF and AAF stand for.

   b. Note 3 refers to a PHF of 4; please identify what this means and how this number was derived.

   c. The capacities listed for the wastewater treatment facility are the maximum month flows. We recommend that the Table also contain the average annual permitted capacity and that the average annual projected and average annual remaining capacities be included in the Table.

3. Page 3-6, demonstrates that the 5-year average flow per equivalent dwelling unit (EDU) in the Township is 326 gpd. However, HTMA is using 216 gpd/EDU and no justification has been provided for the continued use of this flow. It does not appear that HTMA has considered the impact of I/I in the existing facilities between the new connections to the wastewater treatment facility. The Department recommends that HTMA reevaluate the use of 216 gpd/EDU and instead either use 326 gpd/EDU, as demonstrated by the 5-year average flow, or use an EDU figure of 262.5 gpd, as supported by the Department's Domestic Wastewater Facilities Manual.

4. Paragraph 2 on page 3-6 references an annual average flow of 5.98 MGD. This flow figure appears to be out of date according to the 2009 Chapter 94 Report flow noted in Table III-3. This number should be revised according to the 2009 Chapter 94 Report. All calculations should also be revised accordingly.

5. Please provide a detailed cost analysis for the upgrades for the wastewater treatment facility and for the implementation of the sewage management program. Specifically:

   a. What will the upgrades to the treatment facility cost?

   b. The cost analysis of the sewage management program does not appear to include all of the lots in the Township that have an on-lot sewage disposal system. The calculation only appears to include the 30 lots in the Derstine Road Study Area. Please clarify.

   c. Chapter 71 requires the Township to identify both a primary and contingency funding source to implement its plan. Please identify the contingency funding source.

6. Please provide copies of the on-lot sewage needs surveys that were returned to HTMA and the door to door surveys that were completed.

7. The Sewage Needs Table in Exhibit III-3 has a column heading of <72. Please identify what this heading describes.

8. Exhibit IV-8 includes a letter from Hilltown Township noting concerns that they have about the Plan revision. Please provide a copy of Hatfield Township's response to Hilltown Township.

9. The Department notes that the wastewater treatment facility discharges to the West Branch of the Neshaminy Creek. The Neshaminy Creek is an impaired waterway and may require certain treatment requirements. If HTMA has not done so already, please contact Mr. Sohan Garg, NPDES Permits Chief, at sgarg@state.pa.us to request Preliminary Treatment Requirements for the expansion of the treatment facility.

   Please include a copy of your preliminary treatment limits with your response and provide documentation that the wastewater treatment facility will be able to meet these limits.

10. The Department has the following concerns regarding the on-lot operation and maintenance ordinance included in Exhibit V-5:

    a. Section 224-38, Maintenance, states that properties with an on-lot disposal system will be notified once every 4 years to get their system pumped. Please refer to the enclosed fact sheet. The Department recommends that septic tanks be pumped once every 3 years or whenever an inspection reveals solids or scum in excess of 1/3 of the liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system.

    b. For aerobic systems, the Department recommends that the ordinance include language similar to "The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system."

    c. Please identify how the pumping schedule will be established for the existing on-lot disposal systems within the Township.

11. The Department recommends that the implementation schedule be revised as follows:

    a. We discourage the use of actual dates; rather, the schedule should start with the Department approval of the Act 537 Plan as "Time Zero." Any schedule of items after that should be referenced by the number of months after "Time Zero."

    b. The implementation schedule does not include the submission of permits to the Department that will be required for the upgrades.

    c. The schedule should also include an estimated completion date.

    d. The Department recommends that a new Resolution of Adoption be passed since the original one contains the previous implementation schedule.

When the necessary revisions have been completed, as listed above, this Department will initiate a review in accordance with the provisions of Chapter 71, Administration of the Sewage Facilities Program.

If there are any questions concerning the information required, please contact me at 484.250.5186.

Sincerely,

Stefanie Yosmanovich
Sewage Planning Specialist 2
Water Management

cc: Montgomery County Planning Commission
Montgomery County Health Department
Mr. Dorney - Hatfield Township Municipal Authority
CET Engineering Services
Planning Section
Re 30 (GJS11WQM)24-4

CET ENGINEERING SERVICES

July 27, 2011

Stefanie Yosmanovich
Water Department
Southeast Regional Office
Pennsylvania Department of Environmental Protection
2 East Main Street
Norristown, PA 19401-4915

Re: Hatfield Township Act 537 Plan Revision
Response to Preliminary Review Comments

Dear Ms. Yosmanovich,

In response to your January 25, 2011 letter and on behalf of Hatfield Township and the Hatfield Township Municipal Authority we offer the following responses. As discussed, new copies of all the revised sections are attached with page references for revisions noted below.

Comment 1. Please provide a site plan showing the service areas in the adjacent municipalities that are served by the Hatfield Township Municipal Authority.
Response 1. Plate 1 has been revised and is attached.

Comment 2. Please clarify the following for Table III-1 on page **3-3**:

a. Please identify what the acronyms PHF and AAF stand for.
Response 2a. (See Page 3-3): PHF stands for Peak Hourly Flow; AAF stands for Annual Average Flow

b. Note 3 refers to a PHF of 4; please identify what this means and how this number was derived.
Response 2b. (See Page 3-3): This note describes how the Peak Hourly Flow (PHF) of tributary EDUs was derived. A peaking factor of 4 (PHF to AAF) was selected, and thus the AAF contribution of 216 gpd/EDU was multiplied by 4 for a PHF contribution of 864 gpd / EDU. A peaking factor of 4 is a widely accepted factor when estimating peak flows from average flows.

c. The capacities listed for the wastewater treatment facility area the maximum month flows. We recommend that the Table also contain the average annual permitted capacity and that the average annual projected and average annual remaining capacities be included in the Table.
Response 2c. (See Page 3-6): Pumping station and interceptor design capacities are based on peak hourly flows, not average annual flows. In regard to the WWTP a comparison of annual average flow and projected annual average flow is shown on Table III-3 on page 3-6. An additional column has been added showing the remaining capacity.

Comment 3. Page 3-6, demonstrates that the 5-year average flow per EDU in the Township is 326 gpd. However, HTMA is using 216 gpd/EDU and no justification has been provided for the

continued use of this flow. It does not appear that HTMA has considered the impact of I/I in the existing facilities between the new connections to the wastewater treatment facility. The Department recommends that HTMA reevaluate the use of 216 gpd/EDU and instead either use 326 gpd/EDU, as demonstrated by the 5-year average flow, or use an EDU figure of 262.5 gpd as supported by the Department's Wastewater Facilities Manual.

Response 3. HTMA is using 216 gpd/EDU for the average flow rate from new and is considered to be a conservative value. The justification of that flow rate is provided below.

1. **Sewers were first constructed in Hatfield beginning in 1960. During that time, pipe material, pipe joints, and installation practices were significantly inferior as compared to today. HTMA has "STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR WASTEWATER COLLECTION SYSTEM EXTENSIONS" that must be followed for new construction which include use of superior pipe material, inspection during construction, and testing of all sewer mains and laterals (air testing) and manholes (vacuum testing). These specifications have been in place since the year 2000.**

2. **In 2004, Pennsylvania adopted the Uniform Construction Code (UCC) which requires water conservation plumbing fixtures in new home construction.**

3. **A force main sewer to HTMA from Chalfont – New Britton is metered. The sewered area has 124 residential EDUs with construction of the home completed in 2009 using PVC sewers. The flow is pumped and metered into the HTMA sewer system. The total flow for 2010 is 7,900,730. With 124 EDUs, the flow per EDU is 175 gpd/EDU.**

4. **The Clemens Road Pump Station serves 360 residential EDUs, Lowe's, a bank, and a commercial building.**
   - **The sewer system is PVC pipe.**
   - **The flows from the non-residential establishment are estimated from 2010 water meter readings (North Penn Water Company) to be 3, 882,425 gal/yr.**
     1. **Lowe's: 2,300,000 gal/yr (6,301 gpd);**
     2. **Bank: 16,425 gal/yr (45 gpd);**
     3. **Commercial buildings: 1,556,000 gal/r (4,263 gpd).**
   - **The residential units were connected between 1978 and 2004 (199 in 1978, 98 in 1997, 56 in 2004, 7 miscellaneous)**
   - **Total pump station flow for 2010: 26,189,200.**
   - **Average Flow Rate: 170 gpd/EDU [(26,189,200 – 3,882,425) + 365 + 360]**

Comment 4. Paragraph 2 on page 3-6 references an annual average flow of 5.98 MGD. This flow figure appears to be ouf of date according to the 2009 Chapter 94 Report flow noted in Table III-3. This number should be revised according to the 2009 Chapter 94 Report. All calculations should be revised accordingly.

Response 4 (See Page 3-6). These numbers and calculations have been revised.

Comment 5. Please provide a detailed cost analysis for the upgrades for the wastewater treatment facility and for the implementation of the sewage management program. Specifically:

a. What will the upgrades to the treatment facility cost?

Response 5a. The selected alternative does not involve a physical upgrade to the treatment plant and as such, no cost analysis was accomplished.

b. The cost analysis of the sewage management program does not appear to include all of the lots in the Township that have an on-lot sewage disposal system. The calculation only appears to include the 30 lots in the Derstine Road Study Area.
Response 5b (See Page 6-4). This analysis has been revised to reflect all known systems.

c. Chapter 71 requires the Township to identify both a primary and contingency funding source to implement its plan. Please identify the contingency funding source.
Response 5c. Should existing revenues or reserves not be sufficient the Township or HTMA will secure funding through a bond sale.

Comment 6. Please provide copies of the on-lot sewage needs surveys that were returned to HTMA and the door to door surveys that were completed.
Response 6. Copies are attached for your use.

Comment 7. The Sewage Needs Table in Exhibit III-3 has a column heading of <72. Please identify what this heading describes.
Response 7. This heading refers to systems that were installed prior to 1972.

Comment 8. Exhibit IV-8 includes a letter from Hilltown Township noting concerns that they have about the Plan Revisions. Please provide a copy of Hatfield Township's response to Hilltown Township.
Response 8. Upon receipt of the response letter from Hilltown Township, HTMA made several attempts to address their concerns. Specifically, HTMA offered Hilltown Township service, but the terms of a service agreement could not be agreed upon. Most recently, in conjunction with the 2010 Chapter 94 prep, HTMA did receive correspondence regard Hilltown connections of the next five years. This correspondence is included.

Comment 9. The Department notes that the wastewater treatment facility discharges to the West Branch of the Neshaminy Creek. The Neshaminy Creek is an impaired waterway and may require certain treatment requirements. If HTMA has not done so already, please contact Mr. Sohan Garg, NPDES Permits Chief, at sgarg@state.pa.us to request Preliminary Treatment Requirements for the expansion of the treatment facility.

Please include a copy of your preliminary treatment limits with your response and provide documentation that the wastewater treatment facility will be able to meet these limits.
Response 9. HTMA can meet the proposed upper limits at the increased flow and is currently treating to well below these parameters. Since the final TN and TP lower limits listed are based on the Departments assessment only, as to future limits that may be placed in an EPA TMDL, or statewide nutrient criteria, they are not addressed. When these limits are finalized, HTMA will conduct the necessary evaluation to determine if and what process upgrades are required. There is sufficient space on the site to accommodate future upgrades. Regarding toxics, these limits were not evaluated by the Department. Evaluation via PennTOX was requested and the Department stated this was not accomplished at the PTR phase and would occur during the permitting phase. As such, any necessary upgrades would be evaluated at the time final limits are established. Again, there is sufficient space on site to accommodate future process upgrades.

Comment 10. The Department has the following concerns regarding the on-lot operation and maintenance ordinance included in Exhibit V-5:

a. Section 224-38, Maintenance, states that properties with an on-lot disposal system will be notified once every 4 years to get their system pumped. Please refer to the enclosed fact sheet. The Department recommends that septic tanks be pumped once every 3 years or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system.
Response 10a. The language in the ordinance has been modified. A copy of the new ordinance is attached.

b. For aerobic systems, the Department recommends that the ordinance include language similar to "The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system."
Response 10b. There are no aerobic systems within the HTMA service area, however this language has been added to the ordinance.

c. Please identify how the pumping schedule will be established for the existing on-lot disposal systems within the Township.
Response 10c. Upon approval of the Plan revision, all those individuals utilizing on-lot systems will be notified they have 90 days to pump the system or provide evidence of pumping within the last 3 years.

Comment 11. The Department recommends that the implementation schedule be revised as follows:

a. We discourage the use of actual dates; rather, the schedule should start with the Department approval of the Act 537 Plan as "Time Zero". Any schedule of items after that should be referenced by the number of months after "Time Zero".
Response 11a (See Page 8-3) . The implementation schedule has been revised.

b. The implementation schedule does not include the submission of permits to the Department that will be required for the upgrades.
Response 11b. There are currently no capital upgrades planned, and therefore, no permits required. However, dates and milestones with regard to the plant re-rate are included.

c. The schedule should also include an anticipated completion date.
Response 11c. See response 11b.

d. The Department recommends that a new Resolution of Adoption be passed since the original one contains the previous implementation schedule.
Response 11d. A new resolution has been passed and is attached.

Thanks very much, please don't hesitate to contact us should you have any concerns.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

C. ROBERT WYNN ASSOCIATES, INC.

MUNICIPAL & CIVIL ENGINEERING

211 West Broad Street • Quakertown • PA • 18951
(215) 536-7336 • FAX (215) 536-5361

RECEIVED
JAN 18 2011
CET, INC.
HARRISBURG, PA

January 13, 2011

Mr. Peter Dorney, Executive Director
Hatfield Township Municipal Sewer Authority
3200 Advance Lane
Colmar, PA 18915

Subject: Chapter 94 Annual Report
Hatfield Township Municipal Authority
Hilltown Township Report Requirements
File No. 03-047

Dear Mr. Dorney,

The following is a response to your November 223, 2010 correspondence and specifically, the Hilltown Township Checklist included on Pages 24-28. The comments refer to the annual report requirements 94-12 Annual Report identified as incomplete on the report checklist (response shown in *italic*):

1. Section (a)(4) - The map should show all known proposed projects that require public sewer but that are in the preliminary planning stages.

   Enclosed is a map prepared from Figure 7-3 from the Hilltown Township Act 537 Plan Route 309 Study Area Alternative No. 2. The figure has been revised to identify proposed sewer connections and HTMA sewer extension to serve the three parcels within the Township. The planning modules were approved by Hilltown Township on November 22, 2010 and will eliminate an existing holding tank at the Hilltown Tavern along Route 309. The modules have not yet been approved by PADEP.

2. Section (a)(4) - A list accompanying the map summarizing each extension or project and the population to be served.

   Enclosed is the list dated January 13, 2011 identifying an estimated 80 EDUs proposed for service in the period from 2010 thru 2014 and identified in correspondence dated March 29, 2010 to CET Engineering Services.

3. Section (a)(4) - The list should include any include any schedules describing how the project will be completed over time and the effects that this build outright will have on the population served.

   The initial phase approved by the Township on November 22, 2010 includes connection to three parcels and elimination of a holding tank serving the Hilltown Tavern. Future service will include proposed commercial development/redevelopment (Shopping Center Complex) at the intersection of Route 309 and Swartley Road, as well as extension north along Route 309 to serve commercial properties and eliminate three holding tanks.

4. Section (a)(5) - A discussion of the permittees program for sewer system monitoring, maintenance, repair, and rehabilitation, including routine and special activities, personnel and equipment use, sampling frequency, quality assurance, data analysis, and infiltration/inflow monitoring.

   Sanitary sewer system is owned and operated by the Hatfield Township Municipal Authority, who is responsible for maintenance.

5. Section (a)(5) - A calibration report shall be included for all flow measuring, indicating and recording equipment within the collection/conveyance system. Calibration should occur annually.

   Hatfield Township Municipal Authority owns and maintains the sanitary sewer system, and should be responsible for the calibration report.

6. Section (a)(6) - A discussion of the condition of the sewer system, including portions of the sewer system where conveyance capacity is being exceeded or is projected to be exceeded in the next five years.

   Hatfield Township Municipal Authority owns and maintains the sewer system. Hilltown Township performs no inspections, and is unaware of the condition of the sanitary sewer system.

7. Section (a)(6) - Existing capacity should be documented with actual metering of present maximum flows. If not already existing, the permittee should consider best placement of flow meters to document the capacity of major interceptors (greater than 10" in diameter) and/or where lines cross municipal borders. A discussion of present maximum flows should be documented with hourly or instantaneous peak readings taken during the major storm events (greater than 1" of rain). Autodialers may be installed to alert of high flow conditions. The Chapter 94 Report should compare the peak instantaneous flow for each major storm event to the design hydraulic conveyance capacity of the sewer in order to determine whether sufficient capacity is available. The ratio of peak (hourly or instantaneous) to annual average flows should be determined to assess the actual peaking factor for this system.

   Hatfield Township Municipal Authority owns and maintains sanitary sewer system. Hilltown Township has no information regarding existing capacity or metering of flow.

8. Section (a)(6) - A discussion of portions of the system where rehabilitation or cleaning is needed or underway to maintain the integrity of the system and prevent or eliminate bypassing, combined sewer overflow, sanitary sewer overflow, excess infiltration, and other system problems.

   Hatfield Township Municipal Authority owns and maintains sanitary sewer system. Hilltown Township has no information regarding necessary rehabilitation, cleaning, bypass overflow or infiltration.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

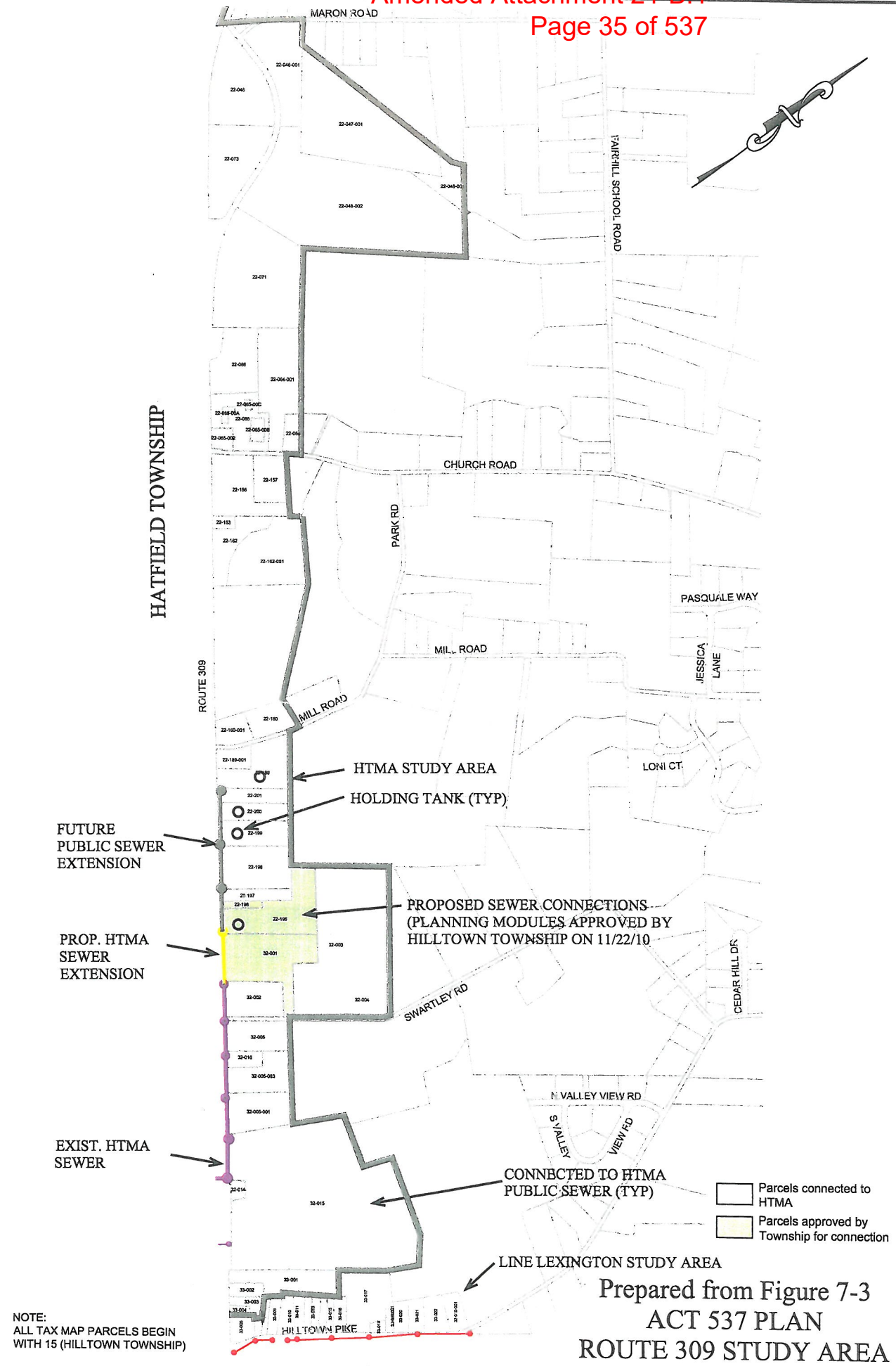
C. Robert Wynn, P.E.
Township Engineer

CRW/ajp

cc: Nancy Adams, Environmental Scientist, CET Engineering Services
Christopher S. Christman, Township Manager (via email)

Projected EDUs (2010 thru 2014)
Hatfield Township Municipal Authority
Hilltown Township
January 13, 2010
File No. 03-047

Tax Map Parcel	Type of Development	EDUs	Comment
15-32-001	Existing - 2 offices, 2 residences	4	Planning module approved by Township on 11/22/10
15-22-195/196	Existing restaurant	7	Planning module approved by Township on 11/22/10
15-32-003	Future retail development including supermarket, stores, restaurants, bank	62	Preliminary plan not submitted
15-22-198	Existing residence & insurance office	2	Currently served by on-lot sewage disposal system
15-22-199	Existing retail business	1	Currently served by holding tank
15-22-200	Existing landscape office	1	Currently served by holding tank
15-22-201	Existing Auto Repair	1	Currently served by on-lot sewage disposal system
15-22-189	Auto dealer repair/detail business (Peruzzi)	2	Currently served by holding tank


MARON ROAD
FAIRHILL SCHOOL ROAD
HATFIELD TOWNSHIP
CHURCH ROAD
PARK RD
PASQUALE WAY
MILL ROAD
JESSICA LANE
ROUTE 309
MILL ROAD
LONI CT
HTMA STUDY AREA
HOLDING TANK (TYP)
FUTURE PUBLIC SEWER EXTENSION
PROPOSED SEWER CONNECTIONS (PLANNING MODULES APPROVED BY HILLTOWN TOWNSHIP ON 11/22/10
PROP. HTMA SEWER EXTENSION
SWARTLEY RD
CEDAR HILL DR
N VALLEY VIEW RD
S VALLEY VIEW RD
EXIST. HTMA SEWER
CONNECTED TO HTMA PUBLIC SEWER (TYP)
Parcels connected to HTMA
Parcels approved by Township for connection
LINE LEXINGTON STUDY AREA
HILLTOWN PIKE
NOTE:
ALL TAX MAP PARCELS BEGIN WITH 15 (HILLTOWN TOWNSHIP)
Prepared from Figure 7-3
ACT 537 PLAN
ROUTE 309 STUDY AREA
ALTERNATIVE #2
EXTEND HTMA PUBLIC SEWER SYSTEM
JANUARY 13, 2011

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Southeast Regional Office

RECEIVED
APR 04 2011
CET, INC.
HARRISBURG, PA

March 30, 2011

Mr. Joel Kostelac, P.E.
CET Engineering Services
1240 N. Mountain Road
Harrisburg, PA 17112

Re: Preliminary Treatment Requirements
Hatfield Township Municipal Authority
NPDES No. PA0026247
Hatfield Township
Montgomery County

Dear Mr. Kostelac:

This is in response to your February 11, 2011, request for Preliminary Treatment Requirements for the discharge of an annual average flow of 7.55 million gallons per day (MGD) to West Branch Neshaminy Creek. This request is for an existing treatment facility owned by the Hatfield Township Municipal Authority (HTMA). The facility is currently permitted for an annual average flow of 6.43 MGD.

Please note that the Department is currently drafting a NPDES permit renewal for an annual average flow of 6.43 MGD. HTMA is still required to submit an application for an amendment to the NPDES permit for an increased annual average flow, as approved by 537 planning. Also, HTMA recently signed a consent order and agreement which includes more stringent effluents limits for total phosphorus than is contained in their existing NPDES permit.

In order to assist with the long term design of the wastewater treatment facility to address the increase of permitted flow, the listed stream impairments, and the lack of assimilative capacity at the point of discharge – the Department proposes the preliminary effluent limits attached to this letter. We have included the effluent limits from the existing NPDES permit for comparison.

West Branch Neshaminy Creek is dominated by treated sewage effluent at the design flow condition. Since there is no additional available assimilative capacity in the stream, this requires that the organic load discharged from the facility be capped at existing permitted load. This is reflected in a moderate reduction of approximately 17% for the proposed effluent concentrations for $CBOD_5$ and ammonia-nitrogen.

West Branch Neshaminy Creek is listed as impaired due to excessive nutrients. The Department is expecting nutrient criteria in the near future, and the Environmental Protection Agency (EPA) is in the process of developing a Total Maximum Daily Load (TMDL) for the Neshaminy Creek basin. We anticipate that the final TMDL will require significant reductions for phosphorus and possibly nitrogen. In the interim, the permitted discharge load of phosphorus will be capped based on the existing discharge load.

If you have any questions, please call Mr. Orest Kolodij at 484-250-5191.

Sincerely,

Sohan L. Garg

Sohan L. Garg, P.E.
Environmental Engineer Manager
NPDES Permits Section
Water Management

Enclosures

cc: Hatfield Township
Mr. Peter Dorney, HTMA
Mr. Bill Gelles
Mr. Jenifer Fields
Planning Section
File

Hatfield Township Municipal Authority
Summary of Proposed Preliminary Treatment Requirements – for 7.55 MGD

Parameter	Existing Limit	Proposed Limit
	Monthly Average (mg/l)	Monthly Average (mg/l)
CBOD5		
(5-1 to 10-31)	10	8.5
(11-1 to 4-30)	20	17
Total Suspended Solids	30	30
Ammonia as N		
(5-1 to 10-31)	2.0	1.7
(11-1 to 4-30)	6.0	5.1
Nitrate and Nitrate as N		
(7-1 to 10-31)	9.0	9.0
Total Nitrogen as N		6.0 – 11.0[3]
Total Phosphorus as P		
(4-1 to 10-31)	2.0 / 1.0[1]	0.1 – 0.6[2]
(11-1 to 3-31)	1.0[1]	0.2 – 1.0[2]
Dissolved Oxygen	6.0 (minimum)	6.0 (minimum)
Fecal coliform	200#/100-ml geo. mean	200#/100-ml geo. mean
Total Residual Chlorine	N/A (UV disinfection)	N/A (UV disinfection)
Toxics		(not evaluated)

Notes:

[1]Existing Consent Order and Agreement includes a 1.0 mg/l average monthly limit for total phosphorus, and a 0.5 mg/l rolling 12-month average limit.

[2]An NPDES permit renewal for 6.43 MGD is currently under development. The permitted discharge load for total phosphorus is capped based on the existing load. The upper value listed represents the existing load. The lower value listed represents anticipated water quality based effluent limits.

[3]There is a TN limit of 11 mg/l inherent in the existing permit effective for the months July thru October. There is a possibility in the future that this limit may be reduced or extended to cover additional months.

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION #11-22

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities and dates are detailed in Section VIII-C of the 537 Plan.

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

Andrew S. Haines, Manager

HATFIELD TOWNSHIP
BOARD OF COMMISSIONERS

BY: _____
Thomas C. Zipfel, President

I, Andrew S. Hames, Secretary of Hatfield Township, hereby certify that the foregoing is a true copy of Township Resolution #11-22 adopted 13th July 2011.

ORDINANCE NO. 627

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, Article IV, On-Lot Sewage Management Program is hereby amended as follows:

i. Section 224-38, Subsection A is hereby amended to read as follows:

A. Upon adoption of this Ordinance, The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped within 90 days of receipt of notification or provide notification to the Township that the on-lot system had been pumped within the previous three (3) years. Thereafter, the Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every three (3) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

ii. Section 224-38, Subsection B is hereby amended to read as follows:

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every three (3) years thereafter or whenever an inspection reveals solids or scum in excess of 1/3 liquid depth of the tank, or more frequently if recommended by the manufacturer of any of the component parts of the system. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

iii. Section 224-38, Subsection C is hereby amended to read as follows:

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every three (3) years. In no case shall such period extend beyond six (6) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

iv. Section 224-38, Subsection G is hereby amended to read as follows:

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks. The Owner shall provide an adequate supply of electrical power with the proper phase, frequency, and voltage as recommended by the equipment manufacturers of the various components of the system.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. Severability.

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. Failure to Enforce not a Waiver.

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. Effective Date.

This ordinance shall take effect within five (5) days of passage.

§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 13 day of July 2011.

Attest: _____

HATFIELD TOWNSHIP

By: _____

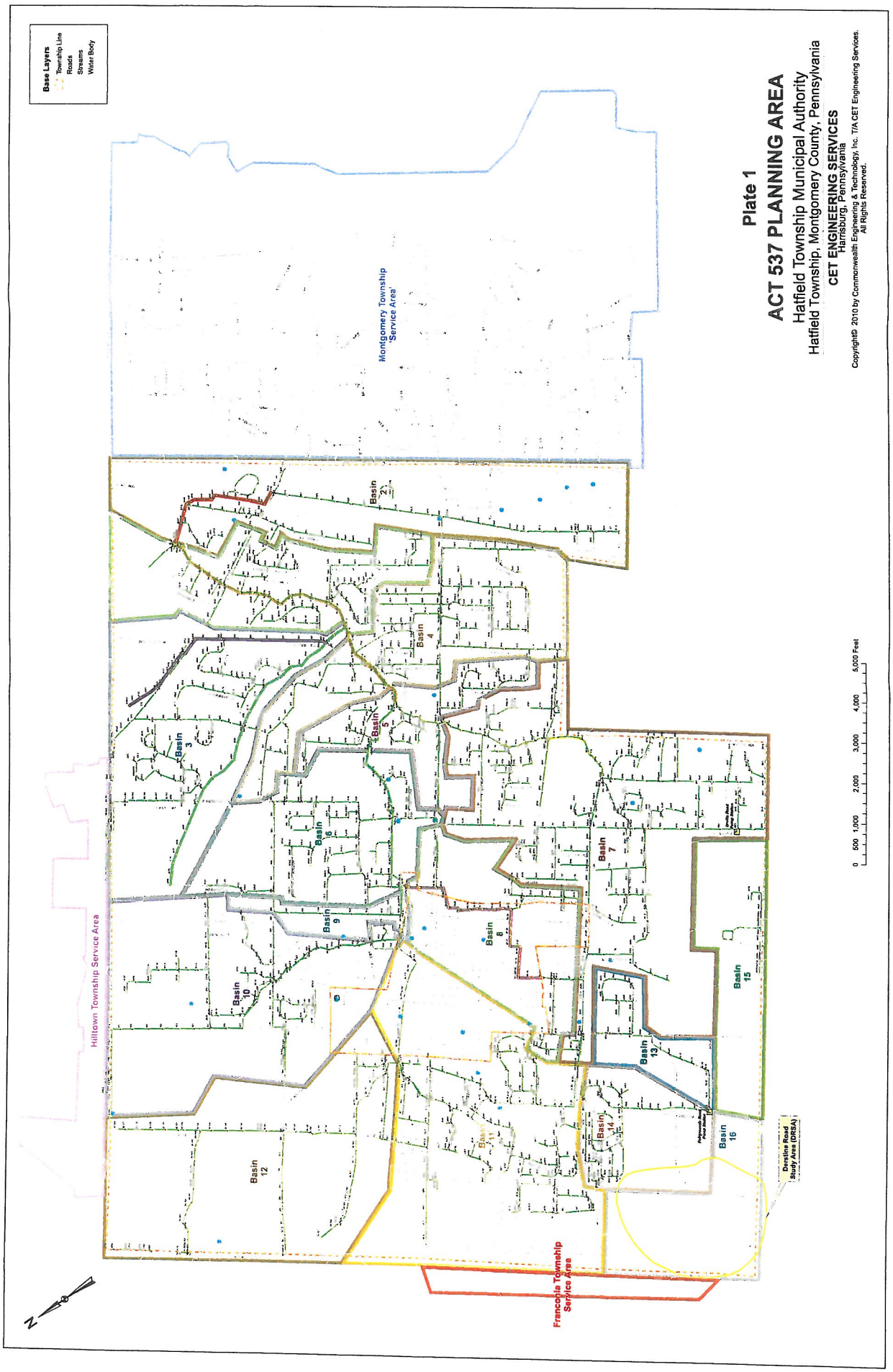

Base Layers
Township Line
Roads
Streams
Water Body
Montgomery Township 'Service Area'
Hilltown Township Service Area
Franconia Township Service Area
Derstine Road Study Area (DRSA)
Basin 2
Basin 3
Basin 4
Basin 5
Basin 6
Basin 7
Basin 8
Basin 9
Basin 10
Basin 11
Basin 12
Basin 13
Basin 14
Basin 15
Basin 16
0 500 1,000 2,000 3,000 4,000 5,000 Feet
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Plate 1
ACT 537 PLANNING AREA
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania
Copyright© 2010 by Commonwealth Engineering & Technology, Inc. T/A CET Engineering Services.
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Act 537 Sewage Facilities Plan

Hatfield Township
Montgomery County, Pennsylvania

November 2010
Approved November 2013

Prepared by:
GHD

1240 North Mountain Rd.
Harrisburg, PA 17112
Ph: 717-541-0622
Fax: 717-541-8004

Hatfield Township
Act 537 Plan

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EXHIBITS

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Exhibit I-1	DEP Approval – 1984 Hatfield Twp. Act 537 Plan
Exhibit I-2	Plan of Study, Task Activity Report, and approval
Exhibit I-3	2007 Corrective Action Plan and DEP Approval
Exhibit I-4	2008 Connection Management Plan and Consent Order and Agreement
Exhibit II-1	DEP Integrated Waters List for West Branch Neshaminy Creek
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Exhibit II-3	Description of Prime Agricultural Farmland
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APPENDICES

Appendix A	Resolution of Adoption
Appendix B	County and Township Planning Commission and County Health Department Comments
Appendix C	Proof of Public Notice
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I. PREVIOUS WASTEWATER PLANNING

A. PLANS AND STATUS OF IMPLEMENTATION

The Pennsylvania Sewage Facilities Act (P.L. 1535 No. 537 of January 24, 1966, effective January 1, 1968, as amended, and enforced upon promulgation of rules and regulations codified under PA Code Chapters 71, 72 and 73) requires that all Commonwealth municipalities develop and implement comprehensive official plans that provide adequate sewage systems for the resolution of existing sewage disposal problems, and for the future sewage disposal needs of new land development and the municipality. Act 537 planning has been a municipal requirement since 1971.

1972 – MONTGOMERY COUNTY – OFFICIAL SEWAGE FACILITIES PLAN

The Montgomery County Planning Commission developed an Official Act 537 Sewage Facilities Plan in 1972, and later updated this in 1978. This plan emphasized large regional treatment plants and expansive interceptor sewers. The Township of Hatfield adopted the Montgomery County prepared Act 537 Plan and constructed an Advanced Wastewater Treatment Facility in 1970 – 1972, as well as a major relief interceptor sewer in 1982 - 1983.

1984 – HATFIELD TOWNSHIP – OFFICIAL PLAN REVISION

The Township submitted an Act 537 Plan Revision in July 1984, which was approved in January 1985. A copy of this approval is located in Exhibit I-1. This Plan Revision established the Hatfield Township Municipal Authority (HTMA) service area. This service area consists of all of Hatfield Township, Hatfield Borough, Hilltown Township in the Line Lexington – Rte. 309 Area, Franconia Township adjacent to Township Line Rd and Rte 309 South, and portions of Montgomery Township.

The primary recommendation of the Plan Revision was to construct a new $7.2 million, 6.43 million gallon per day (MGD) counter current, low-load aeration treatment facility. Capacity in the treatment facility was divided between Hatfield Township (3.79 MGD), Hatfield Borough (0.50 MGD) and Montgomery Township (2.14 MGD). Other contributing municipalities did not enter into capacity agreements. This facility was constructed in 1986 - 1987.

The 1984 Official Plan Revision also identified the “Fairgrounds area between Cowpath and Elroy Rd.” as the single remaining unsewered area of the Township. At the time of the plan preparation, the engineering design and negotiations with developers to provide sewer service to this area was underway. Since that time sewer service has been provided.

The Township kicked off the current plan revision in mid-2008 with the submission of a Plan of Study and Task Activity Report. These items were approved in August 2008, and a copy of the documents and approval is located in Exhibit I-2.

B. HATFIELD TOWNSHIP PLANNING

In response to a January 26, 2005 Notice of Violation for a Sanitary Sewer Overflow in the Neshaminy Interceptor, a Corrective Action Plan (CAP) was prepared in July of 2007. The CAP focused on two primary goals. The first was to reduce to the extent possible, surcharging and overflows within the collection system caused by infiltration and inflow (I/I). The second was to provide for an upgrade in capacity to the Neshaminy Interceptor. This interceptor, running parallel to the Neshaminy Creek, transports the majority of the wastewater flows from within the HTMA service area to the WWTP.

In September 2007, the CAP was approved by DEP. A copy of this plan and approval can be found in Exhibit I-3. Since that time, Hatfield Township and HTMA have moved forward towards the goals of the plan. Maintenance tasks accomplished include televising over 300 laterals, repairing over 900 laterals, installing over 200 observation tees, conducting more than 200 manhole inspections and repairing and lining numerous manholes. HTMA accomplishes its collection system maintenance through two (2) separate ongoing sewer maintenance contracts, one for excavation and one for trenchless technology, and with its own staff of four (4) employees and one (1) manager dedicated to the collection system.

In addition to an overall reduction in I/I flows, HTMA is in the construction phase of a Wet Weather Flow Equalization project. This project involves the construction of two (2) new 4.0 million gallon tanks for offline storage during extreme wet weather events. It also includes the rehabilitation of an existing, unutilized pump station and the construction of a new diversion chamber. This project was bid in early 2009 with construction expected to be complete in 2010.

The Township and HTMA are currently in the permitting process for the replacement of portions of the Neshaminy Interceptor. The Authority is proposing to replace approximately 11,500 feet of existing sanitary sewer. Much of this replacement sewer will consist of 42” and 36” diameter PVC pipe. Construction is expected to commence on this project in 2010.

On March 3, 2008, Hatfield Township Municipal Authority entered into a Consent Order and Agreement (CO&A) with Pennsylvania DEP. This CO&A adjusted the annual average design flow of the plant to 6.98 MGD and required the submission of a Connection Management Plan (CMP). This CMP was submitted in February of 2008 and is updated on a regular basis. A copy of the CO&A and most current CMP can be found in Exhibit I-4. The CMP outlines the remaining capacities in the WWTP for Hatfield Township and the contributing municipalities. These capacities as well as future capacity will be discussed further later in this Plan revision.

C. PLAN REVISIONS, SUPPLEMENTS, AND EXEMPTIONS

In accordance with Ch. 71.58, DEP has delegated the authority to review and approve new land development planning to Hatfield Township. Planning Modules approved by the Township do not constitute a revision or exception to revise, but are a supplement to the Township’s official sewage facilities plan.

Planning Module Component 1 is used for exceptions to planning requirements, if the following conditions exist:

- Subdivision contains less than 10 lots (created after May 15, 1972).
- Soils or site conditions are suitable for onlot sewage systems.
- Proposed sewage system is not underlain by carbonate geology.
- Proposed sewage system is not within one-quarter mile of water supplies that exceed 5 ppm (mg/L) nitrate-nitrogen.
- Proposed development is outside a high quality or exceptional value watershed.
- Subdivision lots and remaining tracts are each larger than 1 acre.

Planning Module Component 2 is used for individual and community onlot systems:

- Non-excepted systems and residential spray irrigation systems
- Proposed retaining tanks – holding tanks, privies, chemical, incinerating, recycling or composting toilets
- Proposed community onlot sewage disposal systems permitted by the County
- Proposing individual or community large volume onlot sewage disposal systems permitted by DEP

Planning Module Component 3 is used for sewage collection and treatment facilities when the following is proposed:

- A subdivision served by sewage collection, conveyance or treatment facilities
- A tap-in to public sewers from a lot with 2 EDUs or more
- Construction or modification of wastewater collection, conveyance or treatment facilities that require a DEP permit

II. PHYSICAL IMPACTS ON WATER RESOURCES AND WASTEWATER SYSTEMS

This section discusses the effects and constraints on water supply and wastewater disposal by land use activities and the natural environment – planning, surface water, groundwater, soils, geology, topography, potable water supplies, wetlands, and floodplains.

A. PLANNING AREAS, MUNICIPAL BOUNDARIES, AND SERVICE AREA BOUNDARIES.

Hatfield Township's *Planning Area* consists of all the land within the municipal boundaries of the Township, and the areas within the adjacent municipalities served by Hatfield Township Municipal Authority sewer facilities. This service area consists of all of Hatfield Township, the Borough of Hatfield, portions of Montgomery Township to the east, Hilltown Township to the north and Franconia Township to the west.

Hatfield Township, Montgomery County, a first-class Township incorporated in 1742, has evolved from a rural farming community into a suburban community with a mix of residential, commercial and industrial users including a well-known food processing operation. The Township, which surrounds the 0.6 sq.mi. Borough of Hatfield, is approximately 30 miles north of Philadelphia. The Township lies primarily in the Neshaminy Creek watershed and covers an area of approximately 10 square miles.

Primary vehicular access to the Township is via PA Route 309 in the northern portion and the Northeast Extension of the PA Turnpike to the south. These prominent traffic routes provide access to population centers in the Route 309 corridor as well as the City of Philadelphia. Additionally, the North Penn Railroad passes through the center of the township in a northwestern direction.

According to the Delaware Valley Regional Planning Commission, the projected 2010 population of the Township is 18,174. With the addition of contributing municipalities to the sewer service area, the HTMA system served 19,214 EDU's in 2009[1].

Most of the planning area is served by the public sewerage and collection system owned and operated by the HTMA. The Planning Area is made up of 16 drainage areas totaling approximately 6,400 acres in Hatfield Township and two basins in Montgomery Township. This area is depicted Plate 1. The North Penn Water Authority (NPWA) provides public water service to the majority of the Township and the Planning Area. There are a relatively small number of on-lot sewage systems and individual wells throughout the Township with the largest concentration of about 30 conventional on-lot systems in the Derstine Road area.

This area, shown on Plate 1, and Figure II-1, is referred to as the Derstine Road Study Area (DRSA).

[1] According to 2009 Chapter 94 Wasteload Management Report (Exhibit III-3)

B. PHYSICAL CHARACTERISTICS

The planning area lies predominantly within the Neshaminy Creek watershed, Sub-Basin 2 (the Central Delaware) of the Delaware River Basin. A small portion of the Skippack Creek watershed drains the southwestern corner of the planning area, specifically the DRSA. The Skippack is tributary to the Lower Perkiomen Creek watershed and the Lower Delaware sub-basin (Sub-Basin 3). These boundaries, along with other streams, waterbodies, and topography can be found on Plate 2

Pennsylvania's Unified Watershed Assessment identified watersheds that do not meet clean water, natural resource, and public health goals and are most in need of restoration. A Watershed Restoration Actions Strategy (WRAS) was developed for the State Water Plan Subbasin 02F "Neshaminy Creek Watershed, Bucks and Montgomery County" and Subbasin 03E "Lower Schuykill River Watershed, Montgomery County" in 2004[23]. WRASs are dynamic documents that are to be updated regularly as more information becomes available and as remediation measures are implemented and water quality improvements are documented.

The West Branch of the Neshaminy Creek is designated by DEP as both a warm water fishery (WWF) and migratory fishery (MF). In the southwestern portion of the Township the Skippack Creek is a trout stream fishery (TSF). These terms are defined in Table II-1 below:

Table II-1: DEP Neshaminy and Skippack Creek Use Designations.

Warm Water Fishes (WWF) - Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
Migratory Fishes (MF) - Passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which ascend to flowing waters to complete their life cycle.
Trout Stocking (TSF) - Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

According to the "2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report[4]" portions the West Branch Neshaminy Creek or their unnamed tributaries are listed under Category 5 or requiring a TMDL. These waterbodies do not meet Pa DEP guidelines for the protection of aquatic life. The most common cause for this is agriculture or land development practices leading to excessive siltation. However, in some cases agriculture and municipal point sources have caused excessive algal growth and nutrient impairment. In response to this, Pa DEP issued a 2003 TMDL for nutrients for the Neshaminy Creek Watershed.

[2] http://www.depweb.state.pa.us/watershedmgmt/lib/watershedmgmt/nonpoint_source/wras/wras-02f.pdf
[3] http://www.depweb.state.pa.us/watershedmgmt/lib/watershedmgmt/nonpoint_source/wras/wras-03e.pdf
[4] http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=535678

This TMDL was later withdrawn in 2008. The Pa DEP intends to issue a new TMDL for the streams and tributaries listed in Category 5 not later than 2015. A full listing of the streams and tributaries of the West Branch Neshaminy, their impairments, potential TMDL timings and causes can be found in Exhibit II-1.

The DRSA is drained by numerous unnamed tributaries to the Skippack Creek. These feed Unnamed Tributary 01097, which is listed under Category 4c in the 2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Category 4c waters are impaired for one or more designated use but not needing a TMDL, as the source of impairment is not a pollutant. A full listing of the streams and tributaries of the Skippack Creek in the DRSA and their impairments and causes can be found in Exhibit II-2. These tributaries are shown on the numerous figures throughout this section.

C. SOILS

Soil characteristics, such as depth to rock or redox features and slope, are used to determine suitability for onlot systems. According to the Montgomery County Soil Survey, as well as USDA and NRCS data, two primary soil associations are found in the Hatfield Township Planning area. These associations are the Abbottstown-Readington-Croton association, occupying most of the planning area, and the Reaville-Penn-Klinesville association which makes up the southwestern portion of the planning area including the DRSA. The extent and location of each are also depicted in Figure II-2, the General Soil Map of Montgomery County.

The Abbottstown-Readington-Croton association is characterized by deep, moderately well drained to poorly drained soils underlain by shale and sandstone. The Abbottstown soil group makes up approximately 30% of this association, Readington approximately 30% and Croton approximately 25%. Hydrologic Soil Group (HSG) classifications for these soils are C (Abbottstown and Readington) and D (Croton). HSG ratings describe the physical drainage properties of each soil series, including texture and permeability, as well as certain physiographic properties, such as depth to bedrock and water table. HSG Group A are well drained and highly permeable and HSG Group D are poorly drained and produce much greater runoff. HSG Groups C and D are not ideal soils for the use of conventional on-lot sewage disposal systems, as they are slowly permeable and have a seasonal high water table. While there are number of these systems in the planning area in this soil association the proximity of these systems to the existing collection and conveyance system lends itself to connection in the future should problems arise or development necessitate. All known on-lot systems in the planning area are shown on Plate 3.

The remainder of the planning area, including the largest concentration of on-lots systems is located in the Reaville-Penn-Klinesville soil association. This soil association is characterized by shallow to moderately deep soils that are well drained to somewhat poorly drained. These soils are underlain by shale with bedrock between 10” and 36” below the surface. The Reaville soil group is the predominant group of this association and makes up approximately 35 – 40% of the association. The Reaville soil group is moderately deep with shale fragments, slowly permeable and in HSG Group C. The Penn soil group, making up approximately 25% of the of the association is moderately deep to shallow, well drained and overlays bedrock. The Penn soil

group is in HSG Group C and may be unsuitable for conventional on-lots systems given the depth to bedrock. The Klinesville soil group makes up 15 to 25% of this association and is generally found in areas of steeper slopes, can be droughty and shallow and contains shale. It is also part of HSG C and may be unsuitable for conventional on-lots systems given the depth to bedrock.

While this association comprises much of the southwest portion of the planning area, the DRSA is a combination of both the associations discussed above as shown on Figure II-2. This depiction shows most of the on-lot systems in either the Readington or Penn soil group. These soil groups are considered either very limited or slightly limited for the use of conventional on-lot systems.

Figures II-6 details the general soil suitability with unsuitable areas due to hydric soils, slopes greater than 25%, and soils with limiting characteristics (i.e. depth to rock, depth to water table) based on the Soil Survey of Montgomery County.

These designations, however, only describe general suitability of the soils group. Conditions of suitability may vary within a particular group. Given this a more detailed on-lot needs analysis was conducted in the DRSA and is discussed further later in this document.

Highlighted in Figure II-5 are soils designated as Prime Agricultural Farmland. As shown, some of these soils exist throughout the DRSA. A description of prime farmland and farmland of statewide importance as prepared by the USDA Natural Resource Conservation Service (NRCS) is enclosed in Exhibit II-3.

D. AND E. GEOLOGY AND TOPOGRAPHY

The Hatfield Township planning area is located in the Piedmont physiographic province and is further classified into the Gettysburg-Newark Lowlands also referred to as the Triassic Lowlands. These areas are depicted on PA DCNR Maps 7 and 13 included as Exhibit II-4 and II-5.

The Triassic Lowlands are comprised primarily of non-carbonate sedimentary rocks of red and brown sandstone, shale, siltstone, and conglomerate of the Brunswick Formation. All of the DRSA is located in the Brunswick Formation. This formation is characterized by reddish-brown mudstone, siltstone, and shale, containing a few green and brown shale interbeds with red and dark-gray, interbedded argillites near base. Flow, including any contaminants, within the Brunswick Formation occurs in small fractures or cracks in the rock, and extent of contamination in groundwater sources is related to the depth to rock and permeability of soils overlaying the Brunswick Formation.

Boulder fields are common in the Triassic Lowlands, however none are present in the planning area or the DRSA.

This area is characterized by rolling lowlands, shallow valleys and isolated hills. The Triassic Lowlands are generally described as low to moderate in relief (approximately 300 – 1000 feet in

elevation); however minimum and maximum elevations of 20' and 1355' above MSL can be found.

Carbonate bedrock as limestone and dolomite that has weathered results in karst topography with features such as sinkholes, depressions and caves. Karst features can function as direct recharge to groundwater aquifers causing contamination. In 2003, the PA Geological Survey published a karst density map. Exhibit II-6 shows the Montgomery County area clipped from this map. As shown there are no karst areas of concern in either the planning area or the DRSA. According to DEP's eMap, no sinkholes are catalogued for the planning area.

Planning area and DRSA topography are shown in Plate 2 and Figure II-1. The impact of slope on suitability for on-lot systems is depicted graphically on Figure II-6.

F. POTABLE WATER SUPPLIES

Potable water is supplied by the North Penn Water Authority (NPWA), a ten member municipal authority serving the entire planning area as well as many neighboring municipalities. NPWA owns and operates the Forest Park Water Treatment Plant (FPWTP); PWS permit no. 0997510, in Chalfont, Bucks County. The NPWA serves over 30,000 customers.

Much of the source water treated at the FPWTP is withdrawn from the Neshaminy Creek below Lake Galena in Bucks County. In the summer months, some source water is withdrawn from the Delaware River at Point Pleasant and used to augment the supply in the Lake Galena reservoir. The FPWTP process includes conventional filtration, granular activated carbon, and ozone disinfection prior to distribution. NPWA also operates twenty groundwater wells in the planning area. Water from these sources is chlorinated prior to distribution.

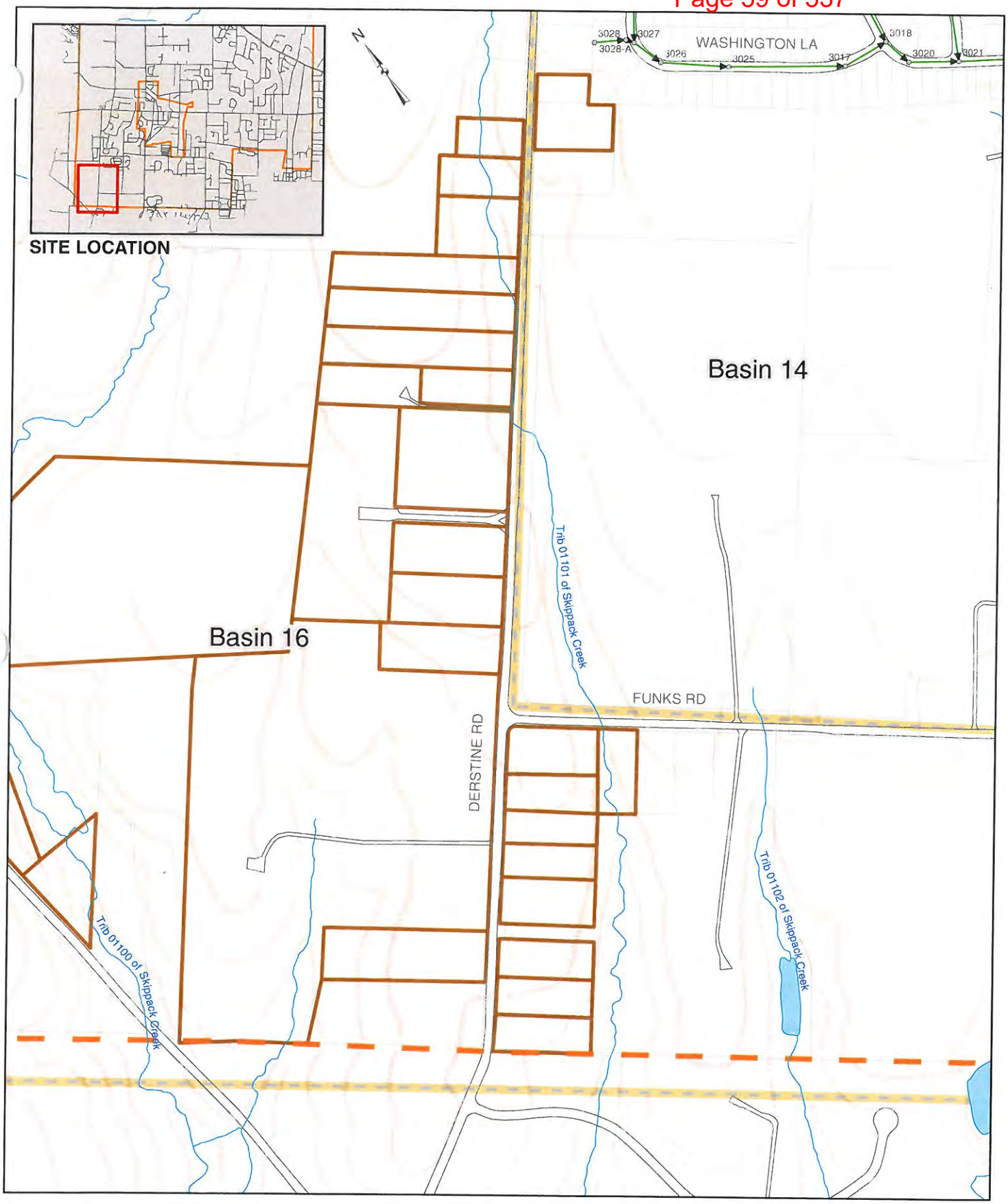
Where public water is not available, property owners rely on groundwater wells. Most of the more productive aquifers are in carbonate rocks, primarily limestone. Although the water-yielding character of the carbonate rocks depends on the degree of fracturing and development of solution cavities in the rock, the limestone formations generally yield moderate to large volumes of water. Well yields in the Piedmont crystalline-rock aquifers are 15 – 20 gpm. Plate 4 includes the NPWA wells and water supply tanks within the planning area. As shown, NPWA does not operate any facilities within the DRSA.

G. WETLANDS AND FLOODPLAINS

Wetland identification focused on the DRSA due to its large concentration of conventional on-lot sewage disposal systems. Wetlands were identified using the National Wetlands Inventory (NWI) mapping[5]. These wetland areas, along with other water resources and hydric soils identified using the Soil Survey of Montgomery County (2003) are shown on Figure II-4. Hydric soils are generally found along watercourses coinciding with wetlands and/or floodplains, although hydric soils are often more extensive than wetland areas. The NWI mapping was compiled by the U.S. Fish and Wildlife Service using color infrared aerial photos indicating soil

[5] http://www.fws.gov/nwi/

moisture content. The quality of the maps varies depending on the quality of the photos, the time the photos were taken, and the type of wetlands being identified. Field confirmation can determine the extent of wetlands within the Township. Wetlands delineated during the preparation of subdivision plans can be added to the Township's GIS database. Any proposed new or replacement facilities would attempt avoid wetlands or potential wetlands.



Survey Results Received
Hatfield Sanitation Basins
Water Body
Stream
Parcels
Township Line

0 200 400 800 Feet

Figure II-1
DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania
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Figure II - 2: General Soil Map of Montgomery County

Gravity Sewer
Manhole
Hatfield Sanitation Basins
Township Line
Parcels
Water Body
Stream

0 200 400 800 Feet

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Figure II-3
DRSA - SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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Figure II-4
DRSA - WETLANDS & HYDRIC SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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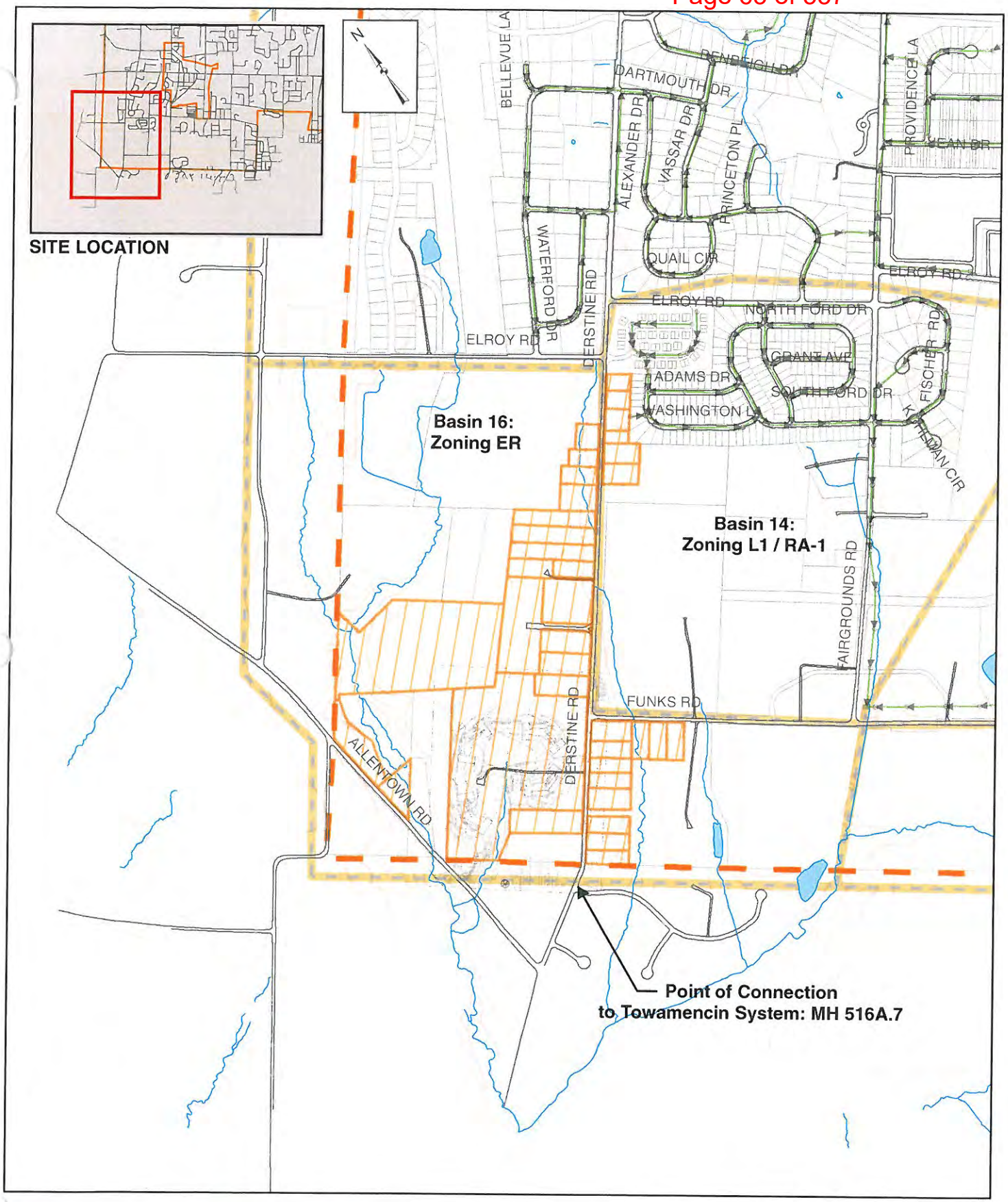

On-Lot System
Hatfield Sanitation Basins
Water Body
Stream
Parcels
Township Line

0 250 500 1,000 Feet

Figure V-1
DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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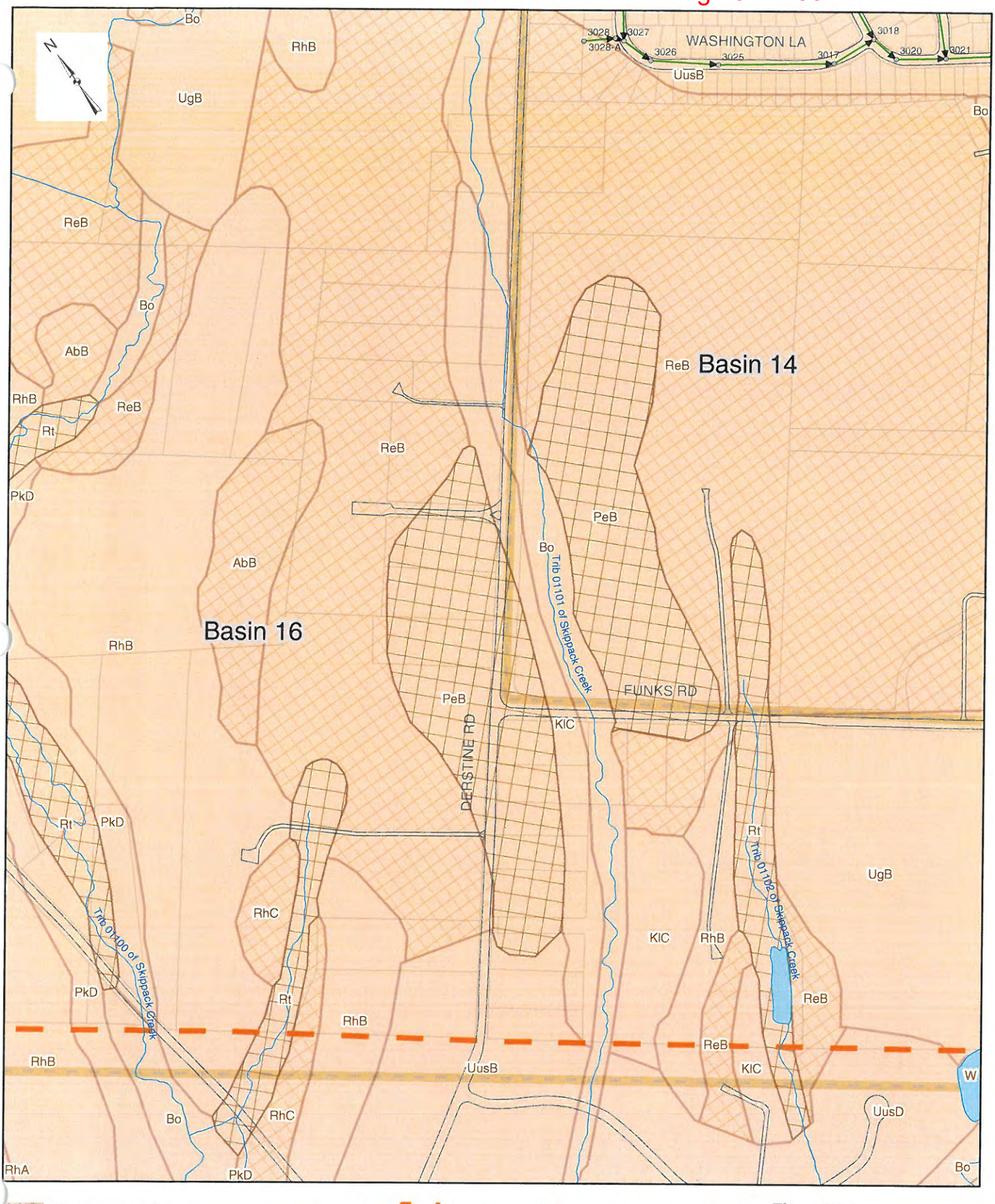

Prime Farmland Soils
Farm Land of Statewide Importance
Soil Classifications
Gravity Sewer
Manhole
Township Line
Parcels
Water Body
Stream

0 200 400 800 Feet

Figure II-5
DRSA - AGRICULTURAL SOILS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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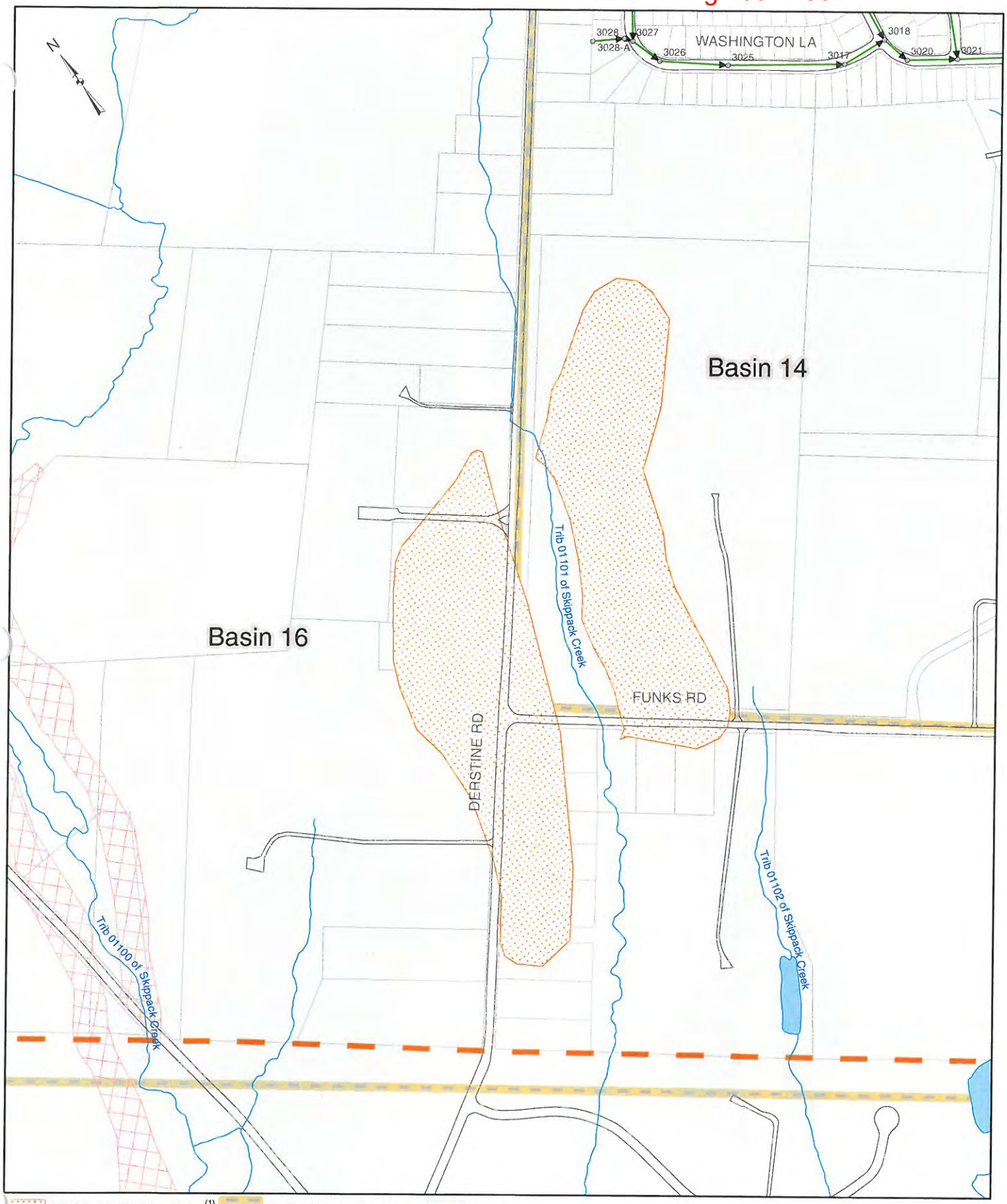

(1) Slightly Limited for Sand Mound Bed or Trench and Spray Irrigation. All other areas mapped are Very Limited for Onlot.
(2) All other areas mapped are under 15%

Figure II-6
SOIL SUITABILITY FOR ON-LOT SYSTEMS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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III. EXISTING SEWAGE FACILITIES IN THE PLANNING AREA – IDENTIFYING THE EXISTING NEEDS

A. SEWER SERVICE AREAS

COLLECTION AND CONVEYANCE

Plate 4 shows the location of the Hatfield Township public sewer service system including interceptors, pump stations, force mains and the Township's wastewater treatment plant in the planning area. As described previously in this plan revision, the HTMA sewer system serves a planning area encompassing 16 basins in the Township, all of the Borough of Hatfield, and portions of Montgomery and Franconia Townships

The Hatfield Township Municipal Authority owns and maintains approximately 81 miles of sewer and 1,440 manholes. The majority of the collection sewers are 8-inch PVC, and the size of the interceptors are as large as 36 inches in diameter. The primary HTMA interceptors are the Neshaminy Interceptor (including the South and West Branch), the Montgomery Interceptor, the Lexington Interceptor, the Hilltown Interceptor and the Fairview Road Interceptor. The HTMA collection system includes two (2) HTMA-owned pump stations, Fairgrounds Rd. and Orvilla Rd. These pump stations are discussed in further detail later in this section. The design capacities and current flows of various collection and treatment systems are listed below in Table III-1.

Basins A and B of the Montgomery Township Municipal Sewer Authority's (MTMSA) sewer system is tributary to HTMA. The MTMSA owns and maintains approximately 63 miles of 8" – 24" gravity sewer and two (2) miles of force main ranging from 2" – 12" in Basins A and B. There is an estimated 1,565 precast concrete and / or brick manholes in the MTMSA sewer system that is tributary to HTMA. Major interceptors within MTMSA's collection system include Villa Glen, Line Street, and Route 309/Richardson Road interceptors. There are three (3) MTMSA pumping stations in Basins A and B that pump to the HTMA collection system including two (2) pump stations located on Knapp Road and one (1) located on Montgomery Avenue.

The Hatfield Borough collection system consists of approximately seven (7) miles of gravity sewer, and is maintained by Hatfield Borough staff. There are no sanitary pump stations located in Hatfield Borough. Wastewater flows from Hatfield Borough are discharged via gravity sewers through Hatfield Borough Manhole 1.

A portion of Franconia Township contributes to the HTMA sewer service area via gravity sewers only (no pump station), and enters the HTMA system at MHs 341-5 and 74-158 as shown on Plate 4.

The HTMA owns and operates a 6.98 MGD Wastewater Treatment Plant (WWTP) that discharges treated effluent under NPDES Permit No. 0026247 to the west branch of the

Nesahminy Creek in Watershed 2-F. The HTMA collection system is permitted under Clean Streams Law Permit No. 4600414. A copy of this NPDES permit is available at HTMA.

TREATMENT FACILITY PROCESS

The WWTP has a permitted design capacity of 6.43 MGD annual average flow and 8.37 MGD maximum monthly flow and was constructed in 1986 - 1987. Additionally, it is permitted for 22,300 lb/day of organic loading. In March 3, 2008 the HTMA entered into a Consent Order and Agreement as previously described in this plan revision, adjusting the design flow to 6.98 MGD. A schematic diagram of the plant as well as an aerial view is shown in Figures III-1 and III-2 respectively. A site plan of the plant including current and abandoned process tankage is included in Exhibit III-1.

In addition to wastewater flows generated in the planning area, HTMA also receives domestic holding tank and septic tank waste with a small amount of industrial process waste via tanker truck for treatment at the HTMA pretreatment facilities. Effluent from the pretreatment facility blends with the influent prior to the primary clarifiers and the HTMA treatment process. The acceptance of this waste is at the discretion of HTMA.

The HTMA wastewater treatment plant processes include pretreatment facilities, mechanical screening, grit and grease removal, primary clarification, conventional activated sludge using countercurrent aeration units, final clarification, and ultraviolet disinfection prior to discharge to the west branch of Neshaminy Creek. Waste sludge is dewatered with centrifuges and incinerated with on-site facilities. A more detailed description of each process is included in the following sections.

The influent pumping system consists of two raw sewage pump stations. Each raw sewage pump station includes three (3) 72 inch diameter open flight screw pumps (10,450 gpm each). Currently only one influent pump station is in operation. The existing unutilized pump station will be rehabilitated and placed into operation in an ongoing flow equalization project, discussed in a latter portion of this section. Screening is provided via three (3) coarse screens. Following pumping and screening flow enters a dual channel grit and grease/scum removal system. After the grit and grease system, flow enters two (2), 80’ diameter, primary clarifiers where approximately 50% removal of BOD and TSS occurs.

Secondary treatment consists of two Schreiber countercurrent aeration units with full-diameter diffuser bridges. The units are approximately 170 feet in diameter with a 16 ½ foot side water depth for a total volume of 5.5 million gallons. There are six blowers, each with a capacity of 1,212 scfm. There are two final clarifiers that follow the aeration units with a diameter of 132 feet. Effluent from the clarifiers is then disinfected using ultraviolet light.

The sludge dewatering and processing facilities are designed for a maximum rate of 2,000 dry lb/hr (24 dry tons/day). The average loading is 1,200 dry lb/hr. Two (2) centrifuges are available with a design loading rate of 2,000 dry lb/hr, with one on standby at all times. The

incinerator is permitted for 24 dry tons per day. If the incinerator is not in operation the liquid sludge is hauled off-site via tanker truck.

In general, HTMA balances the amount of sludge it receives from outside sources with the amount of sludge produced at the HTMA facility in order to maintain a continuous operation of the centrifuge and incinerator. However, the amount of sludge accepted from outside sources is limited so that the incinerator typically operates at only 60 to 75% of capacity, which results in maintaining low levels in the sludge storage tanks. This philosophy allows HTMA significant sludge storage capacity in the event of unexpected downtime and for scheduled downtime to perform preventive maintenance tasks and other scheduled work on the equipment.

EXISTING FACILITIES PROBLEMS

Table III-1 below lists primary collection and treatment systems, design capacities and Chapter 94 overload conditions. As shown the 5 year projected maximum month flow is approaching the current maximum month capacity of the WWTP, however at this time there is no projected overload per Chapter 94. Future capacity beyond the 5 year projection will be evaluated further in this section and subsequent sections of the plan. There are no projected overloads in any of the HTMA interceptors.

Table III-1: Collection System and Treatment Capacities and Flows

Element	Design Capacity[1]	Line Size	Chapter 94[2] or Projected Maximum Value[3]	Remaining Capacity
Funks Rd. Pump Station	1.08 MGD	-	180,500 gpd	899,500 gpd
Orvilla Rd. Pump Station	504,000 gpd	-	288,000 gpd	216,000 gpd
Neshaminy Interceptor[4]	25.0 MGD	27”	19.2 MGD[5]	5.8 MGD
South Branch – Neshaminy	4.1 MGD	24”	2.1 MGD	2.1 MGD
West Branch – Neshaminy	4.1 MGD	24”	3.2 MGD	0.9 MGD
Hilltown Interceptor	0.5 MGD	8”	0.07 MGD	0.43 MGD
Lexington Interceptor	2.4 MGD	18”	0.51 MGD	1.89 MGD
Fairview Drive Interceptor	1.1 MGD	12”	0.42 MGD	0.68 MGD
Wastewater Treatment Plant	8.37 MGD[6]	-	8.34[7] MGD	0.03 MGD

In January 2005, HTMA received a Notice of Violation (NOV) for a Sanitary Sewer Overflow (SSO) at three manholes on the Neshaminy Interceptor. This NOV led to development of the

[1] Based on line size and DEP Sewage Facilities Manual minimum slope, unless otherwise noted
[2] Reported in 2008 Chapter 94 Wasteload Management Report
[3] Based on connected EDUs tributary to each line and a projected PHF of 4 x 216 gpd/EDU or 864 gpd/EDU
[4] Refers to the new Neshaminy Interceptor
[5] Based on 5 year average flow of 6.01 MGD x 3.2 AAF:PHF factor
[6] Permitted maximum monthly flow
[7] Projected 5 year 3 month maximum flow as reported in the 2009 Chapter 94 Wasteload Management Report

HTMA CAP previously discussed. Two capital projects related to the CAP will be discussed in the following section.

UPGRADE AND EXPANSION OF TREATMENT FACILITIES

In conjunction with the HTMA CAP, HTMA is in the design, bid, and construction process to two major capital projects:

Construction of new Neshaminy Interceptor

The existing Neshaminy Interceptor consists of two parallel interceptors originally designed to provide additional capacity and reduce surcharging during extreme wet weather events. The HTMA is replacing the older of the two existing parallel interceptors including approximately 11,500 linear feet of existing sanitary sewer with new, larger capacity sanitary sewer. Construction is expected to commence in early 2011.

Construction of Wet Weather Equalization Facility

To mitigate the potential impacts of high wet weather flows on the biological treatment processes, two new 4.0 million gallon tanks for offline storage adjacent to the plant were added. To convey the flow, construction of two diversion structures were accomplished, one for the HTMA sewer and one for the Montgomery Township Municipal Sewer Authority (MTMSA) sewer. These diversion structures will divert flow to a rehabilitated, currently unused pump station at the lower end of the plant. Each diversion structure will have a gate leading to the equalization (EQ) tanks (diversion gate), and a gate leading to the plant (plant gate). The gates will be electric motor operated with a manual hand wheel back-up.

When the combined flow reaches 24 MGD, the diversion gates will begin to open to allow flow to the pump station and maintain a maximum plant influent equal to the current plant flow setpoint. If/when the opening of the diversion gate alone (due to hydraulic considerations) does not send enough flow to the surge tank to maintain 24 MGD, then the slide gate to the plant will begin to close to force more flow to the pump station. Flow to the surge tanks will be monitored and totalized. Once the totalized flow approaches the capacity of the tanks (eight million gallons) then the diversion gates will close and all wastewater will be directed along the normal route to the plant.

The diversions are also being provided to allow for maintenance and repair of the existing first stage screw pumps and plant headworks. If this equipment requires repair, the diversions will allow the EQ pump station to bypass the headworks and pump the wastewater to the secondary treatment stage.

Rehabilitation of the pump station will consist of replacing existing pumps with 3 new vertical dry well centrifugal pumps with a capacity of 4.3 MGD each. New piping, valves, control

equipment, pump starters, and electrical panels will be provided, with pump control based on wet well level. Attached to the EQ pump station building will be a diversion structure with valves to divert flow to the return line. On the return line will be a flow meter, which shall be integrated into the plant SCADA program. Once a high flow event is over and the plant flow drops below the return flow permissive setpoint, the system shall begin to open/modulate valves to maintain the desired inflow to the plant.

The equalization tanks are 191 foot diameter, 20 foot high glass coated, bolted steel. The floors of the tanks is a poured concrete slab, which slopes inward towards the supply line in order to drain when necessary. Floating mixers and aerators will be provided in the EQ tanks to meet the DEP design requirement to maintain a 1.0 mg/l DO in the basins. Each tank will have level monitoring connected to the plant SCADA system. The tanks normally fill one at a time on automatic control, but have the capability to fill both at the same time through manual valve control. The tanks are provided with an overflow pipe that will drain back to the upper portion of the plant.

The tanks have an automatic flushing system to remove solids after each usage. Several non-potable plant water connections and access points will also be placed around the EQ tanks to provide for cleaning. A new, small utility building will be constructed for the water flush pumps and electrical panel boards. Nonpotable water will be pumped from the buried flush water storage tank to the cleaning system as needed. Construction began on this project in early 2010 and is scheduled for final completion in early 2011.

Installation of New Ultraviolet Disinfection System

In 2009, HTMA underwent the piloting, testing and procurement of a new UV disinfection system. This system selected is based non-contact arrangement where clarified effluent flows through tubes and medium pressure UV lamps are located outside of the flow tubes (and not in the water) and is manufactured by Enaqua[8]. This system will have a peak capacity of 28 MGD. Final design is expected to be complete in 2009 with installation of the new system occurring in late 2010 and early 2011.

RESERVE CAPACITY

The permitted hydraulic capacity of the treatment plant is 6.43 MGD, increased to 6.98 MGD by CO&A, with a maximum month design flow of 8.37 MGD. Table III-3 lists the average 2009 hydraulic and organic loadings to the treatment facility compared with the permitted/design values.

[8] http://enaqua.com/enweb/

Table III-3: Current Average vs. Permitted Flow

	2009 Chap. 94	Projected 2014	Permitted
Average Daily Flow (MGD)	6.36	6.70	6.98
Max. 3 Month Average Flow (MGD)	7.52	8.34	8.37
Average BOD Loading (lbs/d)	12,461	12,886	
Max. Month Average BOD Loading (lbs/d)	16,280	15,979	22,300

The average loadings to the treatment plant were well within the allowable loadings in 2009.

As of December 31, 2009 there were 19,214 EDU's connected to the HTMA sewer and flowing to its treatment facility. Dividing the five year annual average flow of 6,110,000 gpd by the total number of units results in an average flow per EDU of approximately 318 gpd/EDU. The five year average flow per EDU is 326 gpd/EDU. Since new connections generally produce less wastewater per day and are less vulnerable to impact of I/I, HTMA and Township staff utilize 216 gpd/EDU for new connections. This is consistent with current tapping fee calculations and the CMP.

The 2009 Chapter 94 Report lists future connections to the system from known developments over the next five years. Based on this report approximately 1,534 additional EDU's will connect over the next 5 years, while the most current CMP (which accounts for connections made to date) lists 1,565 new connections through 2013. At 216 gallons per connection per day annual average flow, these units equate to an additional 0.34 MGD of wastewater flow. By adding this flow to the annual average flow of 6.36 MGD a total of 6.70 MGD results, with 0.28 MGD reserve capacity remaining. Hatfield Township and HTMA do not maintain a reservation system, and reserve capacity is allocated based on a first come, first serve method for approved planning modules only.

Additionally, in preparation of this plan revision, Hatfield Township sent correspondence to all the contributing municipalities in the planning area. Some of these municipalities responded and the flow requirements are currently included in the numbers above, Chapter 94 projections, and future flow projections discussed below. A copy of this correspondence is included in Exhibit IV-8. As shown, responses were received by Montgomery Township and Hilltown Township, but not Franconia Township or Hatfield Borough.

NON-MUNICPAL, INDIVIDUAL, AND COMMUNITY SEWERAGE SYSTEMS

Several non-municipal, community, and individual wastewater facilities permitted by DEP are located in the Township. According to the DEP eFacts website, the facilities listed in Exhibit III-4 are point source discharges in the Township.

SMALL FLOW TREATMENT FACILITY SYSTEMS – O & M REQUIREMENTS

Small flow treatment facilities (SFTF) are defined by the DEP as "individual or community sewerage systems designed to adequately treat sewage flows not greater than 2,000 gpd using a stream discharge or other methods approved by DEP." These facilities are designed by professional engineers and permitted by DEP rather than the SEO. There are no existing Small Flow Treatment Systems in the Township.

DISPOSAL AREAS

No sewerage systems in the Township use any disposal method other than stream discharge.

B. INDIVIDUAL AND COMMUNITY ONLOT SEWAGE DISPOSAL

There are approximately 60 on-lot systems throughout the Township according to staff and Township documentation. These systems are scattered throughout the Township in both planned developments and single parcels. However, the largest density of these systems exists in the Derstine Road Study Area.

In March 2009, the CET and HTMA Staff conducted a Sewage Needs Survey of the on-lot systems. This, coupled with a review of soil type and suitability for on-lot systems, aids in the evaluation of needs for the Township. The Needs Survey consisted of two parts, a mail survey (conducted in October of 2008) which was sent to the address of all the known on-lot sewage disposal systems, as well as a door to door survey and water sample survey (conducted in March 2009) that was accomplished in the Derstine Road Study Area.

This area was selected for a more detailed study due to the number of systems in this area, the relatively small lot size, and the use of individual potable water systems. Additionally, the geographic location and proximity to the existing sanitary sewer system may facilitate an extension should groundwater contamination be found. Other areas were not selected for door to door surveys or well sampling as the numbers of systems were small and many are within a reasonable proximity to an existing sewer line, or have sufficient room to construct / rehab existing systems. Plate 3 and Figure II-1 show all the on-lot systems in the planning area as well as the DRSA.

TYPES OF ON-LOT SYSTEMS IN USE

Conventional on-lot bed or trench systems and elevated sand mounds are used throughout the Township. There does not appear to be a widespread problem with malfunctioning on-lot systems. There may be individuals who are experiencing problems, however, because of the distance of these homes from the existing public sewer, and because the surrounding population is not very dense, it would not be cost effective to construct an extension to serve these individuals. These spot problems are addressed on a case-by-case basis by the County's Sewage Enforcement Officer.

SANITARY SURVEY

To obtain public health needs information, a sanitary survey using DEP's recommended protocol was completed during March of 2009. With approximately 59 systems throughout the township, DEP requires 35% to be surveyed / sampled. A mail survey was mailed to a total of 59 property owners. Of the surveys mailed, 35 or 59% were returned. An example of this survey is included in Exhibit III-2.

Additionally, the DRSA consists of 24 systems, where Township staff elected to accomplish a more detailed sanitary survey and groundwater sampling effort. With 24 systems DEP requires 50% to be surveyed/sampled. In the DRSA, 18 (75%) mail surveys were returned and 14 (58%) door to door survey and well samples were accomplished. The results are tabulated in Exhibit III-3.

Repair permits are issued by the Montgomery County Health Department (MCHD). Systems can repaired and/or upgraded through various methods including septic tank replacement, beds, trenches, elevated sand mounds, spray and drip irrigation and others. In the DRSA, two repair permits are on file, both for construction of new elevated sand mounds. Other on-lot system repairs conducted, as indicated by the property owner, are listed in Exhibit III-3.

ON-LOT SEWAGE SYSTEM COMPARISON

To identify areas with public health needs, on-lot systems are classified into four categories of condition:

a. *Confirmed malfunction* – identified by SEO, BTG repair permits, piped discharges, backups, wet areas.
b. *Suspected malfunction* – identified by greener grass, unsuitable absorption area location – wetlands or rock outcrops, cesspools in high density developments, and pit privies.
c. *Potential malfunction* – identified by systems that appear to be functioning properly but are preregulatory systems (1972), substandard systems by current standards, unsuitable soils, repair permits per Chapter 73.

d. *Properly functioning* – identified by systems operating satisfactorily, constructed in accordance with permit requirements effective at the time.

Tables III-4.a and III-4.b summarizes data collected from the mail and door to door surveys for the Township as a whole and the DRSA. Figure III-3 depicts confirmed, suspected, and potential malfunctions in the DRSA.

Table III-4.a. Survey data (Township)

#	Confirmed					Suspected			Potential		
	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd
59	2	1	0	0	3	6	0	1	26	0	8
% of Total	3	2	0	0	5	10	0	2	44	0	14

Table III-4.b. Survey data (DRSA)

#	Confirmed					Suspected			Potential		
	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd
24	2	0	0	0	1	6	0	0	15	0	2
% of Total	8	0	0	0	4	25	0	0	63	0	4

Figure II-6 shows soil and topographic limitations to types of on-lot systems that can be installed in the DRSA.

For the Derstine Road Study Area, there appears to be some limitations for the effectiveness of standard in-ground disposal systems (because of the shallowness of limiting zones, hydric soils and some steep slope). Elevated sand mounds may be suitable for homes in this area, but this needs to be investigated on a case-by-case basis. However, because of the relatively small size of many of the lots, siting an on-lot disposal system may not be in accordance with the current regulations for new systems regarding isolation distances from wells, other on-lot disposal areas, homes, etc. Generally it can be difficult to achieve the required isolation distances on lots less than an acre. Because of this, a water supply survey was conducted in this area to determine the extent, if any; groundwater contamination exists in this area.

WATER SUPPLY SURVEY

An individual water supply survey was conducted by the Township in accordance with DEP's Sewage Disposal Needs Identification publication. A well water survey (in areas without public water) of the DRSA was conducted. All well samples were tested for total coliform, fecal coliform and nitrate-nitrogen and of the 24 systems, 14 or 58% were sampled.

EPA's safe drinking water criteria for nitrate in public water supplies is 10 milligrams per liter of sample (10 mg/l). Sources of nitrate-nitrogen include natural decay of organic matter, precipitation, mineral weathering, manure application, chemical fertilizers, and malfunctioning sewage disposal systems. None of the well samples exceeded these criteria.

Of the 14 samples collected, 8, or 33%, had nitrate levels greater than or equal to 5 mg/L and none exceed 10 mg/L. These results are concentrated in the southern portion of Derstine Road. Development sites proposing soil-dependent treatment methods within ¼ mile of a water supply that exceeds 5 mg/L nitrate-nitrogen must conduct a preliminary hydrogeologic study.

Total coliform exists naturally in the soil, on vegetation, and in the intestines of animals. By itself, total coliform does not indicate contamination by a septic system. Total coliform counts greater than or equal to one are considered nonpotable. A high total coliform count may be due to an uncased or improperly cased well (allowing for contamination of the well from the surface). Total coliform was not detected in any of the samples in the DRSA. Some additional, Township-wide sampling did detect total coliform contamination in one system. However, it was not greater than 5 and the presence of fecal coliform was not detected.

Sample results are depicted visually on Figure III-3. A summary of the data for the DRSA is shown in Table III-5.

Table III-5. Water Quality Survey Results

Well Samples	**14**					
	Nitrate	**% of tests**	**TC**	**% of tests**	**FC**	**% of tests**
>0	6	43%	0	0%	0	0%
>5 mg/L	8	57%	0	0%		
>10 mg/L	0	0%	0	0%		

OPERATION AND MAINTENANCE REQUIREMENTS

The HTMA or the Township does not currently require operation and maintenance for individual onlot systems. Montgomery County Health Department staff conducts system inspections for new systems as well as inspections of systems with known problems. Exhibit III-4 contains the MCHD forms required for the construction of a new system or modification of an existing system.

C. SLUDGE AND SEPTAGE GENERATION

Sludge generated at the HTMA WWTP is dewatered in a centrifuge and incinerated. The total quantity of sludge generated at the HTMA WWTP for the calendar year 2008 was approximately 485 dry tons.

Septage is the entire contents – scum, sludge, and wastewater – of a septic tank, aerobic treatment unit tank, holding tank, and composting or chemical toilet. Septage is regulated under 40 CFR Part 503 and PA Chapter 273. Septage from a septic tank is generally stronger than domestic wastewater and holding tank waste. In addition, septage characteristics vary depending on factors such as user habits, tank sizes and design, pumping frequency, climate and seasonal weather conditions, and tributary appliances such as garbage grinders, water softeners, and washing machines.

As reported by HTMA staff, the WWTP received approximately 8.6 MG of septage from local haulers in 2008. The HTMA regulates the haulers through a Hauler's permit. A list of the Township's approved haulers is included in Exhibit III-5. The HTMA also received approximately 21.6 MG and 0.47 MG of holding tank and grease trap waste in 2008, respectively. In addition to domestic septage and holding tank waste, HTMA receives a small quantity of trucked waste from a few industrial sources. These are listed in the Annual Pretreatment Report submitted to DEP with the Annual Chapter 94 report.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
WASTEWATER TREATMENT FACILITY
PROCESS SCHEMATIC

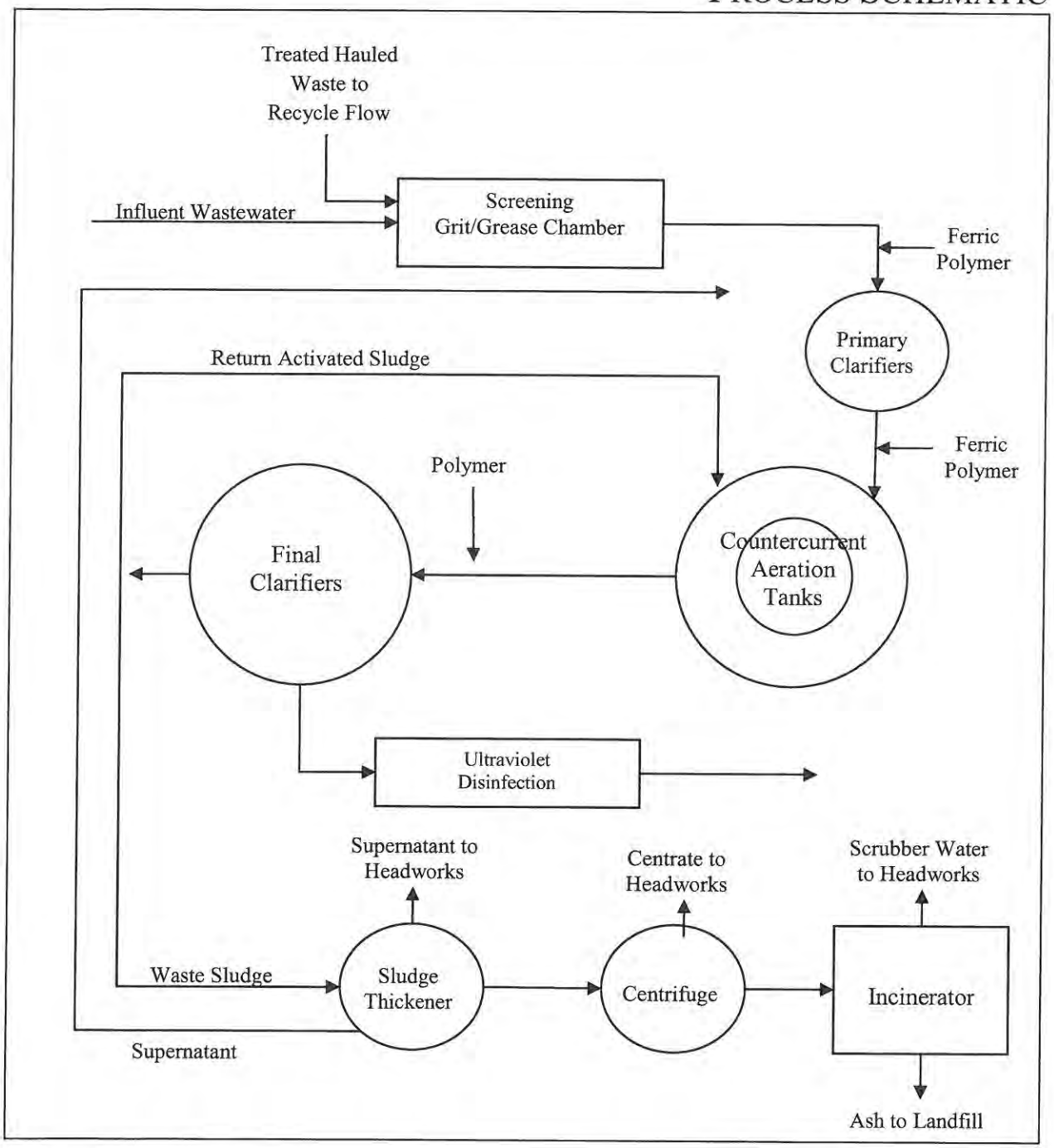
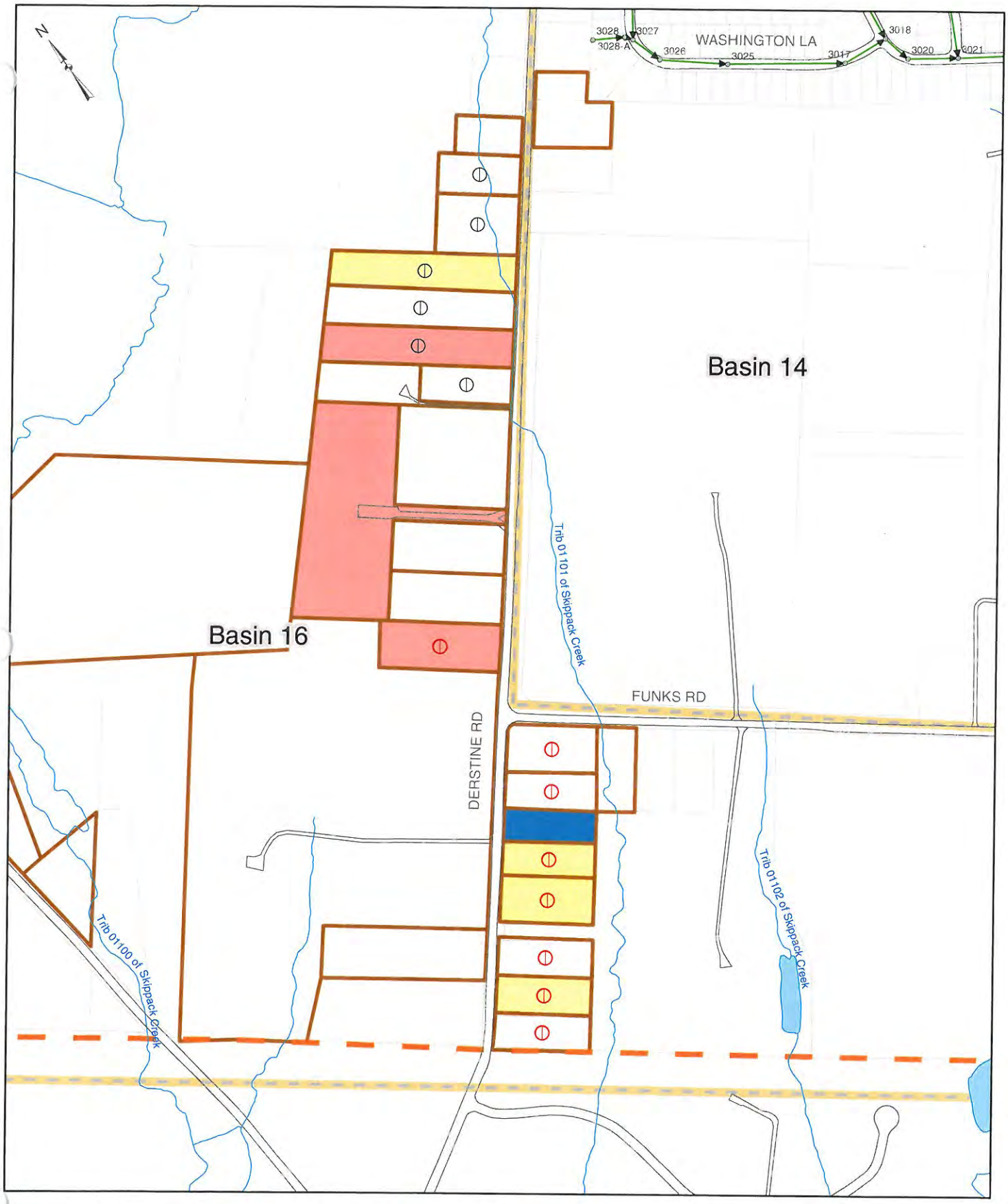


Figure III-1 : HTMA WWTP Process Schematic

Figure III-2: HTMA WWTP Aerial



>5 Mg/L Nitrates
<5 Mg/L Nitrates
Survey Results Received
Confirmed Malfunction
Suspected Malfunction
Potential Malfunction
Water Body
Stream
Parcels
Township Line

* Entire Mapped Area is Brunswick Formation Geology.
** No Total Coliform Contamination was found.

0 200 400 800 Feet

Edit Date: 3/4/2010 1:49 PM
File: J:\Hatfield Township Municipal Authority (0592)\6600 - Act 537\GIS\Results-85x11.mxd

Figure III-3
DRSA - SANITARY SURVEY & WELL SAMPLE RESULTS
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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IV. FUTURE GROWTH AND LAND DEVELOPMENT

A. MUNICIPAL AND COUNTY PLANNING DOCUMENTS

LAND USE AND ZONING PLANS AND REGULATION

The Montgomery County Comprehensive Plan, most recently adopted on September 9, 2004 by the County Board of Commissioners is available online at http://montcopa.org/plancom/comprehesiveplan. This plan, entitled Vision Plan - Shaping Our Future: A Comprehensive Plan for Montgomery County, is intended to provide a vision of the county for the year 2025. This plan is a tool to address land use and recent trends in development projected out through 2025, and proposes alternatives and recommendations to shape how this land use occurs. The "Vision Plan" of the county proposes to:

- Direct new development to logical places, as an extension of existing developed areas or within these areas;
- Preserve critical open space and farmland for future generations;
- Revitalize Main Streets and brownfield industrial sites;
- Tackle traffic congestion effectively, while providing transportation alternatives to the car; and,
- Offer a variety of housing, job, shopping, and recreational choices to county residents.

The overall comprehensive plan was broken into eight separate sections, each focusing on a particular item. These are the Guiding Vision, the Land Use Vision, the Open Space, Natural Features, and Cultural Resource Vision, the Transportation Vision, the Community Facilities Vision, the Water Resources Vision, the Economic Development Vision, and the Housing Vision. Each component of the plan developed goals to attain the proposals listed above. This portion of the Plan Revision will summarize only the Community Facilities and Utilities Vision, Water Resources Vision and Land Use Vision as they pertain to sewage facilities planning in Hatfield Township.

The Land Use Plan, as described above shows how new development can be accommodated in a better way that reduces sprawl, revitalizes older areas, preserves open space, and provides new housing and employment opportunities, while meeting market demand. This plan is aimed at a series of six goals, which can be found in Exhibit IV-1. Of these six goals, the first, "Direct Development in Designated Growth Areas", directly pertains to future facilities planning. The Land Use Plan designates most of Hatfield Township as an Existing Suburban Development. However some portions of the Township, including the western and southwestern areas are Designated Growth Areas. A copy of the Land Use Plan Summary and Growth Areas can be found in Exhibit IV-2. The DRSA is located in the designated growth area as well as a number of other undeveloped areas of the Township. These areas are shown on Plate 5 and will be described in further detail later in this section. Hatfield Township is also designated as a secondary development center, defined as a local community focal point that has a variety of uses.

The Montgomery County Comprehensive Plan addresses sewage facilities and needs through the section entitled "Community Facilities and Utilities Vision". This section identifies three primary goals that affect Hatfield Township sewage facilities planning:

Goal 24: Focus Public Sewer and Water Improvements in Designated Growth Areas
Goal 25: Restrict the Extension of Water and Sewer into Rural Resources Areas
Goal 26: Provide Environmentally-Safe Sewer Facilities

Chapter 2, Sewage Facilities, of the Community Facilities and Utilities Vision, is attached as Exhibit IV-3. This chapter describes the state of the county sewage facilities as well as provides recommendations to meet the goals stated above. These recommendations are listed in Table IV-1 below. This chapter also designates future sewer services areas (Exhibit IV-4) and lists 73 on-lot needs areas, all outside of Hatfield Township.

Table IV-1. County Sewage Facilities Plan Recommendations.

Montgomery County Comprehensive Plan Recommendation
1. Concentrated Sewage Facilities within designated growth areas and existing developed areas.
2. Restrict extension of public sewage into rural resource areas.
3. Provide public sewer and water facilities concurrently, where possible within growth areas.
4. Municipalities with official sewage facilities plans more than 10 years old and those with significant numbers of failing on-lot systems should review and update the documents.
5. Sewage facilities plans should be consistent with regional, county and municipal comprehensive plans, land use plans, zoning ordinances, and open space plans.

The Township Zoning Ordinance and other codified ordinances are available on the website http://www.ecode360.com/?custId=HA2083. A zoning map of the planning area is included as Plate 6.

Sewage facilities and planning in Hatfield Township are governed primarily by the following codified ordinances:

- Chapter 224: Sewers and Sewage Disposal
- Chapter 250: Subdivision and Land Development
- Chapter 282: Zoning

Chapter 224 provides for general sewer use regulations, required connections, holding tank regulations and the Township's waste pre-treatment program. The design of new sanitary sewer facilities and the use of on-lot sewage disposal systems is regulated by the Township's Subdivision and Land Development Ordinance. The Zoning Ordinance provides a standard for lot sizes and arrangements based on zoning and the availability of public sewer and water. All

these documents work together along with the Montgomery County Health Department and HTMA in the siting and construction of sanitary sewer or on-lot sewage disposal systems.

FLOODPLAIN, STORMWATER, AND SPECIAL PROTECTION (CH. 93) PLANS

The 100-year floodplain boundaries shown on Plate 2 were prepared for the National Flood Insurance Program by the Federal Emergency Management Agency (2002).

The Montgomery County Comprehensive Plan outlines numerous best management practices, both structural and non-structural, which municipalities can use to reduce the affect of stormwater discharge. These BMPs are included in the Water Resources Plan Summary which can be found in Exhibit IV-5. As well, the Townships Zoning and Subdivision and Land Development Ordinances regulate development activities in floodplains.

Hatfield Township currently has in place a Stormwater Management Ordinance, Chapter 242 of the Codified Ordinance. This Ordinance places stringent requirements on stormwater facilities and minimizes the need to negotiate size of the stormwater management facilities. Additionally the Township Subdivision and Land Development Ordinance governs the design and construction of new stormwater facilities.

Chapter 93 identifies Special Protection Waters as streams of High Quality (HQ) or Exceptional Value (EV). There are no HQ or EV waters in Hatfield Township.

B. POPULATION

EXISTING AND PLANNED DEVELOPMENT

The 2009 Chapter 94 Report to DEP lists future connections to the collection system from known and anticipated developments projected over the next five years. Per the 2009 Chapter 94 report, total connections to the HTMA system (including contributions from neighboring municipalities) and planned connections over the next six years are shown in Table IV-2. As previously discussed future connections shown below are consistent with correspondence from contributing municipalities.

Table IV-2. Chapter 94 Planned and Projected EDU Connections

		Projected Connections					
Township	Total Connected EDU's	2010	2011	2012	2013	2014	Total Projected and Connected EDU's
Hatfield Twp.	10,589	125	140	140	140	140	11,274
Hatfield Boro	1,550	3	18	8	0	0	1,579
Hilltown Twp.	160	0	0	0	0	0	160
Franconia Twp.	458	0	0	0	0	0	458
Montgomery Twp.	6,457	141	127	97	31	474	7,277
HTMA System	19,214	19,483	19,768	19,963	20,134	20,748	20,748

LAND USE DESIGNATIONS

The County Comprehensive Plan contains a section on existing land use and development patterns. An inventory of land use acreage, updated through 2000, as well as a Land Use Map and Land Use Definitions is contained in Exhibit IV-6.

PAST, PRESENT, AND FUTURE GROWTH TRENDS

The population of Hatfield Township has grown significantly over the past several years. In July 2007, the Delaware Valley Regional Planning Commission developed 2035 population forecasts for Montgomery County. These forecasts, for Hatfield Township and Hatfield Borough are summarized in Table IV-3 below, and the full population forecast can be found in Exhibit IV-7.

Table IV-3. 2035 Population Forecasts

	2000	2005	2010	2015	2020	2025	2030	2035	% Change 00-35
Hatfield Township	16,712	17,577	18,174	18,739	19,273	19,776	20,251	20,689	23.8
Hatfield Borough	2,605	2,889	2,937	2,982	3,025	3,065	3,103	3,138	20.5

The Township growth is comparable to the projected county wide growth with a projected per cent for the Township of 23.8% and the County of 19.4%. Additionally, the County Comprehensive Plan projects approximately 6,500 new connections for the North Penn Area through 2025. This area includes Montgomery Township, Hatfield Township, Upper Gwyned, Towamencin, Hatfield Borough, Lansdale, and North Wales. This area is served by six wastewater treatment plants, including the HTMA WWTP. Utilizing this information, it can be estimated that the projected connection requirement for the HTMA planning area is approximately 25 - 30% of the North Penn projection or approximately 1,600 – 2,000 EDUs by

2025. The county planning information is a useful baseline and with this, the Township and HTMA underwent a more detailed analysis of future projected loadings. This information is provided in the following portion of the plan revision.

C. PROJECTED WASTEWATER LOADINGS

PROJECTED HYDRAULIC LOADING

Projected hydraulic loadings were determined by first making an assessment of the current flow in the Hatfield Township system by the EDU's already connected. Based on the 2009 Chapter 94 report there are currently 19,214 EDU's connected to the system and the five-year average flow per EDU is 327 gpd. This yields a current average flow of 6.28 MGD.

In addition to the current flow there are an additional 1,534 EDU's that are projected to connect in next five years as reported in the 2009 Chapter 94. For purposes of this projection future connections are assumed to contribute **250 gpd/EDU**. This results in a projected flow **0.384 MGD.**

In order to further project flows, a build-out analysis was conducted by Hatfield Township staff. This analysis gave the approximate acreage available for development in each type of zoning classification. By applying an estimate of the potential number of EDU's per acre in each type of zoning the approximate number of future connections can be made. A summary of this analysis is shown below in Table IV-4.

Table IV-4. Projected EDU Connections from Future Growth.

Zoning		Acreage Available	EDU / Acre	Total EDUs	Flow Contribution (GPD)
Residential	RA-1	404	2.0	808	**202,000**
Light Industrial	LI	567	4.5	2,552	**638,000**
	Totals	971		3,360	**840,000**

As shown above this analysis results in an expected additional **0.840 MGD** of flow from build-out of the Township.

Table IV-5 tabulates the above data and includes a sewage contribution from approximately 60 EDU's, assuming all on-lot sewage disposal systems are eventually connected to public sewer.

Table IV-5. Total Projected Future Flow.

Current Flow (MGD)	6.280
Chapter 94 Projected Connections (MGD)	**0.384**
On-Lot Contribution (MGD)	**0.013**
Undeveloped Area Contribution (MGD)	**0.840**
Total Estimated Average Daily Flow (MGD)	**7.517**
Estimated 3 month Maximum Flow (MGD)	**9.246**

As shown above, the average total flow resulting is **7.52 MGD, 0.54 MGD above the 6.98 MGD design capacity of the plant.** When the 5-year average 3-month maximum to annual average flow ratio of 1.23 (per the 2009 Chapter 94 report) is applied, a 3 month maximum flow of **9.25 MGD** results. Given this information, alternatives will be presented in this plan to meet the potential future hydraulic capacity shortfall.

PROJECTED ORGANIC LOADING

Similarly, organic loading is projected below in Table IV-6. A contribution of 0.65 lbs BOD / EDU was used for existing connections as shown in the 2009 Chapter 94 report, while a contribution of 0.41 lbs BOD / EDU was used for future connections.

Table IV-6. Total Projected Organic Load.

	EDU's	BOD Load (lbs/day)
Current Connections	19,214	12,461
Chapter 94 Projected Connections (MGD)	1,534	628
On-Lot Contribution	60	25
Undeveloped Area Contribution (MGD)	3,360	1,378
Totals	24,168	14,492

The projected average BOD load is 14,492 lbs BOD/day. When the 5-year average 1-month maximum to annual average BOD ratio of 1.24 (per the 2009 Chapter 94 report) is applied, a maximum month BOD load of 17,971 lbs BOD/day results, well within the 22,300 lbs/day design capacity.

V. EVALUATE ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

IDENTIFIED NEEDS

Population and wastewater flow projections were developed in Section IV for a buildout scenario. Based on this analysis it is anticipated that Hatfield Township could require an additional approximately **540,000 gpd** hydraulic treatment capacity.

While there are a relatively few on-lot systems throughout Hatfield Township, a small concentration exists in the Derstine Road Study Area. Sanitary and water sampling results indicates some contamination in the DRSA and other on-lot systems throughout the Township. However, this contamination is not at the level to require an immediate land based solution or extension to existing facilities. Improvements to the operation, maintenance and oversight of these systems are necessary to keep them operating effectively, and prevent further contamination. Currently, the permitting, and inspection of these systems is managed at the county level at the Montgomery County Health Department. Well-water sampling in the DRSA as part of this update indicated some pollution concerns from nitrates.

Alternatives to satisfy the projected wastewater facility capacity needs, and the effective long-term operation of on-lot sewage disposal systems are developed in the remainder of Section V.

A. CONVENTIONAL ALTERNATIVES

REGIONAL WASTEWATER TREATMENT

The HTMA owned wastewater treatment plant currently provides regional wastewater treatment for Hatfield Township and portions of surrounding and adjacent communities. On-lot systems taken offline within the planning area, will also follow this regional approach. The DRSA, located in Drainage Basins 14 and 16, could be served by an extension to the existing sewage facilities in Towamencin Township. This alternative is discussed further in the following section.

EXTENSION OF EXISTING FACILITIES TO AREAS WITH NEEDS

While DRSA is not in immediate need for an extension to existing facilities, should contamination increase, or development necessitate, it may be cost effective to construct facilities to serve this area.

Initial sewage planning and design is underway for the development of the 26-acre parcel currently at 82 Derstine Road. The intended development is to be a 240 unit assisted living development housing area, named Derstine Run. The location of this parcel, Hatfield Township drainage basins, and approximate location of possible connection is shown on Figure V-1. Advanced Living and Management, the developer, is submitting sewage planning requirements

and initial design to Towamencin Township for service. The May 19, 2009 overall preliminary grading and utility plan for this development is located in Exhibit V-1. As shown, sanitary sewer from Derstine Run would flow to an existing manhole south of the Hatfield Township line, and would require the construction of a gravity interceptor in Derstine Road in both Hatfield Township and Towamencin Township. Sanitary sewer laterals are also shown extending from the five (5) southernmost parcels in the DRSA. Of these parcels, water samples taken at three all indicated nitrate levels greater than 5 mg/L.

Additional sewer layout and design, conducted as part of this plan revision, show that modifications to the current developers plan could facilitate the service of most of the homes on Derstine Road, south of Funks Road. Additionally, an extension to these facilities, constructed by Hatfield Township, could facilitate the service of the remainder of the properties in the DRSA.

Hatfield Township is currently in discussions with Towamencin Township in developing an agreement for the release of these units. Additionally, by constructing this extension to serve the DRSA and Derstine Run, other undeveloped areas in Drainage Basins 14 and 16 could be served by this extension. This would in turn decrease the required additional treatment capacity at the HTMA WWTP. Correspondence to this effect was sent to Towamencin Township and is included in Exhibit V-3. This change is shown below in Table V-1.

Table V-1. Total Projected Future Flow

Current Flow (MGD)	6.280
Chapter 94 Projected Connections (MGD)	**0.384**
On-Lot Contribution (MGD)	0.013
Undeveloped Area Contribution (MGD)	**0.840**
Flow deduct for Basins 14 and 16 (MGD)	0.050
Total Required Flow (MGD)	**7.467**

Should Hatfield Township extend its own existing facilities to DRSA, for treatment at the HTMA it would require the construction of a gravity sewer system along with a new pump station and force main. This pump station and force main would convey flows from DRSA and Basins 14 and 16 to the new Funks Road Pump Station. Due to the location and topography of this area, double pumping is required.

USE OF EXISTING FACILITIES THROUGH REPAIR, UPGRADE, LOADING REDUCTION AND IMPROVED OPERATION AND MAINTENANCE

In order to meet the future capacity needs of the Township, alternatives must be explored to increase capacity at the WWTP. Alternatives that should be examined under this section, according to DEP planning guidance, are those involving the continued use of existing municipal sewage facilities through one or more of the following:

- Repair
- Upgrading
- Reduction of hydraulic or organic loading to existing facilities.
- Improved operation and maintenance
- Other applicable actions

This alternative will examine the potential for both upgrading existing facilities and increasing the hydraulic loading capacity of the facility via a hydraulic re-rate.

In June 1991, Tracy Engineers prepared, but did not submit, a re-rate application to Pa DER. This application, contained in full in Exhibit V-4, requested the following capacities be increased for the HTMA AWTF above their 1987 design values:

Table V-4. 1991 Re-rate Capacity Adjustments

Parameter	1987 Design Basis	1991 Re-rate Recommendation
Average Daily Flow (MGD)	6.43	8.25
Maximum Monthly Flow (MGD)	-	11.55
Peak Daily Flow (MGD)	13.65	18.00
Peak Hourly Flow (MGD)	20.80	27.00
Raw Influent BOD_5 (lb/d)	11,832	16,513
Raw Influent TSS (lb/d)	11,832	19,265
Raw Influent TKN (lb/d)	2,622	2,752
Raw Influent NH_3-N (lb/d)	1,929	1,514
Raw Influent NO_x (lb/d)	62	207
Raw Influent TP (lb/d)	462	550
Primary Effluent BOD_5 (lb/d)	8,283	10,899
Primary Effluent TSS (lb/d)	4,732	9,247
Primary Effluent TKN (lb/d)	2,622	2,339
Primary Effluent NH_3-N (lb/d)	1,929	1,445
Primary Effluent NO_x (lb/d)	62	330
Primary Effluent TP (lb/d)	462	414

Tracy's analysis was based on both hydraulic and organic capacities of the treatment units based on plant operating data. This analysis showed that the headworks area was a significant hydraulic bottleneck in the plant, and based on their calculations, limited to a peak hourly flow of 27 MGD due to pipe capacity between the grit/grease chamber and pump station two. Additionally, on an average daily flow basis, calculations showed that the limiting treatment units were the aeration tanks, at an ADF of 8.44 MGD. This was based on a minimum 16 hour detention time. Tracy then selected 8.25 MGD as the potential re-rated ADF and set the other flows based on historical peaking factors. Other parameters were then set based on average and expected loadings. These flows and loadings were then examined to determine what if any modifications may be required. CET has reviewed Tracey's findings and recommendations and finds them to still be relevant at this time.

In order to achieve the higher capacity, a number of upgrades to the AWTF were recommended. These upgrades, along with their status are listed in Table V-5 below:

Table V-5. 1991 Hydraulic Re-rate Recommendations

Recommendation	Status
Increase pumping capacity at Pump Station 1 to 27 MGD	Complete
Install higher curbing and grating at influent channel to mechanical screens	Not Complete
Install higher curbing and grating at mechanical screens	Not Complete
Install higher curbing and grating at effluent channel to mechanical screens	Not Complete
Increase pumping capacity at Pump Station 2 to 27 MGD	Complete
Install additional 160 diffusers in aeration reactors	Complete
Install standby return sludge pumping	Not Complete

Based on this re-rate analysis, an ADF of 8.25 MGD, a MMF of 11.55, a PDF of 18.00 MGD, and a PHF of 27.00 MGD is achievable with the completion of the above recommendations or other hydraulic adjustments to the headworks area. Preliminary hydraulic calculations, conducted by CET as a check of the Tracey data, show that the existing arrangement is sufficient for peak flows up to approximately 24 MGD, and are included in Ex. V-5. This alternative would seek to establish the ADF and permitted capacity of the AWTF at 7.55 MGD based on planning in Section IV, and establish the MMF, PDF, at the flows established by Tracy (11.55, 18.0 MGD, respectively) and a PHF of 24 MGD to match the calculated hydraulic capacity. However, in order to facilitate a 27.0 MGD PHF an upgrade to the headworks must be completed. This can be accomplished as stated above, or with a physical re-routing of peak flows around the existing hydraulic bottlenecks. A more detailed analysis and design of these modifications will be accomplished as existing peak hourly flows increase and following the completion of the ongoing flow equalization project (Section III).

Repair or Replacement of Existing Collection System Components

As previously discussed, Hatfield Township and HTMA have an aggressive maintenance program to repair and replace portions of the collection system that contribute to high I/I. This program is conducted on an as-needed, case by case basis. Additionally as discussed in Section IV, the construction of the new Neshaminy Interceptor will alleviate a hydraulic overload and provide for reserve capacity in the Township's main interceptor sewer.

New Community Sewerage Systems

The Township does not currently require or anticipate the need for new community treatment systems. Given the site constraints and soil conditions in DRSA this is not considered a viable

alternative. Additionally, the dispersion of the other on lot systems throughout the Township does not lend itself to community treatment.

INNOVATIVE/ALTERNATIVE METHODS OF COLLECTION/CONVEYENCE

DEP's Guide includes the following "partial listing of innovative and alternative technologies" available to provide individual and system-wide collection technologies:

- Cluster Systems
- Septage Treatment
- Small Diameter Gravity Sewers
- Vacuum Sewers
- Variable Grade Sewers
- Septic Tank Effluent Pump with Pressure Sewers (STEP)

The Township does not anticipate the need to use innovative or alternative methods of collection or conveyance to serve the DRSA. Should these systems be proposed as part of new development, they will be addressed on a case by case basis.

B. INDIVIDUAL SEWAGE DISPOSAL ALTERNATIVES

Individual sewage disposal systems may be permitted for new land development where conditions are suitable as established by the Montgomery County Health Department Sewage Enforcement Officer (SEO), and where the Township assures their proper operation and maintenance as required by Chapter 71.62. The technical solutions available for onlot repair and placement of onlot replacement systems are limited by soil and site conditions. If the soils are suitable in the area of the repair, standard in-ground systems may be used; if the soils are marginal, elevated sand mounds, oversized systems, or shallow placement systems can be considered for use, as is the case in much of the DRSA. The plan should closely evaluate the advantages of testing for and protecting a second suitable site on each lot for future replacement systems. The system design must include provisions for access to system components for maintenance requirements.

As per DEP Planning Module Component 3, a preliminary hydrogeologic evaluation of the proposed development site is required by DEP when a water supply within ¼ mile of the development site exceeds 5 mg/L of nitrate-nitrogen, or DEP has determined that known geologic conditions may contribute to the potential for groundwater pollution.

A sewage management program is recommended to comply with Chapter 71.71, which states that municipalities are required to "assure the proper operation and maintenance of sewage facilities."

The Township can establish a workable comprehensive management program in conjunction with systems already in place with MCHD that ensure proper design and operation. The

Township's program will address the continued use of onlot systems throughout the Township and protect and improve water quality and public health by providing public sewerage where appropriate and by enhancing the performance and reliability of the decentralized systems. In turn, with adequate management, the homeowner's investment is protected, the service life of the system increases which saves on replacement costs, the groundwater is conserved and replenished, and the community eliminates the need to finance extensive collection system sewers. The management program will detail recommended approaches for public education and participation, planning, siting, design, performance, installation, operation, maintenance, inspections/monitoring, corrective actions, record keeping and reporting, and financial assistance and funding of wastewater systems.

In implementing this Sewage Facilities Plan Revision, the Township has adopted an On-Lot Management Ordinance, included in Exhibit V-6. The ordinance requires that each onlot system be inspected and pumped on a regular schedule. The Township's Sewage Management Plan will be managed by theirs and HTMA staff. Coordination will be made with the MCHD SEO in the event a system problem is identified. Qualified haulers shall inspect the onlot system each time the system is pumped and complete the septage manifest report form. Septage will be hauled to the wastewater treatment facility.

The ordinance also provides for the intervention and enforcement capabilities to correct a suspected onlot system problem. System repair, rehabilitation or replacement will be required for those systems that are confirmed as a malfunction.

When evidence of nitrate and fecal coliform contamination is found within the Township, it may be surmised that there are problems with some individual OLDS, as is the case in much of the DRSA. These problems can be addressed in a variety of ways within the tenants of the Sewage Management Plan. These approaches include replacement systems, should site conditions be adequate, and investigation of sources and remedies for contamination, which include but are not limited to well placement, well casing, new well drilling, and well disinfection or ultraviolet disinfection on the service line.

The use of water conservation devices in the home is not mandated by Township ordinance. Although generally accepted as being a good idea, water conservation devices tend to play a negligible role in rural wastewater planning and design. However, where systems are deemed to be overloaded or malfunctioning, water conservation devices may be required to be installed to lessen the hydraulic loading to the existing system.

Each of the systems will be inspected initially per the Township's Onlot Management Program Ordinance. Where necessary, an attempt to replace a failing system with an individual or small flow treatment system will be the initial consideration.

C. SMALL FLOW TREATMENT FACILITIES

Small flow treatment facilities as detailed in DEP's *Small Flow Treatment Facilities Manual,* (November 23, 2003), are restricted to use as a replacement or repair system for onlot system malfunctions as determined by the local agency. While no specific application of these systems have been identified by the needs analysis, this plan allows the local agency and the Township to use a small flow sewage treatment facility when deemed necessary and in compliance with the regulations regarding design, installation, operation, maintenance, and the Township's Sewage Management Program.

D. COMMUNITY LAND DISPOSAL ALTERNATIVES

While no specific application of community land disposal alternatives has been identified in the needs analysis, this plan allows the use of these systems in compliance with Chapter 71.64 of DEP's regulations regarding site and soil suitability, and a hydrogeologic evaluation, and in accordance with the Township's Sewage Management Program.

E. RETAINING TANK ALTERNATIVES

This section has been prepared in compliance with Chapter 71.63. Retaining tanks (defined in Chapter 71.1) may be used with specific restrictions. Any retaining tank waste generated in the Township may be disposed of at the wastewater treatment facility. Requirements for regular service and maintenance of tanks would be enforced through existing Sewer Use Ordinance, Chapter 224, Article 1.

F. SEWAGE MANAGEMENT PROGRAMS

Municipalities are required to assure the proper operation and maintenance of sewage facilities within their borders. The Township intends to institute a Sewage Management Program (SMP) that provides the method to identify, evaluate and implement the operation and maintenance needs of existing and proposed sewage facilities in the Township. This program will assure the future operation and maintenance of existing and proposed sewage facilities, which protects the water resources, public health and homeowner investment. The SMP will be managed and administered by the Township. The Township will coordinate with the MCHD SEO as necessary. This plan revision was sent to MCHD for review. This correspondence, along with MCHD comments is included in Appendix B.

DEP's minimum requirements for a Sewage Management Program in accordance with Chapter 71.73 include:

- ❑ The adoption of the legal authority allowing access for inspections; and the development of a policy for scheduling inspections, and providing a method to notify owners of the policy.
- ❑ Standards for operation, maintenance, repair or replacement of sewage facilities:
  - o Scheduled removal of septage

- Protection of treatment and absorption areas from stormwater impacts and physical damage.
- Reduced hydraulic loading through water conservation devices.
- Maintenance of a systems mechanical and electrical components
- Septage hauler requirements consistent with the Solid Waste Management Act.

- ❑ Establish a fee schedule
- ❑ Enforcement provisions
- ❑ Penalty provisions
- ❑ Ordinances, regulations or policies

In instituting this program the Township has adopted an Onlot Management Ordinance as previously discussed. While the adoption of a management ordinance provides the regulatory framework and grants access for the Township, other key elements of the SMP are discussed in the following section.

Repair, Replacement, or Upgrading of Malfunctioning Onlot Sewage Systems

System rehabilitation will be required for confirmed system malfunctions or for inadequate systems. Repair or replacement of a malfunctioning system will be by a permit issued by the Sewage Enforcement Officer according to the provisions of Act 537 and Chapter 73 Rules and Regulations.

To determine if a system is malfunctioning, any or all of the following inspection tasks may be used, accomplished by HTMA and Township staff and in coordination with the MCHD SEO:

- ❑ Reviewing records of the system.
- ❑ Pumping of the septic tank and checking the tank for water tightness and structural integrity.
- ❑ Checking the balance of the system for integrity—e.g., broken pipes, alarms on pump systems.
- ❑ Probing or excavation to confirm field location.
- ❑ Excavation to determine construction of the field—for proper construction and/or for depth between bottom of trench and rock, groundwater or impermeable layer.
- ❑ Walkover inspection of field area, checking for signs of surfacing effluent.
- ❑ Investigation of nearby slope breaks for evidence of seeping effluent, or to find straight pipes.
- ❑ Dye testing to confirm that seeps do include effluent from the system in question.
- ❑ Flow testing to confirm that a straight pipe emanates from the system in question.
- ❑ Determining proximity of the field to wells.

Public Education

To assure the proper operation and maintenance of the onlot systems in Hatfield Township a public education program would be established. Informational brochures describing how septic

systems work, how to take care of a septic system, water conservation and system record keeping will be made available. This information will be provided by the Township at notification of pump out. Examples of handouts and flyers are included in Exhibit V-7.

EXPANSION AND CONTINUED USE OF EXISTING AND NON-MUNICIPAL SEWAGE FACILITIES

The improved maintenance of existing systems and a method of monitoring performance should allow the continued use of on lot systems throughout the Township. However, repairs and replacement of existing systems, should they malfunction or be found to be substandard, may be challenging on some lots.

It is possible that the Township and the MCHD SEO will have to consider the use of Best Technical Guidance as defined in Chapter 73 of the Pennsylvania Code, or recommend an individual sewage system. Systems suspected of not operating properly shall be inspected by the SEO and if necessary, in accordance with DEP regulations and the Ordinance, be upgraded and improved. Those not upgraded and improved, because it is not feasible to do so, may be replaced by a holding tank. The Onlot Management Ordinance permits the Township to make the changes at the owner's expense if necessary.

To assist municipalities in helping homeowners maintain their systems with the goals of protecting public health and environmental quality, the EPA developed five models for management programs. See Exhibit V-8 for a summary of these models. All models include proper siting and construction of systems, and a systems inventory.

G. COMPREHENSIVE PLANNING

Montgomery County's Comprehensive Plan was developed to allow for land development and economic growth while maintaining the character of the County. Township zoning and land development ordinances are in place to assist in the controlled, orderly development of the Township.

The rules and regulations related to planning within the Township, as outlined in the Township's existing Zoning and Subdivision and Land Development Ordinance appear adequate to manage the proposed technical alternatives. Therefore, no new non-structural comprehensive planning activities are required at this time.

H. NO-ACTION ALTERNATIVE

As shown in Section III and IV, a projected hydraulic overload could occur at HTMA's WWTP during the planning period without addressing the alternatives previously described. Based on this, the no-action alternative is not a viable one at this time as it relates to the WWTP.

In regard to the service of on-lot systems in the Township, specifically the DRSA, a no action approach could be taken. DEP planning guidance requires the no-action alternative include a discussion of the impacts on several items. These items and associated impacts are listed below:

- Water Quality / Public Health: Nitrate contamination already present in the well samples in the DRSA could increase above acceptable levels over time.
- Growth Potential: Lack of public sewerage facilities is generally a hindrance to growth, and any new development proposing land based treatment would require a preliminary hydrogeologic study.
- Community Economic Conditions: These conditions would likely not change with the no-action alternative.
- Recreational Opportunities: These conditions would likely not change with the no-action alternative.
- Drinking Water Sources: As previously stated, current groundwater nitrate could rise above acceptable levels in private wells, leading to potential health hazards.

I. SELECTION OF WASTEWATER TREATMENT ALTERNATIVES

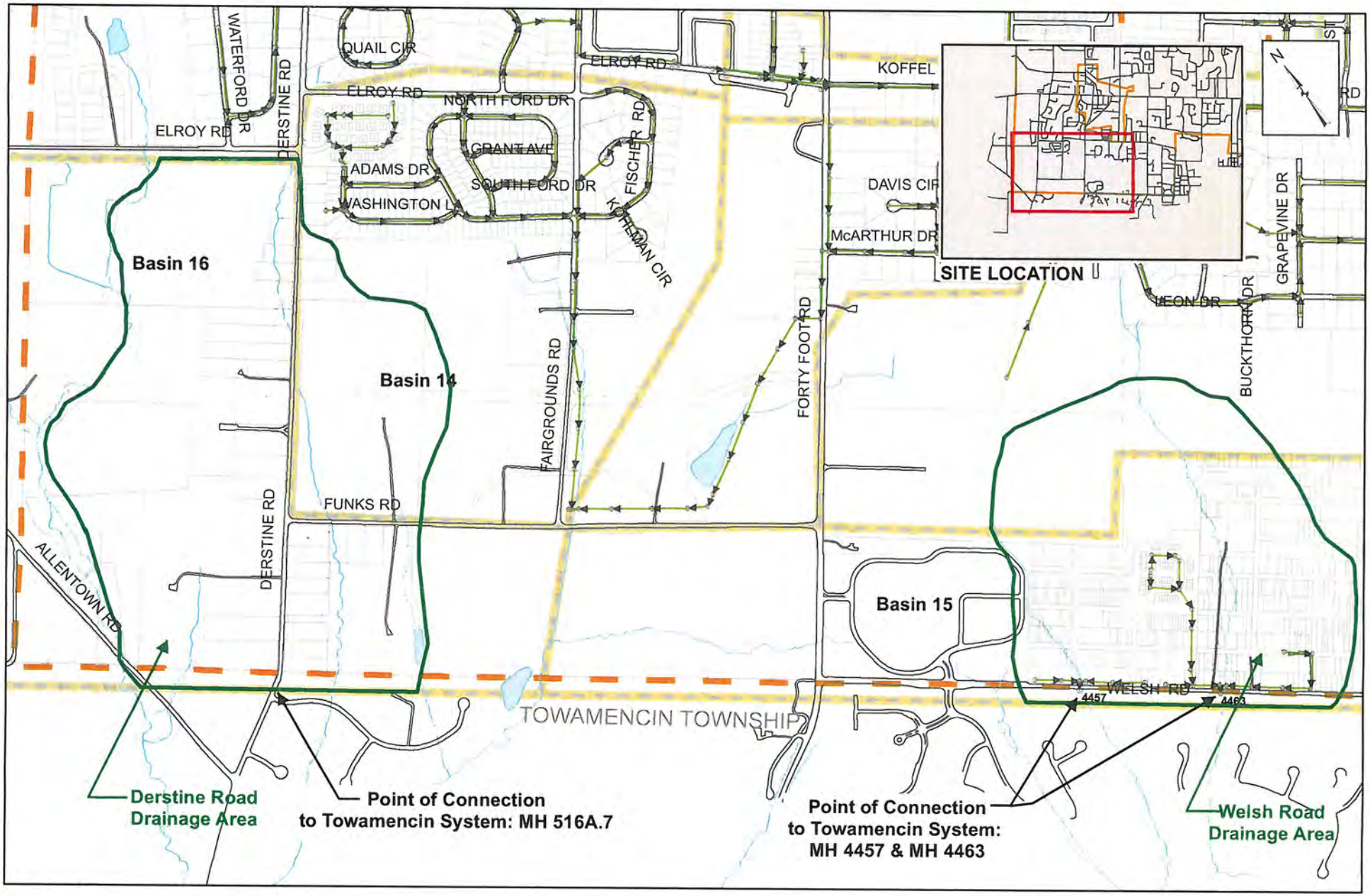
The following wastewater treatment alternatives were selected for further evaluation.

1. Provide additional permitted capacity in the HTMA AWTF via a hydraulic re-rate up to 24 MGD.

2. Develop and implement a sewage management program to ensure the long-term efficacy of on-lot septic systems.

3. Continue negotiations and coordination with Towamencin Township in order to enter into an agreement for the sanitary sewer service for DRSA, portions of Basins 14 and 16 and the Derstine Run development.

4. No-action alternative in regard to service of DRSA area.



Hatfield Sanitation Basins | Manhole | Water Body | Parcels
Gravity Sewer | Stream | Township Line

0 250 500 1,000 Feet

Figure V-1: Basins 14 & 16 Derstine Run Development

Date: 1/5/2011
Path: J:\Hatfield Township Municipal Authority (0532)\6600 - Act 537\GIS\Derstine and Welsh Rd.mxd

DERSTINE & WELSH RD DRAINAGE AREA

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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VI. EVALUATION OF ALTERNATIVES

A. CONSISTENCY ANALYSIS

Wastewater management alternatives developed as part of the Act 537 planning process are evaluated in terms of their relationship to the goals and objectives of various planning, environmental, and natural resource laws and policies of the Commonwealth of Pennsylvania. Title 25, § 71.21.a of the Pennsylvania Code requires the Act 537 plan to address the consistency of each wastewater management alternative with eleven of the Commonwealth's goals and policies. If there is a conflict between the recommended alternative and one of the goals and objectives, the conflict must be resolved in order to obtain regulatory approval.

The following sections discuss the eleven evaluation categories as outlined in the PA DEP Act 537 Plan Content and Environmental Assessment Checklist and the consistency determination as they relate to the alternatives presented in Section V.

CLEAN WATER MANAGEMENT PLANS PER SECTIONS 4 AND 5 OF CLEAN STREAMS LAW

Section 4 of the Pennsylvania Clean Streams Law stresses the importance to maintain clean, unpolluted streams so as to attract industry and provide for outdoor recreational activities, prevent further pollution to streams, and restore polluted streams. Each of the aforementioned factors has direct impacts related to the economic prosperity of Pennsylvania. In regards to wastewater treatment and disposal, Section 5 of the Clean Streams Law recommends a regional approach to wastewater management in part to accomplish the points raised in Section 4.

Both Alternatives 1 and 2 represent an increase in the total organic and hydraulic load on the Neshaminy Creek. However, through continued process optimization and monitoring it is expected that both these alternatives would continue to meet discharge permit limits and maintain the health of the stream. Alternative 3 eliminates local stream contamination by removing on-lot systems from service. Additionally, this alternative represents a regional approach to treatment. The HTMA AWTF is already a regional facility, and as such is consistent with the Clean Streams Law.

MUNICIPAL WASTELOAD MANAGEMENT (CHAPTER 94)

The HTMA annually prepares Chapter 94 Reports on behalf of the Township and is responsible for submission of these reports to DEP. The projections used in this plan are consistent with those included in the Chapter 94 Reports. The alternatives developed for this plan are consistent with the recommendations and findings of the Chapter 94 Reports.

TITLE II CLEAN WATER ACT PLANS

Title II, Section 210 of the Clean Water Act calls for wastewater treatment practices to utilize the best practicable wastewater treatment technologies available to prevent water and other

environmental pollution. It encourages a regional approach to wastewater treatment and disposal, and the control of all point and nonpoint sources of pollution. As shown in Section V, any increase in sewage flow as discussed in Alternate 1 will continue to be treated to within in NPDES permit limits. Additionally, since the treatment facility and conveyance system currently follow the regional approach, these Alternatives are consistent with Title II of the Clean Water Act. Alternative 2 has no impact on regional wastewater treatment.

COMPREHENSIVE PLANS

Montgomery County's Comprehensive Plan goal is to allow for land development and economic growth while maintaining the character of the County. The objectives of the Comprehensive Plan related to sewerage facilities are:

- Concentrate facilities in designated growth areas.
- Restrict extension of public sewage to rural resource areas.
- Provide public sewer and water services concurrently, where possible within growth areas.
- Municipalities with official sewage facility plans more than 10 years old should review and update.

All listed alternatives are consistent with these goals.

ANTIDEGRADATION REQUIREMENTS

To implement federal antidegradation requirements, streams are designated by DEP as High Quality or Exceptional Value waters. No HQ or EV streams exist in the planning area.

STATE WATER PLAN

The current State Water Plan replaces an outdated plan that was completed in 1983. The obsolescence of the current State Water Plan led the Department of Environmental Protection (DEP) to conduct a series of sixteen water forums in the spring of 2001 that sought opinions from the public about water resource management. The forums helped DEP set its strategic water resources management agenda, and generated grass roots support for legislation to require adoption of a new State Water Plan. The Water Resources Planning Act, signed into law on December 16, 2002, established a Statewide Water Resources Committee and six Regional Water Resources Committees that are charged with guiding DEP through the development of a new State Water Plan and updating it at five year intervals. This new updated State Water Plan was adopted in January of 2009.

The updated State Water Plan seeks answers to the following questions: How much water do we have? How much water do we use? How much water do we need? As a functional planning tool, this updated water plan provides Pennsylvanians with a vision, goals and recommendations for meeting the challenges of sustainable water use over a fifteen year planning horizon.

Alternatives presented in this plan are consistent with the goals of the new state water plan. Currently, DEP is identifying critical water planning areas where demand exceeds or is projected to exceed supply, create critical area resource plans or "water budgets", and establish voluntary water conservation programs. As part of the updated plan, DEP projects a potential growth of 20% in the Delaware River Basin. This is consistent with population projections listed in this Plan Revision. A full copy of the plan is located at Pa DEP's new State Water Plan website.[1]

PENNSYLVANIA PRIME AGRICULTURAL LAND POLICY

The Pennsylvania Prime Agricultural Land Policy was established to protect prime agricultural land from irreversible conversions to uses that result in the loss of land as an environmental or essential food production resource. An Agricultural Security Area is a unit of land used for agricultural production. This designation prevents municipalities from enacting ordinances that restrict normal farming practices on existing farms, discourages condemnation of lands by eminent domain by any governmental agency, and make the lands eligible to participate in the State's $100 million Agricultural Easement program where development rights to lands are purchased by a local body to preserve farmlands. Inclusion of property in an Agricultural Security Area does not prevent a landowner from developing the land. These security areas affect the enforcement of ordinances developed under Act 247. The proposed alternatives do not impact Agricultural Security Areas.

COUNTY STORMWATER MANAGEMENT PLANS

The Montgomery County Stormwater planning by PA DEP as part of the Act 167 program is conducted on a watershed basis. The planning associated with the watersheds relating to the Township is not complete. All stormwater management plans associated with the implementation of the alternatives discussed in this report will follow the criteria and planning goals of both the Hatfield Township Zoning Ordinance. Implementation of any of the alternatives discussed will be consistent with the most up to date Montgomery County Stormwater Planning objectives.

WETLAND PROTECTION

Areas classified as wetlands per the US Fish and Wildlife Service's National Wetlands Inventory (NWI) are identified in the DRSA in Figure II-4. The proposed alternatives will not impact any wetlands as identified by the NWI mapping. There do exist, however, several soils types that are identified as having hydric inclusions. A wetland field investigation will be performed in project areas that contain hydric soils. The wetland delineation will take place during the planning stage. Subsequent placement of the sewerage facilities in or through wetlands and/or streams will be minimized. If wetland encroachment cannot be avoided, DEP and US Army Corps of Engineers' approval will be required. Construction through wetlands, if permitted, may require the use of a U.S. Army Corps of Engineer's Nationwide Permit 12 and/or a DEP General Permit BDWM-

[1] http://www.pawaterplan.dep.state.pa.us/StateWaterPlan/docroot/Default.aspx

GP-5. Temporary road crossings through wetlands or streams may require a DEP General Permit BDWM-GP-5.

SPECIES PROTECTION

Pennsylvania Natural Diversity Inventory (PNDI) maintains a database containing site information on regulated plant and animal species, outstanding geological features, and significant natural communities. None of the alternatives listed in Section V include construction projects and therefore do not necessitate PNDI searches.

HISTORICAL AND ARCHAEOLOGICAL RESOURCE PROTECTION

Pennsylvania Title 37, Section 507 requires cooperation between public officials and the Pennsylvania Historical and Museum Commission. None of the alternatives listed in Section V include construction projects and therefore do not require a cultural resource notice.

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B. RESOLUTION OF INCONSISTENCIES

No inconsistencies or conflicts have been identified.

C. WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

While the alternatives do represent additional sewage discharge, no significant impacts to the current water quality standards and effluent limitations are expected.

D. COST ESTIMATES FOR PLAN IMPLEMENTATION

"Present Worth" is the sum, which, if invested at the present time at a given fixed rate, would provide the funds for present capital costs, future capital costs and annual operating/maintenance costs for the planning period. By using a "present worth" method, dollars spent on construction at the beginning of the planning period can be compared to dollars spent on operating costs throughout the planning period.

In regards to Alternative 2, the administrative cost to implement the SMP is estimated at $150 per lot or $8,850. Annual costs to administer the SMP through mail reminders and data tabulation are estimated at $1,500 per year, resulting in a Present Worth of $36,000.

The administrative cost to develop a public education program is estimated at $10,000, include handouts and mass mailings.

E. FUNDING METHODS

Alternatives presented in this plan may be funded out of either existing Township funds or through Sewer Revenue Bond issues. The Township may fund the SMP out of its existing sewer

use funds, or through the collection of a program fee assessed per EDU estimated at $50 per year.

To repair onlot systems, property owners may apply for low-interest loans from $1,500 to $25,000 available through PA Infrastructure Investment Authority and PA Housing Finance Authority. Contact 717-783-4487, or search www.pennvest.state.pa.us

F. IMMEDIATE AND PHASED IMPLEMENTATION

None of the alternatives require immediate or phased implementation.

G. PLAN IMPLEMENTATION

No new municipal departments or municipal authorities are required to implement the proposed plan. The Township and Authority's existing administrative personnel are adequate to implement the proposed alternatives.

VII. INSTITUTIONAL EVALUATION

A. EXISTING WASTEWATER AUTHORITIES

The Hatfield Township Municipal Authority owns and operates the existing collection and conveyance and wastewater treatment facilities. HTMA provides maintenance services for the entire system including collection and conveyance, pump stations, and the treatment facility. Additionally, the Township and HTMA will manage the on-lot systems and will administer the Sewage Management Program.

FINANCIAL AND DEBT STATUS

HTMA's Sewer Revenue Fund Budget is prepared annually and presented to the Authority for review. HTMA projects sufficient revenues from sewer rentals, tapping fees, and other sources to cover yearly expenditures as well as any expenditures relating to the alternatives in this Plan Revision. HTMA is not currently carrying any debt.

Expenditures include costs to operate and maintain the collection system and pumping stations, administer the sewer system, and treatment and maintenance costs associated with the wastewater treatment plant.

STAFF AND ADMINISTRATIVE RESOURCES

As a First Class Township, the Board of Commissioners consists of a five member board who are elected to a 4-year term. The Board of Commissioners meets on a monthly basis, and additionally as required, to review and set policy and to consider and act on other matters as appropriate. Additionally, numerous committees are established to provide recommendations and reports to the Board of Commissioners. These committees include the Civil Service Commission, Environmental Advisory Committee, Health, Hospital, and Education Authority, Industrial Development Authority, HTMA, Parks and Recreation Board, Planning Commission, Pool Advisory Board, Shade Tree Commission, and the Zoning Hearing Board.

The HTMA also consists of a five member board elected to five year, staggered terms. The Authority board meets on a monthly basis and additionally as required. HTMA is staffed by an Executive Director, AWTF Superintendent, Collection System Manager, and also retains a solicitor and consulting engineer.

LEGAL AUTHORITY

The Township currently has established Chapter 224 of its codified ordinances which regulates the use of its sanitary sewer system. The Township has the legal authority to implement selected wastewater management alternatives, and is fully empowered to enforce all ordinances, set user fees and take purchasing actions, raise capital for construction and operation and maintenance of facilities, and negotiate inter-municipal agreements.

Regarding onlot system management, the Township will adopt the Onlot Management Program Ordinance. Upon approval of this plan by DEP, the Township expects to implement, conduct and enforce the Onlot Management Program and Ordinance.

B. INSTITUTIONAL ACTIVITIES NECESSARY TO IMPLEMENT PLAN

NEED FOR NEW MUNICIPAL DEPARTMENTS OR AUTHORITIES

No new municipal departments or authorities are necessary to implement the Plan.

FUNCTIONS OF EXISTING AND PROPOSED ORGANIZATIONS

The HTMA owns and operates the collection, conveyance, and treatment facilities. As such, it is responsible for the maintenance, inspection, and operation of the collection system improvements proposed as alternatives in this Plan.

Upon approval of the Plan, the Township will administer the management (maintenance) of onlot sewage facilities in accordance with the Onlot Management Ordinance.

COST OF ADMINISTRATION AND THE CAPABILITY OF THE AUTHORITY TO REACT TO FUTURE NEEDS

The cost to administer the implementation of the Plan will be incurred by HTMA through their sewer revenue fund sources, tapping fees, and user rates. The Township may enact registration and management fees for the onlot management program administration. Therefore, Township property owners will directly and indirectly incur the majority of the costs to implement the SMP alternative of the Plan.

C. ADMINISTRATIVE AND LEGAL ACTIVITIES NECESSARY TO IMPLEMENT THE PLAN

INCORPORATION OF AUTHORITIES / AGENCIES

Current institutions, embodied as the Township are considered adequate to implement the proposed Plan.

ORDINANCE DEVELOPMENT, REGULATIONS, INTERMUNICIPAL AGREEMENTS

All legal activities currently identified as necessary to implement the Plan are included herein. The Township has in place, refers to, or recently adopted the following documents required to implement the recommendations in this Plan:

1. Hatfield Township Sewer Use Ordinance Chapter 224
2. Hatfield Township Zoning Ordinance Chapter 282
3. Onlot Management Ordinance No. 608

ACTIVITIES REQUIRED TO PROVIDE ROW, EASEMENTS, AND LAND TRANSFERS

This Act 537 Sewage Facilities Plan was advertised for public comment with none received. The County Planning Commission was sent a copy of the 537 Plan for review. Comments received, and responses to the comments received are included in Appendix D. To implement the recommendations of this plan, the Township has formally adopt this Act 537 Sewage Facilities Plan by resolution after the public comment period. A signed and sealed Resolution will be included in Appendix A. Additionally, a preliminary agreement has been reached between Hatfield Township and Towamencin Township to serve the DRSA and portions of Basins 14 and 16.

ADOPTION OF OTHER MUNICIPAL SEWAGE FACILITIES (ACT 537) PLANS

The adoption of other municipal Act 537 plans is not necessary to implement the proposed alternative.

OTHER LEGAL DOCUMENTS

It is not anticipated that any other legal documents, besides those already discussed in this Plan, are required to implement the proposed alternative.

DATES ON IMPLEMENTATION SCHEDULE

All administrative and legal activities necessary to implement the proposed alternative are currently in place. Therefore, the Township is prepared to implement the Plan upon DEP approval.

D. PROPOSED INSTITUTIONAL ALTERNATIVE IDENTIFICATION

The Township intends to implement this Plan by enforcing an Onlot Management Ordinance.

VIII. JUSTIFICATION FOR SELECTED TECHNICAL AND INSTITUTIONAL ALTERNATIVES

A. IDENTIFICATION AND JUSTIFICATION OF CHOSEN TECHNICAL WASTEWATER ALTERNATIVES

Alternatives 1 and 2 are considered the best municipal wastewater collection, conveyance, and treatment alternatives to meet the needs of the Township.

EXISTING NEEDS

Implementation of Alternative 2 meets the existing needs of the Township by providing adequate oversight on both the DRSA and other on-lot systems throughout the Township. This alternative, in conjunction with the programs currently in place with the Montgomery County Health Department, will ensure ground and surface water protection.

Hatfield Township and HTMA will continue to explore with Alternative 3; however, since this alternative is somewhat dependant on development in the DRSA, a definitive implementation schedule cannot be established.

Existing capacity needs are currently being met by the ongoing Neshaminy Interceptor and Flow Equalization projects.

FUTURE NEEDS

Implementation of Alternative 1 will provide the Township and HTMA additional hydraulic and treatment capacity at its Advanced Wastewater Treatment Facility. This alternative, via a re-rate, would bring the AWTF flows up to 7.55 MGD ADF and 11.55 MGD MMF, and eliminate the possible Chapter 94 hydraulic overload.

Additionally, calculations included in Alternative 1 provide for a peak hourly flow capacity of up to 24 MGD. This flow is adequate to meet future need at this time, however ongoing flow analysis by HTMA will monitor peak flows and should it be necessary develop possible modifications for increased peak flow capacity.

OPERATION AND MAINTENANCE

The Township and HTMA is prepared to invest in additional O & M related resources, to meet future flow needs and administer the SMP.

COST EFFECTIVENESS

Implementation of Alternatives 1 and 2 were determined to be cost effective as neither alternative requires a capital upgrade.

MANAGEMENT AND ADMINISTRATIVE SYSTEMS

Existing staffing and resources available to the Township and HTMA are adequate to support all management and administrative duties associated with the implementation of Alternative 1 and 2 with minimal additional costs.

AVAILABLE FINANCING METHODS

As discussed in Section VII, due to the low capital expenditure required for these options, financing is not expected to be necessary

ENVIRONMENTAL SOUNDNESS / COMPLIANCE

Although no capital construction is required, Alternative 1 allows for additional permitted flow discharging to the West Branch of Neshaminy Creek on an annual average basis. As shown, this discharge will be treated to the current NPDES discharge limits. Should additional, future, more stringent regulation arise, HTMA and it's consulting engineer would be conduct further evaluation to determine impacts on the facility.

By instituting an SMP, the Township will be taking a proactive role in ensuring on-lot systems are functioning within published standards.

B. IDENTIFICATION OF CHOSEN CAPITAL FINANCING PLAN

The Township intends to fund Alternatives 1 and 2 through the current sewer budget and revenues.

C. IMPLEMENTATION SCHEDULE

The Township intends to implement both selected alternatives upon approval of this plan revision by DEP. The anticipated schedule is listed below:

- Act 537 Plan Comment and External Review Period: March – April 2010
- Address Comments as necessary: April 2010
- Draft On-lot Management Ordinance: April – August 2010
- Adoption of On-lot Management Ordinance: September 2010
- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Receipt of DEP Comments to Act 537 Revision: January 2011 – **August 2013**
- Submission of Revisions to Act 537 Plan Revision: May 2011 – **October 2013**
- Receipt of DEP Approval to Act 537 Revision: Time Zero (T)
- Implementation of Alternative 2: T+3 months
- Submission of Water Quality Management (WQM) Permit Pt. I Application: T+9 months[1]
- Submission of WQM Pt. II Application: 1 to 6 months following DEP approval of Pt. I Application[2][3]
- Implementation of Alternative 1: 1 to 6 months following DEP approval of Pt. II Application[4]

[1] **Pending review of current plant and most recent Chapter 94 data, HTMA will proceed with an incremental re-rate less than 7.55 MGD.**
[2] Based on DEP timing for review, approval, and issuance of new limits. Required to determine actual toxic limits since they are not available through the PTR process
[3] Timing of this submission is dependent on final limits received and the scope of the application. This could range from a Design Engineers report only to a preliminary design for a process upgrade (necessitated by lower limits)
[4] Depends on (2) and the scope of any required project

Exhibits

Hatfield Township, Montgomery County

Exhibit PS-1

Sewage Management Program Fact Sheet

Hatfield Township, Montgomery County

Fact Sheet

Commonwealth of Pennsylvania • Department of Environmental Protection **Act 537 #3**

SEWAGE MANAGEMENT PROGRAMS
Ensuring Long-Term Use of Onlot Systems Through Proper Operation and Maintenance

The Pennsylvania Sewage Facilities Act (Act 537) requires all municipalities to develop and maintain an up-to-date sewage facilities official plan to protect public health from diseases, prevent future sewage treatment problems and protect the quality of the state's surface water and groundwater. As part of an official plan update, the municipality should consider developing a sewage management program. Such a program to ensure the operation and maintenance of onlot sewage systems should be established before malfunctions are widespread in an area. Malfunctioning onlot treatment systems can endanger public health, degrade the environment and reduce property and community value by discharging onto public areas, private property or contaminating receiving waters including drinking water supplies.

Properly designed and installed onlot treatment systems function better and longer with regular maintenance. Sewage management programs ensure that onlot sewage treatment systems are properly operated and maintained. If operation and maintenance activities are neglected, systems can either fail completely or may function well below their capabilities. This can quickly negate the efforts of a municipality in assuring public health protection through requirements for proper design and installation of these systems.

Municipal sewage management programs can be as simple or as comprehensive as needed and may be based on each municipality's particular needs and resources. This fact sheet explains the importance of municipal sewage management programs and how they are developed by municipalities to meet their needs for individual and community onlot sewage systems.

Why should my municipality manage onlot systems?

Most municipalities have areas that can never be physically or cost-effectively served by public sewer facilities. Areas may contain suitable soils but have scattered malfunctioning onlot treatment systems that can cause public health and other hazards. Malfunctioning individual onlot systems will also often be found in areas that have poor soils and/or small lot sizes. It may become impossible to repair or replace these systems on an individual lot-by-lot basis. If your municipality is faced with this latter situation, you can assess your options for using community onlot systems to meet your long-term needs. In any case, repairing onlot systems as they malfunction typically will not solve the problem permanently until regular management and maintenance of onlot systems is established to help keep the problems that lead to malfunctions from recurring.

What options are available for establishing a Sewage Management Program?

Municipalities have established numerous approaches to sewage management in Pennsylvania. While existing management maintenance permit programs to more complex municipal inspection programs, you should base your sewage management program on the specific needs and resources in your municipality.

In developing a sewage management program for your municipality, you may choose from a variety of possible management service options and administrative alternatives. Management options for onlot systems may include such services as:

- Public and homeowner education;
- Regular pumping of tanks;
- Operation and maintenance activities tailored to specific onlot systems or treatment components;
- Testing and monitoring procedures to assess the quality of effluent treatment; and/or
- Periodic inspections to determine system integrity and operational performance and more.

Administrative alternatives for delivering or ensuring your program's management services can range from:

- Maintenance contracts established between a homeowner and the manufacturer or a third-party maintenance provider;
- Operating permits issued by the municipality based on the system's compliance with particular quality or operating standards;
- Direct provision of management services by the municipality or an established service utility; or
- Direct ownership and management of onlot systems by the municipality or an established utility.

There are many examples and variations of these management service options and administrative alternatives in use in municipalities across Pennsylvania. Your local DEP representative can help you learn more about existing sewage management programs.

How can my municipality begin managing onlot systems?

The first step in the process is for your municipality to assess available administrative, technical, financial and management options by preparing an update revision to its Act 537 official plan. The update revision should provide for identification of all onlot systems and a determination of their operational status. Such factors as the suitability of soils, underlying geology and any peculiar environmental conditions that could impact the continued long-term use of onlot systems are also examined.

Using this information, the various options to ensure performance of routine operation and maintenance for new and existing onlot systems are identified and compared.

Ultimately, the specific options and alternatives for a sewage management program that best fits with your municipality's resources and needs are selected for implementation. In connection with the management program, the plan should also evaluate required needs for septage handling (septage haulers, septage disposal options, etc.) and develop appropriate administrative and legal procedures.

Finally, to allow implementation, your official plan must establish an ordinance that legally authorizes the municipality's program to manage onlot systems.

What other steps are there to developing a Sewage Management Program?

There are several additional steps that should occur together with sewage facilities planning in considering and developing the service options, administrative alternatives, legal procedures, ordinances and other pieces that will make up your municipality's sewage management program. These steps primarily involve gaining understanding and consensus from the residents in your municipality who will be impacted by the proposed management program.

It is important that opportunities be afforded for homeowners and the public to learn what onlot systems are, how they work and why management and maintenance of these systems is so important. Public education meetings, civic events or programs provided at local schools can be excellent ways to get the word out.

The citizens in your municipality will better accept the management program if they have a voice in its planning and development. Surveys or questionnaires, public forums for exchanging questions and opinions, as well as citizen representation on advisory or planning groups can all be very helpful.

Residents need to be informed about the details of the proposed program, how it will affect them and what actions they need to take. Mailings, newsletters, articles or announcements in the local media, websites and public information sessions are just some of the ways Pennsylvania municipalities have educated and involved their citizens.

Are there minimum requirements for Sewage Management Programs?

There are minimum requirements only if a sewage management program is required by regulation. Maintenance standards are listed in Title 25 of the Pennsylvania Code, Chapter 71 §71.73 to make sure that management programs carry out at least the minimum activities necessary to maintain onlot systems (this DEP regulation, as well as others, can be found on-line at www.pacode.com).

Minimum standards include:

- Removal of septage from the treatment tanks once every three years or following a tank inspection that reveals the need for septage removal (when the tank is determined to be more than 1/3 full);

- Maintenance of surface contouring around the system to divert stormwater and to protect the system from damage;
- Water conservation requirements;
- Provisions for septage pumping and disposal; and
- Requirements for holding tank maintenance.

Can municipalities work together through Sewage Management Programs?

Yes. Municipalities in many parts of the state have banded together to form "joint local agencies." These agencies then implement sewage management programs consistently throughout the service areas of their member municipalities.

Can sewage management be administered through existing municipal structures?

Yes. Some municipal governments are already involved in the permitting of onlot sewage systems through programs administered by agencies such as joint sewage committees, county health departments, etc. These existing onlot permitting programs involve testing proposed sites, reviewing designs and addressing adequate system construction through final inspections of installed onlot systems. Unfortunately, in many cases, system installation marks the boundary of the permitting program.

Sewage management programs, administered by joint local agencies, or even municipal sewer authorities, can extend municipal oversight for these permitted systems to include regular operation, maintenance, testing and/or inspection. Such actions assure that the special care and attention taken to properly design and install onlot systems is not negated by the lack of system management and oversight.

Is management of onlot treatment systems cost-effective?

Yes. Maintaining properly installed sewage systems can extend the life of these systems and may save the homeowner the cost of repairing or replacing an abused, malfunctioning onlot system. Sewage management programs can also help prevent future problems from occurring with systems that have been repaired following malfunction.

Municipalities confronting areas with numerous malfunctioning systems often opt to extend sewer lines for great distances. This action may solve the problem, but can be very costly to the municipality and the affected property owners. Sewer lines can inadvertently promote unwanted development. Municipalities might also attempt to deal with areas of malfunctioning individual onlot systems by connecting the affected homes to a single immediate problem; however, there is still the potential for future malfunctioning of the resulting community systems unless the municipality has a management program that commits it to oversee proper operation and maintenance of these larger systems.

Is financial and technical assistance available for my municipality to develop or update its sewage facilities official plan?

Yes. Municipalities can apply to DEP for a planning grant to reimburse up to 50 percent of the cost of preparing a sewage facilities official plan.

Additionally, to assist municipalities in the development of their sewage management programs, DEP has several model ordinances that reflect the requirements typical of the different programs. The "pump" model ordinance reflects the simplest approach to a sewage management program, while the ordinance for a municipal inspection program is the most complex approach. You should keep your municipality's management program as simple and effective as possible to meet your special needs.

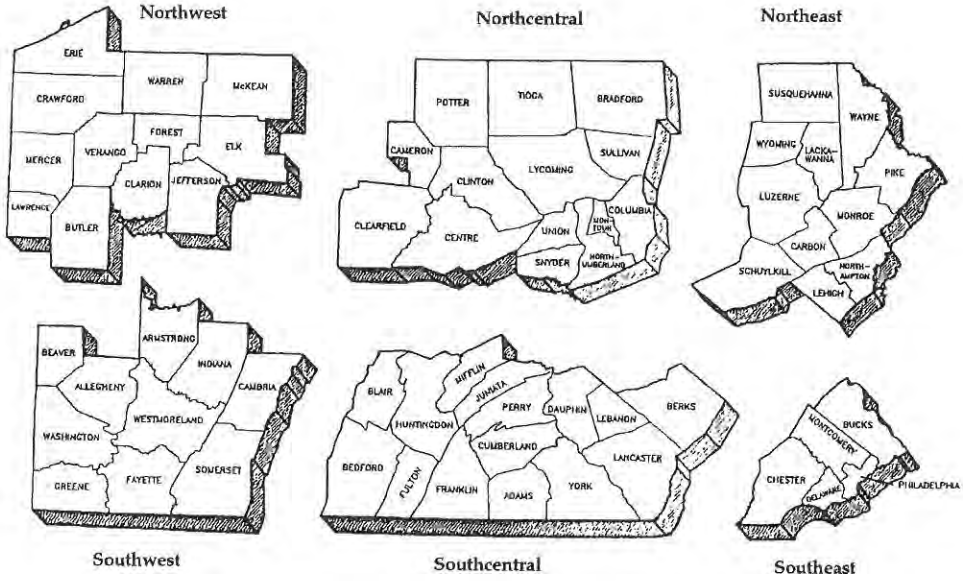
Is there financial assistance available to my municipality to establish and administer a Sewage Management Program?

Yes. Sewage management program costs of staffing and administration are eligible costs of the sewage enforcement reimbursement program. Your management program is expected to charge reasonable fees to cover the costs of the activities you conduct. If revenue does not adequately cover all these costs, your municipality may recover monies from the state to eliminate this deficit amount, up to 50 percent of the total cost of the enforcement program. Local agencies qualifying for 85 percent sewage permitting enforcement reimbursement also qualify for the same method of calculating reimbursement for their sewage management program's activities.

For more information, visit DEP's Web site at www.depweb.state.pa.us, Keyword: "Wastewater."

For more information,
call the DEP regional office in your area or contact:

Department of Environmental Protection
Bureau of Water Standards and Facility Regulation
Division of Planning and Permits
P.O. Box 8774
Harrisburg, PA 17105-8774
(717) 787-8184



DEP Regional Offices

Southeast Region
2 E. Main St.
Norristown, PA 19401
Main Telephone: 484-250-5900
24-Hour Emergency: 484-250-5900

Counties: *Bucks, Chester, Delaware, Montgomery and Philadelphia*

Southwest Region
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Main Telephone: 412-442-4000
24-Hour Emergency: 412-442-4000

Counties: *Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland*

Southcentral Region
909 Elmerton Ave.
Harrisburg, PA 17110
Main Telephone: 717-705-4700
24-Hour Emergency: 1-877-333-1904

Counties: *Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York*

Northwest Region
230 Chestnut St.
Meadville, PA 16335-3481
Main Telephone: 814-332-6945
24-Hour Emergency: 1-800-373-3398

Counties: *Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren*

Northeast Region
2 Public Square
Wilkes-Barre, PA 18711-0790
Main Telephone: 570-826-2511
24-Hour Emergency: 570-826-2511

Counties: *Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming*

Northcentral Region
208 W. Third St., Suite 101
Williamsport, PA 17701
Main Telephone: 570-327-3636
24-Hour Emergency: 570-327-3636

Counties: *Bradford, Cameron, Clearfield, Centre, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union*

Commonwealth of Pennsylvania
Edward G. Rendell, Governor

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Department of Environmental Protection
Kathleen A. McGinty, Secretary
3800-FS-DEP1587 Rev. 6/2006

Exhibit I-1

1984 Hatfield Township Act 537 Plan
DEP Approval Letter

Hatfield Township, Montgomery County

Department of Environmental Resources

1875 New Hope Street
Norristown, PA 19401
215 270-1975

January 11, 1985

Hatfield Township
Board of Supervisors
School Road and Chestnut Street
Hatfield, PA 19440

Re: Sewage Facilities Plan Update
Hatfield Township
Montgomery County

Gentlemen:

A review has been made and completed of your municipality's updated official sewage facilities plan entitled 537 Plan Update, dated July 1984, as prepared by Tracy Engineers, Inc. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the study is hereby granted.

If you have any questions regarding this matter, please feel free to contact me at the above number.

Very truly yours,

GLENN C. STETSON, S.S.
Sewage Facilities Consultant

cc: Montgomery County Planning Commission
Tracy Engineers, Inc.
Hatfield Township Municipal Authority
Division of Local Environmental Services
Re 30 2011.G

Exhibit I-2

Plan of Study, Task Activity Report and Approval

Hatfield Township, Montgomery County

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401

August 12, 2008

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

RECEIVED
AUG 15 2008
CET, INC.
HARRISBURG, PA

Ms. Stephanie Teoli, Manager
Hatfield Township
1950 School Road
Hatfield, PA 19440

Re: Act 537 - Plan of Study
Hatfield Township Act 537 Plan Update
Hatfield Township
Montgomery County

Dear Ms. Teoli:

We have completed our review of your municipality's proposed Plan of Study, as prepared by CET Engineering Services dated April 17, 2008. The Plan of Study proposes a comprehensive, area-wide update of Hatfield Township's Act 537 Official Sewage Facilities Plan.

Approval of the proposed Plan of Study for Hatfield Township is hereby granted. The estimated cost of the plan is $107,835.

By copy of this letter, we are advising Hatfield Borough and Montgomery, Hilltown, and Franconia Townships that specific authorization is needed from the governing body of each municipality for the Hatfield Township Municipal Authority (Authority) to complete sewage facilities planning under Act 537 on their behalf. Each of these municipalities is served by the Hatfield Township Municipal Authority's Wastewater Treatment Facility, and all of the municipalities in the service area may be affected by the Act 537 Plan Update for the proposed plant expansion. Consistent with Chapter 71, Section 71.12(b), the affected municipalities may jointly submit a single plan. Also, consistent with Section 71.41, reimbursement grants may be paid directly to the Authority for the individual municipal costs related to the plan update if each municipality authorizes the Authority in writing to complete planning on their behalf. If the submitted Task Activity Report (TAR) does not cover all of the anticipated planning costs for the municipalities in the service area, the TAR should be revised to include those costs.

Alternately, each municipality may submit a separate Act 537 Plan Update that evaluates the individual municipal needs both within the plant's current service area and for any needed future sewer service area expansion. In order to qualify an individual Plan Update for reimbursement, any municipality proposing to complete their own plan must submit a separate Plan of Study and associated task activity report.

We urge Hatfield Township and the Authority to coordinate with Hatfield Borough and Montgomery, Hilltown, and Franconia Townships early in the planning process in order to facilitate the review of your plan. The Plan Update for the expansion cannot be approved unless it addresses future needs throughout the sewer service area. Please see our letter of June 26, 2007 (copy enclosed), regarding this issue.

Please note, however, that this Plan of Study approval does not constitute a final action by the Department of Environmental Protection (Department). When a completed plan is submitted to us, we will act upon it consistent with Pa. Code Title 25, Chapter 71.

Your municipality's Act 537 Official Plan Update is to be formatted as suggested in "A Guide for Preparing Act 537 Update Revisions," including the necessary items listed in the "Act 537 Plan Content and Environmental Assessment Checklist." All necessary items must be included, and a copy of the completed checklist must be included with your Act 537 Plan. This form is available on our website at http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/Forms/Act537/Forms_537Plan.htm .

Also, please be advised that the Department will not pay grants under the act for planning costs incurred prior to the date of this Plan of Study approval or for information that has been completed previously under local, state, or federal funding programs.

If you have any questions, please contact me at the above phone number.

Sincerely,

John M. Veneziale
Sewage Planning Specialist 2
Water Management

Enclosure: June 26, 2007, letter

cc: Montgomery County Planning Commission
Montgomery County Health Department
CET Engineering Services
Mr. Nagel - Montgomery Township
Mr. Elien - Hatfield Borough
Mr. Lippincott - Hilltown Township
Mr. Baver - Franconia Township
Mr. McHale, RCSOB
Planning Section
Re 30 (joh08wqm)224-18

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

TASK/ACTIVITY REPORT

Hatfield Township — Municipality
Montgomery — County
Hatfield Township — Proposed Planning Area (Attach Map)
Date of Report

Date Completed plan will be submitted to DEP March 2009
Estimated Cost of Plan $107,835.00

Column Headings May Be Changed To Suit The Needs of the Planning Effort Use Additional Sheets if Necessary

Sheet 1 of 1

TASK ACTIVITY NUMBER FROM APPENDIX I	SR. PROJECT MANAGER		STAFF ENGINEER III		STAFF ENV. SCIENTIST		CAD DRAFTER III		CLERICAL		TOWNSHIP MANGER		TOWNSHIP ZONING OFFICER		EXPENSES		SUB TOTAL
	HR/ RATE	$99.00	HR/ RATE	$71.00	HR/ RATE	$63.00	HR/ RATE	$58.00	HR/ RATE	$34.00	HR/ RATE	$90.00	HR/ RATE	$75.00			
	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST	HRS.	COST		COST	
I	8	$792	10	$710	10	$630	12	$696	8	$272	0	$0	0	$0		$20	$3,120
II	3	$297	13	$923	60	$3,780	35	$2,030	5	$170	12	$1,080	9	$675		$50	$9,005
III	5	$495	41	$2,911	115	$7,245	0	$0	10	$340	0	$0	7	$525		$125	$11,641
IV	4	$396	16	$1,136	45	$2,835	0	$0	10	$340	4	$360	49	$3,675		$30	$8,772
V	29	$2,871	135	$9,585	160	$10,080	60	$3,480	10	$340	2	$180	0	$0		$8,500	$34,856
VI	64	$6,336	90	$6,390	110	$6,930	0	$0	10	$340	0	$0	0	$0		$200	$20,376
VII	42	$4,158	12	$852	0	$0	0	$0	5	$170	0	$0	0	$0		$50	$5,230
VIII	45	$4,455	40	$2,840	90	$5,670	20	$1,160	15	$510	0	$0	0	$0		$200	$14,835

JOEL KOSTELAC
Name of Person Completing Report

Signature

STAFF ENGINEER
Title

Authorized Representative Signature

Amended Attachment 21-B.1
Page 119 of 537

Exhibit I-3

2007 Corrective Action Plan and DEP Approval

Hatfield Township, Montgomery County

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
September 25, 2007

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Peter Dorney
Executive Director
Hatfield Township Municipal Authority
3200 Advance Lane
Colmar, PA 18915

Re: Collection System Corrective Action Plan
Hatfield Township Municipal Authority
Montgomery County

Dear Mr. Dorney:

The Department of Environmental Protection (Department) has completed the review of the Hatfield Township Municipal Authority (HTMA) Correction Action Plan (CAP), dated July 30, 2007, and submitted to the Department August 7, 2007. Based on the information the Department has to date, y means of this letter, the HTMA CAP is approved. HTMA's connections are limited to the capacity detailed in our June 29, 2007, letter.

If you should have any questions regarding the Chapter 94 program, please contact Mr. Jim McTish at 484-250-5180 or by e-mail at jmctish@state.pa.us .

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Water Management

cc: Ms. Nowicki – CET Engineering Services
Ms. Teoli – Hatfield Township
Re 30 (GJE07WQ)267-10

CET, INC.
RECEIVED
OCT 0 1 2007
RECEIVED
HARRISBURG, PA

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COLLECTION SYSTEM CORRECTIVE ACTION PLAN

JULY 30, 2007

Prepared by:

CET Engineering Services
1240 North Mountain Road
Harrisburg, PA 17112
Ph: 717-541-0622
Fax: 717-541-8004

A. HATFIELD TOWNSHIP SEWER SYSTEM

1. Service Area Description

Hatfield Township is located in the northeastern portion of Montgomery County, Pennsylvania, near the Montgomery – Bucks County boundary. Hatfield Township surrounds the Borough of Hatfield and borders Lansdale to the south. The Township is approximately 20 miles north of Norristown, Pennsylvania.

The Hatfield Township Municipal Authority (HTMA) Wastewater Treatment Plant (WWTP) processes wastewater flows generated by Hatfield Township, the Borough of Hatfield, Fanconia Township, and Montgomery Township. The HTMA wastewater treatment facility also receives domestic and industrial wastewater via tanker truck for treatment at the HTMA pretreatment facilities, and accepts outside sludges for final processing. Historic and projected EDUs for the HTMA service area, as well as the associated flows anticipated from projected development are shown in Table 1.

Table 1. Historic and projected EDUs per 2006 Chapter 94 data.

	Historic EDUs					Projected EDUs				
YEAR	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Hatfield Twp	9,946	10,029	10,150	10,308	10,350	109	109	109	109	109
Hatfield Boro	1,522	1,533	1,535	1,535	1,541	10	11	0	0	0
Franconia Twp.	441	441	441	441**	441**	0	0	0	0	0
Montgomery Twp.	6,883	6,893	5,977	6,029	6,057	178	114	38	27	16
Subtotal	---	---	---	---	---	297	234	147	136	125
Total EDUs	18,792	18,896	18,103	18,313	18,389	18,686	18,920	19,067	19,203	19,328
Total Flows, MGD[1]	---	---	---	---	5.98	6.08	6.16	6.21	6.25	6.29

2. Wastewater Facilities

The HTMA owns and operates all wastewater collection, conveyance, and treatment facilities within the Township. The wastewater treatment plant (WWTP) has a permitted annual average design flow of 6.43 MGD and a maximum monthly design flow of 8.37 MGD. An organic rerate of the treatment facility in 2005 increased the permitted organic capacity to 22,300 lbs BOD/day. The HTMA WWTP is permitted under NPDES Permit No. PA 0026247.

3. Collection System

The HTMA owns and maintains approximately 73 miles of sewer and 1,440 manholes. The majority of the collection sewers are 8-inch PVC, and the size of the interceptors are as large as 36 inches in diameter.

Basins A and B of the Montgomery Township Municipal Sewer Authority's (MTMSA) sewer system is tributary to HTMA. The MTMSA owns and maintains approximately 63 miles of 8" - 24" gravity sewer and two (2) miles of forcemain ranging from 2" - 12" in Basins A and B. There is an estimated 1,565 precast concrete and/or brick manholes in the MTMSA sewer system that is tributary to HTMA. Major interceptors within MTMSA's collection system include the Villa Glen, Line Street, and Route

[1] Based on the Chapter 94 report 5-year average of 325 GPD/EDU, and the 2006 total EDUs.

309/Richardson Road interceptors. There are three (3) MTMSA pumping stations in Basins A and B that pump to the HTMA collection system including the two (2) pump stations located on Knapp Road and one (1) located on Montgomery Avenue.

The Hatfield Borough collection system consists of approximately 40,325 feet of gravity sewer, and is maintained by Hatfield Borough staff. There are no sanitary pump stations located in Hatfield Borough. Wastewater flows from Hatfield Borough are discharged via gravity sewers through Hatfield Borough Manhole 1 to a HMTA interceptor.

A portion of Franconia Township contributes to the HTMA sewer service area via gravity sewers only (no pump stations).

The HTMA sewer system collects wastewater from 16 basins encompassing all of the Borough of Hatfield and Hatfield Township, and portions of Montgomery and Franconia Townships. A sewer system map with each drainage basin identified is included in Exhibit A.

4. Neshaminy Interceptor

The Neshaminy Interceptor, which runs parallel to Neshaminy Creek, transports the majority of the wastewater flows from within the HTMA service area to the WWTP. The Interceptor runs approximately 4.4 miles from Manhole 2297 to the WWTP. A relief interceptor was added along side of the original interceptor such that throughout most of the interceptor there are parallel sewers with interconnections. Pipe sizes in the Neshaminy Interceptor range from 18" to 36" in diameter, and the majority of the pipe is made out of clay, concrete, or PVC.

B. CORRECTIVE ACTION PLAN (CAP)

The long term goal of the CAP is to reduce, as much as possible, surcharging and overflows within HTMA's collection system caused by I/I. The HTMA strives to accomplish this goal through collection system maintenance, rehabilitation, replacement, and repair. In the shorter term, it is necessary to expand the capacity of the Neshaminy Interceptor to reduce surcharging during extreme wet weather events. Modeling of the Interceptor will provide for the analysis of interceptor expansion alternatives. The following sections provide a description of actions executed and planned by the HTMA to date to reduce inflow and infiltration.

1. Resources for Inflow/Infiltration (I/I) Rehabilitation

The Authority allocates considerable resources to monitor and maintain the collection system. Manpower for collection system maintenance includes a manager, four operators and an inspector. The Authority owns, operates and maintains the following equipment for sewer maintenance: a) two (2) jet/vac trucks; b) one (1) TV/grouting truck (Telespector Inc.); c) one (1) utility truck; d) one (1) TV Ferret sewer main line camera; e) one (1) portable lateral camera; f) one (1) Quick View main line inspection camera; g) two (2) jeeps and one (1) pick-up truck dedicated to road crew.

In addition, funds are allocated for the 2007 purchase of an IBAK sewer main and lateral launch camera for approximately $260,000. In February 2007, the purchase order was issued for this equipment.

2. I/I Monitoring Program

HTMA personnel performed a system-wide flow monitoring test to separate the system into eleven (11) basins. This data is used as a baseline to prioritize future I/I rehabilitation projects. In addition, $150,000 was allocated in 2006 to perform a more intensive flow study, concentrating on the main interceptors in the Township. The flow study was performed by HTMA's engineer, CET Engineering Services (CET), and split the HTMA service area into 16 basins (Exhibit A). The main purpose of this study is to model the sewer interceptor system to determine the hydraulic capabilities and deficiencies of the existing interceptor. Flow monitoring was completed in 2006, and CET is currently conducting the modeling which will be used to develop recommendations for improvements to the interceptor system. HTMA has allocated funds for the improvements.

HTMA regularly televises homeowner's laterals for infiltration. In 2006, three hundred four (304) laterals were televised, comprising of 6,301 ft. of pipe. Findings continue to indicate that the homeowner's cast iron lateral pipe is in good condition. Most problems appear to begin at the connection between the homeowner's 4" cast iron lateral and the 6" clay lateral leading to the main line.

3. Maintenance Programs

Beginning in 2000, HTMA has had an aggressive program of I/I removal. Each year since, contracts have been let to address areas of need based on flow metering results and pending Township road paving activity. HTMA concentrates its efforts on those areas where clay pipe exists, as opposed to those areas with newer PVC pipe. Virtually all of the contracts include the installation of an observation tee, or clean-out on the lateral in the area of the existing 4" to 6" connection point. On laterals where the existing connection point cannot be replaced by the minimal excavation involved in installing an observation tee due to sidewalk or curb location, HTMA utilizes the observation tee to install a liner in the transition, and in any other section of the clay lateral that may be problematic.

In 2006 HTMA awarded three separate maintenance contracts for rehabilitation, and has begun rehabilitation efforts year round. Contracts exist for excavation of laterals and other sewer lines and manholes, trenchless lining of laterals and main lines, and lining of manholes.

One hundred eighteen (118) observation tees were installed on homeowner's laterals in 2006. Twenty four (24) 4" to 6" connections were repaired at the time of excavation, and the remaining connections are in the process of being lined. Approximately 130 observation tees will be installed in 2007, with those connections also planned for replacement of lining. The benefits of the observation tees are two-fold. First, the installation of the tee replaces the problematic 4" to 6" connection point which has shown to be one of the largest sources of I/I. Secondly, the observation tees can be used during heavy rain events to identify excess flows coming from the house which could be the result of a sump pump, floor drains, roof drains, or leaking pipe.

In 2006 HTMA inspected 217 manholes, replacing the chimney sections, frames and lids on 57. Manhole inserts are being placed in manholes throughout the system. Seven (7) badly leaking manholes were lined in 2006.

As of December 31, 2006, HTMA has rehabilitated a total of 699 lateral connections in the six (6) years since beginning this work. A summary of I/I rehabilitation projects that are complete to date, as well as the total project cost (rounded to the nearest hundred dollar) is shown in Table 3.

Emergency maintenance and repairs are performed as soon as possible. When possible, advantage is taken of emergency excavation to incorporate rehabilitative repairs beyond that which is needed to fix the original problem.

Table 3. I/I Project Summary To Date

Year	Project	Total Cost
1998	Flow Study	$40,000
1998-1999	Neshaminy Interceptor Replacement, Phases I & II	$1,098,000
2000	Lateral Repair	$481,900
2001	Lateral Repair	$548,700
2002	Lateral Repair	$386,100
	Interceptor Repair, Liner	$104,900
2003	Lateral Repair	$680,500
2004	Lateral Repair	$164,900
2005	Lateral Repair	$146,800
	Interceptor Flow Study	$17,800
	Equalization Tank Study	$9,500
2006	Lateral Repair	$357,500
	Interceptor Flow Study	$48,400
	Equalization Tank Design	$24,600
	Interceptor Upgrade, Survey	$34,400
	Sewer Lateral Maintenance Contract	$253,300
	Property Purchase, Equalization Tank	$350,000
2007	Sewer Lateral Maintenance Contract	Ongoing
	Interceptor Flow Study	Ongoing
	Equalization Tank Design	Budgeted
	Interceptor Upgrade	Budgeted
Total		**$4,747,300**

All data with regard to the corrective maintenance of the repair system is stored in a format compatible with the computerized Geographical Information System (GIS) program for organizational and reference purposes.

The HTMA continues to commit significant resources toward the rehabilitation of sewer systems throughout the Township, and it has also allocated funds for the construction of one or two surge storage tanks that can be utilized during heavy rain events. Purchase of an adjoining piece of property for the tank(s) was completed in April 2007. Design and geotechnical have been initiated. Part II permit submittals to DEP are anticipated during mid-2007. It is the opinion of HTMA and its engineer that even with continuous rehabilitation of sewer lines and laterals, I/I will always be an issue, and a combination of maintenance efforts in the collection system and surge tanks at the plant are needed to address wet weather flows.

4. Neshaminy Interceptor Improvements

The CAP will provide for an upgrade to the Neshaminy Interceptor. The alternatives to increase the capacity of the Neshaminy interceptor are currently being evaluated by HTMA's engineer, CET Engineering Services, Inc. In October 2005, CET presented a proposal to HTMA to conduct a Hydraulic Study to evaluate the severity and impact I/I has on the Neshaminy Interceptor. The project involved installation of 16 meters that are strategically placed in the Neshaminy Interceptor basin to identify areas

of I/I. The SewerCAD model will then be used to analyze and identify restricting sections, potential discrepancies, and system reactions. These results will be used in the design of the Neshaminy Interceptor improvements.

a. *Neshaminy Interceptor Metering*

HTMA installed 16 flow meters during November and December 2005 to collect flow data from the Neshaminy Interceptor and its primary tributaries. The locations of the monitoring sites and the corresponding drainage basins are listed in Table 4, and are shown in Exhibit A.

Table 4. Meter locations in the HTMA service area.

Manhole	Drainage Basin
2206	7
2702	3
74-9	1
606	1
1230	5
74-56	5
1106	6
74-60A	6
74-25A	5
1252	4
85-4	10
1022	10
74-124	11
74-67C	6
1136	6
202-E	2

Flow monitoring was performed for a period of six (6) months. Rainfall data was collected in conjunction with the sewer metering to correlate with the flow data. The data collected from these meters will be used to 1) calibrate the hydraulic model with actual flows to effectively account for roughness coefficients and validate record drawing information; 2) analyze discrepancies between modeled capacities and measured flows to identify any potential flow restrictions, poor hydraulics and significant system losses. SewerCAD will be used to evaluate existing system capacities and to identify restricting sections in the interceptor. New interceptor design decisions and pipe sizing alternatives will be evaluated using the model to account for other factors such as future growth, flow diversions, and system rehabilitation.

Collection system surveying work needed to complete the model was completed in April 2007. The data analysis and modeling of the Neshaminy Interceptor was completed in June 2007. By August 2007 it is anticipated that the scope of the Neshaminy Interceptor project will be finalized.

5. Corrective Action Plan Schedule

Table 5 summarizes anticipated milestones for the CAP. All dates are tentative pending the actual date of permit(s) approval. For example, should the date of permit approval occur two (2) months after the estimated milestone date listed, all components thereafter shall be adjusted to reflect the two (2) month setback.

Table 5. Corrective Action Plan schedule (tentative).

Collection System Component	Estimated Milestone Date	
Finalize Neshaminy Interceptor Scope	August 2007	
Neshaminy Interceptor Improvement Project		
Preliminary Design	October 2007	
Submit Part II Permit Application	December 2007	
Part II Permit Approval	April 2008	
Advertise for Bids	May 2008	or 2 months after all permits are approved
Contract Award	June 2008	
Construction Start	August 2008	or 2 months after Contract Award
Construction End	May 2009	
Equalization Tank Project		
Preliminary Design	July 2007	
Submit Part II Permit Application	October 2007	
Part II Permit Approval	February 2008	
Advertise for Bids	March 2008	or 2 months after all permits are approved
Contract Award	April 2008	
Construction Start	June 2008	or 2 months after Contract Award
Construction End	February 2009	

6. Connections

When the acceptable CAP is submitted and approved by the DEP, there will be no restrictions on new connections for the remaining capacity of the treatment facility as per Chapter 94, §94.21. The Authority will maintain a chart providing a running tabulation of gallons of capacity allocated for new connections as they are approved by the Authority.

Exhibit I-4

2008 Connection Management Plan and Consent Order and Agreement

Hatfield Township, Montgomery County

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In the Matter of:

Hatfield Township Municipal Authority 3200 Advance Lane Colmar, Pennsylvania 18915	: : : : : : : :	Water Management NPDES Permit No. PA0026247 Annual Average Flow Increase Hatfield Township Municipal Authority Hatfield Township, Montgomery County

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement is entered into this _____ day of _____2008, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department"), and the Hatfield Township Municipal Authority ("HTMA").

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to administer and enforce the Clean Streams Law, Act of June 22, 1937, P.L. 1987, *as amended,* 35 P.S. § 691.1 et seq. ("Clean Streams Law"); The Pennsylvania Sewage Facilities Act, Act of January 24, 1966, P.L. 1535, *as amended,* 35 P.S. §§ 750.1-750.20a ("Sewage Facilities Act"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended,* 71 P.S. § 510-17 ("Administrative Code") and the rules and regulations promulgated thereunder.

B. HTMA exists under the laws of the Commonwealth of Pennsylvania with offices located in Hatfield Township, Montgomery County. The mailing address is 3200 Advance Lane, Colmar, Pennsylvania 18915. The Authority is considered a "municipality" as that term is defined in Section 1 of the Clean Streams Law, 35 P.S. § 691.1.

C. HTMA owns and operates a sewage treatment plant ("Plant"), located in Hatfield Township, Montgomery County, which discharges into the West Branch Neshaminy Creek.

D. The HTMA Plant is currently permitted by a NPDES Permit No. PA0026247, to discharge an annual average flow of 6.43 million gallons per day ("MGD") to the West Branch Neshaminy Creek. A requirement of the NPDES permit is the submission of a monthly Discharge Monitoring Report ("DMR").

E. On June 26, 2007, the Department sent a letter to Hatfield Township and copied the other municipalities tributary to the HTMA Plant, outlining the Department's concerns with the capacity at the HTMA Plant, and requesting that tributary municipalities begin an Act 537 Official Plan Update.

F. On June 29, 2007 the Department sent a letter to Mr. Peter Dorney, Executive Director of the HTMA, that summarized HTMA's current capacity connection needs, including projects that had already received planning approval but were not yet connected, as well as projects with planning pending before the Department. In the June 29, 2007 letter the Department calculated HTMA's remaining available connection capacity to be 70,000 gallons per day.

G. On August 7, 2007 the HTMA submitted to the Department a Collection System Corrective Action Plan ("CAP") dated July 30, 2007 to address a surcharging interceptor identified in HTMA's conveyance system.

H. On September 25, 2007 the Department sent a letter to Mr. Peter Dorney approving the HTMA CAP.

I. On October 25, 2007 the HTMA filed an appeal to the Environmental Hearing Board ("EHB") of the Department's CAP approval letter dated September 25, 2007 challenging only the portion of the Department's September 25, 2007 CAP letter that referenced the June 29, 2007 letter's capacity calculation. *Hatfield Township Municipal Authority v. Commonwealth of Pennsylvania, Department of Environmental Protection, EHB Docket No. 2007-238-MG, 9-25-07 Letter.*

J. On November 1, 2007 the HTMA submitted a request for Preliminary Treatment Requirements ("PTR") for the Plant to discharge an annual average flow of 6.98 MGD to the West Branch Neshaminy Creek.

K. Section 691.402(b) of the Clean Streams Law, 35 P.S. § 691.402(b), states that whenever a permit is required by rules and regulations issued pursuant to this section, it shall be unlawful for a person or municipality to conduct the activity regulated except pursuant to a permit issued by the Department. Conducting such activity without a permit, or contrary to the terms or conditions of a permit or conducting an activity contrary to the rules and regulations of the Department or conducting an activity contrary to an order issued by the Department, is thereby declared to be a nuisance.

L. 25 Pa. Code § 92.7 states that new or increased discharges, or changes of wastestreams, facility expansions, production increases or process modifications, which result in new or increased discharges of pollutants, which discharges do not violate effluent limitations specified in the NPDES permit, shall be reported by submission to the Department of notice of the new or increased discharges. However, a new permit application shall be submitted and a new permit obtained before commencing a new or increased discharge, or change of the wastestream, which would violate effluent limitations in the NPDES permit or which would include any new or increased pollutant not identified in a previous permit application.

M. A treatment facility permittee is required to sign Component 3, Subchapter J, Section 4 of the Department's Sewage Facility Planning Module certifying that the treatment facility does or does not have adequate treatment capacity and is able to provide wastewater services for a proposed development in accordance with both 25 Pa. Code § 71.53(d)(3) and Title 25 Chapter 94 of the Pennsylvania Code.

N. A statutory nuisance pursuant to Section 691.402(b) and a violation of 25 Pa. Code § 92.7 constitutes unlawful conduct under section 611 of the Clean Streams Law, 35 P.S. § 691.611; and subjects a liable party to a claim for civil penalties under Section 605 of the Clean Streams Law, 35 P.S. § 691.605.

O. If a treatment facility permittee signs Component 3, Subchapter J, Section 4 of the Department's Sewage Facility Planning Module certifying that the treatment facility does have adequate treatment capacity and is able to provide wastewater services for a proposed development in accordance with both 25 Pa. Code § 71.53(d)(3) and 25 Pa. Code Chapter 94, but that statement is inconsistent with the treatment facility's allocated sewage facility planning capacity, then the treatment facility permittee has violated 18 Pa. C. S. A. § 4904, as stated in Component 3, Subchapter Q.

P. To date, the HTMA is not in violation of 35 P.S. §§ 691.402(b) and 691.611, 25 Pa. Code § 92.7 and 18 Pa. C. S. A. § 4904.

After full and complete negotiation of all matters set forth in this Consent Order and Agreement ("CO&A") and upon mutual exchange of covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby **ORDERED** by the Department and **AGREED** to by HTMA as follows:

1. **Authority**. This CO&A is an Order of the Department authorized and issued pursuant to Section 5 of the Clean Streams Law, 35 P.S. § 691.5; and Section 1917-A of the Administrative Code, supra.

2. **Findings**.

a. HTMA agrees that the findings in paragraphs A through P are true and correct and, in any matter or proceeding involving HTMA and the Department, HTMA shall not challenge the accuracy or validity of these findings.

b. The parties do not authorize any other persons to use the findings in this CO&A in any matter or proceeding.

3. **Corrective Action.**

a. The HTMA agrees to perform and complete Milestone Actions 1 through 6, below, and the Department agrees to release connection capacity credit incrementally up to an annual average flow of 6.98 MGD, consistent with HTMA's most recently approved Connection Management Plan ("CMP") or Quarterly Plan Update:

#	Milestone Action	Milestone Date
1	Meet a Total Phosphorus (TP) effluent concentration of 0.5 mg/l, or less, as a rolling annual average, reported monthly.	12 months from the execution date of this CO&A.
2	Meet a TP effluent concentration of 1.0 mg/l, or less, as a monthly average.	Within 30 days from the execution date of this CO&A.
3	Meet a TP effluent load of 29.1 lbs/day, or less, as a rolling annual average, reported monthly.	12 months from the execution date of this CO&A.
4	Meet a TP effluent load of 58.2 lbs/day, or less, as a monthly average.	Within 30 days from the execution date of this CO&A.
5	Submit a CMP identifying how HTMA will allocate capacity up to an annual average flow of 6.98 MGD.	Within 30 days from the execution date of this CO&A.
6	Submit a quarterly Plan Update which will indicate the progress made towards achieving the milestones contained in this CO&A.	March 28, June 28, September 28 and December 28 of each year.

b. HTMA's CMP shall, at a minimum, contain:

i. A narrative identifying any instances of HTMA's noncompliance.
ii. A table of all proposed projects that require capacity.
iii. The flows associated with each proposed project in paragraph 3bii.
iv. A proposed timeline for connecting the aforementioned projects.
v. A chart listing plant influent flows for the preceding 12 months.

4. **Stipulated Penalties.**

a. In the event the HTMA fails to comply with Milestone Actions and Milestone Dates #1 - #4 of paragraph 3a of this CO&A, the HTMA shall be in violation of this CO&A and, in addition to other applicable remedies, the HTMA shall make a payment to the Clean Water Fund for an amount determined under the following matrix for each Monthly Average or Rolling Annual Average incident of noncompliance:

VIOLATIONS FOR TOTAL PHOSPHORUS (TP)			
Percent Over Limits (%)	Type of Limit	Penalty Amount ($)	
		Monthly Average	Rolling Annual Average per Month
> 0-25	mg/l or lbs/day	500	500
> 25-50	mg/l or lbs/day	750	750
> 50-75	mg/l or lbs/day	1000	1000
> 75-100	mg/l or lbs/day	1250	1250
> 100	mg/l or lbs/day	1500	1500

b. Stipulated penalty payments for effluent violations shall be accompanied by a copy of the DMR for that month.

c. The Department reserves the right to assess additional civil penalties and/or to bring any action at law or equity, for pollution incidents at or from the Plant which result from actions of the HTMA or its agents whether or not the violation was willful, and any pollution incidents which have an adverse impact on the receiving stream or which adversely affect public health, safety, and welfare.

d. In the event the HTMA fails to comply in a timely manner with Milestone Actions #5 and #6 of paragraph 3a. of this CO&A, the HTMA shall be in violation of this CO&A and, in addition to other applicable remedies, the HTMA shall make a payment to the Clean Water Fund in the amount of ONE HUNDRED DOLLARS ($100.00) per day for each day of noncompliance.

e. Stipulated penalty payments for violations of Milestone Actions and Milestone Dates shall be payable monthly on or before the twenty-eighth day of each succeeding month.

f. Payments for these violations shall be made by corporate check or the like made payable to the Clean Water Fund, and be forwarded to Ms. Dana Walker, Pennsylvania Department of Environmental Protection, 2 East Main Street, Norristown, PA 19401.

g. Any payment under this paragraph shall neither waive the HTMA's duty to meet its obligations under this CO&A, nor preclude the Department from commencing an action to compel the HTMA's compliance with the terms and conditions of this CO&A.

h. Stipulated civil penalty payments for violations of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A resolves the HTMA's liability for civil penalties arising from the violation of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A for which the payment is made and only resolves the HTMA's liability for civil penalties arising from the violation of Milestone Actions and Milestone Dates #1 - #6 of paragraph 3a of this CO&A for which the payment is made.

i. Stipulated civil penalties shall be due automatically and without notice.

5. **Additional Remedies**

a. In the event that the HTMA fails to comply with any provision of this CO&A, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this CO&A.

b. The remedies provided by this paragraph are cumulative and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of that remedy.

7. **Reservation of Rights.** The Department reserves the right to require additional measures to achieve compliance with applicable law. The HTMA reserves the right to challenge any action which the Department may take to require those measures.

8. **Transfer of Site.**

a. The duties and obligations under this CO&A shall not be modified, diminished, terminated, or otherwise altered by the transfer of any legal or equitable interest in the Plant or any part thereof.

b. If the HTMA intends to transfer any legal or equitable interest in the Plant which is affected by this CO&A, the HTMA shall serve a copy of this CO&A upon the prospective transferee of the legal and equitable interest at least thirty (30) days prior to the contemplated transfer and shall simultaneously inform the Department official named in paragraph 9.

c. The Department may agree to modify or terminate the HTMA's duties and obligations under this CO&A upon transfer of the Plant.

9. **Correspondence with Department.** All correspondence with the Department concerning this CO&A shall be addressed to:

Ms. Dana Walker, Compliance Specialist
Department of Environmental Protection
2 East Main Street
Norristown, PA 19401
Direct: 484-250-5970 - Facsimile: 484-250-5971

10. **Correspondence with HTMA.** All correspondence with HTMA concerning this CO&A shall be addressed to:

Steven A. Hann, Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin
375 Morris Road
P.O. Box 1479
Lansdale, Pennsylvania 19446-0773
Direct: 215-257-3666 - Facsimile: 215-661-0315

The HTMA shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this Consent Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above address.

11. **Force Majeure**.

a. In the event that the HTMA is prevented from complying in a timely manner with any time limit imposed in this CO&A solely because of a strike, fire, flood, act of God, or other circumstances beyond the HTMA's control and which the HTMA, by the exercise of all reasonable diligence, is unable to prevent, then the HTMA may petition the Department for an extension of time.

b. The HTMA shall only be entitled to the benefits of this paragraph if it notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, the expected duration of the delay, and the efforts which have been made and are being made by the HTMA to mitigate the effects of the event and to minimize the length of the delay. The initial written submission may be supplemented within 10 days of its submission. In the event that the HTMA fails to comply with the requirements of this paragraph specifically and in a timely fashion, the Department may render this paragraph null and of no effect as to the particular incident involved.

c. The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by the HTMA and other information available to the Department. In any subsequent litigation, the HTMA shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information then available to it.

12. **Severability**. The paragraphs of this CO&A shall be severable and should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

13. **Entire Agreement**. This CO&A shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior drafts shall be relevant or admissible for purposes of determining the meaning or intent of any provisions herein in any litigation or any other proceeding.

14. **Attorney Fees**. The parties agree to bear their respective attorney fees, expenses, and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this CO&A.

15. **Modifications**. No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

16. **Titles**. A title used at the beginning of any paragraph of this CO&A may be used to aid in the construction of that paragraph, but shall not be treated as controlling.

17. **Decisions under Consent Order**. Any decision which the Department makes under the provisions of this CO&A is intended to be neither a final action under 25 Pa. Code Section 1021.2, nor an adjudication under 2 Pa.C.S. Section 101. Any objection which the HTMA may have to the decision will be preserved until the Department enforces this CO&A.

18. **NPDES Permit.** Should HTMA receive an NPDES permit with TP limits more stringent than this CO&A, then the TP limits of the NPDES permit will supersede the TP limits in this CO&A.

19. **Termination.** The terms and conditions of this CO&A shall terminate on the date that the HTMA, following planning, permitting and construction (if necessary) at the HTMA Plant, has sufficient capacity to handle current and future flows to the HTMA Plant as detailed in an updated Act 537 plan.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of the HTMA certify that they are authorized to execute this Consent Order and Agreement on behalf of the HTMA; that the HTMA consents to the entry of this Consent Order and Agreement as a final **ORDER** of the Department; and that the HTMA hereby knowingly waives its right to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, the Act of July 13, 1988, P.L. 530, No. 1988-94, 35 P.S. § 7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a); and Chapters 5A and 7A, or any other provision of law. Signature by the HTMA's attorney certifies only that the agreement has been signed after consulting with counsel.

FOR:
Hatfield Township Municipal Authority

Name Date

Title

FOR:
Hatfield Township Municipal Authority

Steven A. Hann, Esquire Date
Hatfield Township Municipal Authority

FOR:
Commonwealth of Pennsylvania
Department of Environmental Protection

Jenifer Fields, P.E. Date
Regional Manager
Water Management

FOR:
Commonwealth of Pennsylvania
Department of Environmental Protection

Lauren G. Rosen Date
Assistant Counsel
Southeast Regional Office

Amended Attachment 21-B.1
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Updated 2/25/08

HTMA WWTP	Connection Status				
Tributary Municipality	EDUs	Connected	Remaining		Time
Name of Subdivision	#	edus	edus	gpd	
Hatfield Township					
Country Fresh	100.0	0.0	100.0	21,600	Within 1 year
Westport Farms Subdivision	86.0	62.0	24.0	5,184	Within 1 year
Cameron	4.0	2.0	2.0	432	Within 1 year
R & L Carriers	7.5	0.0	8.0	1,728	Within 1 year
Snyder Square Shopping Center	61.0	54.0	7.0	1,512	Within 1 year
Loh Hagey, Temporary	126.0	100.0	26.0	5,616	Within 1 year
Patel Minor Subdivision, 529 Cowpath Road	1.0	0.0	1.0	216	Within 1 year
Wurzco Tract	3.0	0.0	3.0	648	Within 1 year
Hatfield Auto Aucton	9.3	0.0	9.0	1,998	Within 1 year
McCallum Minor Subdivision	1.0	0.0	1.0	216	Within 1 year
Hatfield Pointe	48.0	0.0	48.0	10,368	Within 1 year
Firefox	33.0	0.0	33.0	7,128	Within 1 year
Arbors Commercial	10.0	0.0	10.0	2,160	Within 1 year
Cavalier Construction	3.0	0.0	3.0	648	Within 1 year
Interstates Fleets	2.0	0.0	2.0	432	Within 1 year
Evans Builders, Oak Park Road	4.0	0.0	4.0	864	Within 1 year
Saligman Tract	3.0	0.0	3.0	648	Within 1 year
ProTract Engineering	1.0	0.0	1.0	216	Within 1 year
Monaravi Office, Pratful Patel	4.0	0.0	4.0	864	Within 1 year
North Penn Community Health	12.5	0.0	12.5	2,700	Within 1 year
Miscellaneous	25.0	0.0	25.0	5,400	Within 1 year
			326.5		
Snyder Tract Subdivision	89.0	0.0	89.0	19,224	Within 2 year
Barclay Road Subdivision, Temporary	27.0	0.0	27.0	5,832	Within 2 year
Amendola	5.0	0.0	5.0	1,080	Within 2 year
Altemose Oak Tree Associates	20.0	0.0	20.0	4,320	Within 2 year
Hi Arc Reality, Koffel Road	6.0	0.0	6.0	1,296	Within 2 year
Godman Subdivision	2.0	0.0	2.0	532	Within 2 year
Altemose Flex Building	5.0	0.0	5.0	1,080	Within 2 year
Line Lexington Ind. Park, Lot B1	10.0	0.0	10.0	2,160	Within 2 year
Line Lexington Ind. Park, Detail Center	5.5	0.0	5.5	1,188	Within 2 year

Amended Attachment 21-B.1
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Country Fresh	100.0	0.0	100.0	21,600	Within 2 year
			269.5		
Sub-Total		**218.0**	**596.0**	**128,890**	
Montgomery Township					
Montgomery Office Development	3.0		0.0	1,800	Completed
Manor Tract	10.0	10.0	0.0	0	Completed
675 Bethlehem Pike (restaurant and 2 retail)	10.0	10.0	0.0	0	Completed
Dick's Sporting Goods	9.0	9.0	0.0	0	Completed
Heckler Tract	36.0	0.0	36.0	9,000	Within 1 year
Firefox	115.0		115.0	34,500	Within 1 year
Taco Bell Restaurant	11.0	0.0	11.0	3,300	Within 1 year
Indian Lake Farm Subdivision	20.0	19.0	1.0	5,700	Within 1 year
Vacchiano Tract	2.0	0.0	2.0	600	Within 1 year
Connelly Tract	4.0	0.0	4.0	1,200	Within 1 year
			169.0		
Logo's Group Development	36.0	0.0	36.0	10,800	Within 5 year
Montgomery Babtist Church	21.0	0.0	21.0	5,250	Within 5 year
Trefoil Properties, Inc. Development	10.0	0.0	10.0	3,000	Within 5 year
Calhoun Tract	7.0	0.0	7.0	2,100	Within 5 year
Best Western Hotel	77.0	0.0	77.0	23,100	Within 5 year
Longhorn Steakhouse	17.0	0.0	17.0	3,062	Within 5 year
Montgomery Avenue, 15 properties	34.0	2.0	32.0	9,600	Within 5 year
Miscellaneous	45.0	25.0	20.0	6,000	Within 5 year
Arbors Commercial	7.0	0.0	7.0	2,100	Within 5 year
Montgomery Mall Expansion, Housing	500.0	0.0	500.0	125,000	Within 5 year
			727.0		
Parcel # 46-00-00853-001	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00841-004	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-00844-004	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00850-004	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00847-007	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-00253-007	4.0	0.0	4.0	1,200	Within 3-5 years
Parcel # 46-00-03103-001	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-03124-007	4.0	0.0	4.0	1,200	Within 3-5 years

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Parcel # 46-00-00679-007	2.0	0.0	2.0	600	Within 3-5 years
Parcel # 46-00-00673-001	1.0	0.0	1.0	300	Within 3-5 years
Parcel # 46-00-03127-007	8.0	0.0	8.0	2,400	Within 3-5 years
Parcel #46-00-00835-001	20.0	0.0	20.0	6,000	Within 3-5 years
Parcel # 46-00-00910-007	30.0	0.0	30.0	9,000	Within 3-5 years
			77.0		
Sub-Total		**75.0**	**973.0**	**269,212**	
Hatfield Borough					
Lapio-Hatfield Subdivision	8.0	8.0	0.0	0	Completed
Bethany Bible	2.0	2.0	0.0	0	Completed
Cameron Subdivision	4.0	4.0	0.0	0	Within 1 year
McCormick	1.0	0.0	1.0	300	Within 1 year
Penn Street	3.0	0.0	3.0	900	Within 1 year
McGrath	3.0	0.0	3.0	900	Within 1 year
Clegg Tract	3.0	0.0	3.0	648	Within 1 year
			10.0		
Snyder Tract Subdivision	12.0	0.0	12.0	2,592	Within 2 year
Sub-Total		**14.0**	**22.0**	**2,748**	
Hilltown Township					
Hilltown Pub	15.0	0.0	15.0	3,240	Within 2 year
Sub-Total		**0.0**	**15**	**3,240**	
Grand Total			**1606.0**	**404,090**	

Note: HTMA flow per EDU for new units = 216 gallons

Exhibit II-1

DEP Integrated Waters List for West Branch Neshaminy Creek

Hatfield Township, Montgomery County

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
Rock Run			
HUC: 02040201			
Aquatic Life (2813) - 5.48 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
Rock Run (Unt 02923)			
HUC: 02040201			
Aquatic Life (2813) - 4.82 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
Scotts Creek			
HUC: 02040201			
Fish Consumption (13080) - 0.21 miles			
Source Unknown	PCB	2006	2019
West Branch Neshaminy Creek			
HUC: 02040201			
Aquatic Life (8841) - 1.13 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
Aquatic Life (8842) - 7.1 miles			
Agriculture	Excessive Algal Growth	2002	2015
Municipal Point Source	Cause Unknown	1998	2011
	Excessive Algal Growth	2002	2015
	Metals	1998	2011
	Nutrients	1996	2008
	Organic Enrichment/Low D.O.	1996	2008
Aquatic Life (13861) - 1.1 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02869)			
HUC: 02040201			
Aquatic Life (8841) - 0.09 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02870)			
HUC: 02040201			
Aquatic Life (8841) - 0.42 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02871)			
HUC: 02040201			
Aquatic Life (8841) - 0.77 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02872)			
HUC: 02040201			
Aquatic Life (8841) - 0.28 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02873)			
HUC: 02040201			
Aquatic Life (8841) - 0.19 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02874)			
HUC: 02040201			
Aquatic Life (8841) - 0.26 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02875)			
HUC: 02040201			
Aquatic Life (8841) - 0.52 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02876)			
HUC: 02040201			
Aquatic Life (8841) - 0.84 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02877)			
HUC: 02040201			
Aquatic Life (8841) - 0.48 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02878)			
HUC: 02040201			
Aquatic Life (8844) - 2.32 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02879)			
HUC: 02040201			
Aquatic Life (8844) - 1.51 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02880)			
HUC: 02040201			
Aquatic Life (8844) - 0.39 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02881)			
HUC: 02040201			
Aquatic Life (8844) - 0.51 miles			
Land Development	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02882)			
HUC: 02040201			
Aquatic Life (8844) - 0.39 miles			
Land Development	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02883)			
HUC: 02040201			
Aquatic Life (8841) - 0.61 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02884)			
HUC: 02040201			
Aquatic Life (8848) - 3.46 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02885)			
HUC: 02040201			
Aquatic Life (8848) - 0.38 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02886)			
HUC: 02040201			
Aquatic Life (8848) - 1.76 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02889)			
HUC: 02040201			
Aquatic Life (7620) - 0.58 miles			
Municipal Point Source	Nutrients	1996	2008
	Pathogens	1996	2008
Aquatic Life (8846) - 0.65 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
Aquatic Life (8847) - 1.18 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02890)			
HUC: 02040201			
Aquatic Life (8846) - 0.36 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02891)			
HUC: 02040201			
Aquatic Life (8846) - 0.65 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015
Aquatic Life (8847) - 0.95 miles			
Urban Runoff/Storm Sewers	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02892)			
HUC: 02040201			
Aquatic Life (8846) - 0.64 miles			
Municipal Point Source	Nutrients	2002	2015
Urban Runoff/Storm Sewers	Siltation	2002	2015

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed	TMDL Date
West Branch Neshaminy Creek (Unt 02893)			
HUC: 02040201			
Aquatic Life (8841) - 0.39 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02894)			
HUC: 02040201			
Aquatic Life (13861) - 3.16 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02895)			
HUC: 02040201			
Aquatic Life (13861) - 1.1 miles			
Small Residential Runoff	Siltation	2008	2021
West Branch Neshaminy Creek (Unt 02896)			
HUC: 02040201			
Aquatic Life (8841) - 1.01 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02897)			
HUC: 02040201			
Aquatic Life (8841) - 0.41 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02898)			
HUC: 02040201			
Aquatic Life (8841) - 0.32 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015
West Branch Neshaminy Creek (Unt 02899)			
HUC: 02040201			
Aquatic Life (8841) - 1.13 miles			
Agriculture	Excessive Algal Growth	2002	2015
	Siltation	2002	2015

Exhibit II-2

DEP Integrated Waters List for Skippack Creek

Hatfield Township, Montgomery County

2008 Pennsylvania Integrated Water Quality Monitoring and Assessment Report - Streams, Category 4c Waterbodies, Pollution not Requiring a TMDL

Stream Name / Use Designation (Assessment ID) / Source	Cause	Date Listed
Skippack Creek (Unt 01096) HUC: 02040203		
Aquatic Life (13862) - 0.97 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01097) HUC: 02040203		
Aquatic Life (13862) - 2.86 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01098) HUC: 02040203		
Aquatic Life (13862) - 0.65 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01099) HUC: 02040203		
Aquatic Life (13862) - 1.08 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01100) HUC: 02040203		
Aquatic Life (13862) - 1.5 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01101) HUC: 02040203		
Aquatic Life (13862) - 0.98 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01102) HUC: 02040203		
Aquatic Life (13862) - 0.49 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01103) HUC: 02040203		
Aquatic Life (13862) - 2.6 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01104) HUC: 02040203		
Aquatic Life (13862) - 0.64 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01105) HUC: 02040203		
Aquatic Life (13862) - 0.64 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01106) HUC: 02040203		
Aquatic Life (13862) - 0.7 miles		
Small Residential Runoff	Water/Flow Variability	2008
Skippack Creek (Unt 01107) HUC: 02040203		
Aquatic Life (13862) - 0.66 miles		
Small Residential Runoff	Water/Flow Variability	2008

Exhibit II-3

Description of Prime Agricultural Farmland

Prime and other Important Farmlands

Soil Map Units considered important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. The listing of these soils does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

"Prime farmland" is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent.

More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

"Unique farmland" is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be **"farmland of statewide importance"** for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be **"farmland of local importance"** for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Exhibit II-4

DCNR Map 7 - PA Geologic Map

Hatfield Township, Montgomery County

MAP 7

DCNR

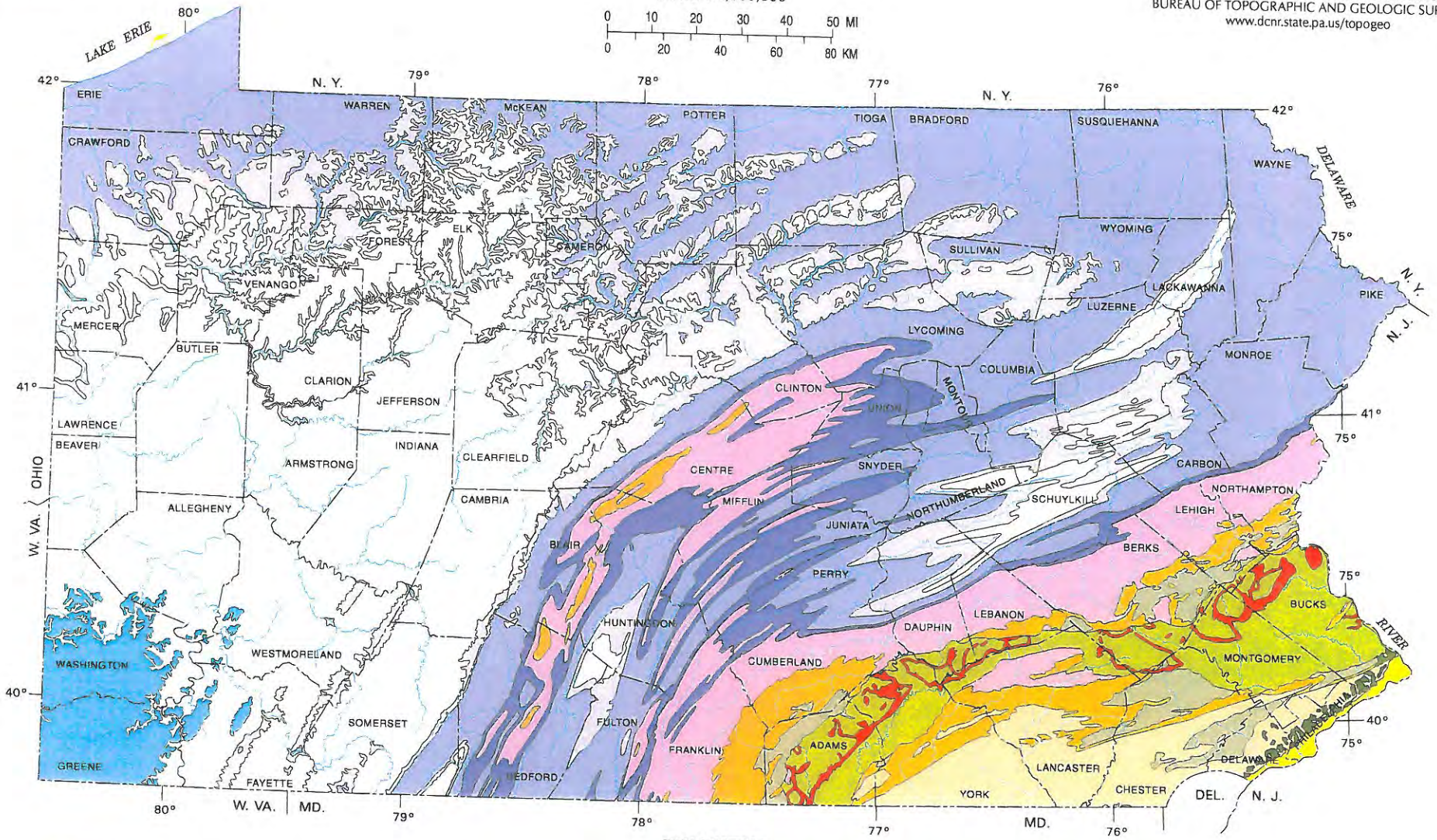
GEOLOGIC MAP OF PENNSYLVANIA

SCALE 1:2,000,000

0 10 20 30 40 50 MI

0 20 40 60 80 KM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

QUATERNARY (0–1.8 mil. yrs.)
Sand, gravel, and silt.
Sand and gravel.

TERTIARY (1.8–65 mil. yrs.)
Sand, gravel, silt, and clay.
Sand and gravel.

* **JURASSIC AND TRIASSIC** (144–248 mil. yrs.)
Red sandstone, shale, and conglomerate (green), intruded by diabase (red).
Building stone, iron.

PERMIAN (248–290 mil. yrs.)
Cyclic sequences of shale, sandstone, limestone, and coal.
Lime, clay.

PENNSYLVANIAN (290–323 mil. yrs.)
Cyclic sequences of sandstone, red and gray shale, conglomerate, clay, coal, and limestone.
Coal, clay, lime, building stone.

MISSISSIPPIAN (323–354 mil. yrs.)
Red and gray sandstone, shale, and limestone.
Flagstone, limestone, clay.

DEVONIAN (354–417 mil. yrs.)
Red sandstone, gray shale, black shale, limestone, and chert.
Flagstone, silica sand, clay, lime.

SILURIAN (417–443 mil. yrs.)
Red and gray sandstone, conglomerate, shale, and limestone.
Lime, building stone.

ORDOVICIAN (443–490 mil. yrs.)
Shale, limestone, dolomite, and sandstone.
Slate, limestone, zinc, clay.

CAMBRIAN (490–570 mil. yrs.)
Limestone, dolomite, sandstone, shale, quartzite, and phyllite.
Lime, building stone.

LOWER PALEOZOIC (443–570 mil. yrs.)
Metamorphic rocks (metasedimentary and meta-igneous); schist, gneiss, quartzite, serpentine, slate, and marble.
Building stone, talc.

PRECAMBRIAN (older than 570 mil. yrs.)
Gneiss, granite, anorthosite, metadiabase, metabasalt, metarhyolite, and marble.
Building stone, graphite, sericite.

*Cretaceous rocks, which are present in small areas of southern Montgomery County, cannot be shown at the scale of this map.

Prepared by Bureau of Topographic and Geologic Survey. Third Edition, 1990; Fourth Printing, Slightly Revised, 2007.

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Exhibit II-5

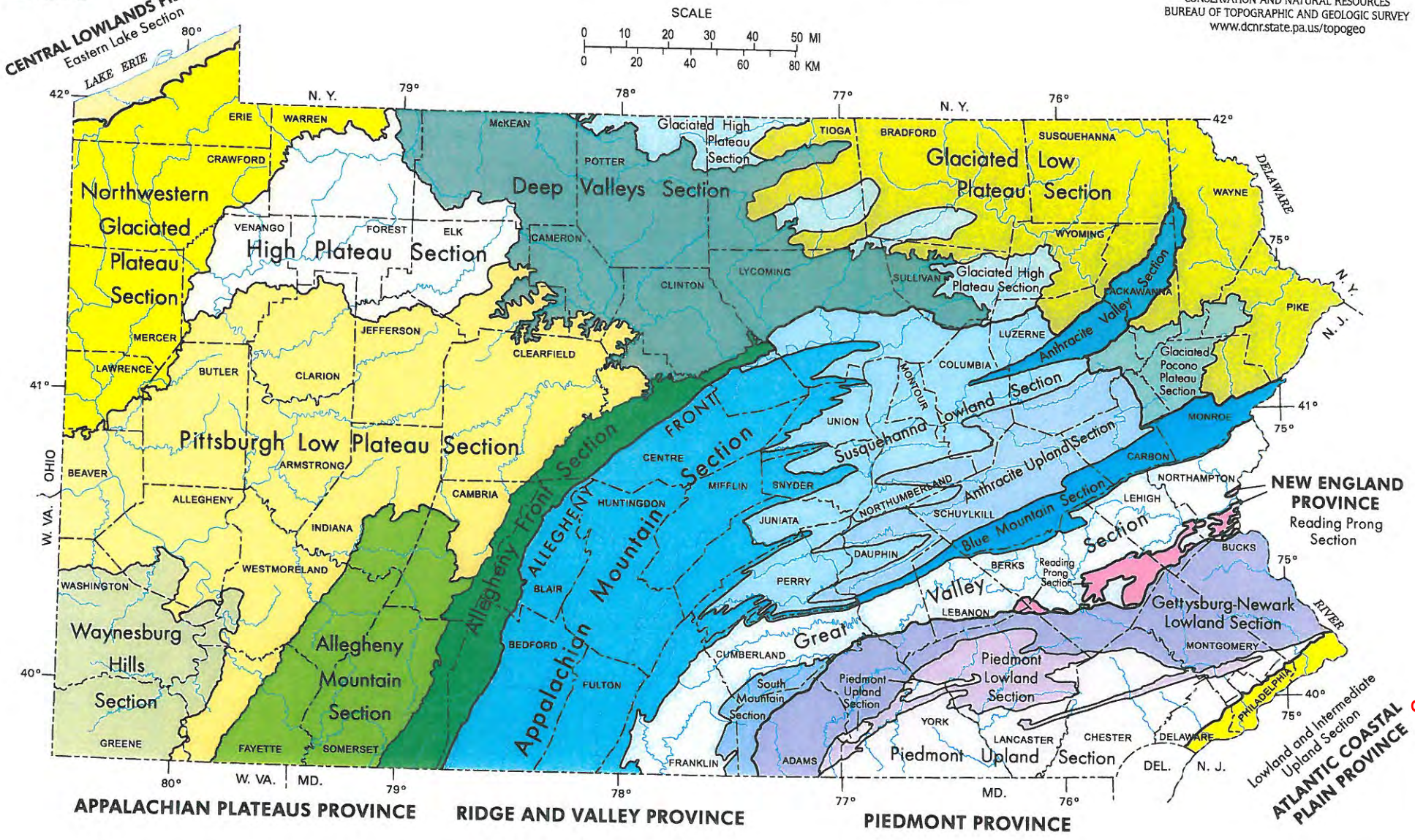
DCNR Map 13 - PA Physiographic Provinces Map

MAP 13

DCNR

PHYSIOGRAPHIC PROVINCE OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

CENTRAL LOWLANDS PROVINCE: Eastern Lake Section

APPALACHIAN PLATEAUS PROVINCE: Northwestern Glaciated Plateau Section; High Plateau Section; Pittsburgh Low Plateau Section; Waynesburg Hills Section; Allegheny Mountain Section; Allegheny Front Section; Deep Valleys Section; Glaciated High Plateau Section; Glaciated Low Plateau Section; Glaciated Pocono Plateau Section

RIDGE AND VALLEY PROVINCE: Appalachian Mountain Section; Susquehanna Lowland Section; Anthracite Valley Section; Anthracite Upland Section; Blue Mountain Section; Great Valley Section; South Mountain Section

NEW ENGLAND PROVINCE: Reading Prong Section

PIEDMONT PROVINCE: Gettysburg-Newark Lowland Section; Piedmont Lowland Section; Piedmont Upland Section

ATLANTIC COASTAL PLAIN PROVINCE: Lowland and Intermediate Upland Section

SYMBOLS: Approximate boundary between physiographic provinces; Approximate boundary between physiographic sections

Compiled by W. D. Sevon. Fourth Edition, 2000.

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PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

PHYSIOGRAPHIC PROVINCE	PHYSIOGRAPHIC SECTION	DOMINANT TOPOGRAPHIC FORM	LOCAL RELIEF[1]	UNDERLYING ROCK TYPE	GEOLOGIC STRUCTURE	APPROXIMATE ELEVATION[2] Min.	Max.	DRAINAGE PATTERN	BOUNDARIES	ORIGIN
CENTRAL LOWLANDS	Eastern Lake	Northwest-sloping, lake-parallel, low-relief ridges.	Very low to low.	Shale and siltstone.	Beds either horizontal or having low south dip.	570	1,000	Parallel.	*Northwest:* Lake Erie. *Southeast:* Base of escarpment.	Glacial, lake, and fluvial deposition and erosion.
APPALACHIAN PLATEAUS	Northwestern Glaciated Plateau	Broad, rounded upland and deep, steep-sided, linear valleys partly filled with glacial deposits.	Very low to moderate.	Shale, siltstone, and sandstone.	Subhorizontal beds.	900	2,200	Dendritic.	*Northwest:* Base of escarpment. *Southeast:* Glacial border.	Fluvial and glacial erosion; glacial deposition.
	High Plateau	Broad, rounded to flat uplands having deep, angular valleys.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Low-amplitude, open folds.	980	2,360	Dendritic.	*Northwest:* Glacial border. *Northeast:* Margins of deep valleys. *South:* Arbitrary along drainage divides between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Pittsburgh Low Plateau	Smooth to irregular, undulating surface; narrow, relatively shallow valleys; strip mines and reclaimed land.	Low to moderate.	Shale, siltstone, sandstone, limestone, and coal.	Moderate- to low-amplitude, open folds, decreasing in occurrence northwestward.	660	2,340	Dendritic.	*Northwest:* Glacial border. *Elsewhere:* Arbitrary at topographic changes with adjacent sections.	Fluvial erosion; periglacial mass wasting; strip mining.
	Waynesburg Hills	Very hilly with narrow hilltops and steep-sloped, narrow valleys.	Moderate.	Sandstone, shale, red beds, and limestone.	Horizontal beds.	848	1,638	Dendritic.	Arbitrary at change of topography.	Fluvial erosion and landslides.
	Allegheny Mountain	Wide ridges separated by broad valleys; ridge elevations decrease to north.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some limestone and coal.	Large-amplitude, open folds.	775	3,210	Dendritic.	*East:* Arbitrary between coal and noncoal areas. *West:* Base of west flank of Chestnut Ridge. *North:* Approximates northeast terminus of large-amplitude, open folds.	Fluvial erosion; some periglacial mass wasting.
	Allegheny Front	*East:* Rounded to linear hills rising by steps to an escarpment; hills cut by narrow valleys. *West:* Undulating hills sloping away from escarpment.	Moderate to high.	Shale, siltstone, and sandstone.	*South:* Broad fold. *Elsewhere:* Beds having low northwest dip; some faults.	540	2,980	Parallel and trellis.	*East:* Stream at base of hills below escarpment. *West:* Arbitrary between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Deep Valleys	Very deep, angular valleys; some broad to narrow uplands.	Moderate to very high.	Sandstone, siltstone, shale, and conglomerate.	Moderate-amplitude, open folds that control valley orientations.	560	2,560	Angulate and rectangular.	Arbitrary at margins of deep valleys, either at top of valley slope or along drainage divide.	Fluvial erosion; periglacial mass wasting.
	Glaciated High Plateau	Broad to narrow, rounded to flat, elongate uplands and shallow valleys.	Low to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Moderate-amplitude, open folds.	620	2,560	Angulate and dendritic.	*East:* Base of escarpment. *Elsewhere:* Arbitrary with margins of deep valleys.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Low Plateau	Rounded hills and valleys.	Low to moderate.	Sandstone, siltstone, and shale.	Low-amplitude folds.	440	2,690	Dendritic.	Base of escarpments of adjacent uplands; base of Pocono escarpment. *Elsewhere:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Pocono Plateau	Broad, undulatory upland surface having dissected margins.	Low to moderate.	Sandstone, siltstone, and shale; some conglomerate.	Beds having low north dip; some small folds.	1,200	2,320	Deranged.	*South and east:* Base of Pocono escarpment. *North:* Crest of drainage divide. *West:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
RIDGE AND VALLEY	Appalachian Mountain	Long, narrow ridges and broad to narrow valleys; some karst.	Moderate to very high.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs; variety of faults.	440	2,775	Trellis, angulate, and some karst.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *West and northwest:* Center of valley bottom west of westernmost linear ridge. *Elsewhere:* Base of slope change of eastern ridges; arbitrary between ridges.	Fluvial erosion; solution of carbonate rocks; periglacial mass wasting.
	Susquehanna Lowland	Low to moderately high, linear ridges; linear valleys; Susquehanna River valley.	Low to moderate.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs.	260	1,715	Trellis and angulate.	Base of slope change to higher ridges of all surrounding areas; arbitrary in valley areas.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Anthracite Valley	Narrow to wide, canoe-shaped valley having irregular to linear hills; valley enclosed by steep-sloped mountain rim.	Low to moderate.	Sandstone, siltstone, conglomerate, and anthracite.	Broad, doubly-plunging syncline; faults and smaller folds.	500	2,368	Trellis and parallel.	Outer base of surrounding mountain.	Fluvial and glacial erosion; some glacial deposition.
	Anthracite Upland	Upland surface having low, linear to rounded hills, strip mines, and waste piles; upland surrounded by an escarpment, a valley, and a mountain rim.	Low to high.	Sandstone, shale, conglomerate, and anthracite.	Many narrow folds having steep limbs; many faults.	320	2,094	Trellis.	*Northeast:* Arbitrary between coal and noncoal areas. *Elsewhere:* Outer base of surrounding mountain.	Fluvial erosion; some glacial erosion and periglacial mass wasting.
	Blue Mountain	Linear ridge to south and valley to north; valley widens eastward and includes low linear ridges and shallow valleys.	Moderate to high.	Sandstone, siltstone, and shale; some limestone and conglomerate.	*Southwest:* South limb of broad fold. *Northeast:* Small folds north of Blue Mountain.	300	1,680	Trellis.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *Northwest:* Base of mountain; base of Pocono escarpment. *Northeast:* Arbitrary.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Great Valley	Very broad valley. *Northwest half:* Dissected upland. *Southeast half:* Low karst terrain.	Low to moderate.	*Northwest:* Shale and sandstone; slate at east end. *Southeast:* Limestone and dolomite.	Thrust sheets, nappes, overturned folds, and steep faults; many third- and fourth-order folds.	140	1,100	Dendritic and karst.	*North:* Base of slope change on southeast side of Blue Mountain. *South:* Base of slope change to adjacent uplands.	Fluvial erosion; solution of carbonate rocks; some periglacial mass wasting.
	South Mountain	Linear ridges, deep valleys, and flat uplands.	Moderate to high.	Metavolcanic rocks, quartzite, and some dolomite.	Major anticlinorium having many second- and third-order folds.	450	2,080	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion of highly variable rocks; some periglacial mass wasting.
NEW ENGLAND	Reading Prong	Circular to linear, rounded hills and ridges.	Moderate.	Granitic gneiss, granodiorite, and quartzite.	Multiple nappes.	140	1,364	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
PIEDMONT	Gettysburg-Newark Lowland	Rolling lowlands, shallow valleys, and isolated hills.	Low to moderate.	Mainly red shale, siltstone, and sandstone; some conglomerate and diabase.	Half-graben having low, monoclinal, northwest-dipping beds.	20	1,355	Dendritic and trellis.	Base of slope changes with adjacent uplands and lowlands. *Elsewhere:* Arbitrary.	Fluvial erosion of rocks of variable resistance.
	Piedmont Lowland	Broad, moderately dissected, karst valleys separated by broad, low hills.	Low.	Dominantly limestone and dolomite; some phyllitic shale and sandstone.	Complexly folded and faulted.	60	700	Dendritic and karst.	*South:* Base of slope change to adjacent upland. *North:* Mesozoic red rocks.	Fluvial erosion; some periglacial mass wasting.
	Piedmont Upland	Broad, rounded to flat-topped hills and shallow valleys.	Low to moderate.	Mainly schist, gneiss, and quartzite; some saprolite.	Extremely complexly folded and faulted.	100	1,220	Dendritic.	*East:* Base of low to vague Fall Line escarpment. *North:* Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
ATLANTIC COASTAL PLAIN	Lowland and Intermediate Upland	Flat upper terrace surface cut by shallow valleys; Delaware River floodplain.	Very low.	Unconsolidated to poorly consolidated sand and gravel; underlain by schist, gneiss, and other metamorphic rocks.	Unconsolidated deposits underlain by complexly folded and faulted rocks.	0	200	Dendritic.	*Northwest:* Base of low to vague Fall Line escarpment. *East:* Arbitrary.	Fluvial erosion and deposition.

[1]Local relief: 0 to 100 feet, very low; 101 to 300 feet, low; 301 to 600 feet, moderate; 601 to 1,000 feet, high; >1,000 feet, very high.
(Relief categories listed here for Pennsylvania do not necessarily apply to other states or countries.)
[2]Elevations are in feet.

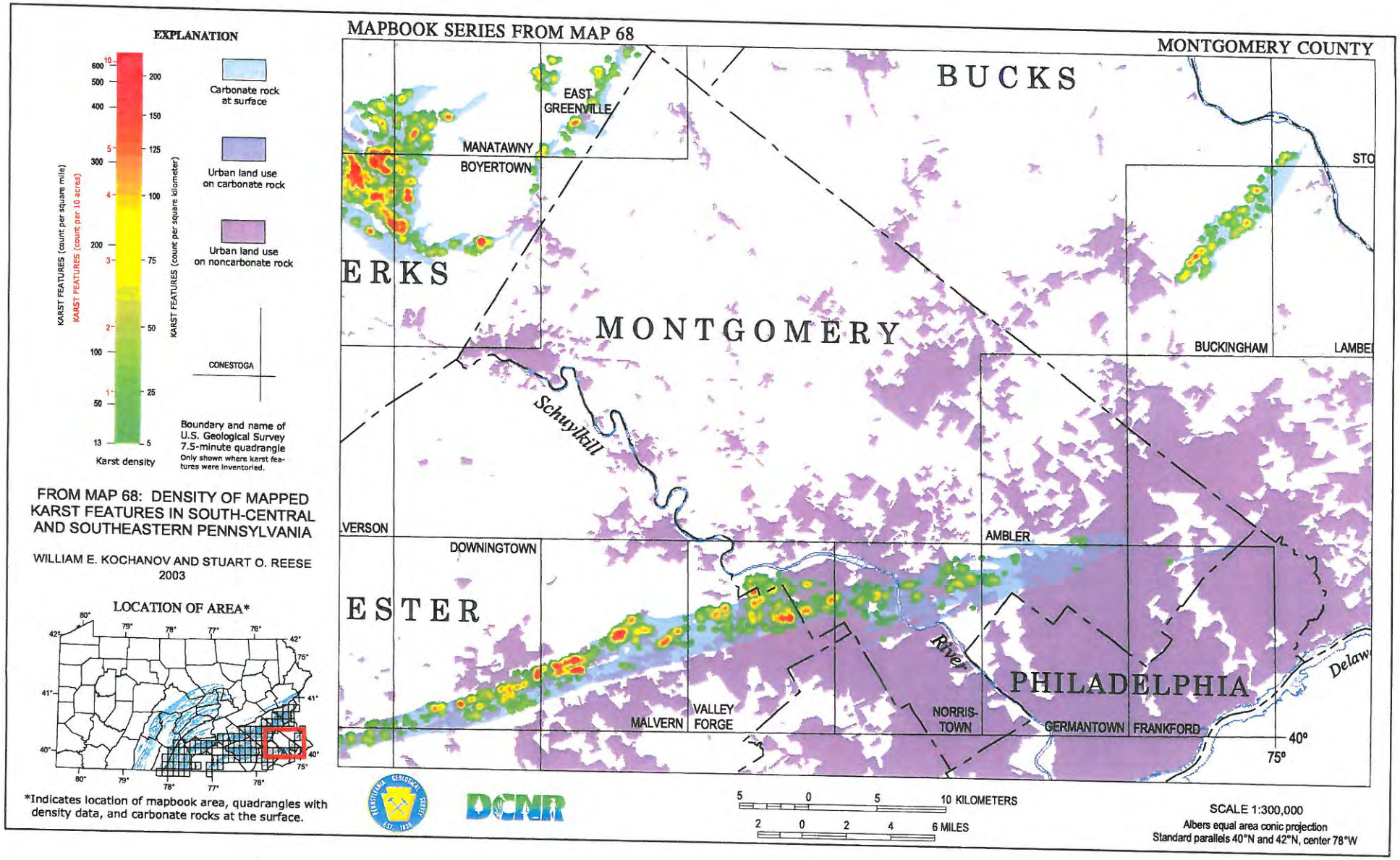
2200-MP-DCNR0382
Printed on Recycled Paper.

Amended Attachment 21-B.1
Page 155 of 537

Exhibit II-6

Montgomery County USGS Quad and Karst Density

Hatfield Township, Montgomery County



Amended Attachment 21-B.1
Page 157 of 537

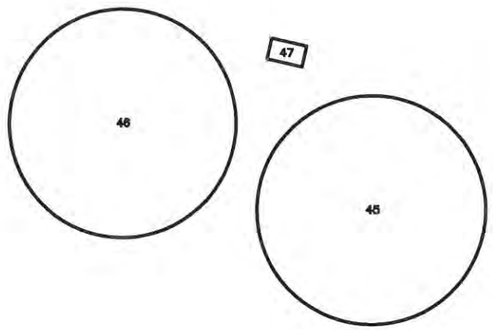
Exhibit III-1

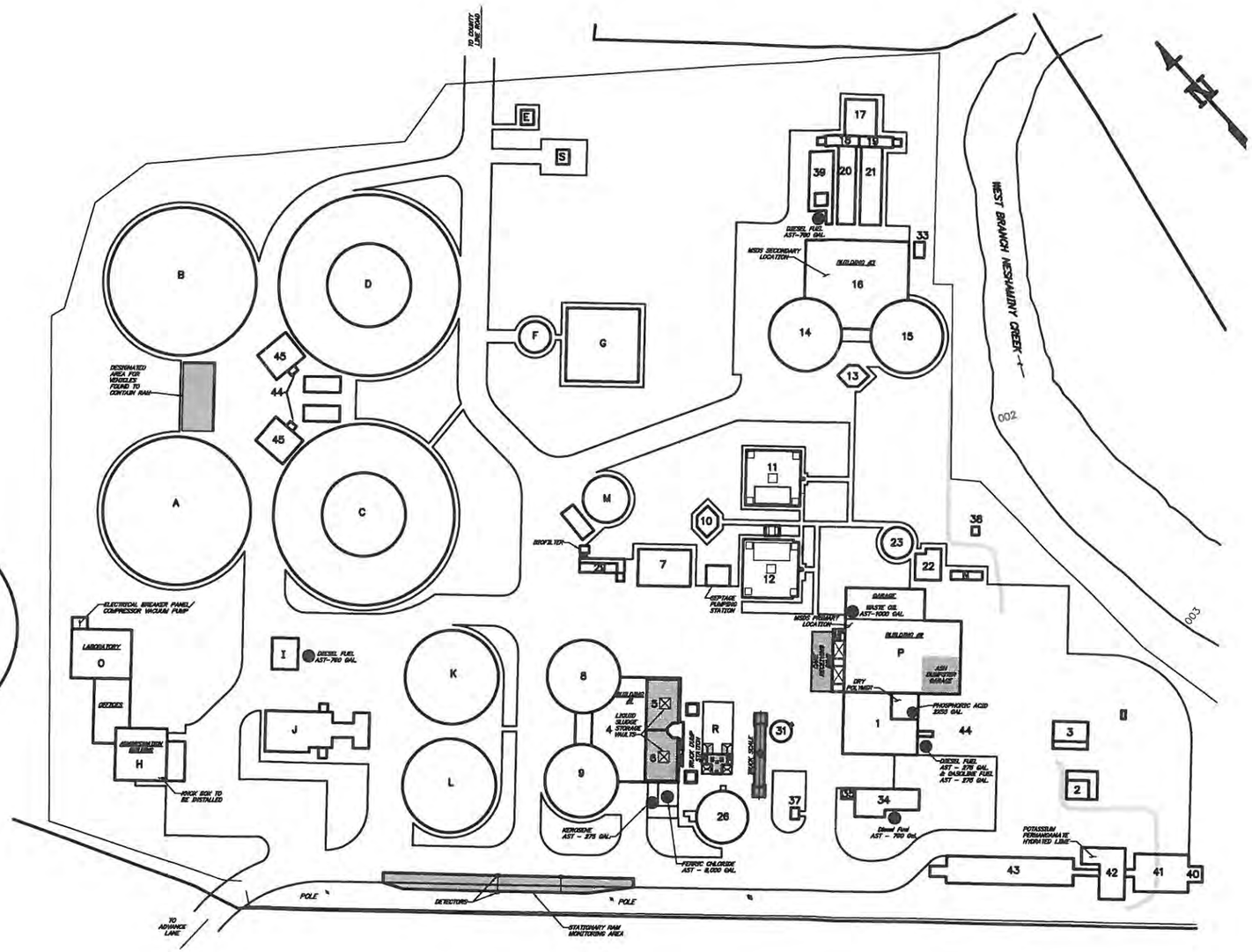
WWTP Site Plan

Hatfield Township, Montgomery County

EXISTING FACILITIES:

ITEM NO.	DESCRIPTION
1.	CONTROL BUILDING
2.	PUMP STATION NO. 1 (ABANDON)
3.	PUMP STATION NO. 2 (ABANDON)
4.	CHEMICAL FEED BUILDING (BUILDING #1)
5.	LIQUID SLUDGE STORAGE TANK NO. 1
6.	LIQUID SLUDGE STORAGE TANK NO. 2
7.	AUXILIARY SURGE STORAGE TANK (ABANDON)
8.	PRIMARY CLARIFIER NO. 1 (ABANDON)
9.	PRIMARY CLARIFIER NO. 2 (ABANDON)
10.	AERATION BASINS HEADBOX (ABANDON)
11.	TRUCK WASTE AERATION BASIN NO. 1
12.	TRUCK WASTE AERATION BASIN NO. 2
13.	SECONDARY CLARIFIER TANKS NO'S. 1 AND 2 HEADBOX (ABANDON)
14.	SECONDARY CLARIFIER NO. 1 (ABANDON)
15.	SECONDARY CLARIFIER NO. 2 (ABANDON)
16.	MAINTENANCE BUILDING (BUILDING #3, MSDS SECONDARY LOCATION)
17.	CHEMICAL WASTE SLUDGE PUMP VAULT NO. 1 (ABANDON)
18.	FLOCCULATOR TANK NO. 1 (ABANDON)
19.	FLOCCULATOR TANK NO. 2 (ABANDON)
20.	TUBE CLARIFIER NO. 1 (ABANDON)
21.	TUBE CLARIFIER NO. 2 (ABANDON)
22.	BACKWASH PUMP VAULT (NOT USED)
23.	BACKWASH STORAGE TANK
28.	SLUDGE THICKENER TANK
30.	SLUDGE CONTROL HEADBOX (ABANDON)
31.	SLUDGE BLEND TANK
33.	POWER TRANSFORMER
34.	ELECRICAL EQUIPMENT AREA
35.	DEEP WELL NO. 1
36.	SCREENING CHAMBER (ABANDON)
37.	DEEP WELL NO. 2
38.	ELECTRICAL AND TELEPHONE MANHOLE NO. 2
39.	CHEMICAL PUMPING BUILDING (ABANDON)
40.	METERING FLUMES
41.	SCREW PUMP STATION NO. 1
42.	SCREENINGS BUILDING
43.	GRIT AND GREASE REMOVAL UNIT
44.	6 x 8 POLYMER SHEDS
45.	EQUALIZATION TANK NO. 1
46.	EQUALIZATION TANK NO. 2
47.	UTILITY BUILDING
A.	SECONDARY CLARIFIER NO. 1
B.	SECONDARY CLARIFIER NO. 2
C.	AERATION REACTOR NO. 1
D.	AERATION REACTOR NO. 2
E.	SECONDARY CLARIFIER EFFLUENT SPLITTER BOX
F.	ELEVATED UTILITY WATER STORAGE TANK
G.	ULTRAVIOLET DISINFECTION TANK
H.	ADMINISTRATION BUILDING
I.	ELECTRICAL BUILDING
J.	SCREW PUMP STATION NO. 2
K.	PRIMARY CLARIFIER NO. 1
L.	PRIMARY CLARIFIER NO. 2
M.	SLUDGE STORAGE SILO
N.	EFFLUENT METERING FLUME PIT
O.	LABORATORY BUILDING
P.	INCINERATOR BUILDING (BUILDING #2, MSDS PRIMARY LOCATION
Q.	TRUCK SCALE
R.	TRUCK DUMP STATION
S.	MORTON GARAGE





SITE PLAN

LEGEND:

- Permitted Facility – Incinerator
- 100 YR Floodplain
- Fence
- Solid Waste Storage Or Loading & Unloading Areas
- Scales & Weigh Stations
- Storage Tanks

0 60 120 180 240 300

SCALE: 1"=60'

DESIGNED BY TEW	HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	DATE SEPT. 2007
DRAWN BY BAA	SITE PLAN	JOB NO. 0592.12
CHECKED BY JFM	HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA	FILE NPDES.DWG
APPROVED BY TEW	CET Engineering Services Harrisburg, Pennsylvania	DRAWING NO. NPDES
SCALE 1" = 60'	Copyright © 2006 by Commonwealth Engineering & Technology, Inc. T/A CET Engineering Services. All rights reserved.	SHEET 1 OF 1

Exhibit III-2

Mail and Door to Door Survey Example

Hatfield Township, Montgomery County

RLES MURGIA, Chairman
ALD D. ATKISS, Vice Chairman
HARRY RUTHERFORD, Asst. Secretary
BARRY WERT, Secretary/Asst. Treasurer
CHARLES SIBEL, Treasurer

PETER R. DORNEY, Executive Director

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
CLEAN WATER

CET ENGINEERING SERVICES
Engineer
717-541-0622

HAMBURG, RUBIN, MULLIN,
MAXWELL & LUPIN
Solicitor
215-661-0400

October 10, 2008

Advanced Living Management & Devel.
1392 Allentown Road
Lansdale, PA 19446

Re: Hatfield Township
Act 537 Sewage Facilities Planning
Field Survey

Dear Resident and/or Property Owner:

This letter is being sent regarding a property you reside on, or may just own in Hatfield Township. In accordance with the Pennsylvania Department of Environmental Protection (PA DEP)'s Act 537 Sewage Facilities Plan requirements, Hatfield Township and the Hatfield Township Municipal Authority are conducting a sewage facilities needs analysis in your area. Part of the Plan is to evaluate current methods of sewage disposal in your area to assure that these do not affect current or future water quality.

In order to gather this information with the least cost while still respecting your privacy, we ask that you fill out and return the attached survey concerning water supply and waste disposal as soon as possible.

The survey will be used in a variety of ways. For instance:

1. It will be used to plan a sampling and testing of existing wells, if wells are used in your area. If your well is selected for sampling, please allow the person collecting the sample to collect it as close to the well as possible. Not every well must be tested, but if you wish to have your well sampled, please indicate this on your response;
2. It will be used to identify where we must actually send a person to verify facts. This is part of the process called "validating the survey". If your property is selected for such a visit, we ask your cooperation.
3. It may provide information which will require us to look at certain areas in more detail, possibly surveying for information door-to-door in a few selected areas.

Please return the survey form to us not later than November 14, 2008. Your answers are very important. With this survey we hope to obtain data which meets part of the minimum legal standards on which to base future public decisions concerning questions on local water supply safety and wastewater disposal.

If you have any questions, please contact the Hatfield Township Municipal Authority at (215) 822-9300. Please mail or deliver the survey form and request for your well to be sampled to: Hatfield Township Municipal Authority, 3200 Advance Lane, Colmar, PA 18915.

Thank you for your help in this survey effort.

Sincerely,

Peter Dorney,
Executive Director
Hatfield Township Municipal Authority

SEWAGE NEEDS
MAIL SURVEY

October 10, 2008

Hatfield Township and HTMA are conducting a survey to determine what sewage problems may exist in this area. The survey results will be used to determine if sewage problems exist, and the best and most economical way of correcting the problems. Please complete the form to the best of your ability, and return it by: November 14, 2008 to the HTMA office at 3200 Advance Lane, Colmar, PA 18915

If you have any questions please contact Peter Dorney, Executive Director, HTMA, at 215-822-9300.
Please note: this survey may be followed by a partial or whole door to door survey.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ PHONE: (_____) -_____
ADDRESS: _____

1. How many people live in your house? _____ SEASONAL / ALL YEAR?
2. How large is your lot? _____
3. Do you have more than one sewage system on your lot? Y/N
   If yes, explain: _____
4. What kind of water system do you have? WELL? SPRING? PUBLIC? OTHER? _____
   Do you treat your water? Y/N If yes, how? _____
   If you have a well: Is it DUG or DRILLED ? How Deep? _____ ft. Cased? Y/N
5. How far is the well or spring from the drain field _____ ft. Is well UP/DOWN SLOPE ___
   Have you every had your water tested? Y/N When? _____
   What were the results? _____
   _____
7. What kind of sewage system of you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

8. Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

9. How old is your system? _____ Was it permitted? Y/N When? _____
10. Have you every noticed any of the following near your septic system?

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS
ODORS	WATER PONDING OR SURFACING
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME
SYSTEM OVERFLOW	OTHER _____

11. Was your system every pumped out? Y/N How often? _____ Last time? _____
    If it was pumped, was it inspected for cracks or broken baffles? _____
12. Was your system ever repaired? Y/N When? _____ By permit? Y/N
    What part was repaired or replaced?
    TANK REPAIRED/REPLACED
    LINE: REPAIRED/REPLACED
    DRAIN FIELD: REPAIRED/REPLACED
13. Are you aware of any other sewage problems?
14. COMMENTS:

DOOR TO DOOR
NEEDS SURVEY

Munic.: Hatfield Township Co.: Montgomery Study Area: HTMA Date: _____
General weather conditions: _____

A survey is being conducted to determine if there are any sewage problems in this area. This is a general survey and the results are intended to be used in evaluating the need for community wide solutions.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ STREET: _____ CITY: _____
ZIP: _____ PHONE #: _____ OWNER OR RENTER? NUMBER OF RESIDENTS: ___
What kind of water system do you have? WELL? SPRING? CISTERN? PUBLIC? OTHER?
If you have a well: Is it DUG or DRILLED ? HOW DEEP? _____ ft. Cased? Y / N
How far is the well or spring from the drain field _____ ft. Is well UP/DOWNHILL _____
Do you treat your water? Y / N How? CL/UV DISINFECTION, SOFTENER, ION, OTHER _____
Was the water ever tested? Y / N When? _____
Any contamination? Y / N What (TC, FC, N, etc.) _____

How large is your lot? _____ No. of dwelling units? _____
One or more sewage systems? _____ COMMERCIAL/RESIDENTIAL?

What kind of sewage system do you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE

OTHER _____

Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER		

How old is your system? _____ Was it permitted? Y / N When? ___
Have you every noticed any of the following near your septic system? _____

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS	ODORS
WATER PONDING OR SURFACING	SYSTEM OVERFLOW	
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME	

OTHER _____

If you noticed any of the above, are they seasonal or year-round? _____

Have you ever had your system pumped out? Y / N How often? _____ Last time? _____
If it was pumped, was it inspected for cracks or broken baffles? Y / N What part? _____

Has the system every been repaired? Y / N When? _____ By permit? Y / N What part? _____
TANK REPAIRED/REPLACED LINE: REPAIRED/REPLACED DRAIN FIELD: REPAIRED/REPLACED
COMMENTS: _____

DO I/WE HAVE YOUR PERMISSION TO CONFIRM THIS INFORMATION BY LOOKING AROUND? Y / N

SEWAGE NEEDS MAIL SURVEY

October 10, 2002

Hatfield Township and Hatfield Township Municipal Authority (HTMA) are conducting a survey to determine what sewage problems may exist in this area. The survey results will be used to determine if sewage problems exist, and the best and most economical way of correcting the problems. Please complete the form to the best of your ability, and return it by: November 14, 2008 to the HTMA office at 3200 Advance Lane, Colmar, PA 18915

If you have any questions please contact Peter Dorney, Executive Director, HTMA, at 215-822-9300.
Please note: this survey may be followed by a partial or whole door-to-door survey.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ PHONE: _____
ADDRESS: 470 Derstine Rd. Hatfield PA 19440

1. How many people live in your house? 3 SEASONAL (ALL YEAR?)
2. How large is your lot? 1.3 acre
3. Do you have more than one sewage system on your lot? Y(N)
   If yes, explain: _____
4. What kind of water system do you have? (WELL?) SPRING? PUBLIC? OTHER? _____
   Do you treat your water? (Y)N If yes, how? Water Softener
   If you have a well: Is it DUG or DRILLED? How Deep? _____ ft. Cased? Y/N
5. How far is the well or spring from the drain field _____ ft. Is well UP/DOWN SLOPE ___
   Have you every had your water tested? (Y)N When? 5/2004
   What were the results? (attach copy if possible) _____

7. What kind of sewage system of you have? (CIRCLE ALL THAT APPLY)

(SEPTIC TANK)	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

8. Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

(SEPTIC TANK)	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
PUBLIC SEWER	OTHER _____	

9. How old is your system? 7 Was it permitted? Y/N When? _____
10. Have you every noticed any of the following near your septic system?

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS
ODORS	WATER PONDING OR SURFACING
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME
SYSTEM OVERFLOW	OTHER _____

11. Was your system every pumped out? (Y)N How often? _____ Last time? 6/2007
    If it was pumped, was it inspected for cracks or broken baffles? yes
12. Was your system ever repaired? Y(N) When? _____ By permit? Y/N
    What part was repaired or replaced?
    TANK REPAIRED/REPLACED
    LINE: REPAIRED/REPLACED
    DRAIN FIELD: REPAIRED/REPLACED
13. Are you aware of any other sewage problems? No
14. COMMENTS:
    Bought house in July 2004
    Well pump was replaced May 2007

DOOR TO DOOR
NEEDS SURVEY

Munic.: Hatfield Township Co.: Montgomery Study Area: HTMA Date: 8-3-09
General weather conditions: CLEAR/COLD

A survey is being conducted to determine if there are any sewage problems in this area. This is a general survey and the results are intended to be used in evaluating the need for community wide solutions.

(CIRCLE OR FILL IN AS APPROPRIATE; ADD COMMENTS AS NEEDED)

NAME: _____ STREET: _____ CITY: _____
ZIP: _____ PHONE #: _____ OWNER OR RENTER? NUMBER OF RESIDENTS: 3-5
What kind of water system do you have? WELL? SPRING? CISTERN? PUBLIC? OTHER?
If you have a well: Is it DUG or DRILLED ? HOW DEEP? 180' ft. Cased? Y / N
How far is the well or spring from the drain field _____ ft. Is well UP/DOWNHILL _____
Do you treat your water? Y / N How? CL/UV DISINFECTION, SOFTENER, ION, OTHER _____
Was the water ever tested? Y / N When? ≥ 2000
Any contamination? Y / N What (TC, FC, N, etc.) _____

How large is your lot? ≥ 1 ACRE No. of dwelling units? 1
One or more sewage systems? 1 COMMERCIAL/RESIDENTIAL?

What kind of sewage system do you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER _____		

Where does your laundry and/or sink water go? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STEAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER		

How old is your system? 30+ years Was it permitted? Y / N When? —
Have you every noticed any of the following near your septic system? NO

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS	ODORS
WATER PONDING OR SURFACING	SYSTEM OVERFLOW	
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME	
OTHER _____		

If you noticed any of the above, are they seasonal or year-round? _____

Have you ever had your system pumped out? Y / N How often? ≥ 5YRS Last time? ≥ 2002-03
If it was pumped, was it inspected for cracks or broken baffles? Y / N What part? _____

Has the system every been repaired? Y / N When? _____ By permit? Y / N What part? _____
TANK REPAIRED/REPLACED LINE: REPAIRED/REPLACED DRAIN FIELD: REPAIRED/REPLACED
COMMENTS: _____

DO I/WE HAVE YOUR PERMISSION TO CONFIRM THIS INFORMATION BY LOOKING AROUND? Y / N

Exhibit III-3

Survey Tabular Results

Hatfield Township, Montgomery County

Hatfield Township, Montgomery County PA
Sewage Needs Survey
HTMA 537 Plan (0592.66)

Act 537 Plan Needs Analysis
11/22/10 3:22 PM

	Property Address								Test Results			Confirmed					Suspected			Potential			Other
	Owner	No.	Street	Town	Zip	Mail Surv. Resp	Well?	Age	DTD Surv.	NO_3	TC	FC	Wet	BTG permits	Piped	Backups	Holding tank	Green grass	Unsuitable soils	Privy cesspools	< 72	Soils/ Geo	Repair'd	
1	Lillian Moyer	13	Allentown Road	Hatfield, PA	19440																			
2	Franklin and Georgette Koehler	3501	Allentown Road	Hatfield, PA	19440																			
3	John and Bonnie Hercolini	3579	Allentown Road	Hatfield, PA	19440																			
4	Hatfield Bergey LP	3016	Bethlehem Pike	Hatfield, PA	19440																			
5	Benjamin and Janet Brower	3020	Bethlehem Pike	Hatfield, PA	19440	Y	Y	5									Y							pumped 10/08
6	Charles Chevrolet Inc	3100	Bethlehem Pike	Hatfield, PA	19440	Y	Y	37									Y				X			Pumped mnthly
7	Hatfield Recon Center Inc	3150	Bethlehem Pike	Hatfield, PA	19440																			
8	Charles Chevrolet Inc	3200	Bethlehem Pike	Hatfield, PA	19440																			
9	Philip Leber	3224	Bethlehem Pike	Hatfield, PA	19440	Y	Y	15	Y	ND	NEG	NEG												Pumped every 4 to 5 years
10	Resident	3266	Bethlehem Pike	Hatfield, PA	19440																			
11	North Penn Reality LLC	3436	Bethlehem Pike	Hatfield, PA	19440																			
12	Fred Crist	3528	Bethlehem Pike	Hatfield, PA	19440									X									Y	MCHD repair permit - BTG
13	Fred Crist	3544	Bethlehem Pike	Hatfield, PA	19440																			
14	Kema Reality	90	County Line Road	Hatfield, PA	19440																			
15	Robert and Sina Cristinzio	276	County Line Road	Hatfield, PA	19440																			
16	Paul and Shiela Roth, Trustees	17	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	5.06	NEG	NEG									X			Pump every 5 yrs, 2005, clean test report
17	Chester and Evelyn Jandzio	33	Derstine Road	Hatfield, PA	19440	Y	Y	47	Y	6.24	NEG	NEG						Y			X		Y-1988	Pump 1999, DF replaced 88 (permit), green at DF
18	Harold and Margaret Thomas	48	Derstine Road	Hatfield, PA	19440																			
19	Stanley Sine	49	Derstine Road	Hatfield, PA	19440	Y	Y	34	Y	6.62	NEG	NEG												Pump twice / yr, 3/08 (rental property)
20	Edward and Christine Richhart	65	Derstine Road	Hatfield, PA	19440	Y	Y	42	Y	7.43	NEG	NEG						Y			X			Pump 2003, clean test report
21	Ronald and Diane Miller	81	Derstine Road	Hatfield, PA	19440	Y	Y	44	Y	5.96	NEG	NEG						Y			X		Y-2000	Pump every 3 yrs, 2005, DF-00 (no permit)
22	Advanced Living Management & Dev	82	Derstine Road	Hatfield, PA	19440	Y	Y																	Pump yearly, 2007
23	Paul and Lois Christman	97	Derstine Road	Hatfield, PA	19440	Y	Y	42													X		Y-2008	DF flushed 08, no permit, pump 3/08
24	Ruth Hopf	113	Derstine Road	Hatfield, PA	19440		Y	40	Y	6.31	NEG	NEG									X			
25	Donald and Carolyn Kratz	355	Derstine Road	Hatfield, PA	19440	Y	Y	41	Y	7.89	NEG	NEG									X			Every 5, 2007; septic w/ French drain
26	Brian and Cheryl Martin	416	Derstine Road	Hatfield, PA	19440	Y	Y	48	Y	5.50	NEG	NEG	Y					Y			X			Pump 3/08; Undersize for 7 person household
27	Marlin and Charlene Bergey	424	Derstine Road	Hatfield, PA	19440	Y	Y	20																
28	Vernon and Miriam Derstine	438	Derstine Road	Hatfield, PA	19440	Y	Y	48													X			Pump 2005
29	Vernon and James Derstine	444	Derstine Road	Hatfield, PA	19440	Y	Y	48									Y				X		Y -2003	Pump monthly, MCHD repair permit - 03
30	James and Darlene Derstine	450	Derstine Road	Hatfield, PA	19440	Y	Y	40													X			Pump yearly 5/08
31	Kevin and Jo Ann Goettner	462	Derstine Road	Hatfield, PA	19440																			
32	Raymond and Barbara McKnight	470	Derstine Road	Hatfield, PA	19440	Y	Y		Y	3.73	NEG	NEG												
33	Abram and Mary Anne Kratz	478	Derstine Road	Hatfield, PA	19440	Y	Y	7	Y	3.38	NEG	NEG	Y					Y					Y-2003	Pump 8/01; ESM w/ 1500 gal ST (MCHD - permit)
34	John and Frances Hunsberger	486	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	3.12	NEG	NEG									X			
35	Vicki Scott and Joseph Gallagher	494	Derstine Road	Hatfield, PA	19440	Y	Y	40	Y	3.07	NEG	NEG						Y			X			Pump every 3 yrs, 2004, Notify in adv. of visit
36	Curtis Reid and Connie Nace	510	Derstine Road	Hatfield, PA	19440		Y	50	Y	2.75	NEG	NEG									X			
37	William and Edith Sayers	524	Derstine Road	Hatfield, PA	19440	Y	Y	36	Y	4.90	NEG	NEG												Pump every 4, 2004
38	Mark and Margaret Flaherty	636	Derstine Road	Hatfield, PA	19440																			
39	Virginia Metz	639	Derstine Road	Hatfield, PA	19440	Y		50													X			Pump every 2 years, 2007
40	Norman Moyer	1426	Derstine Road	Hatfield, PA	19440	Y	Y	75												Y?	X			Clean test, pumped 10/08 (every 10)
41	Gerald and Sherry Moyer	1660	Derstine Road	Hatfield, PA	19440	Y	Y	40													X			Every 3-4 yrs, pump 10/08, clean test 11/08
42	Resident	1700	Derstine Road	Hatfield, PA	19440																			
43	Matthew Young and Karen Hoffman	1750	Derstine Road	Hatfield, PA	19440	Y	Y	38	Y	1.33	NEG	NEG									X			Pump yearly
44	Michael and Carolann Saylor	1832	Derstine Road	Hatfield, PA	19440																			
45	Richard and Ellen Baum	491	Forty Foot Rd.	Hatfield, PA	19440	Y	Y	?													X		Y-99	New tank - 1999 (permit?)
46	Vincent and Jennifer Diantonio	1043	Koffel	Hatfield, PA	19440	Y		?													X			Pump every 2, 2007, req. no field confirm.
47	Richard Lewis	2124	Lenhart	Hatfield, PA	19440	Y	Y	100													X		Y-??	Septic/Seepage, well not domestic water, pumped 30+ years, pipes replaced
48	Thomas Pennise	2522	Lenhart	Hatfield, PA	19440																			
49	James and Dorothy Mease	2528	Lenhart	Hatfield, PA	19440	Y	Y	?													X			Pump 2/08, every other year
50	Charlotte Dubroff	2505	E. Orvilla	Hatfield, PA	19440	Y		22 / 34																Two systems, pumped every 2 yrs
51	Kathryn Grazel	2909	E. Orvilla	Hatfield, PA	19440	Y	Y	9																Tank and pumped to sewer system
52	Resident	3100	E. Orvilla	Hatfield, PA	19440																			
53	Forst Family Partnership	3226	Penn St.	Hatfield, PA	19440	Y	Y	??													X			Pump every 2 yrs
54	Leroy and Mary Walter	2041	Township Line Rd.	Hatfield, PA	19440	Y	Y	36	Y	1.37	NEG	NEG												Pump 2006
55	Daniel and Wendy Walter	2051	Township Line Rd.	Hatfield, PA	19440	Y		16																Every 3-4 yrs, 2008
56	Alfred and Gail Walter	2071	Township Line Rd.	Hatfield, PA	19440	Y	Y	43													X			Every 4-5 yrs, 2008
57	Keith and Katherine Oldham	2437	Unionville Pike	Hatfield, PA	19440																			
58	Peter and Beth Gower	2445	Unionville Pike	Hatfield, PA	19440																			
59	Paul Landis	2709	Unionville Pike	Hatfield, PA	19440	Y	Y	??	Y	5.24	3	NEG									X			Last pump approx. 3 yrs.
60										5.74	4	NEG												
	Total =	59				36	34		18				2	1	0	0	3	6	0	1	26	8		
						% of Total	61	58		31			3.4	1.7	0.0	0.0	5.1	10.2	0.0	1.7	44.1	13.6		
						Req'd %	35			35														
						No. Req'd	21			21														
	Derstine Rd. Needs Area =	24				Rcv'd	19			14														
	Surveys Req'd (50%) =	12				% of Total	79.1667			58														

Exhibit III-4

Montgomery County Health Department
Sewage Management Forms

Hatfield Township, Montgomery County

MONTGOMERY COUNTY HEALTH DEPARTMENT

Norristown Health Center
1430 DeKalb Street, PO Box 311
Norristown, PA 19404-0311
610-278-5117
Fax: 610-278-5167

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610-970-5040
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Eastern Court House Annex
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215-784-5415
Fax: 215-784-5524

CHECKLIST FOR SEWAGE SYSTEM DESIGN

The following items must be provided to constitute a **COMPLETE** application submittal:

SYSTEM LOCATION AND PROTECTION

All referenced corner elevations denoting the absorption area, including the tanks, shall be staked in the field and protected from disturbance.

APPLICATION FOR AN ON-LOT SEWAGE DISPOSAL SYSTEM PERMIT (Form 290) must be completed by the applicant and/or authorized agent. **All** information in Parts I and III shall be provided by the applicant and/or authorized agent and signed under Part IV. Part II is for **Local Agency** Use Only.

1. Part III, the **Plot Plan** must include at minimum the following items and be drawn **TO SCALE:**
   a. Lot dimensions (in feet) with precise property lines
   b. **Exact** location of the following:
      I. **All** existing & proposed water supplies (including adjacent properties)
      II. Existing & proposed buildings
      III. **All** observation test probes (with identification) and percolation tests.
      IV. Proposed treatment tanks
      V. Proposed absorption area (including distance in feet from property corners and/or two non-parallel property lines)
   c. Reference to north
   d. Bench mark location and elevation
   e. Direction and percentage of slope **(AS MEASURED ON SITE)**
   f. Distance to nearest stream, floodway or wetland
   g. **Exact** isolation distances as set forth in PA Code Title 25, Chapter 73, Section 73.13 *A/B bed's 50 foot down-slope no construction zone*
   h. Provide for diversion of surface runoff waters around the proposed sewage system.
   i. **All** right-of-ways or easements
   j. Detention/retention basins and storm water seepage beds
   k. Other information as required by Montgomery County Health Department.

SITE INVESTIGATION AND PERCOLATION TEST REPORT (Form 290 Appendix A) shall be completed in its entirety by the authorized agent and/or project consultant.

DESIGN CALCULATIONS (showing required computations)

1. Minimum absorption area
2. Septic tank capacity
3. Design flow
4. Friction loss
5. Total dynamic head

6. Minimum dosing volume
7. Dosing or siphon tank capacity
8. Pump curve and specified pump or siphon

TREATMENT TANK DETAIL (side profile with all dimensions)

1. Indicate type of treatment tank to be used
2. Building sewer showing required slope of last ten (10) feet and clean-out
3. Inlet & outlet elevation
4. Baffles (inlet & outlet)
5. Inspection port
6. Manhole cover
7. Elevation of existing grade at septic tank

DOSE/SIPHON/LIFT TANK DETAIL (side profile with all dimensions)

1. Elevation of existing grade at tank
2. Inlet & outlet elevation
3. Pump/siphon elevation
4. Elevation of OFF, ON & ALARM floats
5. Profile of all piping, fittings & electrical connections from pump/siphon to manifold
6. Conduit protection for electrical lines

ABSORPTION AREA DETAIL

1. Top view must be drawn **TO SCALE**
   a. Dimensions in feet
   b. Ground elevations for **All** corners of the absorption area; **All** corner elevations of individual trenches must be provided (and extremities of the berm for elevated sand mound systems)
   c. Laterals, hole spacing, manifold & bed layout

2. End view must be drawn **TO SCALE**
   a. Ground elevation at highest & lowest sides
   b. Depth of sand or excavation at highest & lowest sides
   c. Slope of sand & soil berm
   d. Depth of stone below and above piping
   e. Depth of hay/straw/building paper over stone
   f. Depth of top cover
   g. Manifold & spacing of piping
   h. Seeding or sodding

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Site Evaluation Application Procedure

The applicant (owner, owner in equity or authorized agent) shall complete the Observation Test Probe Application and Percolation Test Application. The Agent Authorization Form shall be completed and notarized if someone other than the property owner(s) will be filing the application, conducting tests, attending meetings or receiving notices and other communication concerning the permitting and installation of the system.

The applicant must submit the Observation Test Probe Application, Percolation Test Application and Agent Authorization Form, if applicable, along with a check or money order **(DO NOT SEND CASH)**, made payable to the "Montgomery County Treasurer", for the required fee. Please note that a separate application must be completed for each individual lot to be tested.

The applicant or his authorized agent is responsible for preparing the observation test probe excavations and performing the percolation tests. The site testing must be performed in accordance with MCHD requirements which shall be sent to the applicant upon scheduling a site evaluation. An appropriate agent of the MCHD must be present for **ALL** site testing.

A PA ONE CALL System serial number must be obtained by the applicant, authorized agent or contractor performing the excavation. This number must be obtained no less than three and no more than ten working days prior to the scheduled observation test probes, and given to MCHD 24 hours prior to the scheduled appointment.

Upon completion of a satisfactory site evaluation, the applicant may submit a design of the proposed sewage system (which shall be completed by a competent designer) for MCHD review.

SITE EVALUATION PREPARATION

A site evaluation is conducted as part of the procedure for determining suitability for the on-lot disposal of sewage. The evaluation is conducted in two (2) phases; observation test probes and percolation testing. Observation test probes are conducted to determine the capability of the soil to effectively renovate sewage effluent prior to it entering the groundwater. The probes are excavated adjacent to the proposed absorption area and evaluated to determine the present of a limiting zone. A limiting zone is a condition of the soil which affects its renovative capability and may include seasonal high water table, bedrock, open jointed or fractured rock, or insufficient soil fines.

Percolation testing is conducted to determine the rate at which sewage effluent can be expected to seep into the soil. This rate and the anticipated sewage flow of the structure are calculated to provide minimum absorption area size requirements.

The following instructions are provided for the applicant to prepare the site in a manner consistent with Montgomery County Health Department (MCHD) Operational Procedures. MCHD STRONGLY RECOMMENDS A COMPETENT SEWAGE FACILITIES CONSULTANT BE RETAINED TO ASSIST THE APPLICANT WITH THE SITE EVALUATION.

A. OBSERVATION TEST PROBES

1) A Pennsylvania One Call System Serial Number must be obtained 3 to 10 days prior to the Sewage Enforcement Officer (SEO) witnessing the test probes. This serial number should be obtained by the excavator and must be given to MCHD at least 24 hours prior to the scheduled test probes.

2) A minimum of two (2) test probes shall be excavated with a backhoe at opposite ends of the proposed absorption area. Both the upslope and downslope probes shall be within ten (10) feet of the perimeter of the proposed absorption are.

3) The excavation shall be to the depth of the limiting zone or a maximum of eight (8) feet where no limiting zone is encountered. Access steps or a ramp must be provided at one end of the test probe.

4) All test probes shall be evaluated by a MCHD SEO with a written profile report provided to the applicant/authorized agent.

5) MCHD requires the backhoe be on-site at the time of the evaluation in the event that further test probes are required.

6) All observation test probe excavations shall be backfilled within five (5) days of the SEO's evaluations.

B. PERCOLATION TESTING

1) The applicant/authorized agent shall submit a scalar pre-percolation test plot plan containing the following items:

a) Percolation test area showing all test holes
b) Depth of all percolation test holes
c) Precise property lines
d) Lot dimensions

e) Location of applicant well(s) and neighboring well(s) within 100 feet or public water lines within 10 feet of the proposed absorption area
f) All observation test probes and limiting zones
g) Percentage and direction of slope
h) Reference to north.
i) Location and size of existing septic system (if applicable)
j) Location of all streams, lakes or other surface waters within fifty (50) feet of the proposed absorption area on the applicant property or on any adjacent property

2) All percolation holes must be located in the proposed absorption area for all system types.

3) A minimum of six (6) percolation test holes (6 – 10 inches diameter) shall be dug on contour and uniformly spaced over the proposed absorption area.

4) The inside of each hole shall be scarified with a sharp instrument to remove any smeared soil surfaces and filled with two (2) inches of coarse sand or fine gravel.

5) The initial presoak shall be conducted 8 to 24 hours prior to the percolation test, at which time a minimum of 12 inches of water shall be placed in all holes and left undisturbed.

6) The final presoak shall be conducted 60 minutes prior to the percolation test. A minimum of 6 inches of water shall be placed in all holes and a fixed point of reference shall be recorded from the stationary float. The water level shall be readjusted to this point every 30 minutes for 1 hour.

7) A measurement shall be taken at the end of the hour and the following time intervals shall be used to read each test hole:

a) Water remaining in hole: 30 minute interval readings
b) No water remaining in hole: 10 minute interval readings

8) The water shall be readjusted to the fixed reference point (approximately 6 inches over the gravel) after each reading.

9) The test readings for each individual test hole shall continue until a stabilized rate is obtained or a minimum of 8 readings has been completed. A stabilized rate is obtained when there is a ¼ inch or less difference between the highest and lowest of four consecutive readings.

10) The drop that occurs in the final period for each individual hole, expressed as minutes per inch, shall be used to calculate the arithmetic average percolation rate.

Upon completion of satisfactory test probes and percolation test, the applicant/authorized agent may submit a complete Application for An On-Lot Sewage Disposal System Permit and design based on the site evaluation for MCHD review. Proposed subdivisions must receive final approval from the Pennsylvania Department of Environmental Protection prior to issuance of an on-lot sewage disposal system permit.

MONTGOMERY COUNTY HEALTH DEPARTMENT

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AGENT AUTHORIZATION

_____, 20_____ Application No. _____

I, We, _____ owner(s) of the real property located in the

Township of _____, County of Montgomery and Commonwealth of

Pennsylvania more specifically described as follows:

_____

_____

do hereby authorize, empower and appoint _____ as my lawful agent exclusively and specifically with reference to acquisition of a **PERMIT FOR INSTALLATION OF AN ON-LOT SEWAGE DISPOSAL SYSTEM(S)** on the property described above. My agent herein named is authorized to file applications, conduct tests, attend meetings, receive notices and to do any and all other acts necessary for the permitting of said system(s). My agent is specifically authorized, in my absence, to receive the notice required by 35 P.S. 750.7 et. seq.

IN WITNESS WHEREOF, I, WE, hereunto place our hand(s) and seal(s).

_____ _____

Signature/Property Owner Agent Signature

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF _____

On the _____ day of _____, A.D., 20____, before me, the undersigned Officer, personally appeared known to (satisfactorily proven) be the person(s) whose name(s) subscribed to the within instrument, and acknowledged that he/she executed the same for the purposes therein contained.

Witness my hand and Notarial Seal, the day and year aforesaid.

THIS FORM MUST BE NOTARIZED
AND HAVE A COMPLETE ACKNOWLEDGMENT
IF AN AGENT IS APPOINTED

Form: Agent Authorization

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SITE EVALUATION
OBSERVATION TEST PROBE APPLICATION

Sewage Application No. _____

Name of Applicant _____ Telephone Number _____

Address of Applicant _____ Zip Code _____

Site Address _____ Subdivision Name _____

Municipality _____ County _____

Tax Parcel No. (12 Digits) _____ Block No. _____ Unit No. _____

Signature/Property Owner _____ Signature/Property Owner _____

Name of Agent _____ Telephone Number _____

RESIDENTIAL __ COMMERICIAL __ REPAIR __ RELOCATION __ COMMUNITY __

Estimate Flow: _____ gallons/day

Location of site (draw map or provide clear narrative directions)

All of the above information is to be supplied by the applicant. At the time you complete this form, also complete Part I of the Application for Sewage Disposal so that the same information is supplied on both forms. Return ONLY this form with the appropriate Fee. The Application for Sewage Disposal must be submitted with all test results and the system design.

Form: Probe Application

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SITE EVALUATION
PERCOLATION TEST APPLICATION

Sewage Application No. _____

Name of Applicant | Telephone Number

Address of Applicant | Zip Code

Site Address | Subdivision Name

Municipality | County

Tax Parcel No. (12 Digits) | Block No. _____ Unit No. _____

Signature/Property Owner | Signature/Property Owner

Name of Agent | Telephone Number

RESIDENTIAL __ COMMERICIAL __ REPAIR __ RELOCATION __ COMMUNITY __

Estimate Flow: _____ gallons/day

Location of site (draw map or provide clear narrative directions)

All of the above information is to be supplied by the applicant. At the time you complete this form, also complete Part I of the Application for Sewage Disposal so that the same information is supplied on both forms. Return ONLY this form with the appropriate Fee. The Application for Sewage Disposal must be submitted with all test results and the system design.

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DIVISION OF WATER QUALITY MANAGEMENT
ON-LOT SEWAGE DISPOSAL
FEE & PERMIT SCHEDULE
EFFECTIVE JANUARY 1, 2005

I. RESIDENTIAL & COMMERCIAL SEWAGE DISPOSAL SYSTEMS

A.	**NEW INDIVIDUAL** on-lot system or relocation of absorption area		
*	1. Site Evaluation (Test Pits)		$190.00
*	2. Site Evaluation (Perc Test)		$190.00
	3. Application review & installation inspection		$175.00/EDU
B.	**COMMUNITY** on-lot system		
*	1. Site Evaluation (Test Pits)		$190.00
	2. Site Evaluation (Perc Test)		$190.00 $115.00 for each additional EDU
	3. Application review & installation inspection		$175.00/EDU
C.	**ALTERNATE & EXPERIMENTAL** on-lot system		
*	1. Site Evaluation (Test Pits)		$190.00
*	2. Site Evaluation (Perc Test)		$190.00
	3. Application review & installation inspection		$210.00/EDU
D.	**REPAIR and/or RE-USE** of an existing on-lot system		
*	1. Application review & installation inspection	Major Minor	$90.00/EDU $20.00/EDU
	(Consult your SEO for repair policy prior to submitting an application)		
E.	**REDESIGN** of on-lot system Application Review		$90.00/EDU
F.	**TRANSFER** of Permit		$25.00
G.	**VERIFICATION** for permit exemption		$30.00

II. ON-LOT SUBDIVISION

***A.**	Site Evaluation (Test Pits)		$190.00/EDU
***B.**	Site Evaluation (Perc Test)		$190.00/EDU
C.	Plan Review & Exemptions	< Ten (10) EDUs > Ten (10) EDUs	$115.00 $115.00 + $12.00/EDU over 10

III. PUBLIC SEWER PLAN REVIEW

A.	Ten (10) EDUs & below	$115.00
B.	Above Ten (10) EDUs	$230.00

One Equivalent Dwelling Unit (EDU) corresponds to flow of 400 gallons per day (gpd). Any single-family residence located independently on an approved lot will be considered to have one (1) EDU regardless of the estimated sewage flow.

Use of the MCHD consultant requires additional fees for time and mileage.

$25.00 for Duplicate Permits.

*New fees will be required when an appointment is cancelled by an applicant/agent after MCHD arrival on-site or upon any site evaluation requiring additional appointments.

Revised 1/1/2005

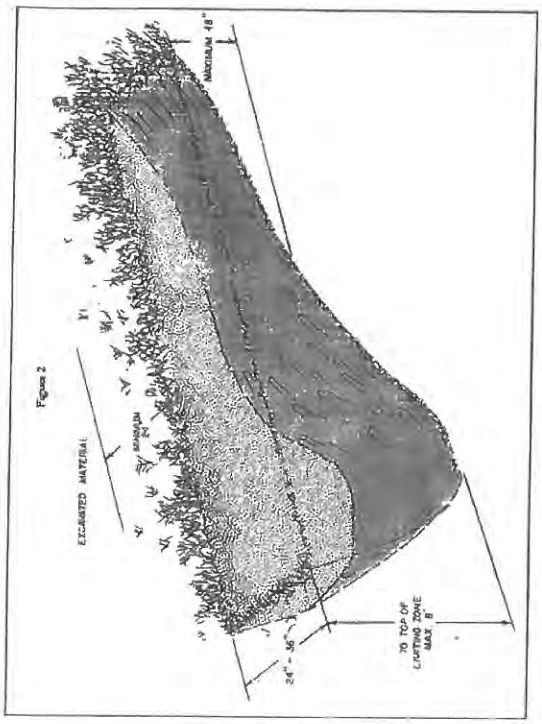
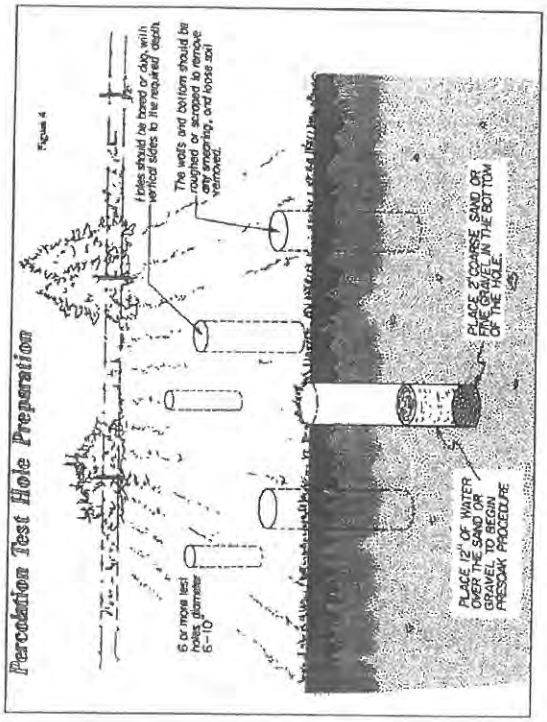


Figure 2
EXCAVATED MATERIAL
MINIMUM 48"
24" - 36"
TO TOP OF LIFTING ZONE MAX. 8'


Percolation Test Hole Preparation
Figure 4
6 or more test holes, diameter 6–10"
Holes should be bored or dug, with vertical sides to the required depth.
The walls and bottom should be roughned or scraped to remove any smearing, and loose soil removed.
PLACE 2" COARSE SAND OR FINE GRAVEL IN THE BOTTOM OF THE HOLE
PLACE 12" OF WATER OVER THE SAND OR GRAVEL, TO BEGIN PRESOAK PROCEDURE

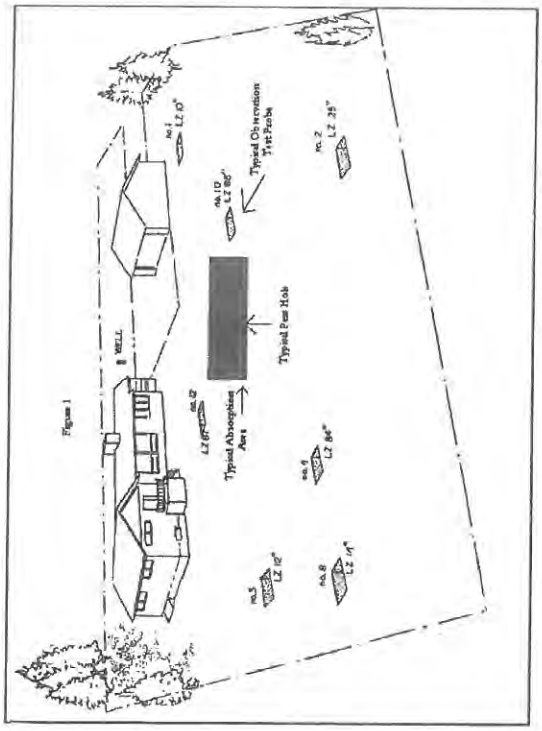


Figure 1
WELL
Typical Observation Pipe Holes
Typical Absorption Area
Typical Perc Hole

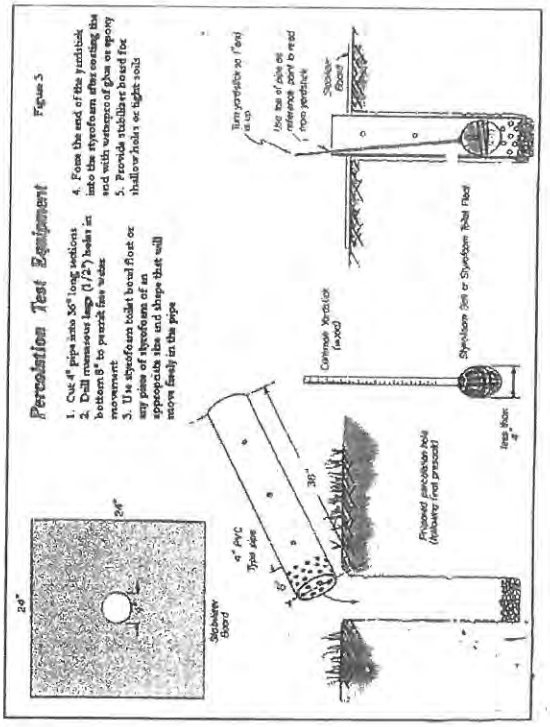

Percolation Test Equipment
Figure 3
1. Cut 4" pipe into 36" long sections
2. Drill numerous large (1/2") holes in bottom 8" to permit free water movement
3. Use styrofoam toilet bowl float or any piece of styrofoam of an appropriate size and shape that will move freely in the pipe
4. Force the end of the yardstick into the styrofoam after coating the end with waterproof glue or epoxy
5. Provide stabilizer board for shallow holes or light soils
24"
Stabilizer Board
4" PVC Test Hole
6"
30"
Proposed percolation hole (following final presoak)
Common Yardstick (wood)
Styrofoam Ball or Styrofoam Toilet Float
Stabilizer Board
Use top of hole as reference point to read from yardstick
Turn yardstick to read at top

Exhibit III-5

Approved List of Haulers

Hatfield Township, Montgomery County

Ace Disposal Corp.	1133 W. Valley Hill Rd.	Malverne, PA 19355
Allen, George C. and Son	4375 County Line Road	Colmar, PA 18915
Aqua Wastewater Services	60 Schoolhouse Road	Souderton, PA 18964
Borger Septic Tank Cleaning	RD#1, Box 1473	Saylorsburg, PA 18353
B&C Septic Service	305 Three Mile Run Rd.	Sellersville, PA 18960
Clemens Septic Service	673 Keller Creamery Road	Telford, PA 18969
D & K Disposal, Inc./John Larson	898 Gravel Pk.	Palm, PA 18070
Franc Environmental	P.O. Box 5098	New Britain, PA 18901
Free Flow	P.O. Box 98	Hatboro, PA 19040
Gary's Septic Service, Inc.	P.O. Box 333	Pipersville, PA 18947
Gray Brothers, Inc.	1696 E. Lancaster Ave.	Paoli, PA 19301
GSP Management	Box 677	Morgantown, PA 19543
Heckler, Preston	400 General Hancock Blvd.	North Wales, PA 19454
Heckman, C.F. & Son	2668 Leiscz's Bridge Road	Leesport, PA 19533
Hill, Clifford Sanitation	P.O. Box 265	Kutztown, PA 19530
Kiriposki and Sons, Inc.	5447 Blue Church Rd.	Coopersburg, PA 18036
Lansdale Borough WWTP	One Vine Street	Lansdale, PA 19446
Lower Salford Twp. Authority	P.O. Box 243	Harleysville, PA 19438
Lukens	2412 Hill Road	Sellersville, PA 18960
Montgomery Twp. Sewer Auth.	1001 Stump Road	Montgomeryville, PA 18936
Nauman, B & R Inc.	75 Pocono Heights Rd.	Tobyhanna, PA 18466
Newhart, B. and Sons	RD#3, Box 3566	Stroudsburg, PA 18360
Norbill Disposal	5610 Haring Road	Doylestown, PA 18901
Pursell Septic Tank Cleaning	1219 River Road	Upper Black Eddy, PA 18972
Roberson, Donald	3163 Bedminster Road	Ottsville, PA 18942
U.S. Environmental	409 Boot Road	Downingtown, PA 19335
Ziegler, Ron	P.O. Box 263	Pipersville, PA 18947

Exhibit IV-1

Montgomery County Comprehensive Plan
Land Use Goals

List of Vision Plan Goals

Detailed actions for each of these 48 goals are listed in the pages following this list.

Guiding Vision (page 58)

Goal 1: Support Smart Growth and Preservation Efforts both Regionally and Locally

Goal 2: Work Together to Identify and Resolve Problems and Concerns

Goal 3: Implement Plans Effectively and Cooperatively

Goal 4: Identify and Address Problems at the Most Appropriate Level – Local, Regional, Watershed, etc.

Land Use (page 60)

Goal 5: Direct Development to Designated Growth Areas

Goal 6: Enhance Older Developed Areas

Goal 7: Preserve Rural Resource Areas

Goal 8: Encourage Sound Land Use Planning and Design

Goal 9: Ensure Compatible Development in Residential Neighborhoods

Goal 10: Preserve and Create Community Identity and a Sense of Place

Open Space, Natural Features, and Cultural Resources (page 68)

Goal 11: Preserve Large Interconnected Areas of Significant Open Space

Goal 12: Protect and Manage Wetlands, Streams, Steep Slopes, Woodlands, and Natural Habitats

Goal 13: Create a Greenway System along Rivers, Creeks, and Other Sensitive Natural and Historic Features

Goal 14: Develop a Countywide Network of Interconnected Trails

Goal 15: Provide Park Facilities to Meet the Public's Recreation Needs

Goal 16: Preserve Farmland and Farming

Goal 17: Protect Scenic Roads, Vistas, and Viewsheds

Goal 18: Protect Historic Resources and Cultural Landscapes

Transportation (page 74)

Goal 19: Manage Traffic Congestion

Goal 20: Improve Transportation Safety

Goal 21: Increase Opportunities to Take Public Transit, Walk, Ride a Bike, or Other Nonautomotive Transportation Means

Goal 22: Move Goods Efficiently and Considerately

Goal 23: Maintain Air Travel as a Transportation Option

Community Facilities and Utilities (page 78)

Goal 24: Focus Public Sewer and Water Improvements in Designated Growth Areas

Goal 25: Restrict the Extension of Water and Sewer into Rural Resource Areas

Goal 26: Provide Environmentally-Safe Sewer Facilities

Goal 27: Provide Adequate Energy and Communication Utilities with as Minimal a Negative Impact as Possible

Goal 28: Provide Appropriate Solid Waste Disposal that has a Minimal Negative Impact

Goal 29: Provide High-Quality Emergency Services and Health Facilities

Goal 30: Integrate Educational and Cultural Facilities into Communities

Water Resources (page 84)

Goal 31. Provide an Adequate Supply of Water for Both Consumption and Natural Habitats

Goal 32. Protect Water Quality

Goal 33. Effectively Manage Flooding

Goal 34. Create Attractive Stormwater Facilities that Control Flooding, Recharge Groundwater, and Improve Water Quality

Economic Development (page 86)

Goal 35: Maintain the County's Diverse Economy

Goal 36: Attract and Retain Business by Maintaining a High Quality of Life

Goal 37: Create a Good Business Climate

Goal 38: Retain a Skilled Workforce for County Businesses

Goal 39: Support a Readily Available Workforce

Goal 40: Revitalize the County's Downtowns and Main Streets

Goal 41: Adaptively Reuse Vacant and Underutilized Industrial Sites

Goal 42: Redevelop Vacant and Underutilized Shopping Centers

Housing (page 91)

Goal 43: Provide Enough Homes to Meet Future Housing Demand

Goal 44: Encourage a Variety of Housing to Meet the Needs of People with Different Ages, Incomes, and Lifestyles

Goal 45: Maintain and Conserve Existing Homes and Neighborhoods

Goal 46: Promote Walkable and Well-Designed Residential Developments

Goal 47: Encourage More Units of Affordable Housing for County Residents

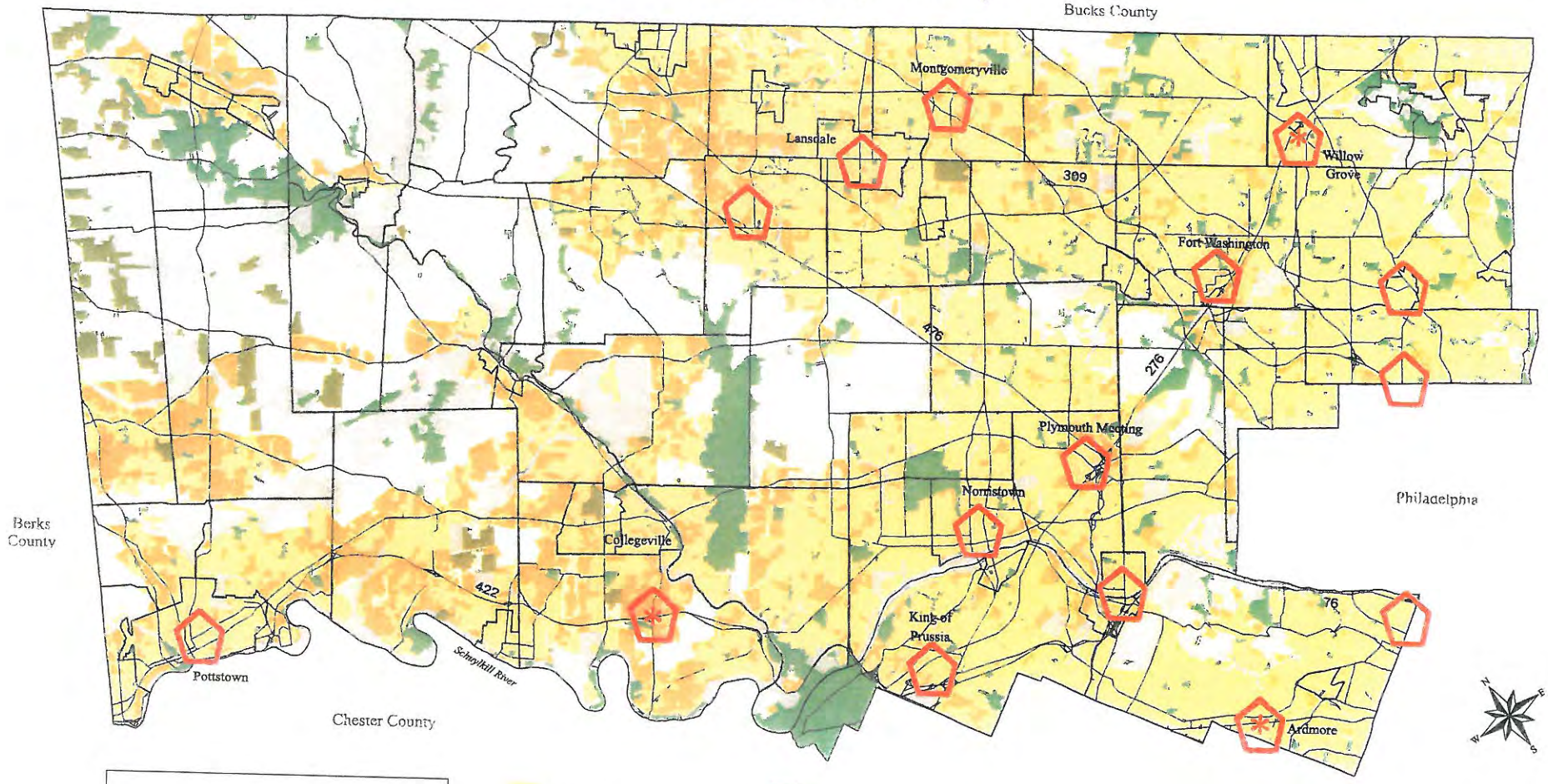
Goal 48: Support Housing for People with Special Needs

Exhibit IV-2

MC Comprehensive Plan Growth Map and Land Use Plan Summary

Hatfield Township, Montgomery County

2025 Growth and Preservation Plan - Montgomery County



The designated growth areas include approximately 35,000 acres of land. Under this plan, between 20,000 and 25,000 acres would be developed, with the remainder providing market flexibility. This acreage would provide enough room for 49,000 new homes and 77,000 new jobs.

- Existing Suburban Development
- Existing Rural Development
- Designated Growth Areas
- Major Development Center *
- Existing Preserved Open Space
- Existing Preserved Farmland
- Proposed Open Space
- Rural Resource Areas

Growth and Preservation categories valid as of 2000.

* Development centers are graphically represented by a pentagon but the size and shape of these centers will vary significantly from the pentagon, with some being fairly distinct compact concentrations of activity, others having elongated shapes along road corridors, and some being more free-form configurations encompassing portions of several municipalities. The development centers containing the asterisk, while graphically showing the pentagon symbol at a particular location, are really comprised of several somewhat separated centers of activity which together form the development center.

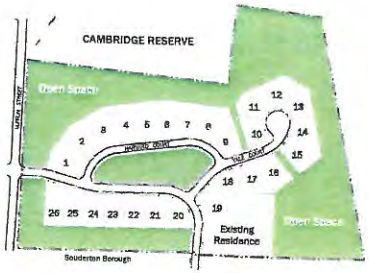
This map is based on 2000 ortho photographs, Montgomery County Board of Assessment Appeals tax maps, Municipal Officials, and field surveys conducted by the County Planning Commission. All attempts were made to maintain relative accuracy, however, this map should not be used for engineering purposes.

Amended Attachment 21-B.1
Page 186 of 537

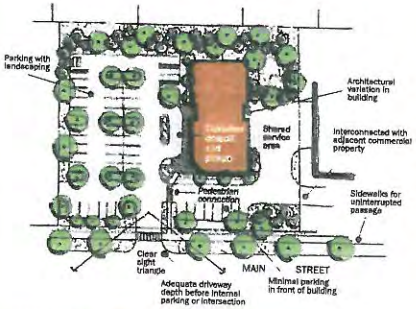
Accomplishing the Vision

To achieve the best development possible, municipalities must plan for the future by using county and local comprehensive plans as a foundation. But planning alone won't do it. This planning must be followed by innovative zoning and flexible site design. The *Land Use Plan* identifies many of these innovative methods; a few of these are described below.

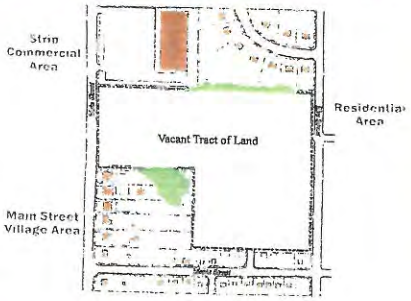
Residential cluster zoning is one innovative technique that can preserve important natural or historic features on a site. With cluster zoning, homes are placed on smaller lots so 60 percent or more of a site can be preserved as open space.



Through zoning and the plan review process, retail development can be improved with interconnected parking lots, better pedestrian access, extensive landscaping, and appropriate building design. Retail uses should be concentrated in nodes and never stripped out along roads and highways.



Another innovative zoning technique is mixed-use development. This development contains a variety of interconnected residential, commercial, institutional, and open space uses. Mixed-use development can function as a transition from intensely used areas, such as highways and retail centers, to less intense areas such as residential neighborhoods and parks.



To view this plan online visit:

www.montcopa.org/plancom/comprehensiveplan

For additional information, contact the Montgomery County Planning Commission at 610.278.3722 or mcpowebmaster@mail.montcopa.org.

Land Use Plan Summary

Shap

A Comprehensive Plan for Montgomery County

Adopted by the county commissioners in 2005

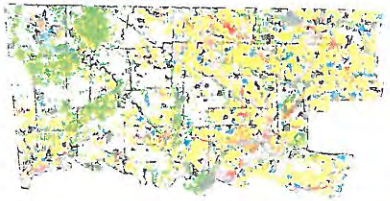
Current Trends

From 1970 to 2000, developed land in the county increased from under 32 percent of the total county area to nearly 54 percent. Over these 30 years, Montgomery County experienced rapid suburbanization and became a major employment and retail center for the region.

This growth has satisfied market demand but has too often been poorly designed, disconnected from the community, and inadequately served by existing roads and infrastructure. The cumulative impact has been a sprawling and inefficient land use pattern. If this land use pattern continues, it will consume most of our remaining open space, increase government expenses, and lead to a more fragmented landscape.

1970 Existing Land Use

2000 Existing Land Use



Vision for the Future

The county's Land Use Plan shows how new development can be accommodated in a better way that reduces sprawl, revitalizes older areas, preserves open space, and provides new housing and employment opportunities while meeting market demand.

Using the Land Use Plan as a guide, new development will be directed to logical locations. New suburban residential areas, for example, should be a logical extension of existing development and should be located near shopping, schools, and utilities.

Under the Land Use Plan, rural areas and open space would retain their unique character through the purchase of land and development rights and the use of innovative zoning.

With the Land Use Plan, new infill development will be compatible with existing developed areas, reinforcing a sense of community and place.

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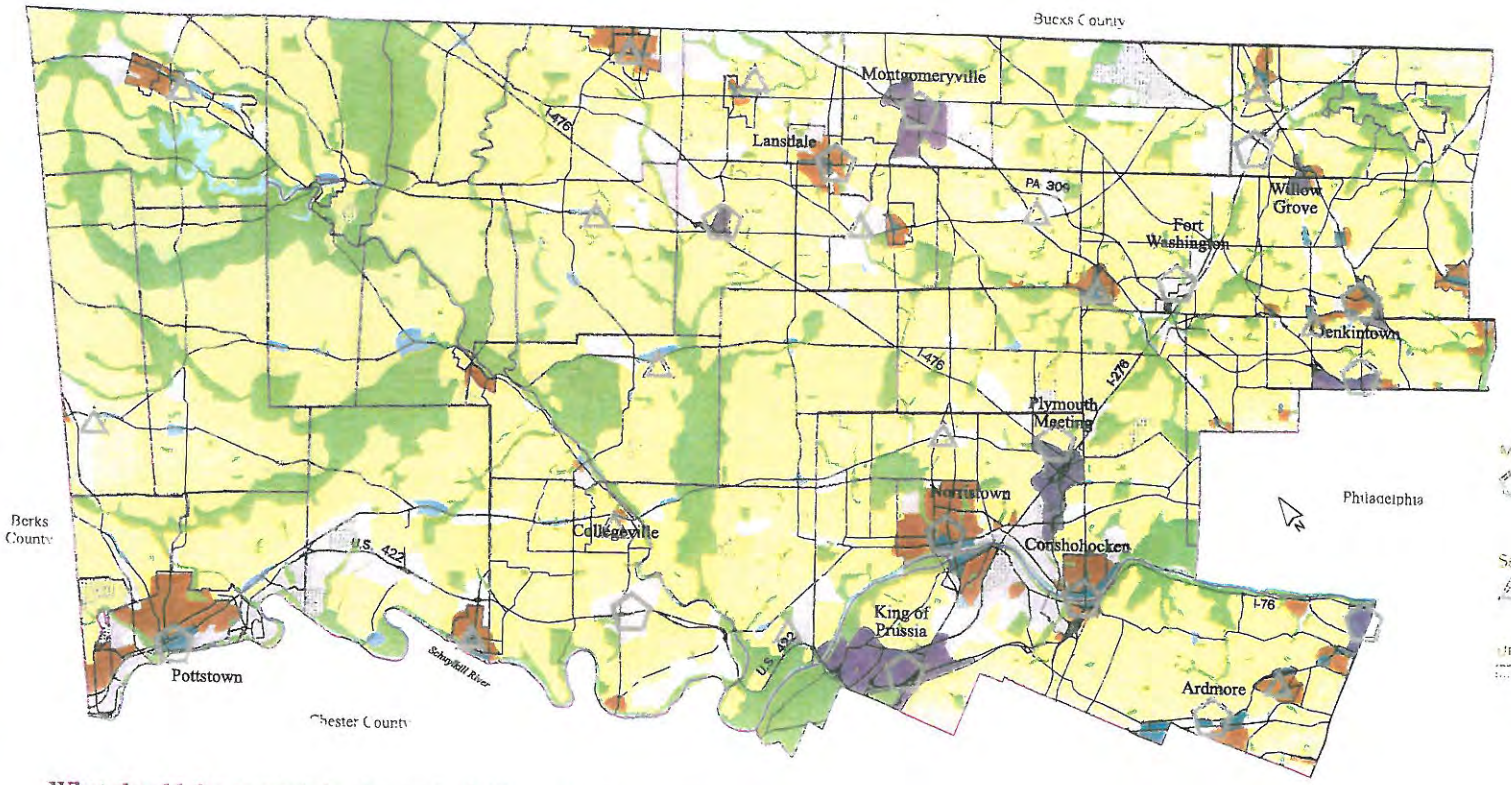

Over time, the county's landscape will evolve as many individual land use decisions are made. New development should match the overall character and intensity of the area in which it is located.

Major Development Center

Major development centers are existing regional focal points that are expected to intensify and contain a broader mix of uses over time.

Secondary Development Center

Secondary development centers are local community focal points that have a variety of uses.

Unique County-Wide Land Use

Unique county-wide land uses include airports, quarries, power plants, landfills, and similar uses. These are expected to remain in their current locations.

What should the county's landscape look like in the future? The illustrations and descriptions of land use categories shown below provide a glimpse of the future.

Suburban Center | Employment Center | Community Mixed-Use and Services | Town Center | Village Center | Town Residential Area | Suburban Residential Area | Rural Area | Open Space

Suburban Centers have a mix of major retail, employment, entertainment, and residential uses. Although designed for autos, these centers are evolving to become more walkable and transit-friendly.

Employment Centers typically contain offices, industry, and supporting uses such as limited retail or residential. They should be designed for good road access and pedestrian mobility.

Community Mixed-Use and Services have retail areas that meet local shopping needs, but also include institutional uses, offices, and homes. These areas should connect to neighborhoods and include attractive landscaping.

Town Centers have a traditional downtown mix of retail, office residential, entertainment, and institutional uses. Buildings are close to sidewalks, and store fronts contain front doors and ground-level windows.

Village Centers have a traditional village mix of residential and retail, with some offices and institutions. Small-scale buildings are historic in character, with parking to the rear.

Town Residential Areas have a mix of residential housing types, generally at a relatively high density. These areas may also contain institutional and minor commercial uses. Small-scale buildings are built near sidewalks with parking to the rear.

Suburban Residential Areas have a variety of residential housing types and densities. They may also have other supporting uses. Natural areas are preserved while homes easily accommodate cars and pedestrians.

Rural Areas have preserved farmland and woodlands. Any new development should be clustered and designed to blend into the rural landscape.

Open Space areas are generally undeveloped natural areas that should be preserved.

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Exhibit IV-3

Chapter 2, Sewage Facilities, MC Community Facilities and Utilities Vision

Sewage Facilities

This chapter does not constitute an official update of the Montgomery County Act 537 Sewage Facilities Plan of 1972, and therefore will not supercede any municipal sewage facilities planning undertaken since that time. Instead, this chapter will provide background information on sewage facilities planning, review the status of public and private sewage facilities within the county, and provide policies for ongoing sewage facilities planning.

Sewage facilities are one of the most important and expensive public services that a community provides for the health of its residents and the protection of the environment. All developments rely on some type of sewage facilities, such as an individual on-lot septic system or a public sewage treatment system. These facilities ensure that domestic waste is properly collected, treated and disposed. However, if not operated and maintained properly, negative health and water quality impacts can result.

All developments rely on some type of sewage facility.

Existing Conditions

The first half of this chapter provides background information on sewage facilities options and briefly describes the roles of the various agencies involved in the planning and permitting processes of sewage facilities. In addition, it attempts to summarize the status of sewage facilities within Montgomery County—from the large, centralized public systems to the individual on-lot septic systems serving one home.

History and the Regulatory Environment

The planning, permitting, construction, and operation of wastewater facilities is regulated by numerous federal, regional, state, and local requirements. The most significant federal legislation pertaining to water quality issues of wastewater is the Clean Water Act. The various titles of the Clean Water Act establish procedures for federal assistance for public wastewater facilities, establish effluent limitations for dischargers, require states to set water quality standards for all streams, and establish the National Pollution Discharge Elimination System (NPDES) program. Section 208 of Title II directs the

states to develop areawide wastewater management plans for areas identified as having water quality problems. In 1980, the Delaware Valley Regional Planning Commission completed such a plan for southeastern Pennsylvania titled *COWAMP/208; Water Quality Management Plan, Southeastern Pennsylvania.*

The Pennsylvania Sewage Facilities Act (Act 537) became law in 1966 (revised in 1974) and became one of the first statewide laws to govern sewage facilities planning. This Act requires municipalities to develop and implement Official Sewage Facilities Plans to ensure adequate sewage service for existing needs and new growth. The Act established an on-lot system permitting program and standards for on-lot sewage disposal systems. These regulations also established the planning module process for revising the Official Sewage Facilities Plans. Regulations written to implement the Act took effect in 1972.

Additionally, Chapters 71, 72, and 73 of the Pennsylvania Code describe the regulations required to administer the sewage facilities planning program and provide standards for sewage disposal systems.

There are a number of groups that exercise separate, but closely interrelated, roles concerning wastewater management within Montgomery County. Municipal sewer authorities and local sewer departments are mainly responsible for the daily operation and maintenance of the public sewage treatment plants and conveyance facilities. Municipal governing bodies are charged with developing official sewage facilities plans, adopting the plans, and implementing the recommendations of the plans. A number of regulatory agencies also play a role in the overall sewage facilities treatment process:

- The Department of Environmental Protection (DEP) and the Delaware River Basin Commission (DRBC) each exercise oversight responsibilities and set water quality objectives. Specifically, DEP reviews and approves official sewage facilities plans and revisions, awards planning grants for official plan development, trains and certifies local sewage enforcement officers, and provides technical assistance. DEP also administers the National Pollutant Discharge Elimination System (NPDES) program and other aspects of the Clean Water Act.
- The Montgomery County Planning Commission fills an advisory role in reviewing revisions and

Purposes of Official Sewage Facilities Plans:

- ***To provide for the safe and efficient collection, treatment and disposal of existing and future sewage flows generated within the service area.***
- ***To protect the health safety and welfare of citizens.***
- ***To prevent future sewage disposal problems.***
- ***To provide protection for both the groundwater and surface waters of the Commonwealth.***

amendments to municipal official sewage facilities plans and planning module applications for individual developments.

- The Montgomery County Health Department oversees the bulk of the on-lot sewage system program, including conducting site evaluations, issuing permits, and conducting inspections. They also review municipal official Act 537 plans and planning module submissions for on-lot sewage systems.

The Montgomery County Official Sewage Facilities Plan was the first attempt at a coordinated document for long-range sewage planning in Montgomery County. It was adopted in 1972 and updated in 1978. This plan was adopted by 60 of the 62 county municipalities and served as their official sewage facilities plan. Since that time, most Montgomery County municipalities have written their own official plans and updated them periodically through the planning module and plan revision

1972 Montgomery County Official Sewage Facilities Plan:

- ***Provided a status report on disposition of sewage treatment plants existing at that time.***
- ***Made recommendations on future development of public sewers.***
- ***Identified on-lot sewage disposal problem areas.***
- ***Was adopted by 60 of 62 municipalities as their own official plan.***

Figure 1
1972 Montgomery County Offical Sewage Facilities Plan

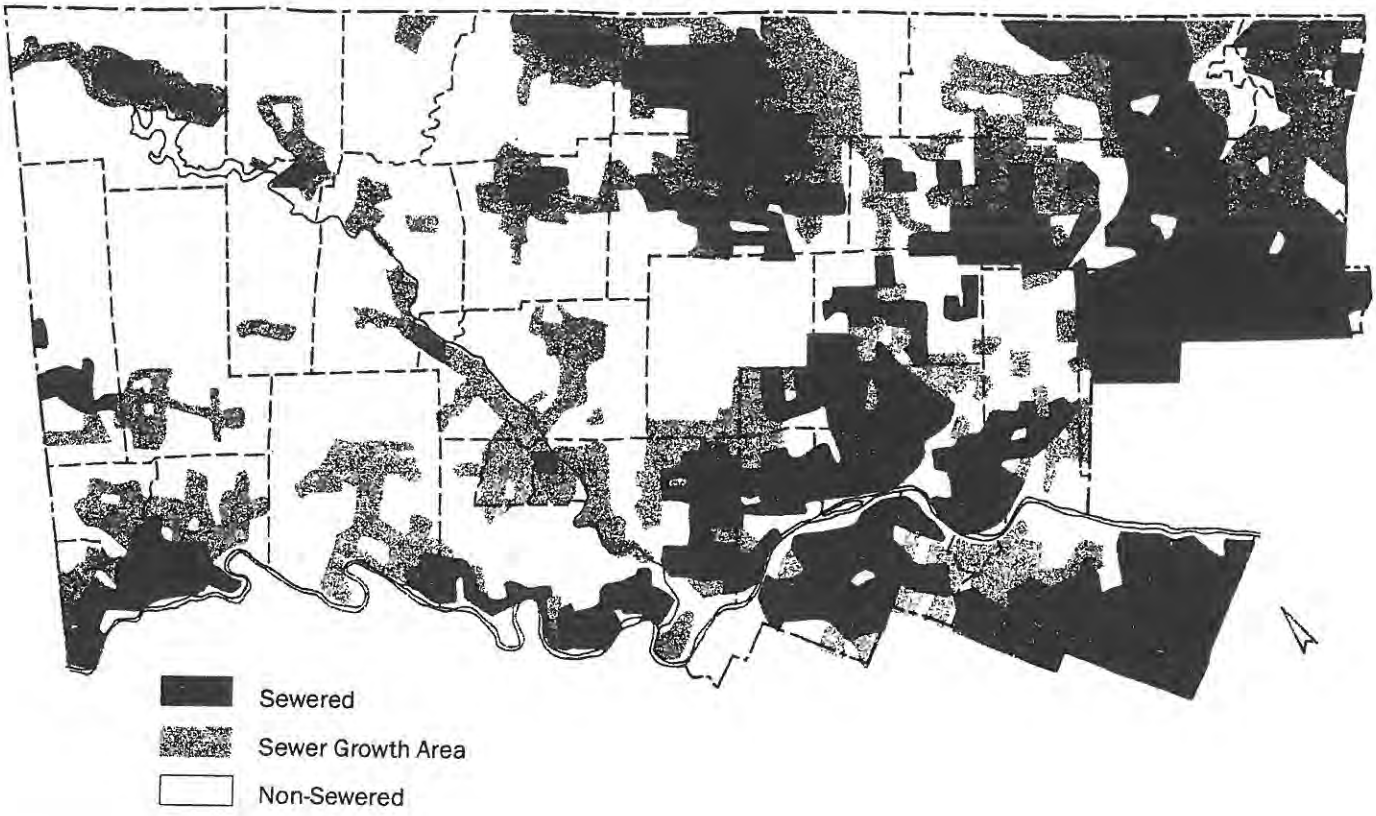


Figure 2
Act 537 Plan Dates–Municipal Official Sewage Facility Plans

Municipal Official Plan				Montgomery County Plan or Other
Municipality	Year	Municipality	Year	Municipality
Abington Township	(1999)	Perkiomen Township	(1998)	Ambler Borough
Bryn Athyn Borough	(1998)	Plymouth Township	(1994)	Bridgeport Borough
Collegeville Borough	(1986, 1997 submittal)	Pottstown Borough	(1995)	Cheltenham Township
Conshohocken Borough	(1997)	Red Hill Borough	(1984)	Green Lane Borough (1974 201 Study)
Douglass Township	(2002)	Royersford Borough	(1987)	Jenkintown Borough
East Greenville Borough	(1984)	Schwenksville Borough	(1998)	Marlborough Township
East Norriton Township	(1994)	Skippack Township	(2003)	Narberth Borough
Franconia Township	(1988, 2003 submittal)	Souderton Borough	(1988)	Norristown Borough
Hatboro Borough	(1998)	Telford Borough	(1990, 1999 submittal)	Rockledge Borough
Hatfield Borough	(1988)	Towamencin Township	(1997)	Salford Township (1978 201 Study)
Hatfield Township	(1987)	Trappe Borough	(1986, 1997 submittal)	Springfield Township
Horsham Township	(2002)	Upper Dublin Township	(1998)	Upper Salford Township (1978 201 Study)
Lansdale Borough	(1996)	Upper Frederick Township	(2000)	
Limerick Township	(2001)	Upper Gwynedd Township	(1990, 2001 submittal)	
Lower Frederick Township	(2002)	Upper Hanover Township	(2002)	
Lower Gwynedd Township	(1982, 2001 submittal)	Upper Merion Township	(1991)	
Lower Merion Township	(1998)	Upper Moreland Township	(1998)	
Lower Moreland Township	(2003)	Upper Pottsgrove Township	(2002)	
Lower Pottsgrove Township	(2000)	Upper Providence Township	(2000)	
Lower Providence Township	(2003)	West Conshohocken Borough	(1997)	
Lower Salford Township	(2001)	West Norriton Township	(1991)	
Montgomery Township	(2003)	West Pottsgrove Township	(1991)	
New Hanover Township	(2003)	Whitemarsh Township	(2000)	
North Wales Borough	(1985)	Whitpain Township	(2000)	
Pennsburg Borough	(1984)	Worcester Township	(2003)	

Note (0000) = Date approved by DEP

processes. However, a few municipalities still fall under the jurisdiction of the 1972/1978 Montgomery County Official Sewage Facilities Plan.

Municipal official Act 537 Plans are just one tool used by local officials to determine where development is located and the type of development permitted. Municipal zoning ordinances and comprehensive plans are the other critical elements in determining the pace of growth. Coordination between municipal zoning ordinances, land use policies found within municipal comprehensive plans, and sewage facilities planning ensures that development is directed in an orderly fashion and not solely based upon market factors.

Description of Existing Sewage Facilities

In the past, large municipally owned sewage treatment plants and public sewer conveyance systems have been constructed to service new development, address on-lot problem areas, and

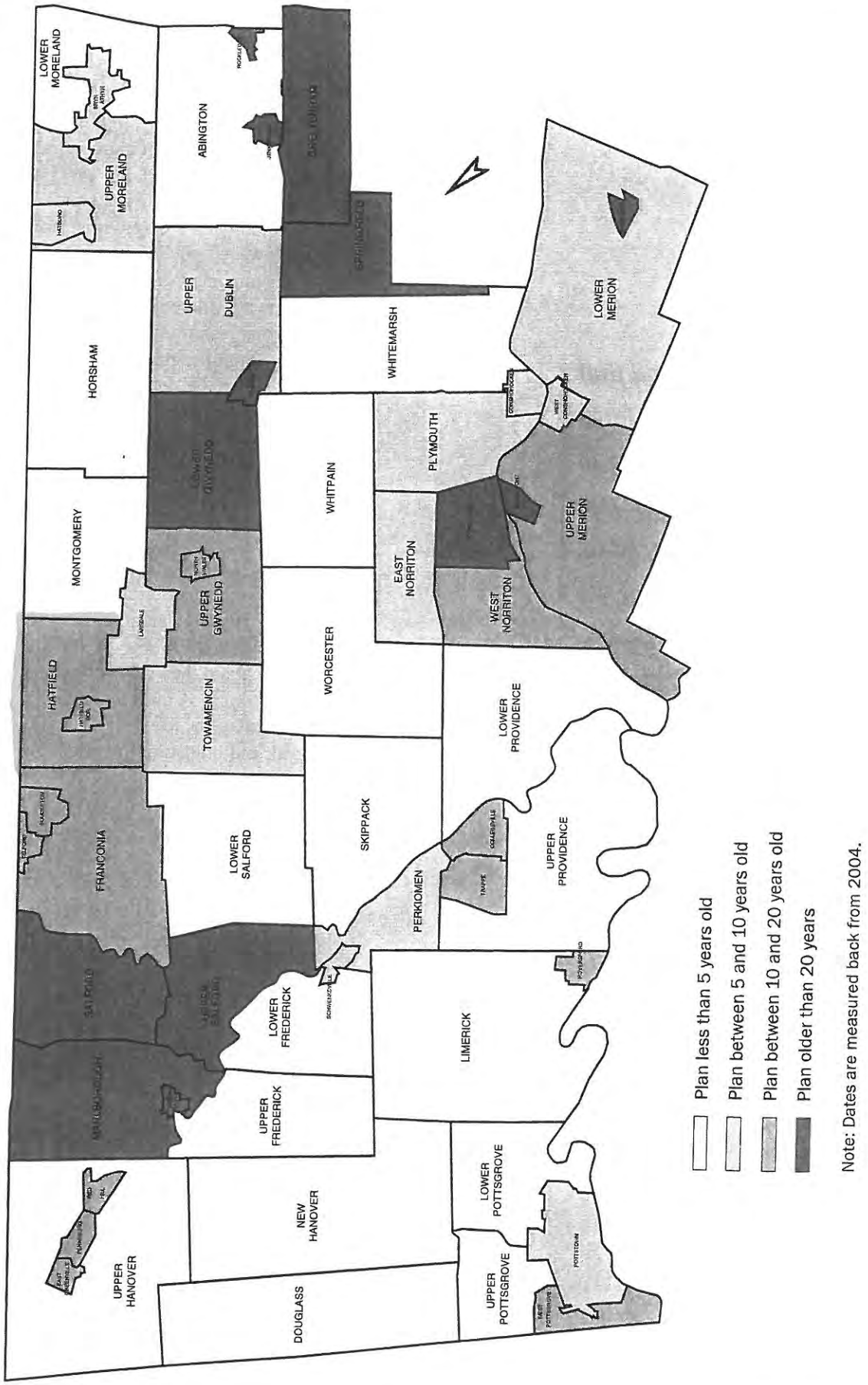


Figure 3
Age of Municipal Act 537 Offical Plan
Montgomery County

meet the regulations of Act 537. In addition to these systems, various forms of on-lot sewage disposal systems and a few package treatment plants have become an integral part of many municipal official sewage facility plans. Yet, not every municipality within Montgomery County operates a sewage treatment facility or even provides access to public sewers. However, public sewage facilities are an important component of the overall infrastructure necessary to accommodate growth while protecting environmental resources.

Today, it is estimated that 88% of all county residents are served by some form of centralized collection and treatment system, while approximately 60% of the county land area has access to public sewers.

Sewage facilities have changed dramatically since 1904 when the first sewage collection system was constructed in Montgomery County by Lower Merion Township - with treatment provided by the Southwest Philadelphia Sewer Plant.

Since the adoption of the Montgomery County Official Sewage Facilities Plan in 1972 and its update in 1978, the Montgomery County Planning Commission has periodically published status reports on the disposition of sewage facilities within the county. This document, *Sewage Facilities Inventory*, summarizes sewage facilities trends and information about the various treatment plants within the county. A map accompanies the inventory, delineating the location of municipal, non-municipal, and industrial treatment plants, as well as pump stations and sewer lines. The most recent inventory report was completed in 1998.

There are currently 41 municipally owned and operated treatment plants within Montgomery County. The most recent plant, Limerick Township's Possum Hollow Sewage Treatment Plant, was completed in 2003. Portions of eastern Montgomery County continue to be served by Philadelphia's sewage treatment system. In some cases, several municipalities are entirely served by one or more treatment facility. In other cases, the municipal system only serves a small portion of the municipality.

Montgomery County is diverse. It contains urban, developing, and rural areas. Historically, development has occurred in the east and spread westward across Montgomery County. The municipally owned sewage facilities in the eastern part of the county seem to be most often concerned with operation and maintenance activities. The western part of the North Penn Area and the Route 113, the Route 422, and Route 100 corridors currently appear to be experiencing the most

development pressure. Many of the sewage facilities in these areas are planning upgrades and expansions to deal with the new development. Rural areas are interspersed between the North Penn Area and the northern and western borders of the county. Most municipalities in these western communities are also anticipating some growth. Some are taking steps to upgrade, expand, or build new facilities. However, a few municipalities have taken a bold position and are holding firm to their limited or complete lack of public sewage systems as a growth management tool.

In the 1998 *Sewage Facilities Inventory,* seven sewage planning areas were developed based on similarities regarding sewage facilities (i.e., shared service areas to a plant) and development characteristics (rural, urban, suburban). However, for this plan it was decided that discussions and evaluations of sewage facilities planning should be more consistent with the planning regions described in the *Land Use Plan.* The following map and table depict the various public sewage facilities found within the twelve Montgomery County regional planning areas.

Nonmunicipal Plants

There are approximately 27 nonmunicipal, nonindustrial waste treatment plants operating in the county. These plants accommodate a wide variety of uses including apartment complexes, military installations, hospitals, nursing homes, mobile home parks, campsites, commercial establishments, schools, residential subdivisions, and a correctional institution. These privately owned facilities are often not well coordinated with nearby municipal systems.

Interestingly, there were 35 nonmunicipal treatment plants in the county in 1972 when the first County Sewage Facilities Plan was written. The decrease in the number of non-municipal treatment plants fulfills one of the stated goals of the original Montgomery County Sewage Facilities Plan (1972/1978). Although this update to the County Sewage Facilities Plan does not specifically recommend the elimination of specific treatment plants, their closure or connection to public systems would reduce the number of stream dischargers within the county, which is a stated goal. We do recommend that where these private facilities will continue to exist, that they be properly operated and maintained.

In addition, many industrial properties in the county have specialized sewage treatment facilities.

According to the Montgomery County Health Department (MCHD), there are approximately 30,000 on-lot septic systems in Montgomery County serving the needs of approximately 91,000 users (which represents approximately 12% of the county population).

Figure 4
MONTGOMERY COUNTY MUNICIPAL SEWAGE TREATMENT PLANTS BY REGION

Sewage Treatment Plants by Region			
Planning Region	Municipalities	STPs Serving the Region	Comments
Upper Perkiomen	Marlborough, Upper Hanover, Red Hill, East Greenville, Pennsburg, Green Lane.	Green-Lane Marlborough STP, Upper Hanover STP, Upper Montgomery (UMJA) STP.	
Indian Valley	Lower Salford, Upper Salford, Franconia, Salford, Souderton, Telford.	Lower Salford-Harleysville STP, Lower Salford-Mainland STP Souderton Borough STP, Telford Borough STP, Upper Gwynedd-Towamencin STP, Hatfield Township STP.	Salford and Upper Salford Townships are not served by public sewers. Lower Salford Township contains another public STP (Indian Hills). It is a package type plant that currently only serves one residential development.
Pottstown Area	New Hanover, Douglass, Upper Pottsgrove, Lower Pottsgrove, West Pottsgrove, Pottstown.	New Hanover Township STP, Berks-Montgomery (BMMA) STP, Pottstown Borough STP.	A new municipal treatment plant was constructed in New Hanover Township in 2002. It replaces the old plant and spray discharge fields. The new plant has a stream discharge to Swamp Creek.
Central Perkiomen Valley	Skippack, Perkiomen, Lower Frederick, Upper Frederick, Trappe, Collegeville, Schwenksville.	LPVRSA-Oaks STP, Lower Frederick Township STP, Upper Frederick Township STP, Schwenksville Borough STP.	
Spring-Ford Area	Lower Providence, Royersford, Limerick.	LPVRSA-Oaks STP, Royersford Borough STP, Limerick-King Road STP, Limerick-Possum Hollow STP.	Limerick Township finished completion of a second STP (Possum Hollow) in 2003, rated at 0.700 MGD. It is expected to be on-line by the end of 2003.
North Penn	Montgomery, Hatfield Township, Upper Gwynedd, Towamencin, Hatfield Borough, Lansdale, North Wales.	Montgomery-Eureka STP, Hatfield Township STP, Upper Gwynedd Township STP, Upper Gwynedd-Towamencin STP, Lansdale Borough STP, North Wales Borough STP.	
Norristown Area	Norristown, East Norriton, West Norriton, Worcester, Upper Providence.	Norristown Borough STP, ENPW JSA STP, Upper Gwynedd Township STP, Upper Gwynedd-Towamencin STP, Worcester-Berwick Place STP, Worcester-Valley Green STP, Royersford Borough STP, LPVRSA-Oaks STP.	One small drainage area to the Norristown plant contains combined sewers. The Berwick Place STP primarily serves properties in the Fairview Village area of Worcester while the Valley Green STP serves properties in Center Point Village.
Main Line-King of Prussia	Lower Merion, Upper Merion, Narberth, West Conshohocken, Bridgeport.	Upper Merion-Matsunk STP, Upper Merion-Trout Run STP, Conshohocken Borough STP, Bridgeport Borough STP, Philadelphia WWTC.	Upper Merion Township can shift flows between the two plants through the Abrams Run Pump Station.
Horsham-Willow Grove	Horsham, Upper Moreland, Lower Moreland, Hatboro, Bryn Athyn.	Horsham-Park Creek STP, Upper Moreland-Hatboro JSA STP, Lower Moreland-Chapel Hill STP, Bryn Athyn-Mason's Mill STP, Abington-Sandy Run STP, Philadelphia WWTC.	Bryn Athyn Borough is planning to purchase a second plant (Academy of the New Church) to service some failing on-lot systems in the southeast corner of the borough.
Ambler Area	Upper Dublin, Lower Gwynedd, Whitpain, Ambler.	Upper Dublin/BCWSA STP, ENPWJSA STP, Ambler Borough STP, Upper Gwynedd Township STP, Whitemarsh Township STP.	The Upper Dublin STP was recently purchased by the Bucks County Sewer & Water Authority - the first privately held municipal plant in the county serving several developments.
Conshohocken-Plymouth Meeting	Whitemarsh, Plymouth, Conshohocken.	Whitemarsh Township WWTC, ENPWJSA STP, Conshohocken Borough STP, Ambler Borough STP.	
Eastern Montgomery County	Abington, Cheltenham, Springfield, Jenkintown, Rockledge.	Abington-Sandy Run STP, Philadelphia WWTC.	

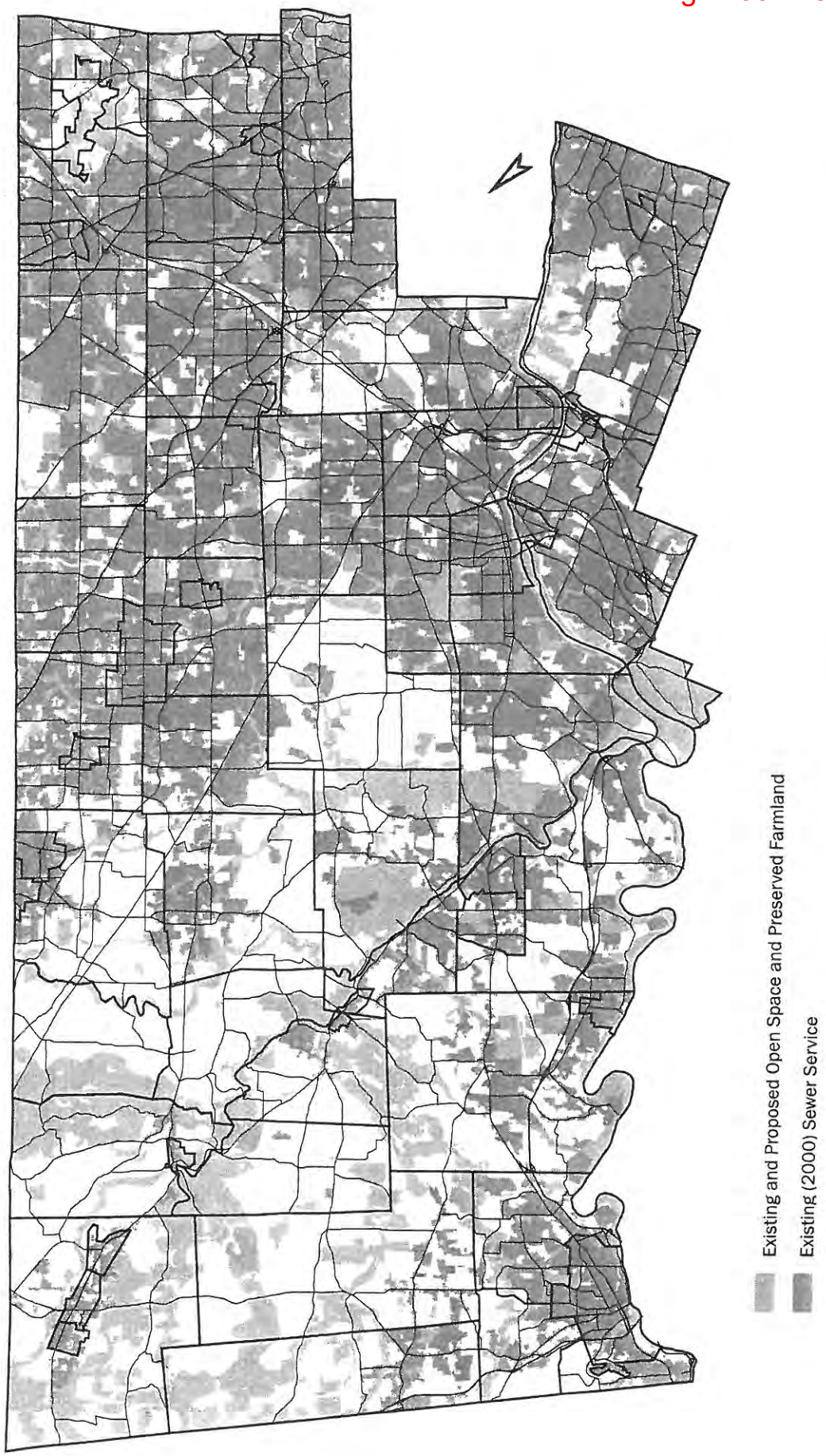


Figure 5
MONTGOMERY COUNTY EXISTING SEWER SERVICE AREAS

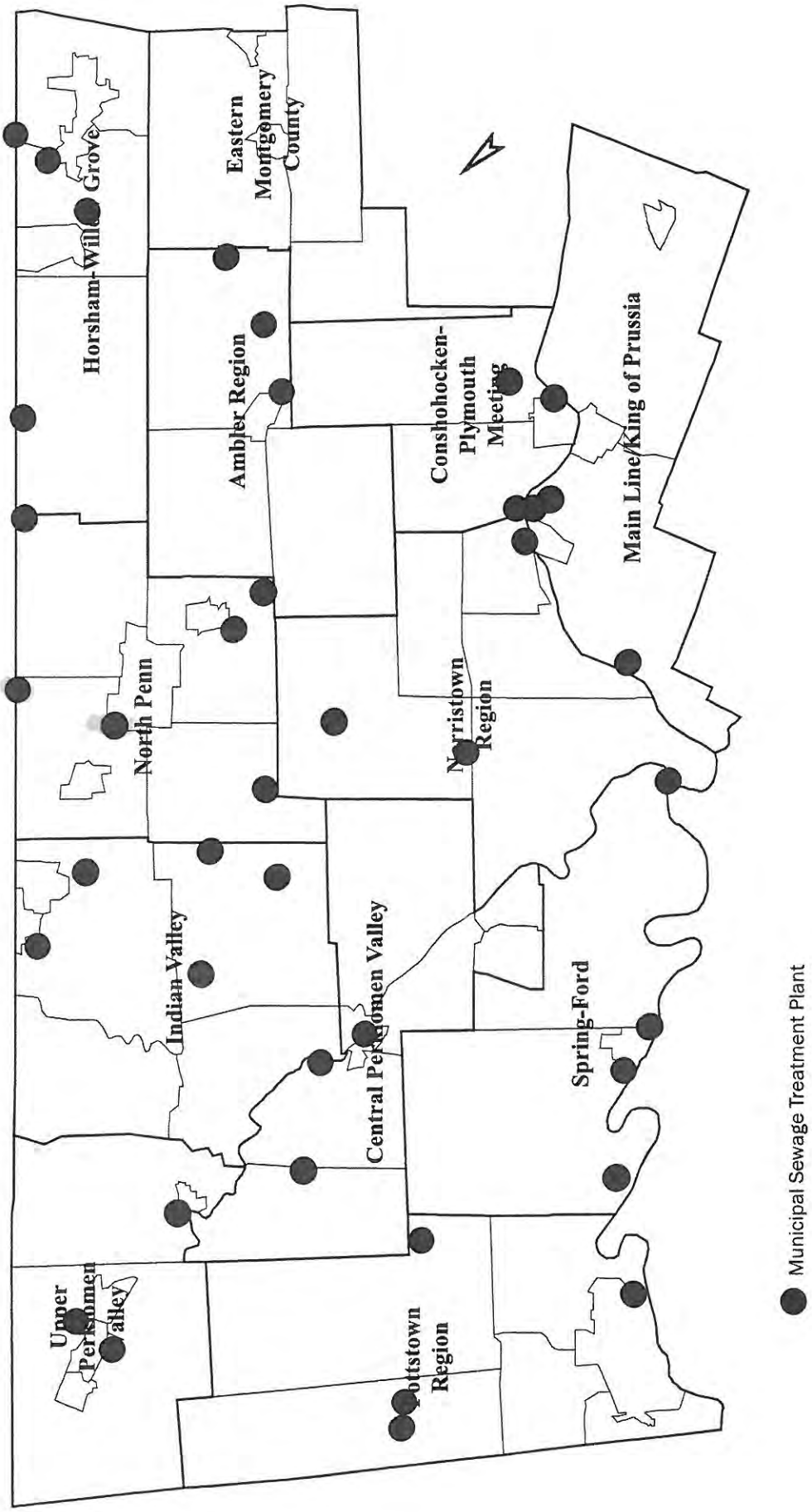
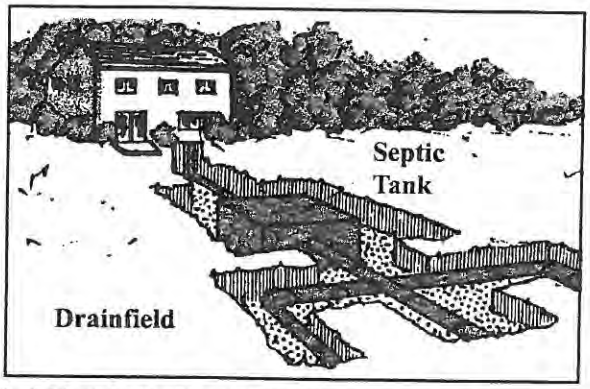


Figure 6
Montgomery County Municipal Sewage Treatment Plants by Region

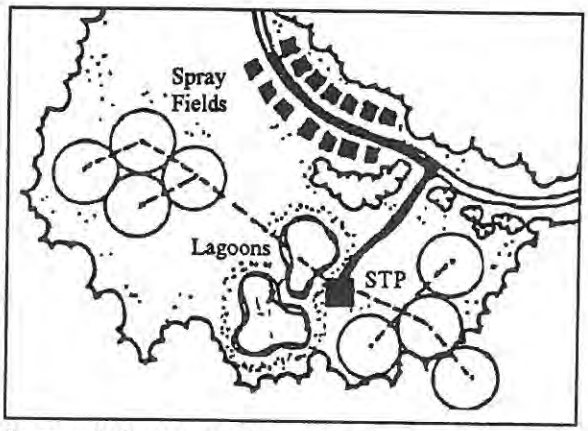
On-Lot Sewage Facilities within the County

Many of Pennsylvania's and Montgomery County's rural areas rely on on-lot wastewater systems. On-lot systems are sewage systems on the property of the homeowner that treat and dispose of domestic waste through natural processes. Approximately one-third of Pennsylvania residents depend on on-lot septic systems to treat their sewage (PADEP Fact Sheet, 1998). The majority of these systems are installed in rural and semi-rural areas because of the isolation of the property they serve or because of the lack of available public sewerage.

A few Montgomery County municipalities, such as Salford and Upper Salford Townships, do not contain any public sewage systems at all. These municipalities rely solely on community and individual on-lot sewage disposal systems to meet the needs of their residents.



Individual On-Lot System: collects, treats, and disposes of sewage generated by a single residetial unit.



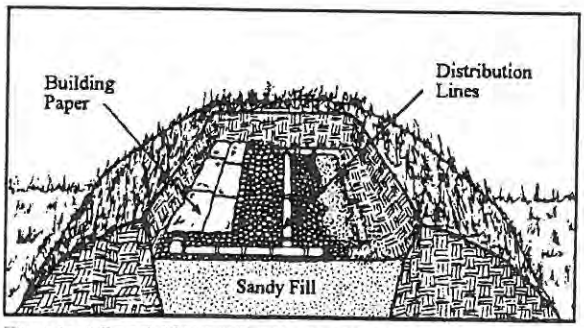
Community System: collects and treats sewage from several residential units; usually located on the site.

Sewage Facilities Choices/New Technology

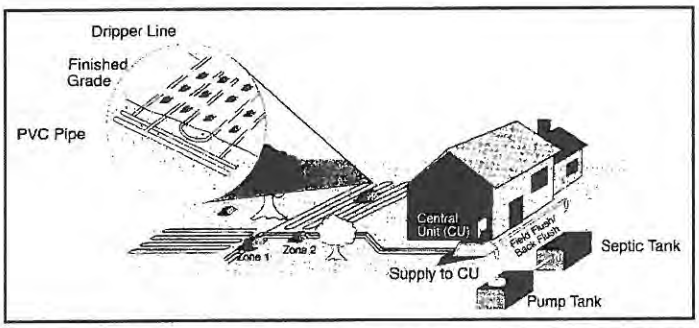
Sewage facilities planning options have expanded beyond the conventional septic system and municipal sewage treatment facility. Development is occurring in areas previously inaccessible to sewage facilities with the aid of new treatment technology. Individual on-lot and community systems are being proposed where there are no public sewers or excess capacity is unavailable. Municipalities reviewing sewage facilities proposals are looking at alternatives considered to be experimental a few years ago.

Proper sewage facilities planning involves a systematic comparison of all feasible alternatives for wastewater collection, conveyance, treatment, and disposal. The selection of alternatives should be based on the ability to meet mandated requirements as well as consistency with local wastewater facility objectives. Costs of all sorts (monetary, socioeconomic, and environmental) must also be considered.

In 1992, MCPC developed a booklet titled *Sewage Facilities: Understanding the Alternatives* that summarized the numerous public and private sewage facilities planning options available. Figures 7 and 8 summarize some of the information found in that booklet. It should be noted that some methods of sewage collection, treatment, and disposal can be used with more than one type of system. While the interchangeable nature of sewage system components makes it difficult to address all the possible



Elevated Sand Mound Systems are common throughout Montgomery County.



Drip irrigation or trickle systems apply treated wastewater to soil slowly and uniformly through a network of thin, flexible tubing placed at shallow depths in the soil. This type of on-lot system, once experimental, is now considered an approved alternative system by DEP.

Diagram courtesy of National Small Flows Clearinghouse.

Example sewage treatment plant.

combinations of alternatives in this report, the flexibility of sewage components means greater applicability for systems and a wider range of choices for municipalities.

The list of viable sewage system alternatives represents a flexible menu of sorts. Using this menu, the municipality can develop a prioritized list of alternatives that reflect municipal goals. This list can be incorporated into the municipality's Official Sewage Facilities Plan. New development proposals then would be required to consider the alternatives in the order listed in the municipal plan.

New and Alternative Public Sewer Options

Traditional wastewater facilities planning has focused on conventional, centralized wastewater technology (i.e. central treatment facilities with gravity sewers, pump stations and force mains). Most governmental authorities and engineers have preferred this technology because it has a tried and proven record. In fact, this philosophy of centralization was emphasized in the 1972 *Montgomery County Sewage Facilities Plan* where large regional treatment plants and expansive interceptors were proposed to serve most of the county.

The emphasis on traditional technology can however discourage consideration of many worthy alternatives. The latest developments in wastewater technology are dynamic and constantly being proposed and/or improved. Low pressure collection systems, grinder pumps, effluent pump sewer systems, vacuum sewer systems, and small diameter systems are just a few forms of collection and conveyance alternatives to traditional public systems. Some of these technologies have even been used successfully in Montgomery County. For example, Bryn Athyn Borough has initiated a plan to utilize a combination of small diameter public sewer lines to convey liquid wastes to a treatment plant and existing septic tanks on lots to treat the solid components. Often these unique systems can have lower cost per unit and lower installation costs than traditional systems. However, the trade-off is that these systems can have higher operation and maintenance costs.

Almost all public sewage systems constructed in the county rely on surface waters to receive the discharge from treated wastewater. In fact, 40 of the 41 public treatment plants within the county discharge their effluent directly to a waterway.

Figure 7
Sewage System Components

Systems	Collection	Treatment	Disposal
On-lot Disposal Systems	Collection lines minimal; a lateral and possibly some type of pump.	Septic or aerobic tank, sand filter or rotating media; drip irrigation; single unit package treatment plants are available.	Absorption field or a sand mound; spray, or stream discharge.
Community Systems	Collection line or force main, small diameter sewers, vacuum sewers, pressure sewers or individual septic tanks with effluent collection. May need lift stations and grinder pumps.	Septic or aerobic tank, sand filter, rotating media, lagoons, centralized community plant.	Absorbtion field or sand mound; spray or stream discharge.
Public or Centralized Systems	Collection line or force main, pressure or vacuum sewers, small diameter pipe.	Sewage treatment plant.	Stream discharge or spray irrigation.

Figure 8
Dispersal Options for On-Lot Sewage Facilities

Name	Description	Advantatges	Disadvantages
Bed/Trench	Effluent from the septic or areobic tank is treated in the bed/trench media and the surrounding soil.	Commonly used, minimal maintenance.	Requires a relatively deep limiting zone.
Contour System	Effluent is spread over a broad area of buried pipe in a shallow trench that follows the contour of the land.	Larger area for effluent dispersal than most systems.	Systems that are too long may require pressurization, requires a level bottom of the trench.
Drip Irrigation/Trickle Systems	Applies pretreated wastewater to soil slowly and uniformly through a network of thin, flexible tubing placed at shallow depths in the soil.	Minimal site disturbance, flexible tubing can be placed around trees and shrubs, and complex terrain.	Possibility of clogging.
Gravelless and Chamber Systems	Vaulted cross-section, flat, uncontained bottom, uses a material other than gravel in the trench, provide some capacity to store effluent until it can be absorbed into the soil.	Faster installation and increased volume of void space per unit length compared to conventional trenches.	Cost.
Elevated Sand Mound	Mound consists of a raised drainfield, sandfill on top of a gravel-filled bed.	Overcomes site restrictions (limiting zones due to unsuitable soils).	Aesthetics, cost.
Vapotranspiration	Employ the combined effects of evaporation from soil and transpiration from plants to dispose of wastewater effluent.	Can be used on sites with very porous soils and in close proximity to water wells (50 feet).	Not as effective in areas with high rainfalls, high humidity, low average daily temperatures and low levels of solar radiation.
Pressure/Low Pressure	Shallow, dosed soil absorption systems.	Can be especially designed to overcome the site constraints such as high water table, can be located on sloping ground or on uneven terrain.	Cost.
Recirculating Sand Filter	Septic or areobic tank to remove solids, effluent is pumped to a sand filter tank, effluent can be recirculated through the filter mulitiple times.	Higher quality effluent due to the recirculation.	

Special Protection Waterways in Montgomery County:

- ***High Quality Streams: entire Unami Creek Watershed, Valley Creek.***
- ***Exceptional Value Streams: none.***

Federal rules regulate maximum pollutant loads from sewage treatment plants. Alternatives to stream discharge should be explored where small order streams or high quality streams exist.

Stream discharge systems have to meet strict requirements under the National Discharge Elimination System (NPDES) permitting program. However, unexpected problems and a lack of maintenance can result in deleterious impacts to our streams. This concern is even greater with individual residential treatment systems and non-municipal systems that are privately operated and maintained. When treatment plants discharge to small streams or headwater areas, these impacts can be exacerbated, especially since streams experience broad fluctuations in flow in our area and are often low. The assimilative capacity of these streams can be overtaxed by excessive or improper waste discharges. In fact, a number of Montgomery County sewage treatment plants have recently applied to DEP to relocate their outlet pipes away from small tributaries and into the main stem of a local waterway due to this concern and as a result of some recent revisions to the NPDES permitting requiring stricter effluent limitations. Thus, alternatives to stream discharge should be evaluated in areas where only small order streams or High Quality and Exceptional Value streams are available.

Another recent federal regulatory tool aimed at reducing pollutant loads to our streams and rivers that will likely affect pipe-discharge type wastewater treatment plants is the TMDL or Total Maximum Daily Load requirement. The TMDL is a requirement of the Clean Water Act that involves assessing the health of a waterway and developing a strategy for impaired waterways to meet the state's water quality standards. After a thorough study of all the potential pollution sources to a waterway a maximum limit for each of the pollutants is established. This limit represents how much pollution the waterbody can receive and absorb while still meeting the water quality requirements. DEP is currently overseeing the creation of TMDLs for a few watersheds in Montgomery County, particularly the Schuylkill River and the Wissahickon Creek. And since there are numerous wastewater treatment plants discharging to these watersheds, often times providing the majority of the base flow during low flow conditions, the results of the TMDL process could lead to additional pollution prevention requirements for these treatment plants.

Land disposal of wastewater can be an appropriate alternative to stream discharge systems. How-

ever, due to the large land area required for these systems, this alternative might be most appropriate for individual residential, non-municipal systems, and small municipal systems – or possibly in rural areas with a group of failing on-lot systems or in cluster-type developments in rural resource areas. Spray irrigation and drip irrigation systems are the two most common forms of land disposal options. These systems permit advanced levels of treatment in addition to groundwater recharge. The operation and maintenance costs also tend to be lower for these systems as well. Up until 2003, New Hanover Township utilized a spray irrigation system to disperse its municipal waste. Currently, the Mason's Mill Sewage Treatment Plant in Bryn Athyn Borough is the only publicly owned treatment plant using spray irrigation for its discharge. This is a small municipal system.

Treated effluent can be used to irrigate nursery crops.

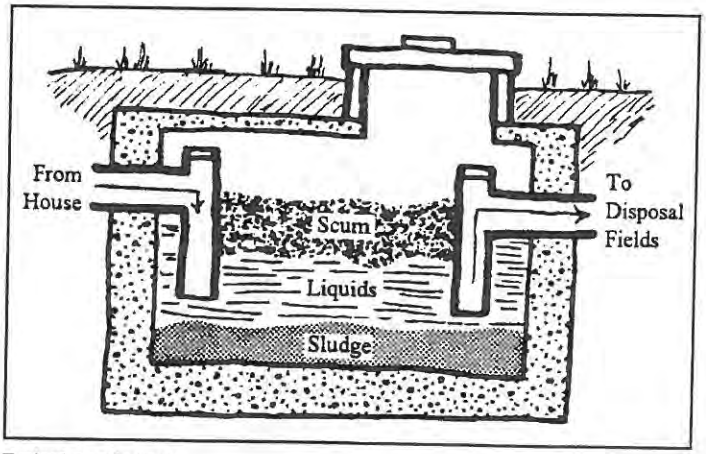
New and Alternative On-Lot Sewage Options

While soil types are generally not a significant limiting factor when planning public sewer service, soil is the foundation of conventional onsite wastewater treatment. Soil type and characteristics have traditionally been the most important factor in determining if an on-lot sewage system can be installed and which type of system will function best on a site.

Individual on-lot systems are located on the developed lot and involve either subsurface or surface disposal of the treated effluent. Septic systems are one of the most common types of on-lot sewage facilities. They employ a treatment tank that allows for liquid waste to percolate through the soil where it is neutralized and broken down further.

There are several variations to the standard septic system depending on soil, site, and operational conditions. The greatest variety exists in the choices of effluent dispersal. There are standard trenches, seepage bed systems, subsurface sand filters, elevated sand mounds, and individual residential spray irrigation systems (IRSIS). The selection of which of these variations to use on any one site is influenced by certain site conditions and constraints. The four most influential are: slope, setbacks, soil characteristics, and permeability (the ability of water to move through spaces in the soil).

Other restricting site parameters for on-lot sewage systems include topography, separation distances/setbacks, existing water sources, depth to limiting zones, and position in the landscape.



Typical septic tank.

Figure 9
SEWAGE TREATMENT PLANTS BY WATERSHED

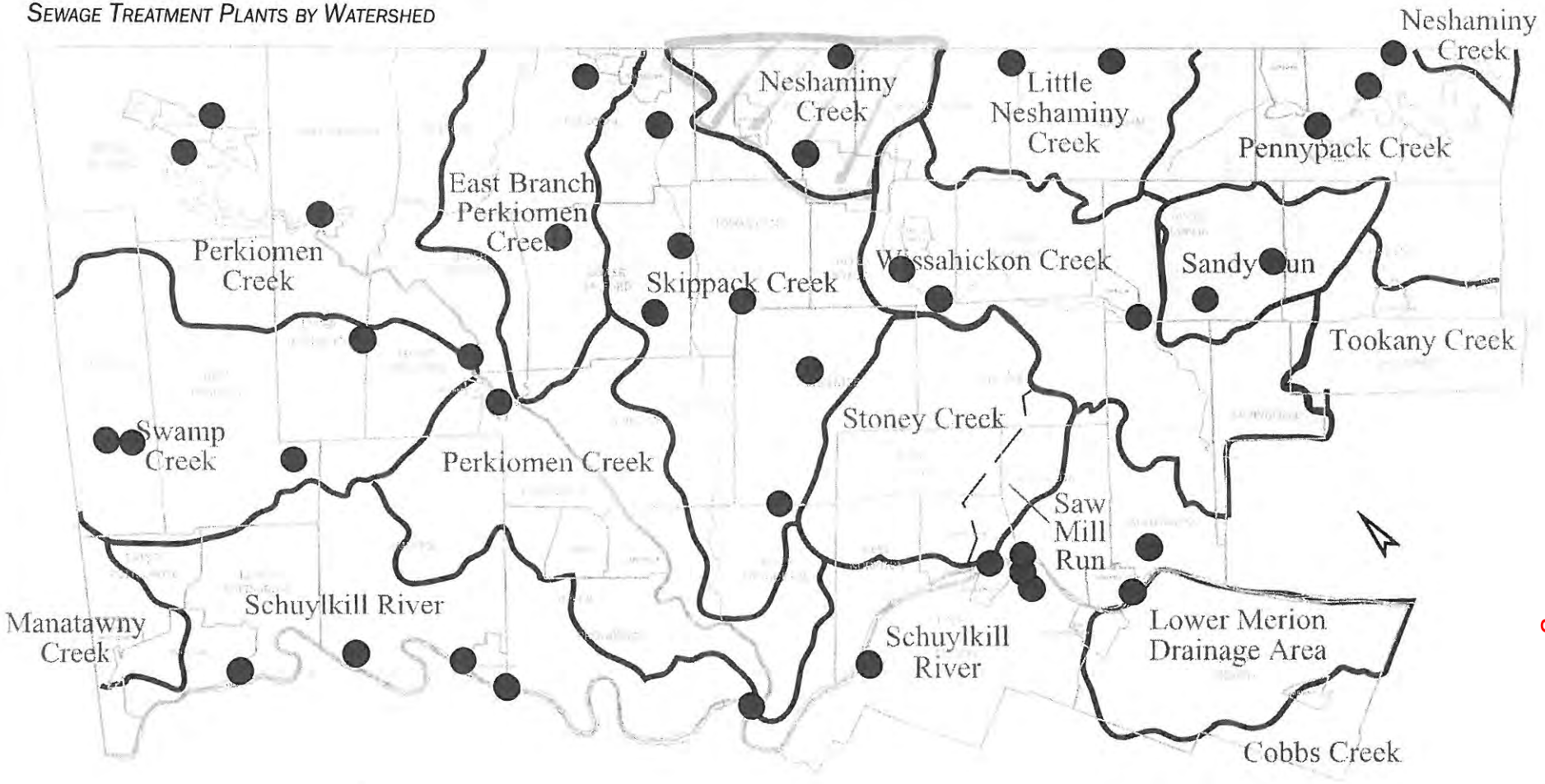


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Figure 10
Montgomery County Municipal Sewage Treatment Plants by Watershed

Watershed	Municipal Plants	Discharge	Nonmunicipal Plants	Discharge
Cobbs Creek				
East Branch Perkiomen Creek	Lower Salford Township (Harleysville STP) Telford Borough STP	Tributary to Indian Creek Indian Creek	New Life Boys Ranch	East Branch Perkiomen Creek
Little Neshaminy Creek	Horsham Township STP	Park Creek	English Village Apartments US Naval Air Station The Orchard	Park Creek Park Creek Little Neshaminy Creek
Lower Merion Drainage Area			Philadelphia Country Club	Saw Mill Run
Manatawny Creek				
Neshaminy Creek	Hatfield Township STP Lansdale Borough STP Montgomery Township STP	West Branch Neshaminy Creek West Branch Neshaminy Creek Neshaminy Creek		
Pennypack Creek	Bryn Athyn Borough STP (Mason's Mill) Lower Moreland Township STP (Chapel Hill) Upper Moreland-Hatboro STP	Pennypack Creek Tributary of Southampton Creek Pennypack Creek	Abington Memorial Hospital Holy Redeemer Hospital Meadowbrook Apartments Academy of the New Church	Tributary to Meadow Brook Meadow Brook Meadow Brook Huntingdon Valley Creek
Perkiomen Creek	Green Lane-Marlborough STP Lower Frederick Township STP LPVRSA, Oaks STP Schwenksville Borough STP Upper Hanover Township STP Upper Motgomery Joint Authority	Perkiomen Creek Perkiomen Creek Perkiomen Creek Perkiomen Creek Macoby Creek Green Lane Reservior	Limerick Trailer Park West Montco Vo-Tech School St. Gabriel's Hall Green Hill Mobile Home Park Marlborough Elementary School Camp Green Lane Graterford Prison YMCA of Pottstown & Upper Perkiomen Valley Upper Salford Township Building	Lodal Creek Lodal Creek Perkiomen Creek Green Lane Reservior Green Lane Reservior Ridge Valley Creek Tributary to Perkiomen Creek Macoby Creek Perkiomen Creek
Sandy Run	Abington Township STP Upper Dublin Township STP	Sandy Run Sandy Run		
Schuylkill River	Bridgeport Borough STP Conshohocken Borough STP E. Norriton/Plymouth/ Whitpain JSA Limerick Township STP Norristown Borough STP Pottstown Borough STP Royersford Borough STP Upper Merion Township (Matsunk STP) Upper Merion Township (Trout Run STP) Whitemarsh Township STP	Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Schuylkill River Frog Run Schuylkill River Tributary to Schuylkill River	Valley Forge Trailer Park Regal Oaks Development River Park	Schuylkill River Sprogels Run Schuylkill River
Skippack Creek	Lower Salford Township (Indian Hills STP) Lower Salford Township (Mainland STP) Souderton Borough STP Upper Gwynedd-Towamencin STP Worcester Township (Berwick Place STP) Worcester Township (Valley Green STP)	Tributary to Skippack Creek Skippack Creek Little Skippack Creek Towamencin Creek Tributary to Skippack Creek Zacharias Creek	Methacton School District	Tributary to Skippack Creek
Stony Creek/Saw Mill Run				
Swamp Creek	Berks-Montgomery Municipal (BMMA) Boyertown Borough STP Upper Frederick STP	West Branch Swamp Creek West Branch Swamp Creek Goschenhoppen Creek	New Hanover/Upper Frederick Joint Elementary School Camp Laughing Waters Montgomery County SPCA	Tributary to Swamp Creek West Branch Swamp Creek Goschenhoppen Creek
Tookany Creek				
Wissahickon Creek	Ambler Borough STP North Wales Borough STP Upper Gwyedd Township STP	Wissahickon Creek Wissahickon Creek Wissahickon Creek		

This home in Upper Salford Township uses a sand mound for sewage collection treatment and disposal.

Good soil for on-lot sewage treatment is relatively free of rock and not saturated with water. The soil structure must allow the liquid waste to pass through at a suitable rate—slow enough to allow microorganisms time to feed on the harmful material, yet fast enough to dispose of the amount of liquid waste entering the absorption area.

An overwhelming predominance of the county's soils are classified as having severe limitations for on-site disposal systems due to shallow depth to groundwater. Therefore, very few new conventional on-lot septic tank systems are installed today in the county. Instead, mound-type on-lot systems, which include a sand and gravel bed raised above the ground surface, are more common.

The elevated sand mound makes up for the lack of natural suitable soil by using a special blend of sandy fill material placed on top of the natural soil. This type of on-lot facility is common throughout Montgomery County. However, no on-lot sewage system, including the sand mound, is maintenance free. They all require some form of regular maintenance and the marginal soils in many areas of the County make maintenance even more critical. On-lot sewage management programs are discussed later in this chapter.

More recently, development is occurring in areas previously inaccessible to sewage facilities with the aid of new treatment technologies. DEP has entered into a multi-year contract with Delaware Valley College to do a worldwide search for new, low-cost on-lot technologies that could be used in the climate and soil conditions prevalent within Pennsylvania. The project initially involved monitoring six new or modified technologies for a wide range of soil conditions across the Commonwealth. One of the first systems approved for use as a result of this study was a drip irrigation system. In addition, DEP and the Department of Conservation and Natural Resources have begun a joint project to demonstrate experimental/innovative on-lot disposal technologies in a number of Pennsylvania State Parks. Recent regulatory changes have classified nine previously experimental systems as standard technology.

Sewage treatment technology has progressed to the point where environmental constraints such as poor soil types or steep slopes or the lack of sewage treatment capacity in municipal systems may no longer preclude growth. While the absence of centralized sewers can no longer be used to deter

growth, municipalities can effectively guide development by providing for sewage treatment systems in areas that are appropriate for growth from a land use policy and environmental perspective.

Sewage Facilities Plan

This half of the Sewage Facilities Chapter includes specific recommendations developed for both centralized and on-lot systems that will act as county policy through 2025. It includes a county sewage growth area map, an analysis of existing sewage capacity at the various public treatment plants within each planning region, a look at on-lot sewage problem areas and some ideas on how to provide effective sewage facilities to those problem areas in the rural sections of the county without inducing sprawl and large-scale growth.

Central and Public Facilities

Providing adequate sewage facilities and other infrastructure, such as public water facilities or roadways, can support growth management efforts. An Act 537 Plan, when closely linked with zoning and land use ordinances, provides a roadmap portraying the future of the municipality in terms of anticipated development and needed infrastructure.

Most large-scale residential and nonresidential developments rely on centralized sewage facilities to convey, treat, and dispose of sewage. A municipality can therefore direct growth to designated areas by coordinating the provision of public sewage facilities with land use planning, zoning, and other infrastructure.

Providing for public sewage service in areas where zoning allows growth can therefore direct growth to these appropriate areas or away from environmentally sensitive areas. Coordinating sewage facilities with land use planning, zoning, and other infrastructure is one of a municipality's strongest tools for influencing development.

Past wastewater facilities planning, including the 1972 *Montgomery County Sewage Facilities Plan* emphasized large, extensive regional wastewater facilities, conforming to the notion that these facilities would provide more cost-effective (economies of scale) construction and greater assurance of proper management. For example, the 1972 *Montgomery County Sewage Facilities Plan* recommended a municipal sewage treatment plant in Schwenksville

Central and public sewer facilities should generally be targeted towards designated growth areas.

Rural resource areas generally should not be served by central and public sewer facilities.

Borough to serve the borough, sections of Lower Frederick Township, and Upper Salford Township. This regional approach has for the most part been utilized in Lower Montgomery County on a subregional level and regionally only in the Lower Perkiomen Valley. The regional approach will most likely continue to be the most feasible alternative for these areas. However, this type of wastewater planning may not necessarily be appropriate for the newly specified growth areas of the county.

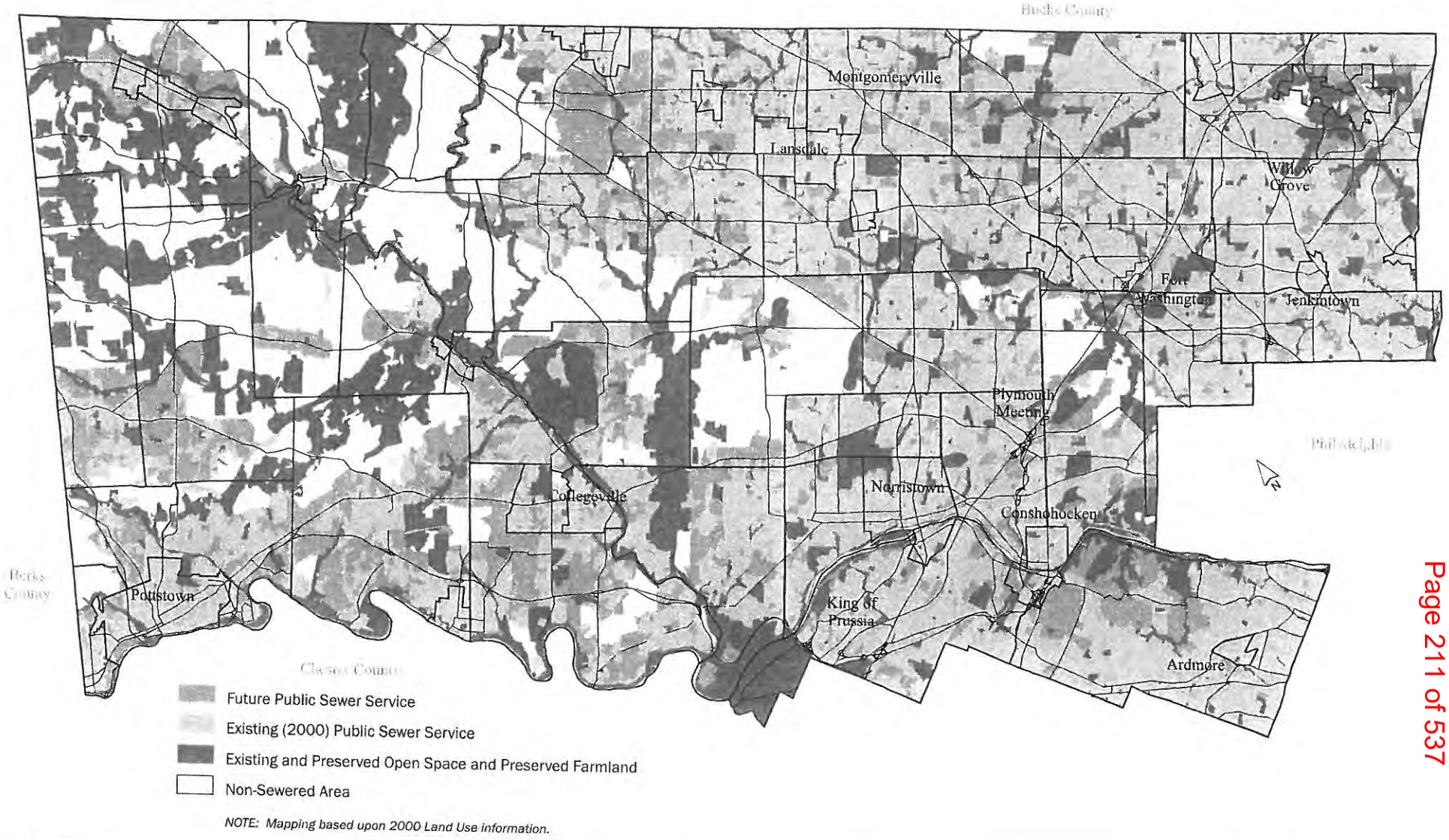
Extensions to the municipal sewage system are often made to accommodate growth. As long as adequate capacity exists at the treatment facility, the costs are reasonable and serving the area conforms to local zoning and land use policies, sewer line extensions are often the most appropriate alternative. However, extending public sewers may itself encourage growth. Extending municipal sewers to rural, low-density areas can strain municipal resources and create a system with high user fees. In order to balance the provision of public sewers with the desire to not encourage unnecessary growth, most municipalities have been developing sewage growth areas.

Sewer growth areas are required as part of a municipality's official Act 537 plan. The sewer growth maps indicate locations within the municipality where public sewer service is expected to expand within a five, ten, and possibly even twenty year period. The maps also delineate what sections of a municipality, if any, are to remain rural in nature and utilize on-lot sewage facilities for the same planning periods.

In order to accommodate anticipated growth without encouraging sprawl-type development, it is imperative that sewer growth area maps closely mirror municipal land use plans. It is equally important that zoning regulations for density, lot sizes and community facilities be consistent with the sewer growth area map. It is in this context that we have developed the Montgomery County Sewer Growth Area Map.

The Sewer Growth Area Map shows those areas of the county where centralized sewer service is currently available and those areas projected to have centralized sewers by 2025. The areas designated for future sewer service closely mirror the future land use growth area map in the *Vision Plan*. Individual municipal Act 537 future growth area maps, DVRPC growth projections, concentrations of failing on-lot systems, and the County Water Service Map were also consulted to develop the future growth area boundary. The white

Figure 11
EXISTING AND FUTURE SEWER SERVICE AREAS



NOTE: Mapping based upon 2000 Land Use information.

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areas of the map are considered rural resource areas and it is in these areas that centralized sewage systems should be avoided.

The extent to which sewer service can be extended to new and existing development is often also constrained by the lack of treatment capacity or distance to sewer lines. On the other hand, excessive capacity can stimulate rapid growth, which can place a burden on a municipality in terms of its ability to provide services and to plan for smart growth. It also precludes using sewage facilities to phase development or guide development to suitable locations.

Since the availability of sewage capacity can be such an important factor in determining the type, pace, and intensity of development within the county, we conducted an exercise to examine the existing sewage capacity available within each of the twelve regional areas and estimated a future demand for capacity in each region.

A tabulation of excess capacity within each region has been calculated and listed on Figure 12. The projected sewage capacity needs for 2025, based on 2025 growth projections developed for this plan, (Total 2025 Capacity Demand) was then compared to existing excess capacity in the regions to determine if sufficient sewage capacity currently exists to meet the projected demands.

Possible reasons for large capacity excesses in the Pottstown, Main Line/King of Prussia and Eastern Montgomery County regions:

- ***Industries leaving the boroughs, i.e. Mrs. Smith's leaving Pottstown Borough.***
- ***Large reserved capacity agreements with the City of Philadelphia (Eastern Montgomery County and Main Line/King of Prussia regions).***

Figure 12
ESTIMATED MONTGOMERY COUNTY SEWER CAPACITY NEEDS FOR 2025

Regional Planning Areas	2025 New Units Designated Growth Area	2025 New Units Infill Development	Existing Units Currently Served by Water Only That Will be Served by Sewers	2025 Total Residental Capacity Demand (gpd)*	2025 New Employment	2025 Employment Capacity Demand (gpd)	Total 2025 New Capacity Demand (gpd)
Upper Perkiomen Valley	1,440	140	125	468,875	2,550	12,750	481,625
Indian Valley	4,813	610	644	1,668,425	3,900	19,500	1,687,925
Pottstown	6,540	507	223	1,999,250	2,800	14,000	2,013,250
Central Perkiomen Valley	5,479	814	129	1,766,050	2,100	10,500	1,776,550
Spring-Ford	5,456	864	10	1,740,750	6,300	31,500	1,772,250
North Penn	5,099	1,400	73	1,807,300	22,650	113,250	1,920,550
Norristown	4,329	369	701	1,484,725	7,800	39,000	1,523,725
Main Line/King of Prussia	612	290	1,673	708,125	10,450	52,250	760,375
Horsham/Willow Grove	2,508	392	617	967,175	5,400	27,000	994,175
Ambler	2,219	923	297	945,725	6,050	30,250	975,975
Conshohocken/Plymouth Meeting	436	345	469	343,750	14,050	70,250	414,000
Eastern Montgomery County	213	688	271	322,300	600	3,000	325,300
TOTAL	**39,144**	**7,342**	**5,232**	**14,222,450**	**84,650**	**423,250**	**14,645,700**

Information generated based on US Census data, Delaware Valley Regional Planning Commission sewer inventory and employment forecasts data, and information MCPC obtained for the 1998 Sewer Status Report.

* Total residential capacity demand is derived by multiplying total units newly served by sewers by 275 gallons per day per unit.

As can be seen in the Deficiency Analysis table (Figure 13), it is projected that only one region, the Central Perkiomen Valley Region, does not currently have sufficient capacity to meet the 2025 projected demand. Flows from four of the municipalities within this region (Skippack, Perkiomen, Collegeville & Trappe) are sent to the Oaks Regional wastewater treatment plant. Capacity deficiencies have been a common problem for these and the other municipalities served by this plant for a number of years. However, the Lower Perkiomen Valley Regional Sewer Authority and the Montgomery County Sewer Authority have begun planning a plant expansion that should meet capacity projections to 2020.

The three other municipalities within the Central Perkiomen Region are Schwenksville Borough, and Upper and Lower Frederick Townships. The residential projections for Lower Frederick Township in 2025 show significant increases. Public sewage service is provided to Lower Frederick Township by the Schwenksville Borough STP (in the southeastern corner) and via the Lower Frederick Township STP, a small facility located near Spring Mount. There may not be sufficient capacity at this facility to handle the residential projections. So, this could also factor into the deficiency.

These charts do not include the capacity required to serve the on-lot problem areas outside the proposed sewer growth area, mapped by numbers in Figure 16. It is anticipated that these problem areas will primarily be resolved without the extension of public sewer systems. There are also some important limitations to the Deficiency Analysis chart since sewage plant service areas often cross the regional areas defined in the Comprehensive Plan. For example, the six municipalities served by the Oaks Regional Wastewater Plant in Upper Providence Township are bound by a legal service and allocation agreement. However, four of these municipalities lie within the Central Perkiomen Valley planning region while one lies within the Spring-Ford planning area and another lies in the Norristown planning area.

Another important discovery of this exercise was that despite sufficient capacity within most of the regions to support projected needs through 2025, many municipalities and authorities are planning expansions to existing plants. However, dispersing

Figure 13
Estimated Montgomery County Sewer Capacity Needs for 2025

Regional Planning Area	Existing Total Capacity (MGD)	Existing Allocated Capacity (MGD)	Existing Available Capacity (MGD)	2025 Capacity Demand (MGD)	2025 Available Capacity (MGD)**
Upper Perkiomen Valley Region	2.350	1.337	1.013	0.482	0.531
Indian Valley Region	4.740	2.654	2.086	1.688	0.398
Pottstown Region	18.725	7.755	10.970	2.013	8.957
The Pottstown STP has significant amounts of excess capacity, however allocation agreements between the servicing municipalities and the borough authority are currently limiting the availability of this excess. Industries leaving the borough (i.e. Mrs. Smiths) may have also contributed to the excess.					
Central Perkiomen Valley Region	3.460	3.302	0.158	1.777	-1.619
4 of the 7 municipalities in this region send flows to the Oaks regional plant. It is currently experiencing a capacity deficiency. A plant expansion is in design stages. Additionally, Upper Frederick Township has a projected employment increase and Lower Frederick Township has a significant projected residential housing unit increase that may overtax the treatment plants serving those municipalities.					
Spring-Ford Region	7.075	4.231	2.844	1.772	1.072
Limerick Township finished construction of a new STP in 2002 (Possum Hollow STP) rated at 0.7 MGD. This design flow amount is included above in the available capacity column. However, since the plant has yet to receive any flows, no amount from this plant was attributed to the existing flows column.					
North Penn Region	24.231	15.886	8.345	1.920	6.425
Most of the excess capacity is available at the Hatfield, Upper Gwynedd and Upper Gwynedd-Towamencin plants.					
Norristown Region	14.769	8.888	5.881	1.524	4.357
Although the Norristown plant has the most available capacity in this region, the age of this plant makes the actual amount of excess uncertain.					
Main Line/King of Prussia Region	27.870	13.797	14.073	0.760	13.313
Philadelphia and the 2 Upper Merion STPs have municipal allocations more than double current demand. Industries leaving the region may also contribute to the excess.					
Horsham/Willow Grove Region	9.409	7.193	2.216	0.994	1.222
Ambler Region	10.611	6.478	4.133	0.976	3.157
Conshohocken/Plymouth Meeting Region	6.795	4.473	2.322	0.414	1.908
Eastern Montgomery County Region	25.678	13.132	12.546	0.325	12.221
Approximately twice as much capacity is allocated at the Philadelphia STP than currently being used, or anticipated to be needed, thereby contributing to the large 2025 excess. Industries leaving the region may also contribute to the excess.					
TOTAL	155.713	89.126	66.587	14.645	51.942

** All 2025 available capacity may not be immediately available to every municipality within each region due to service agreements and physical limitations, i.e. topography, distance between development and plant in a region. Information in this chart compiled from municipal Act 537 Plans, 1998 MCPC Sewer Status Report, and correspondence with some of the sewer authorities.

Expansions/Re-rates planned, but not yet approved, and not included in available capacity amounts above:

- *Conshohocken Borough submitted an application for a re-rate to 2.35 MGD (from 2.3 MGD) in 2002.*
- *Montgomery Township has submitted an application to expand the Eureka plant to 2.4 MGD, more than 3 times its current capacity.*
- *A request to re-rate the Telford Borough STP to a capacity of 1.23MGD has been submitted to DEP.*
- *A planned expansion of the LPVRSA-Oaks STP to 14.25 MGD is in the design stages. This is a 4.75 MGD increase.*
- *Lower Moreland Township is planning an expansion of the Chapel Hill STP to 0.267 MGD, an increase of 47,650 gpd.*
- *New Hanover Township has submitted a proposal to increase the capacity of its plant by 0.885 MGD to 1.71 MGD.*
- *An application to expand the Telford Borough STP from 1.1 MGD to 1.23 MGD has been submitted to DEP.*
- *Upper Gwynedd/Towamencin STP has submitted an application to expand to 7.3 MGD from 6.5 MGD.*

the existing excess capacity throughout the regions is not a simple task. Legal service and allocation agreements, politics and topography all play a role in keeping sewage facilities planning primarily a local, instead of regional, endeavor.

Clusters on the Edge of Designated Growth Areas

The Montgomery County Planning Commission encourages all future public sewer systems to be located within the designated growth area, as discussed above. And as can be seen in the accompanying tables, sufficient capacity should exist in each of the regions to allow for the increase in sewer demand. However, we realize that there may be some instances, particularly with cluster-type developments, where a centralized sewage system could be the most logical solution for new development in rural resource areas. With that being said, we have developed the following criteria to determine the most appropriate sewage facilities systems for cluster development outside sewer growth areas.

Criteria for Serving Clusters on the Edge of Designated Growth Areas.

In order to consider a centralized sewer system in the rural resource area, a development should be designed as a rural cluster with:

1. *A minimum of 60% open space (ideally 75%).*
2. *A proposed density less than 1 dwelling unit per acre.*

Only if a cluster development fits the above two criteria and is located less than ½ mile from an existing public sewer system, should this cluster tie into the public facilities.

If the cluster-type development meets the above criteria and is located greater than ½ mile away from a public sewer system, on-lot sewage facilities systems should be considered as the primary means to service the lots (i.e. on-lot systems within the open space).

A hierarchy of sewage facilities choices for rural resource areas can be found later in this chapter. It can be used as a guide should soils based on-lot systems prove unfeasible.

Concentrations of Failing On-Lot Systems

As discussed earlier in this chapter, failing on-lot sewage systems can pose both health and environmental concerns to a community. Most known areas of concentrated failing on-lot systems in Montgomery County today are in the western, village areas of the county. However, there are still a few locations in the eastern part

of the county where on-lot system problems have not been fully addressed. For instance, in 2001, the Horsham Township Sewer and Water Authority submitted a revised Act 537 plan that proposed the extension of public sewers and the construction of a pump station to serve various existing commercial and industrial facilities along Easton Road (Route 611). These facilities are currently served by failing on-lot systems and holding tanks requiring constant pumping and transport to off-site disposal areas. The extension will direct flows to the Upper Moreland/Hatboro STP. In addition, Lower Moreland Township has been working for the last 12 years to hook up every home in the municipality to the public system. Twelve years ago there were 1,600 homes in the township with on-lot systems. In 2002, the second-to-last phase of the project was underway to connect 200 residents with on-lot systems. As of Summer 2003, there are still 65 on-lot systems planned for a future connection.

The 1972 *County Sewage Facilities Plan* identified 73 areas where clusters of on-site systems were malfunctioning or where problems could be expected due to the existence of one or more unfavorable conditions (high density, poor soils, etc.). Fifty-four (54) of these areas (75%) were located in areas delineated as 10-year sewer growth areas in the County Sewage Facilities Plan and would be eliminated if all of the recommendations of the plan were implemented.

Of the original 73 problem areas identified in the 1972 Plan, only 14 have yet to be eliminated. However, 40 new on-lot problem areas have been identified in Montgomery County since then and are listed in the following figures. Some of these new problem areas are located in sewer growth areas and are planned for connection to the public system in the near future. However, approximately 22 of the 40 new sites are located in non-growth areas. Solutions to these problem areas will require more creative planning.

As can be seen in Figures 14, 15, and 16, there are a total of 54 areas of concentrated on-lot sewage problems within the county today. Twenty-three of those problem areas are located in either existing sewered areas or proposed sewer growth areas (designated by code letters). The 31 problem areas identified by number and shown on Figure 16 represent those problem areas located in rural resource areas. For the purposes of this plan, an area

Vernfield is one of the many on-site sewer problem areas that have been corrected since 1972.

- ***Only 14 of the 54 on-lot problem areas listed and mapped in Figures 14 through 16 were also identified in the 1972 County Act 537 Plan.***

- ***The remaining 40 are new on-lot problem areas, discovered since the previous county update.***

Figure 14

Montgomery County On-Lot Problem Areas Located in Existing Sewered or Designated Growth Areas

Map	Problem Area Name	Municipality	Description	Status/Recommendation
A	Short Lane Area	Lower Moreland	Residential properties with malfunctioning systems on small lots, identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
B	Pioneer Road Area	Upper Moreland	Industrial area, many lots with holding tanks, identified by sewage enforcement officers based on complaints and/or inspections.	
C	Sampson Road Area	Upper Moreland	Residential properties, many with cesspools on small lots, identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
D	Pardee Lane, Serpentine Lane, and Church Road	Cheltenham	Approximately 250 single-family dwellings with old on-lot systems.	The Township has been discussing the feasibility of connecting to the public system and also adopted an on-lot maintenance ordinance that requires yearly inspections.
E	Fairwood Lane/ Pennsylvania Ave	Whitemarsh	13 residential properties identified in Municipal Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
F	West Valley Green Road/ Bethlehem Pike	Whitemarsh	11 residential and 5 commercial properties identified in Municipal Act 537 Plan, also identified in the County 1972 Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
G	Germantown Pike/ Andorra Road/Andorra Hill Road	Whitemarsh	45 residential properties identified in Municipal Act 537 Plan.	Planned for public sewer connection by the township within 10 years, in proposed growth area on County Sewer Service Area map.
H	River Road Area	Lower Merion	Older homes/cottages immediately adjacent to the Schuykill River, most with sewage systems over 40 years old.	Located in proposed growth area on County Sewer Service Area map.
I	Youngsford Rd/Black Rock Road/Merion Square Road/Williamson Road Area	Lower Merion	Approximately 80 homes in the central part of the township, below Gladwyne.	Lower Merion Township is conducting a study to consider the extension of public sewer systems to these homes, located in proposed growth area on County Sewer Service Area Map.
J	Bittersweet Circle	Lower Providence	Indentified by sewage enforcement officers based on complaints and/or inspections, unique area of relatively new development where determination of the source of mal-functioning units has been difficult.	Located in proposed growth area on County Sewer Service Area map.
K	Fairview Village	Worcester	Numerous lots in the Eastern and Western ends of the Fairview Village Service Area, identified in the 1972 County Act 537 Plan and a 1995 Worcester Township Act 537 Plan.	2002 Municipal Act 537 Special Study proposes to connect these properties to the Berwick Place STP.
L	Collegeville Road/ Landis Road Area	Skippack	Identified as Area B in Skippack Township 2003 Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
M	Lywiski Road & Evansburg Road Area	Skippack	Identified as Area A in Skippack Township 2003 Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
N	Schoolhouse Road near Souder Road	Franconia	Identified in 2003 Municipal Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map and draft Indian Valley Regional Planning Commission Comprehensive Plan.
O	Lower Road between Meetinghouse and Schoolhouse Roads	Franconia	Identified in 2003 Municipal Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map and draft Indian Valley Regional Planning Commission Comprehensive Plan.
P	Bavington Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
Q	Fulmer Road Area	Lower Frederick	Area of small residential lots,identified by sewage enforcement officers based on complaints and/or inspections.	
R	Schwenk Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.

Continued:

Map	Problem Area Name	Municipality	Description	Status/Recommendation
S	Zieglerville Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections.	Located in proposed growth area on County Sewer Service Area map.
T	Wagner Rd/Faust Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Located within proposed municipal sewer growth area according to 2003 537 Act Plan Update.
U	Palm	Upper Hanover	This isolated village contains 80 residences, 10 commercial properties and a church. All use on-lot sewage facilities systems, many installed prior to 1960. Also identified in the 1972 County Act 537 Plan.	A 2001 Municipal Act 537 Plan has been approved to connect these lots and other nearby commercial and industrial properties to public sewers at a new municipally owned treatment plant (formerly a TTT Realty treatment plant). Aquisition and upgrading of the plant has been completed and currently being implemented.
V	Tylersport	Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Located in proposed growth area on County Sewer Service Area map.
W	Frederick/Obelisk	Upper Frederick	1999 Municipal Act 537 Plan designated this area as a future sewer growth area, on-lot problems were not found to be serious; 1978 County Act 537 Plan Update identified.	Located in proposed growth area on County Sewer Service Area map.

Figure 15

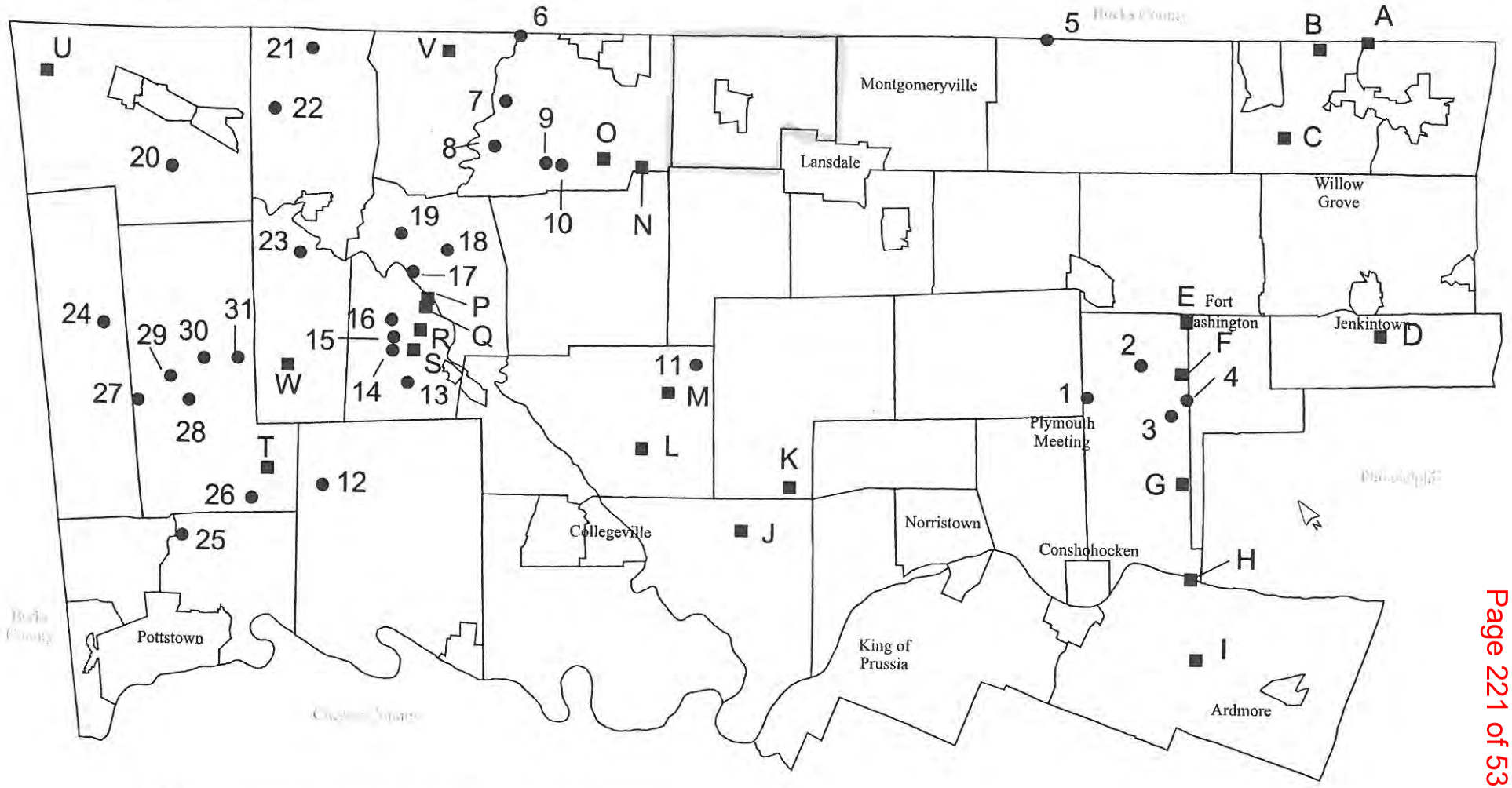
Montgomery County On-Lot Problem Areas in Rural Resource Areas

Map	Problem Area Name	Municipality	Description	Status/Recommendation
1	Stenton Ave/Sheaff Lane	Whitemarsh	23 residential properties identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
2	Toland Drive Area	Whitemarsh	49 residential properties identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
3	Cricket Road/W. Valley Green Road	Whitemarsh	30 residential properties and 1 golf course identified in Municipal Act 537 Plan.	Planned for connection within 10 years (2003 Act 537 Plan).
4	Valley View Road Area	Whitemarsh	43 residential properites identified in Municipal Act 537 Plan.	Planned for connection within 5 years (2003 Act 537 Plan).
5	County Line Road/ Park Road	Horsham	Residential area, identified by sewage enforcement officers based on complaints and/or inspections.	Recent land development plans propose bringing public sewers to this area.
6	County Line and Hollow Roads	Franconia	12 residential lots, identified in 1988 Draft Municipal Act 537 Plan.	Further investigation is needed to determine if on-lot problems still exist.
7	Earlington Area	Franconia	Approximately 87 residential lots with potential on-lot problems, area identified in 1998 Draft Municipal Act 537 Plan, 2003 Franconia Township Act 537 Update, and the County 1972 Plan.	2003 Act 537 Plan Update recommends the implementation of an on-lot disposal management program to address this area.
8	Morwood Area	Franconia	Approximately 50 residential lots with potential on-lot problems, area identified in 1988 Municipal Draft Act 537 Plan and 2003 Franconia Township Act 537 Update.	2003 Act 537 Plan Update recommends the implementation of an on-lot disposal management program to address this area.
9	Clemens and Indian Creek Road	Franconia	7 lots identified in 1988 Municipal Draft Act 537 plan.	Further investigation is needed to determine if on-lot problems still exist.
10	Schoolhouse Road and Rte. 113	Franconia	7 lots near Rte. 113 identified in 1988 Municipal Draft Act 537 Plan.	Further investigation is needed to determine if on-lot problems still exist.
11	Christine Drive/Barbara Road/Legat Lane Area	Skippack	Identified as Area D in Skippack Township 2003 Act 537 Plan Update.	
12	Fruitville Area	Limerick	Identified by 1998 sewer feasibility study and by sewage enforcement officers based on complaints and/or inspections.	Sewer feasibility study looked at serving a portion of Fruitville Road south of Fruitville Road south of Hartenstine Creek, to the intersection of Ridge Pike, as well as the businesses along Ridge Pike at or near this intersection with public sewers, due to other sewer related obligations (Possum Hollow STP). It was recommended that any project be pursued at a later date.

Continued:

Map	Problem Area Name	Municipality	Description	Status/Recommendation
16	Cepp Road Area	Lower Frederick	Identified by sewage enforcement officers based on complaints and/or inspections and in the 1972 County Act 537 Plan.	
17	Salford	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
18	Salfordville	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
19	Woxall	Upper Salford	Village area identified by sewage enforcement officers and in 1972 County Act 537 Plan Update.	Further investigation is needed to determine extent of on-lot problems.
20	Lakeshore Drive/Lloyd Lane Area	Upper Hanover	Identified by sewage enforcement officers based on complaints and/or inspections and in 1972 Montgomery County Act 537 Update.	
21	Ziegler Rd Area	Marlborough	Identified by sewage enforcement officers based on complaints and/or inspections.	
22	Geryville Pike Area	Marlborough	Identified by sewage enforcement officers based on complaints and/or inspections.	
23	Perkiomenville	Upper Frederick	Municipal Act 537 (1999) identified this as a potential future growth area, but did not specifically indicate that there was a on-lot problem here; County Act 537 Plan Update identified this area as well.	
24	Congo/Sassmansville	Douglass/ New Hanover	Numerous residential units in the villages of Congo and Sassmansville and between the two villages along Hoffmansville Road, identified in the 1972 County 537 Plan Update and both New Hanover Township and Douglass Township Act 537 Plan Updates.	A plan has been developed to provide public sewers with ultimate treatment at BMMA to 129 lots in this problem areas within a 20 year planning period.
25	Ringing Rocks Area (Kiem Street and Route 663 to the park)	Lower Pottsgrove	Residential area identified by sewage enforcement officers based on complaints and/or inspections.	
26	Sanatoga Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	
27	Middle Creek Road Area	New Hanover	Properties along Middle Creek Road, between Big Road and Ludwig Road, identified in 2003 Municipal Act 537 Plan Update.	
28	Miles Road Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Some, but not all properties lie within municipal proposed sewer growth area.
29	Layfield Area	New Hanover	Identified in 2003 Municipal Act 537 Plan Update.	Approximately half the parcels (south side of Big Road) are within a proposed sewer growth area.
30	Church Road Area	New Hanover	Church Road properties between Big Road and Hoffmansville Road identified in 2003 Muncipal Act 537 Plan Update.	
31	New Hanover Square	New Hanover	Village area identified in both the 1972 County Act 537 Plan Update and the 2003 Municipal Act 537 Plan Update.	

Figure 16
On-Lot Problem Areas in Montgomery County



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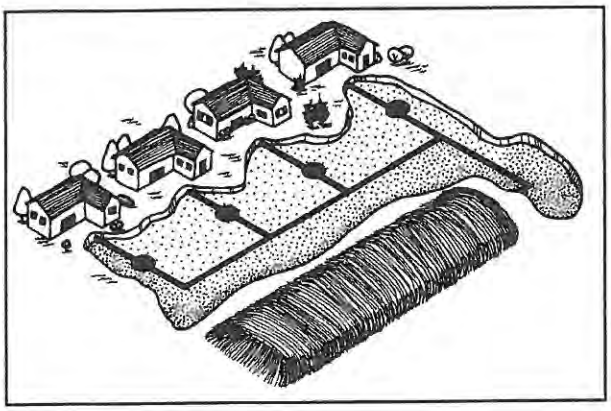
of concentrated on-lot sewage problems was considered an area that contained approximately ten dwelling units or more, in close proximity, where there are units known to be failing or malfunctioning. These areas were identified through municipal official Act 537 plans, the 1972 Montgomery County Act 537 Plan, and information provided by the Montgomery County Health Department. Most areas of on-lot problems within the growth area are isolated and/or planned for corrective measures within the next 10 years. They were mapped in part to help justify the extent of the growth area. However, the location of these on-lot problem areas within the Montgomery County proposed sewer growth area is not a guarantee that the municipality or municipal authority will definitely extend public sewers to those areas within the near future.

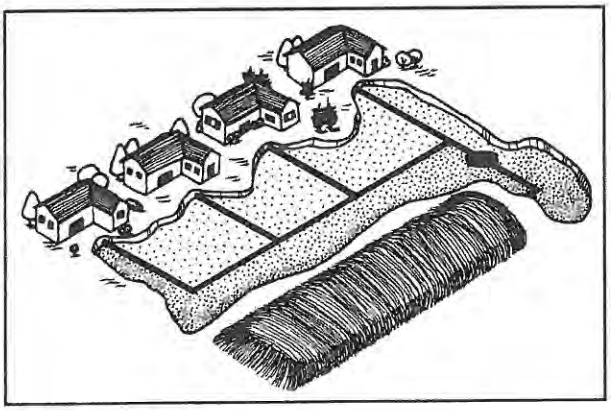
Most of the on-lot problem areas located outside the existing served and growth areas represent villages or small communities in the western section of the county where public sewers are not available. Because these problem areas are not located in sewer growth areas, solutions will require more creativity and planning.

While it's imperative for health and environmental reasons to eventually eliminate malfunctioning on-lot sewage facilities within these rural village areas, extending large diameter sewer interceptors from the closest treatment plant is not, and should not be, considered the only solution. Instead, each on-lot problem area should be studied, on a case-by-case basis, to determine the best corrective method. These studies should include a detailed analysis of other areas within Montgomery County and the Southeastern PA region where similar problems have been solved. Innovative solutions should be examined in addition to more traditional means. For instance, in order to bring public sewage service to the village of Palm, Upper Hanover Township has purchased an existing treatment plant that formerly served an industrial/manufacturing company near the village. This plant is currently being updated to accept domestic flows from the village. This unique solution provides public sewer service to homes with malfunctioning systems without the need to extend large interceptors from the township's main plant (Macoby STP). And by acquiring and upgrading a vacant, former industrial plant, the municipality will achieve multiple goals: providing sewers to an area of critical need without inducing growth and reducing pollution potential to the environment by

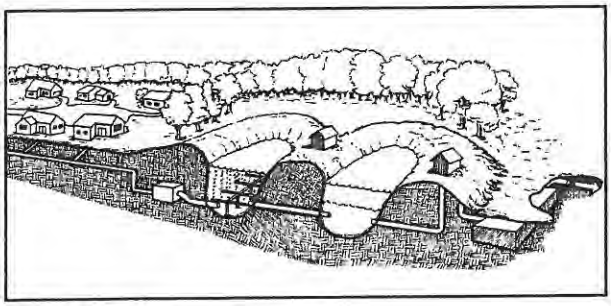
The county still has many rural villages that may periodically have on-site sewage problems.



Common Absorption Field.



Community System.



Lagoon System.

eliminating an industrial discharger and upgrading a vacant STP for domestic flows only. It is strongly recommended that the municipalities listed in Figure 15 with on-lot problem areas begin an Act 537 Plan revision specifically intended to address these on-lot problem areas.

In the 1992 document *Guidelines for Design, Installation & Operation of Small Flow Treatment Facilities,* DEP established a hierarchy of sewage disposal alternatives for small flow situations that must be evaluated prior to plan submittal. This guidance begins with the consideration of connection to public sewers and progresses to a treatment facility with dry stream discharge, only as a last resort. Following these similar principles, MCPC has developed a hierarchy of sewage facilities planning for use by municipalities in rural resource areas to resolve on-lot problem areas.

As a guide to the municipalities identified in Figures 15 and 16, and any future locations where on-lot problem areas may arise within the county, this hierarchy of preferred sewage facilities options has been developed. The hierarchy was developed with the goal in mind to allow for a solution that produces the least amount of growth pressure and minimizes environmental impacts in these rural areas, while still addressing the sewage problem. The alternatives should be considered in the prioritized order provided here.

Prioritized recommendations for correcting on-lot problem areas outside sewer growth area:

1. Repair/replace failing on-lot systems with newer on-lot systems such as mound systems, small flow treatment facilities, and alternative systems.
2. Build a community lagoon systems with spray or drip irrigation for effluent disposal.
3. Build a mechanized community disposal systems (package plants). Effluent disposal options should consider spray or drip methods over stream discharge.
4. Install small diameter/low pressure piping system and connect into existing public system.
5. Extend public sewers only after all other options have been exhausted, and size system to limit further growth.

Providing permanent solutions to malfunctioning on-lot sewage facilities can be very costly. Since many times these malfunctions occur in rural areas

where family incomes are low to moderate, funding sources should be sought to lower the cost to homeowners for correcting malfunctions.

Hierarchy of Sewage Facilities Choices for Rural Resource Areas

The intent of this hierarchy is to provide new, low-density development in rural resource areas with an effective sewage treatment and disposal method that has the least growth inducing impact. The list includes commonly used methods of treatment and disposal; DEP designated alternate and experimental systems are not included. Holding tanks are only an interim method of managing sewage, and also are not included in this list.

A hierarchy for cluster development is included in the section titled, "Clusters on the Edge of Designated Growth Areas." A separate hierarchy for correcting malfunctioning on-lot sewers is provided in the section titled, "Concentrations of Failing On-lot Systems." The following hierarchy should be applied to standard lot residential or nonresidential development in the rural resource area.

The alternatives should be considered in the prioritized order in which they are presented. Factors other than the cost of the system or availability of open land must be considered. The size of building lots may need to be increased to find an adequate percolation site for the on-lot system and accommodate a more desirable alternative.

1. On-lot systems with subsurface disposal (the on-lot system could include one or more septic or aerobic tanks, and a sand filter. Subsurface disposal methods include sand mounds, drip, and trench systems).
2. Individual Residential Spray Irrigation Systems (IRSIS).
3. Community lagoon system with spray discharge.
4. Community lagoon system with subsurface discharge (for small developments).
5. Community sand mound (with either individual or community septic tank(s).
6. Mechanical treatment system with spray discharge.
7. Mechanical treatment system with subsurface discharge (for small developments).

8. Community lagoon system with stream discharge.
9. Mechanical treatment with stream discharge.
10. Individual low flow treatment systems with stream discharge.

Connection of new, standard lot style (non-cluster) development to public sewers is not consistent with the recommendations of this plan.

Sewage Management Programs

Most on-lot sewage disposal systems are not interim facilities but are the permanent means of treatment and disposal of sewage. As stated earlier, an overwhelming predominance of the county's soils are classified as having severe limitations for on-site disposal systems. Based on annual complaint response statistics compiled since 1992, the Montgomery County Health Department estimates that between 5% and 10% of the 30,000 existing on-lot systems in the county may not be functioning properly. Malfunctioning on-site disposal systems can lead to ground and surface water pollution. Problems produced by malfunctioning systems include groundwater pollution, surface seepage and/or stream pollution. Long-term maintenance and inspection is critical to keep these systems operating properly. Therefore, an important component of a municipal sewage facilities plan is its on-lot disposal system (OLDS) management program.

The main goal of a management program is to ensure that these on-lot sewage systems are properly operated and maintained. Without operation and maintenance these systems can fail completely or function well below their capacities. A sewage management plan establishes the legal, administrative, and financial mechanisms needed for long-term operation and maintenance.

Sewage management plans are developed based on the specific needs and resources of the municipality in mind, and can therefore be as simple or comprehensive as warranted. However, Chapter 71 of the PA Code does specify some minimal maintenance standards that all sewage management plans must include. A simple management plan might encompass a pumping and maintenance education campaign and/or permit program. A more comprehensive sewage management program would include periodic inspections of on-lot systems by a municipal employee or contractor. Regardless of the extent of the sewage management

program, municipalities should attempt to convey to homeowners that properly installed and maintained sewage systems can extend the life of the system and reduce future repair costs.

Water Quality Issues

Treatment and disposal of wastewater has a direct bearing on groundwater and surface water resources. Both are utilized in the county as a source of drinking water supply. Insufficiently treated wastewater can cause surface water pollution and contribute to the contamination of ground water supplies. Although water quality discharge requirements and monitoring for sewage treatment plants (STPs) has increased dramatically in the past few decades due to programs such as the National Pollution Discharge Elimination System (NPDES) permitting program, most types of sewage systems still pose potential water quality concerns to our streams. Hydraulic and/or biologic overloads, plant malfunctions, as well as inflow and infiltration problems have been experienced at nearly all-municipal facilities at some time in the past.

One of the biggest concerns with the discharge of sewage effluent to our streams is the decrease in base flow found within the regional waterways. The reduced amount of water found within a stream between storm events (base flow) is directly linked to another common trend in regional development, sprawl. Sprawl development typically results in significantly reduced groundwater infiltration. As we pave over the soil or cover it with buildings, less rainfall and runoff is able to reach into groundwater supplies. Since groundwater supplies help to maintain stream base flow, land development practices have contributed to a decrease in the ability of streams to assimilate nutrients and pollutants discharged into them via treatment plants.

This concern of a waterway's ability to assimilate effluent from treatment plant discharges also applies to community and private sewage treatment plants, as well as small flow treatment facilities (SFTF). Small flow treatment facilities are an on-lot sewage system technology being proposed more frequently in recent years within Montgomery County. These facilities are a small-scale treatment plant designed to process flows from a single residence. They are typically only approved as an

The county's waterways are a vulnerable resource that must be protected.

on-lot sewage facilities system in areas where access to public sewers is not feasible and all other on-lot systems are not viable.

Despite the stringent permitting and design requirements for these devices, approximately 15 proposals for SFTFs within Montgomery County have received planning approval within the last 3 years (2000 through 2002). Homeowners should be made aware of the more complicated maintenance requirements of these facilities and the cumulative water quality effect that multiple SFTFs could have on a single waterway.

Another water quality concern related to sewage facilities planning relates to the issue of groundwater mining. This phenomenon can result when public sewage facilities and public water facilities are not installed in an area in tandem. If a municipality extends public sewer lines into areas where individual wells are used for potable water supplies, a loss of groundwater recharge can result. In effect water is often withdrawn from one watershed for potable sources and then discharged into a separate watershed via discharge from a municipal sewage treatment plant.

Groundwater mining, where wells extract water that is discharged to a stream through a public sewer system, should be avoided by providing public sewer and water in tandem.

Recommendations

In order to implement the sewage facilities planning policies discussed in the second half of this chapter, the county has established the following recommendations.

- Municipalities should concentrate sewage facilities within designated growth areas and existing developed areas.
- Municipalities are encouraged to restrict extension of public sewage into rural resource areas.
- Attempts should be made to provide public sewer and water facilities concurrently, where possible within growth areas.
- All municipalities with official sewage facilities plans more than 10 years old and those with significant numbers of failing on-lot systems should review and update the documents.
- Sewage facilities plans should be consistent with regional, county, and municipal comprehensive plans, land use plans, zoning ordinances, and open space plans.

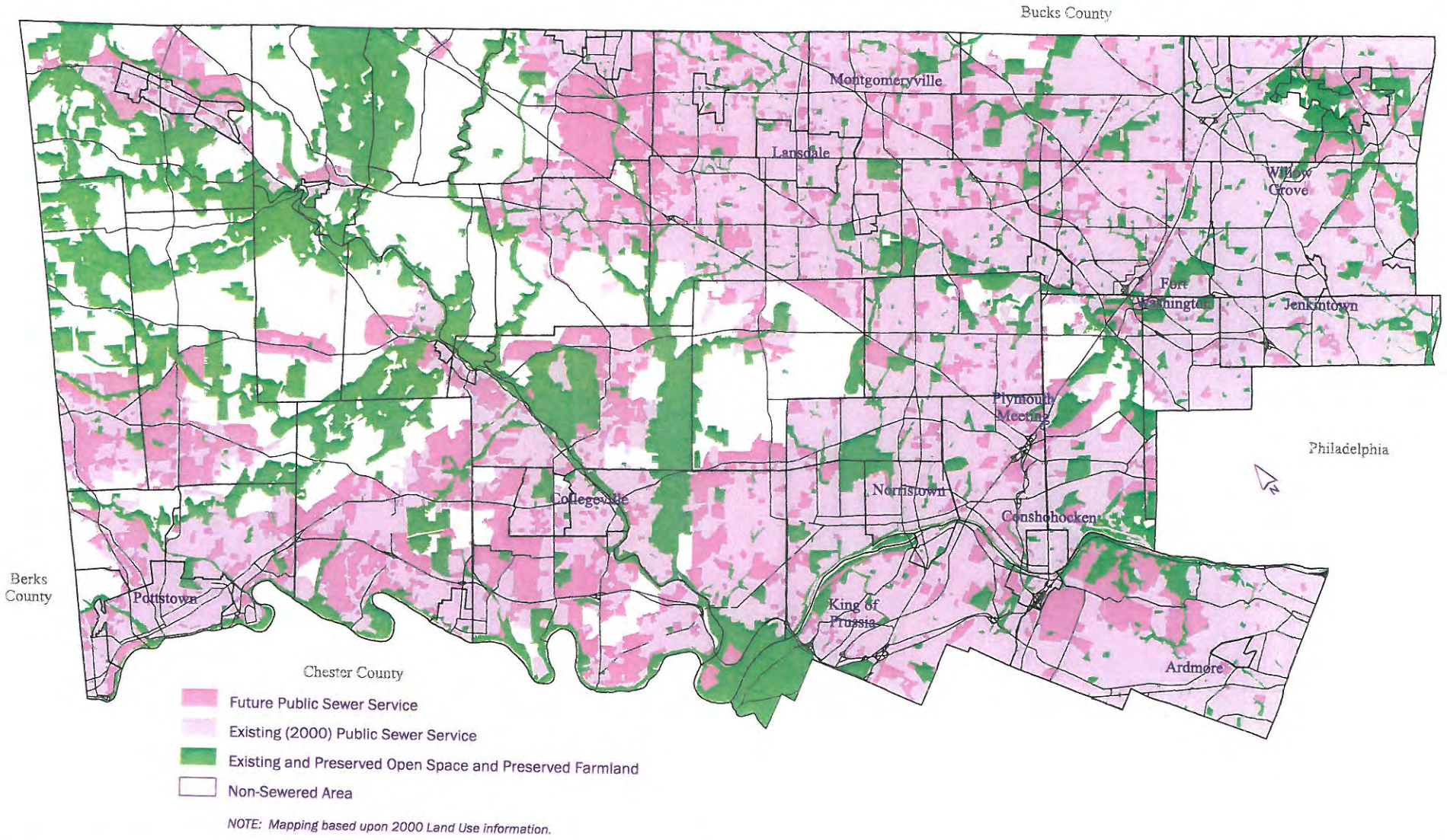
- All municipalities in which on-lot sewage systems exist should develop sewage management programs that help local property owners maintain their systems.
- When cluster-type developments are proposed outside sewer growth areas, centralized sewers should only be extended if the development meets the standards described earlier in this chapter.
- Municipalities are encouraged to use the provided hierachy of sewage treatment alternatives for development within rural resource areas or develop their own similar list for sewage planning purposes.
- Municipalities should encourage the proper oversight and maintenance of private sewage treatment plants (package plants) and industrial plants. For those private and industrial plants that are not being properly maintained and exist within a proposed sewer growth area, municipalities should consider their elimination and connection into the public system.
- The proliferation of stream discharge systems (municipal, private, and small flow treatment facilities) on High Quality or Exceptional Value waterways or other streams with sensitive assimilative capacities (headwaters, Karst) should be avoided.

Exhibit IV-4

MC Future Sewer Service Areas

Hatfield Township, Montgomery County

Figure 11
Existing and Future Sewer Service Areas



Amended Attachment 21-B.1
Page 231 of 537

Exhibit IV-5

MC Comprehensive Plan: Water Resources Summary

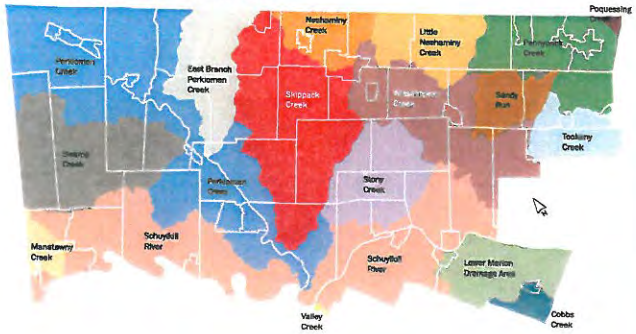
Hatfield Township, Montgomery County

Accomplishing the Vision

Stormwater Management

Stormwater ignores government boundaries and can have a cumulative impact on a watershed. In fact, the quantity of stormwater produced in a developing watershed can increase rapidly even when individual stormwater control facilities are built. To address this impact and determine the best design of future stormwater facilities, Montgomery County is preparing stormwater management plans (Act 167 plans) for each designated watershed. These plans outline release rate requirements and other regulations local municipalities must adopt for their stormwater control ordinances.

Designated Act 167 Watersheds



Best Management Practices (BMP)

Best management practices can dramatically improve stormwater control. These practices include:

- Naturalized basins.
- Vegetated swales.
- Reduced or disconnected impervious surfaces.
- Rain gardens.
- Bioretention areas or bioswales.
- Porous pavement.
- Infiltration basins.
- Sediment forebays.
- Stormwater extended detention ponds.
- Stormwater ponds.
- Constructed wetlands.
- Existing basin enhancements.

This bioswale protects water quality and makes the parking lot more attractive.

This naturalized basin filters stormwater by removing pollutants and allowing water to infiltrate into the soil.

To view this plan online visit:
www.montcopa.org/plancom/comprehensiveplan

For additional information, contact the Montgomery County Planning Commission at 610.278.3722 or mcpcwebmaster@mail.montcopa.org.

This brochure is a summary of the 2025 county *Water Resources Plan*, an element of the Montgomery County comprehensive plan. Other elements of this comprehensive plan include the *Vision Plan*, the *Land Use Plan*, the *Transportation Plan*, the *Economic Development Plan*, the *Open Space, Natural Features, and Cultural Resources Plan*, the *Housing Plan*, and the *Community Facilities Plan*.

These plans were financed in part by a grant from the Commonwealth of Pennsylvania, Department of Community and Economic Development.

MONTGOMERY COUNTY COMMISSIONERS
James R. Matthews, Chairman • Thomas Jay Ellis, Esq. • Ruth S. Damsker

WaterResources Shaping Our Future

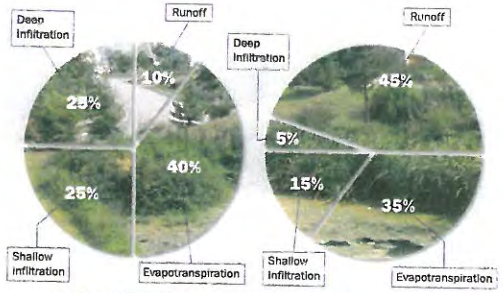
Water Resources Plan Summary

A Comprehensive Plan for Montgomery County

Adopted by the county commissioners in 2005

Current Trends

The water cycle is a natural process that is profoundly affected by people and development. Over the past few decades, the human impact on water has been recognized and addressed with various regulations, including requirements for stormwater control, discharges into streams, and withdrawals from groundwater supplies. In addition, substantial public and private investment has successfully been made to improve water. Nevertheless, the county still experiences flooding, water shortages, and pollution in some locations.



Runoff increases dramatically when development occurs.

Under the Water Resources Plan, the county will have an adequate supply of water in all areas and for all purposes, both consumption and natural habitat.

With the Water Resources Plan, the county's water will be safe and clean.

Vision for the Future

The county's Water Resources Plan shows how government, developers, businesses, and residents can work together to better manage water resources.

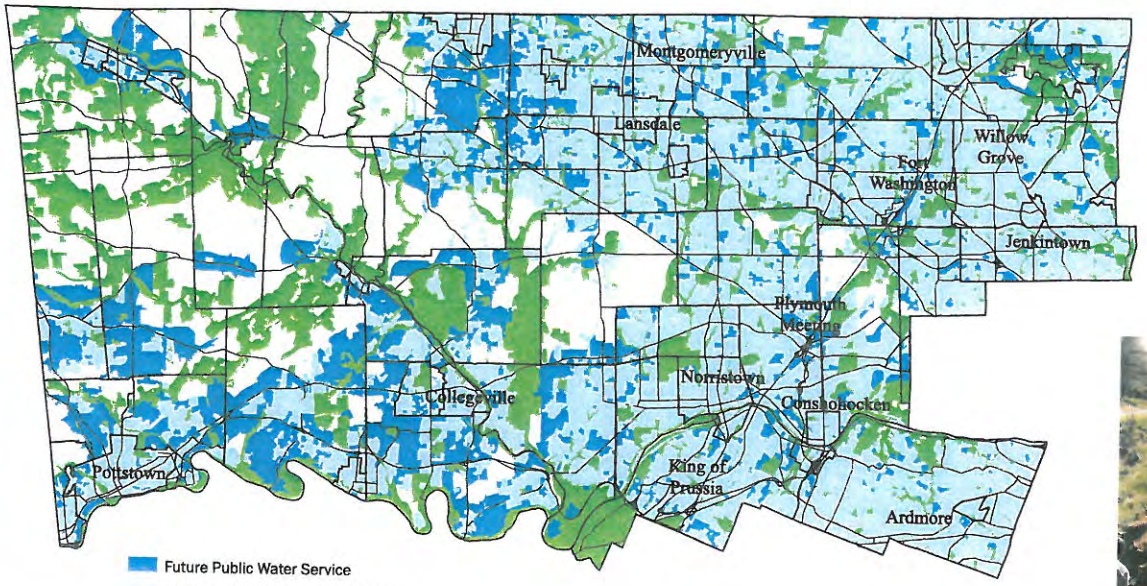
As shown in the Water Resources Plan, the impact of flooding on people and properties will be mitigated.

Using the Water Resources Plan as a guide, stormwater facilities will be improved by mimicking the natural water cycle.

Amended Attachment 21-B.1
Page 238 of 587

Existing and Future Public Water Service
Montgomery County in 2025

Accomplishing the Vision



Future Public Water Service

Existing (2000) Public Water Service

Existing and Preserved Open Space and Preserved Farmland

Areas without Future Public Water Service

Note: Mapping based upon 2000 Land Use information.

Volunteers help with a streambank stabilization project that will reduce erosion and improve water quality.

Water Supply

Most of the county's new homes and businesses will be served by public water, either through existing lines or through extensions into future public water service areas. These future service areas generally correspond to the designated growth areas in the *Vision Plan*, although water service sometimes extends into rural areas where there are concentrations of failing wells or into existing developed areas already served by public sewers.

New development should be limited in areas not expected to be served by public water. Local municipalities with large numbers of failing wells should prepare local water resource plans to help mitigate the impact of new rural development.

All county water users, whether they are served by public water or wells, should adopt and promote strong water conservation measures, including low-flow fixtures, drought-tolerant landscaping, and reuse of water.

Water Quality

Over the past few decades, the quality of the water flowing through Montgomery County has improved significantly. This is due mostly to government regulation of discharges from sewer plants and industrial operations combined with public funding for plant upgrades.

Despite these improvements in water quality, pollution still exists. Much of this pollution comes from nonpoint sources such as runoff from parking lots, roads, farms, golf courses, suburban lawns, construction sites, animal concentrations, and other sources.

The effects of this runoff can be mitigated with stormwater best management practices (see back page), better erosion and sediment control on construction sites, less impervious surface, better farm practices, and more protection of natural areas, including steep slopes, wetlands, riparian corridors, floodplains, and woodlands.

Flooding

Despite everyone's best efforts, flooding is a natural occurrence that will continue in the future. The following actions will help reduce the impact of future floods, especially where natural floodplains have already been developed.

- Improve the flood warning system for the public and emergency services.
- Keep new buildings out of floodplains or, when old brownfield sites in revitalizing towns are being rebuilt, require new buildings to be elevated above flood levels.
- Maintain the drainage system and make sure debris does not block inlets, outlets, and bridge underpasses.
- Identify man-made constriction points on local streams and, over time, widen these constriction points.
- In places that have flooded repeatedly, potentially acquire properties and relocate the occupants.
- Effectively enforce floodplain regulations.
- Adopt natural resource protection ordinances, including riparian corridor and wetland ordinances.
- Inform the public about the real dangers of flooding.

New development on existing developed land in floodplains should be elevated and floodproofed.

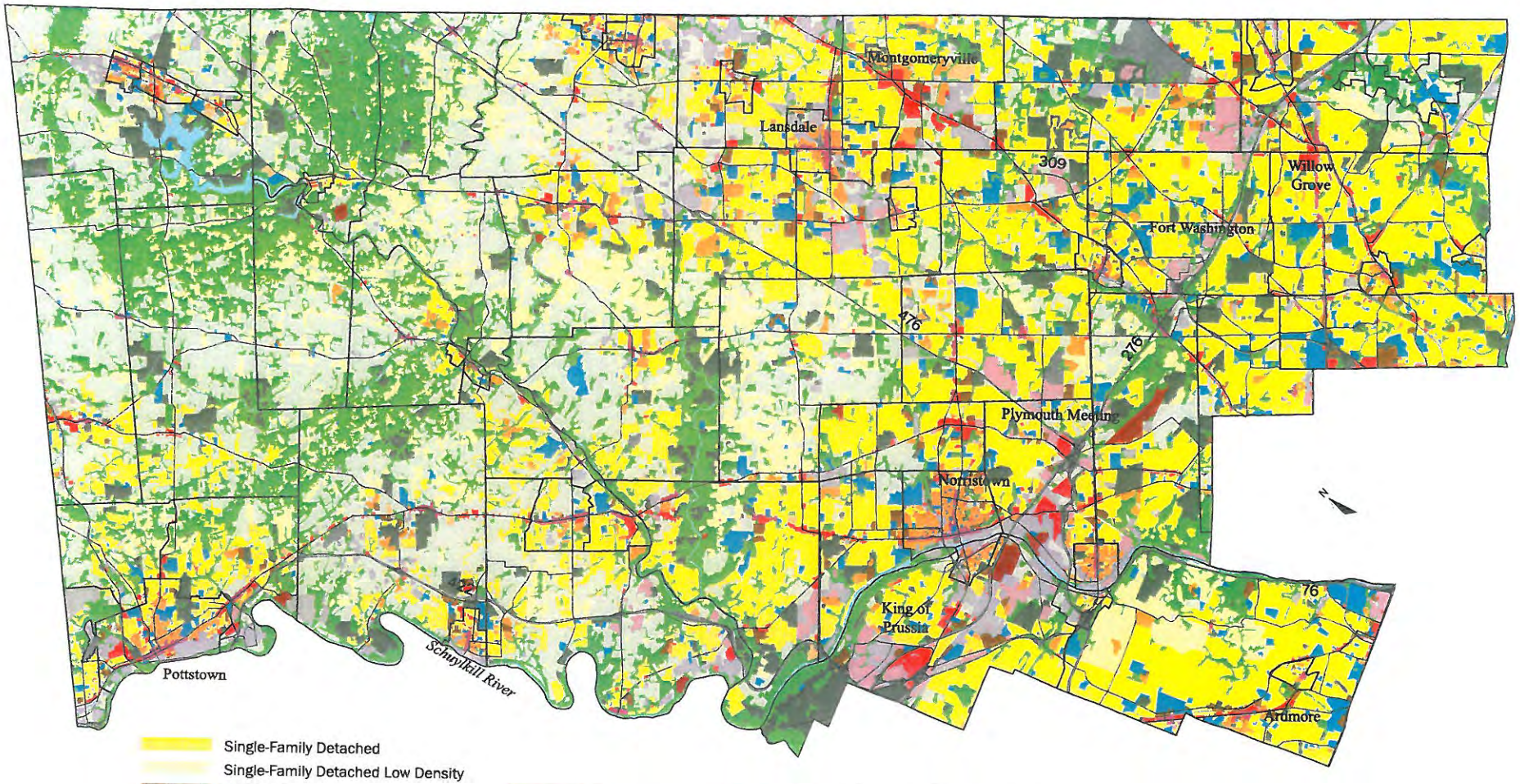
Amended Attachment 21-B.1
Page 234 of 537

Exhibit IV-6

MC Existing Land Use Designations and Map

Hatfield Township, Montgomery County

Figure 1
2000 Existing Land Use in Montgomery County



This map is based on 2000 ortho photographs, Montgomery County Board of Assessment Appeals tax maps, Planning Commission staff review, and field surveys conducted by the County Planning Commission. All attempts were made to maintain relative accuracy, however, this map should not be used for engineering purposes.

Amended Attachment 21-B.1
Page 236 of 537

Exhibit IV-7

Delaware Valley Regional Planning Commission Population Forecasts

Hatfield Township, Montgomery County

Appendix — Population by municipality, 2000 through 2035

Jurisdiction	2000 Census	2005 Estimate	2010 Forecast	2015 Forecast	2020 Forecast	2025 Forecast	2030 Forecast	2035 Forecast	Absolute change 2005-2035	Percent change 2005-2035
Montgomery County	**748,978**	**780,544**	**802,340**	**822,952**	**842,452**	**860,816**	**878,158**	**894,136**	**113,592**	**15%**
Franconia Township	11,525	12,200	13,505	14,739	15,906	17,005	18,044	19,000	6,800	56%
Hatboro Borough	7,390	7,332	7,392	7,448	7,501	7,552	7,599	7,643	311	4%
Hatfield Borough	2,605	2,889	2,937	2,982	3,025	3,065	3,103	3,138	249	9%
Hatfield Township	16,712	17,577	18,174	18,739	19,273	19,776	20,251	20,689	3,112	18%
Montgomery Township	22,025	24,358	24,961	25,531	26,071	26,579	27,058	27,500	3,142	13%

Sources: U.S. Census Bureau (2000 data); Delaware Valley Regional Planning Commission, incorporating comments from the planning staffs of the Commission's nine member counties (2005 estimates and 2010-2035 forecasts). The DVRPC Board formally adopted these forecasts on July 26, 2007, with affirmative votes from all voting members except Bucks County.

Amended Attachment 21-B.1
Page 238 of 537

Exhibit IV-8

Contributing Municipality Future Flow Requirement Correspondence

Hatfield Township, Montgomery County

CET ENGINEERING SERVICES

April 7, 2008

Mr. John Nagel, Township Manager
Montgomery Township
1001 Stump Road
Montgomeryville, PA 18936

CERTIFIED MAIL NO. 7007 0710 0002 4083 8649
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear John,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the its wastewater treatment plant in an effort to establish overall future demands.

According to the current capacity agreement, Montgomery Township owns 1/3 of the current plant design capacity or 2.14 million gallons per day (MGD). Please provide a projection of additional capacity that may be required in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

MONTGOMERY TOWNSHIP MUNICIPAL SEWER AUTHORITY
1001 STUMP ROAD, MONTGOMERYVILLE, PA 18936-9605
TELEPHONE (215) 393-6930
FAX (215) 362-8711

RECEIVED
MAY 19 2008
CET, INC.
HARRISBURG, PA

May 15, 2008

Ms. Jodi Reese, P.E.
CET Engineering Services
1240 Mountain Road
Harrisburg, PA 17112

RE: Act 537 Planning – Hatfield Township

Dear Ms. Reese:

I am replying to your April 7, 2008 letter to John Nagel, Manager of Montgomery Township. Act 537 Planning has been delegated by the Township to the Montgomery Township Municipal Sewer Authority.

On behalf of the Township, I am confirming that Montgomery Township Municipal Sewer Authority currently owns 2.14 (minimum) MGD capacity in the Hatfield Township Municipal Authority Wastewater Treatment Plant and needs all of that capacity. Montgomery Township flow now approximates 1.8 MGD and the attached chart shows that we will need an additional available flow of 267,000 GPD through final build-out of the Township. This means that we believe that our current flows plus our future needs are within the capacity to which we are already entitled. We do not currently desire additional capacity and it is the Township's intention to remain within our purchased capacity of 2.14 (minimum) MGD.

Sincerely,

Beverly Brown

Beverly Brown
Manager

Cc: Pete Dorney, HTMA
John Nagel, Montgomery Township Manager
Stephanie Teoli, Hatfield Township Manager

Montgomery Township	Dep Code	Dep Approved	Flow GPD	Flow EDU	Connected	Remaining	GPD	Time Frame
Heckler Tract		NO	9,000	36	0	36	9,000	Within 1 year
Firefox		NO	34,500	115	0	115	34,500	Within 1 year
Manor View		YES	2,500	10	10	0	0	Connected
Montgomery Baptist Church		NO	5,250	21	0	21	5,250	Within 5 years
Logo's Group Development	1-46940-185-3H	YES	10,800	36	0	36	10,800	Within 5 years
Taco Bell Restaurant	1-46940-225-E	YES	3,300	11	0	11	3,300	Within 1 year
Indian Lake Farm Subdivision	1-46940-238-E	YES	6,000	20	19	1	300	Within 1 year
Trefoil Properties, Inc. Development	1-46940-251-E	YES	3,000	10	0	10	3,000	Within 5 years
Calhoun Tract	1-48940-278-3J	YES	2,100	7	0	7	2,100	Within 5 years
675 Bethlehem Pike (restaurant and 2 retail)	1-46940-286-E	YES	3,000	10	10	0	0	Connected
Best Western Hotel	1-46940-290-E	YES	23,100	77	0	77	23,100	Within 5 years
Longhorn Steakhouse	1-46940-294-E	YES	5,100	17	0	17	5,100	Within 5 years
Montgomery Avenue, 15 properties	1-46940-301E	YES	11,900	34	2	32	9,600	Within 5 years
Dick's Sporting Goods	1-46940-299-E	YES	2,700	9	9	0	2,700	Connected
Arbors Commercial		NO	2,100	7		7	2,100	Within 5 years
Vacchiano Tract	1-46940-301E	YES	600	2	0	2	600	Within 1 year
Connelly Tract	1-46940-285E	YES	1,200	4	0	4	1,200	Within 1 year
Miscellaneous		NO	13,500	45	25	20	6,000	Within 5 years
Montgomery Mall Expansion		NO	125,000	500	0	500	125,000	Within 5 years
Parcel # 46-00-00853-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00841-004		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-00844-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00850-004		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00847-007		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-00253-007		NO	1,200	4	0	4	1,200	Within 5 years
Parcel # 46-00-03103-001		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-03124-007		NO	1,200	4	0	4	1,200	Within 5 years
Parcel # 46-00-00679-007		NO	600	2	0	2	600	Within 5 years
Parcel # 46-00-00673-001		NO	300	1	0	1	300	Within 5 years
Parcel # 46-00-03127-007		NO	2,400	8	0	8	2,400	Within 5 years
Parcel # 46-00-00835-001		NO	6,000	20	0	20	6,000	Within 5 years
Parcel # 46-00-00910-007		NO	9,000	30	0	30	9,000	Within 5 years
Totals			287,750	1,048	75	973	266,750	

CET ENGINEERING SERVICES

April 7, 2008

Mr. William McCauley, Acting Manager
Hatfield Borough
401 South Main Street
Hatfield, PA 19440

CERTIFIED MAIL NO. 7007 0710 0002 4083 8656
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Mr. McCauley,

In February 2008 Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to the 2007 Hatfield Township Chapter 94 Wasteload Management Report, Hatfield Borough's current contribution to the system is 1,546 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the borough. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

CET ENGINEERING SERVICES

April 7, 2008

Mr. Kevin Baver, Manager
Franconia Township
671 Allentown Road
PO Box 128
Franconia, PA 18924

CERTIFIED MAIL NO. 7007 0710 0002 4083 8625
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Kevin,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. As you may recall, planning was initiated on this project in September of last year. Since that time a draft Plan of Study and Task Activity Report has been developed.

In order to continue the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to the 2007 Chapter 94 Wasteload Management Report, Franconia Township's current contribution to the system is 441 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager

CET ENGINEERING SERVICES

April 7, 2008

Mr. Chistopher S. Christman, Township Manager
Hilltown Township
13 West Creamery Rd.
P.O. Box 260
Hilltown, PA 18927

CERTIFIED MAIL NO. 7007 0710 0002 4083 8632
RETURN RECEIPT REQUESTED

RE: Act 537 Planning – Hatfield Township

Dear Mr. Christman,

In February 2008, Hatfield Township requested the Hatfield Township Municipal Authority (HTMA) take the lead in planning and developing the Township Act 537 Plan Revision. This Plan Revision will address planning periods of 10 years, 20 years, and final buildout of the Township. Planning was initiated on this project in September of last year and since that time a draft Plan of Study and Task Activity Report has been developed.

In order to begin the Plan Revision Process, HTMA is contacting all municipal entities currently sending flows to the HTMA wastewater treatment plant in an effort to establish overall future demands.

According to HTMA records, Hilltown Township's current contribution to the system is 160 EDU's. Please provide a projection of additional EDU's that may be committed to the system in the next 10 years, 20 years, and final buildout of the township. Additional capacity above the current level may require an expansion project at the expense of contributing municipalities of the Authority.

Due to DEP submission requirements, we request a response not later than May 9, 2008. Planning will proceed as if no additional flow is anticipated should a response not be received by that time. Thank you in advance for your assistance in this matter.

Sincerely,

CET Engineering Services

Jodi Reese, P.E.
Principal Engineer

xc: Pete Dorney, HTMA
Stephanie Teoli, Hatfield Township Manager
C. Robert Wynn Associates, Inc., 211 West Broad St., Quakertown, PA 18951

HILLTOWN TOWNSHIP
13 West Creamery Road
P.O. Box 260
Hilltown, PA 18927
(215) 453-6000 Fax (215) 453-1024
www.hilltown.org

May 5, 2008

RECEIVED
MAY 07 2008
CET, INC.
HARRISBURG, PA

Ms. Jodi Reese, P.E.
Principal Engineer
CET Engineering Services
1240 North Mountain Road
Harrisburg, PA 17112

RE: Act 537 Planning – Hatfield Township & Hilltown Township

Dear Ms. Reese:

Hilltown Township is in receipt of your letter dated April 07, 2008 requesting information pertaining to an Act 537 Plan Revision being created by Hatfield Township Municipal Authority (HTMA) on behalf of Hatfield Township.

Hilltown Township is requesting a time extension on the information requested, as it is difficult to gather the appropriate data. As you are aware, Act 537 planning is strictly a municipal function. We would like to request copies of any "Scope of Work" that was authorized by PA DEP without Hilltown's review or input, since this question potentially involves a revision to the DEP approved Act 537 Plan for Hilltown Township.

Moreover, your request indicates that there are currently 160 EDUs connected to the HTMA wastewater treatment plant. Please provide information on all of the parcels that have reserved capacity and/or are currently served by the HTMA.

As you may or may not be aware, Hilltown Township Resolution 1999-33, which is enclosed for your review, adopted the Act 537 Plan for Hilltown Township, identified six items to be implemented for the various study areas within the Township. Specifically, item three included "Extension of Hatfield Township Municipal Authority public sewer collection system to serve businesses and residential properties along Route 309 with the Route 309 Corridor Study Area. This will involve the execution of a service area agreement between Hilltown Township and the Hatfield Township Municipal Authority. Treatment of effluent will occur at the Hatfield Township Municipal Authority Treatment plant." This service area agreement has not been executed.

Furthermore, your correspondence indicates that additional capacity above the current level may require an expansion project at the expense of the contributing municipalities of the Authority. Is this same requirement being imposed on Hatfield Township? This is an unusual provision and has not been required previously by the HTMA or by any other Authorities serving Hilltown Township. Typically, when a servicing authority increases capacity at a treatment plant for future connections, the cost of that plant expansion is borne by the Authority with the cost recovered by those future connections.

We are aware that Hatfield Township Officials met privately with PA DEP and we are requesting the same opportunity be afforded to Hilltown Township.

Similarly, it is our hope that we can schedule a joint meeting with representatives from the Department, HTMA, and Hatfield Township to come to a resolution of this issue. Please contact me at your earliest convenience to set a date for this joint meeting. Hilltown Township would certainly offer to host the meeting.

Sincerely,
Hilltown Township

Christopher S. Christman
Township Manager

Cc: Supervisor Richard J. Manfredi – Chair
Supervisor John B. McIlhinney – Vice Chair
Supervisor Barbara Salvadore – Secretary/Treasurer
Joseph A. Feola – SE Regional Director – PA DEP
Clinton Cleaver – Sewage Planning Supervisor - PA DEP
Elizabeth Mahoney – Sewage Planning Supervisor - PA DEP
C. Robert Wynn – Township Engineer
Francis X. Grabowski, Esq. – Township Solicitor
Stephanie Teoli – Hatfield Township Manager
Pete Dorney – HTMA
James Groff - HTWSA
File

RESOLUTION No. 99 - 33

A RESOLUTION FOR 537 WASTEWATER FACILITIES PLAN REVISION

WHEREAS Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as Amended, and the Rules and Regulations of the Pennsylvania Department of Environmental Protection, The Department adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requiring Hilltown Township to adopt an Official Sewage Facilities Plan for the provision of adequate sewage systems and to revise said plan from time to time as may be necessary, and

WHEREAS Hilltown Township has prepared the said plan and has found it adequate for the wastewater disposal and management needs of the entire Township.

NOW, THEREFORE, BE IT RESOLVED that Hilltown Township hereby adopts the plan known as the Hilltown Township Wastewater Facilities Plan for the wastewater and management needs as the Official Plan of the municipality. The Township hereby assures the Department of the proper and timely implementation of the said plan as set forth therein:

The alternatives of choice to be implemented for the six study areas in the Township are as follows:

1. Implementation of a collection and conveyance system and construction of a sewage treatment plant to provide additional treatment plant capacity to serve that portion of the development district within the jurisdictional limits of the Hilltown Township Water and Sewer Authority (HTWSA study area).

2. Continued reliance on treatment facilities of the Pennridge Wastewater Treatment Authority to provide public sewer service within the Telford Borough Authority area of jurisdiction (Mill Creek basin study area) and Perkasie Borough Authority study area. This includes Telford Borough Authority participation in a PWTA plant expansion and purchase of additional capacity within the expanded plant; and execution of a service area agreement between Hilltown Township and Perkasie Borough Authority.

3. Extension of Hatfield Township Municipal Authority public sewer collection system to serve businesses and residential properties along Route 309 within the Route 309 corridor study area. This will involve the execution of a service area agreement between Hilltown Township and Hatfield Township Municipal Authority. Treatment of effluent will occur at the Hatfield Township Municipal Authority (HTMA) treatment plant.

4. Increased level of municipal involvement in wastewater facility planning and maintenance through implementation of a public education program.

5. Implementation of an inspection/monitoring program of the operation and maintenance of holding tanks, small flow treatment facilities, and individual residential spray irrigation systems within the Township.

6. Implementation of a wastewater alternative selection process for all developments to ensure utilization of the most cost effective and environmentally sensitive disposal/treatment facilities.

SO RESOLVED this 22 day of Nov, A.D., 1999, by the Board of Supervisors of Hilltown Township, Bucks County, PA.

ATTEST:

Lynda Serman

HILLTOWN TOWNSHIP
BOARD OF SUPERVISORS

Wm H. Bennett
Chairman

Vice Chairman

John S. Bender
Supervisor

Exhibit V-1

Derstine Run Grading and Utility Plans

Hatfield Township, Montgomery County

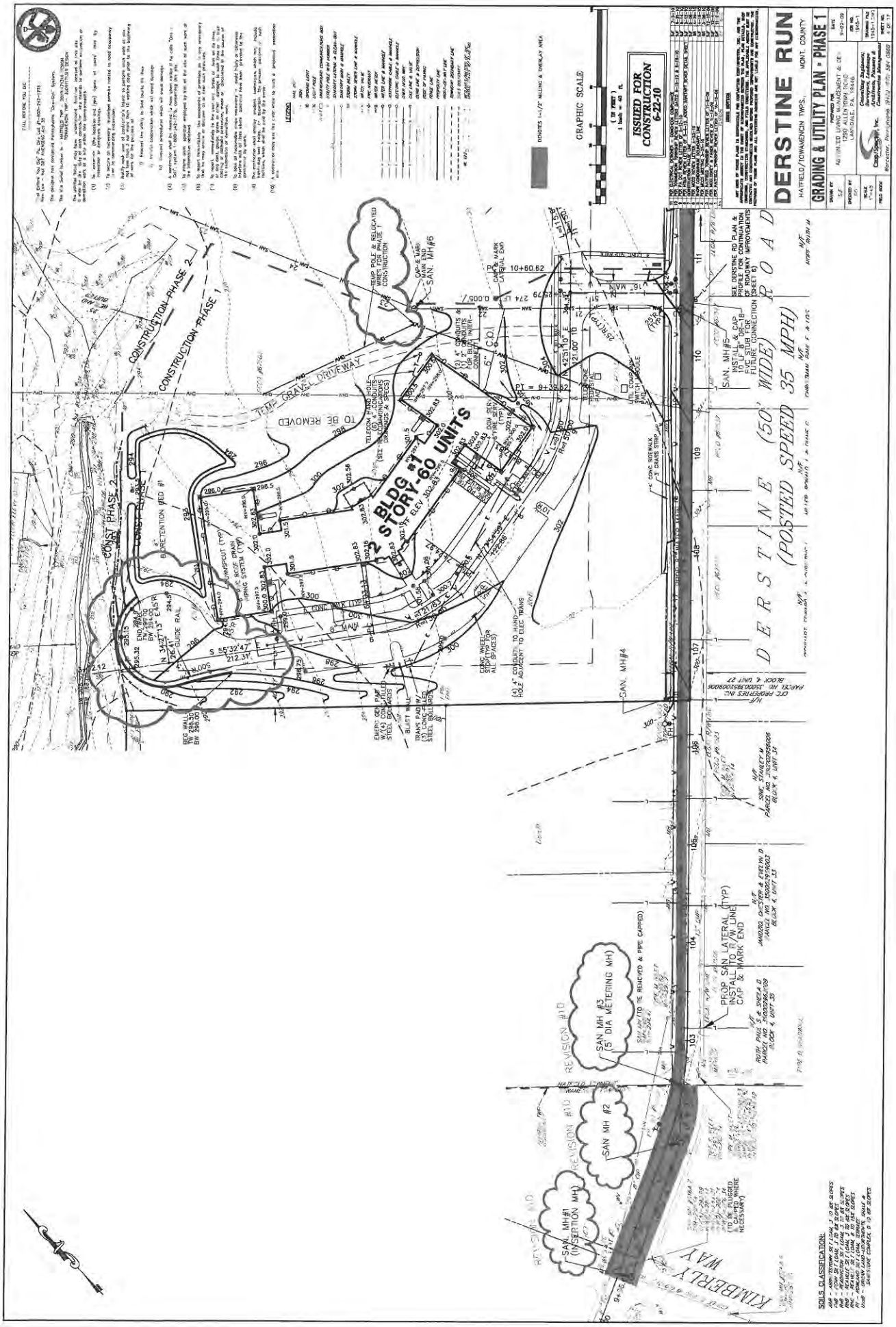

DERSTINE RUN
HATFIELD/TOWAMENCIN TWPS., MONT. COUNTY
GRADING & UTILITY PLAN - PHASE 1
ISSUED FOR CONSTRUCTION 6-22-10
GRAPHIC SCALE
DERSTINE ROAD (50' WIDE) (POSTED SPEED 35 MPH)
CONSTRUCTION PHASE 1
CONSTRUCTION PHASE 2
CONST PHASE 2
TEMP GRAVEL DRIVEWAY
TO BE REMOVED
BLDG #1 2 STORY-60 UNITS
BLDG #2 2 STORY-60 UNITS
BIORETENTION BED #1
BIORETENTION BED #2
SAN. MH#1 (INSERTION MH)
SAN. MH#2
SAN. MH#3 (5' DIA METERING MH)
SAN. MH#4
SAN. MH#5
SAN. MH#6
PROP SAN LATERAL (TYP) INSTALL TO R/W LINE CAP & MARK END
REVISION #10
KIMBERLY WAY
SOILS CLASSIFICATION:
Allenwood Gravelly Loam, 3 to 8% Slopes
Ava - Ava Loam, 3 to 8% Slopes
Ava - Ava Loam, 8 to 15% Slopes
Reb - Reaville Silt Loam, 0 to 3% Slopes
ReC - Reaville Silt Loam, 3 to 8% Slopes
ReD - Reaville Silt Loam, 8 to 15% Slopes
Udub - Urban Land-Udorthents, Shale &
Sandstone Complex, 0 to 8% Slopes

Exhibit V-2

DRSA Preliminary Sanitary Sewer Layout

Hatfield Township, Montgomery County

Exhibit V-3

Correspondence to Towamencin Township And Agreement

Hatfield Township, Montgomery County

CHARLES MURGIA, Chairman
DONALD D. ATKISS, Vice Chairman
HARRY RUTHERFORD, Asst. Secretary
BARRY WERT, Secretary/Asst. Treasurer
CHARLES SIBEL, Treasurer

PETER R. DORNEY, Executive Director

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
CLEAN WATER

CET ENGINEERING SERVICES
Engineer
717-541-0622

HAMBURG, RUBIN, MULLIN,
MAXWELL & LUPIN
Solicitor
215-661-0400

February 8, 2010

Robert A. Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Derstine Road Area and HTMA Basins 14 and 16

Dear Mr. Ford,

As part of Hatfield Township's ongoing Act 537 planning and revision process, CET Engineering Services conducted an On-Lot Sewage Disposal System Needs Analysis throughout Hatfield Township. The attached figure depicts an area of the Township referred to in the current Draft Act 537 Plan Revision as the Derstine Road Study Area (DRSA). This area is comprised of HTMA Sewage Drainage Basin 16 and a portion of Drainage Basin 14. There are approximately 30 on-lot sewage disposal systems in this area primarily situated in the parcels adjacent to Derstine Road. Sanitary and well sampling in this area indicated increased levels of nitrate contamination, but no coliform contamination at this time. As such, the Act 537 planning and Needs Analysis process requires the development of alternatives to provide sewage treatment, either via conventional collection and conveyance or other land based methods, to this area.

Additionally, HTMA and Hatfield Township have been made aware of development plans for a 26 acre parcel in the DRSA, adjacent to Derstine Road. Development plans indicate the construction of an assisted living facility requiring 240 EDUs of sewage capacity. These plans also indicate that the developer intends to construct a conventional collection system which would serve the facility via a collector sewer constructed along Derstine Road to the south, connecting to a Manhole 516A.7 in Towamencin Township.

The timing of this submission is such that Towamencin Township could be considered in Hatfield Township's Act 537 planning process as a potential alternative for providing sewage collection and treatment not only for the planned development but also for the remainder of the on-lot systems in the DRSA and other potential future development. In order to do so, an extension to the developers proposed line in Derstine Road could be constructed. This line would run north to approximately Elroy Road to serve the on-lot systems and future undeveloped areas along Derstine Road. Initially, however, approximately 10 on-lot systems along Derstine could potentially be served via the developer's collector sewer, resulting in approximately 250 new EDUs (including 240 EDU's from Derstine Run).

Should HTMA construct a further extension to this line, north along Derstine Road, approximately 20 more on-lot systems could be served. Additionally, approximately 70 acres exist in these basins that are not yet fully developed. The areas east of Derstine Road are currently zoned Light Industrial (LI) and Residential (RA-1), with much of the not fully developed area in the LI zoning classification. Areas west of Derstine Road are zoned Estate Residential (ER). It is estimated that an additional approximately 200 EDUs could result should this land be fully developed at the current zoning. Based on this, a future potential connection of another 220 EDUs for a total of 470 EDUs could occur.

A detailed review of the developers plans as well as further coordination with residents in the DRSA is required to ensure the collector line in Derstine Road could pick up the associated on lot systems, or if individual grinder pumps are necessary.

Therefore at this time, Hatfield Township and Hatfield Township Municipal Authority are requesting that Towamencin Township and the Upper Gwynedd Towamencin Municipal Authority consider the acceptance of the basins as described herein. HTMA's analysis has concluded that it would be more prudent and cost effective to service this area by gravity to Towamencin Township than to install a new pump station. Primarily, since the plans for the assisted living facility are moving forward, HTMA requests that Towamencin Township evaluate its existing collection, conveyance and treatment facilities for the ability to accept and include 250 EDUs into its system in the near future, with the potential for an additional 220 EDUS in the more distant future.

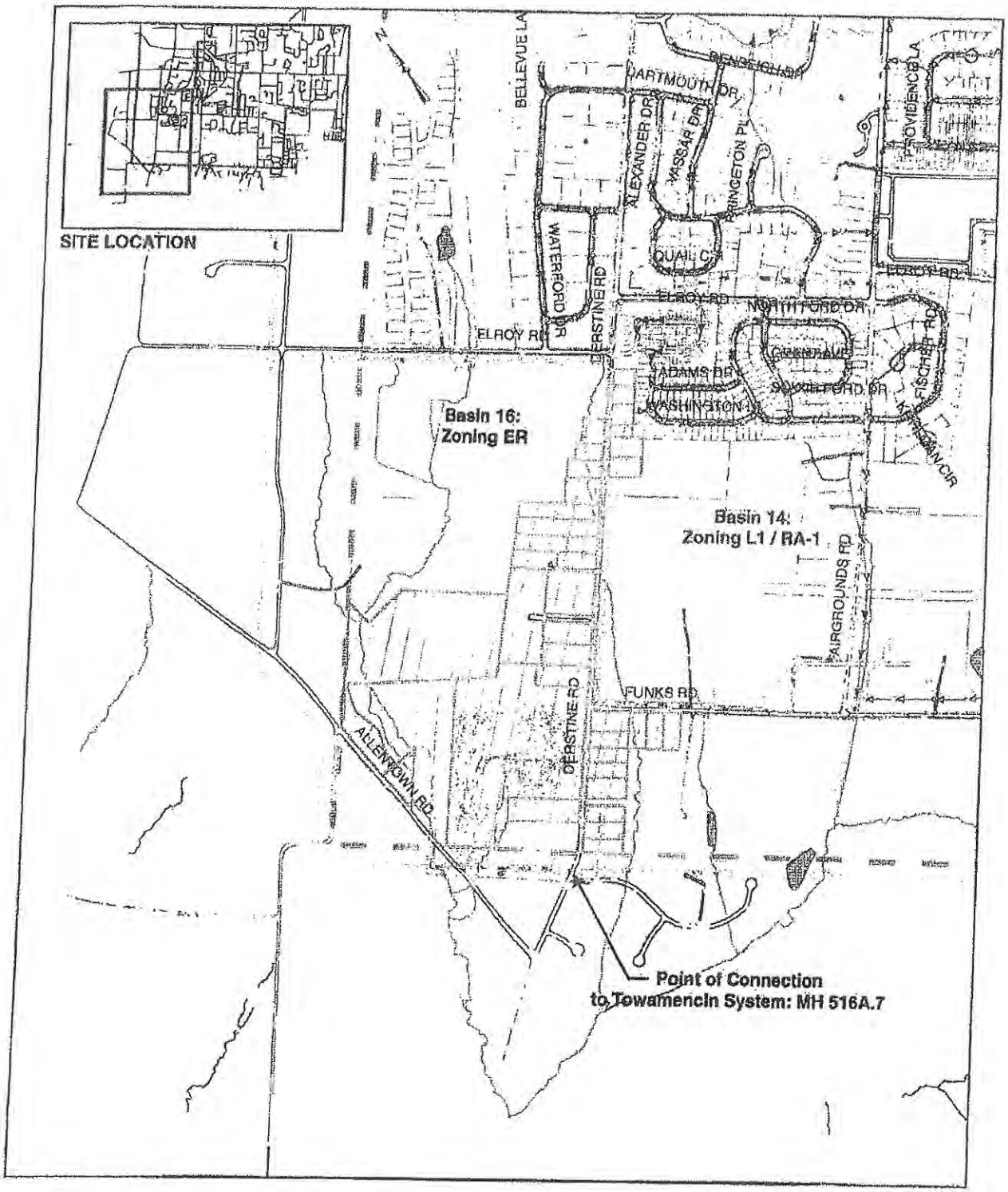
Should you have any questions or concerns please do not hesitate to contact me.

Sincerely,

Peter Dorney
Executive Director

Joel K. Kostelac, P.E.
Staff Engineer

Cc: Tom Whittle, CET
Joel Kostelac, CET
Andrew Haines, Hatfield Township
Ken Amey, Hatfield Township
Paul Mullin, HRMM&L
File



DERSTINE RD STUDY AREA (DRSA)
Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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Last Saved: 9/8/09 10:19 AM
File: J:\Hatfield Township Municipal Authority\2006 wo\004 - HTMA SIS\Derstine Study Area - Overall 8.5x11 1000scale.mxd

BURSICH
Sharing your Vision

Engineers | Planners | Surveyors | Landscape Architects

March 2, 2010

Mr. Robert Ford, Manager
Towamencin Township
1090 Troxel Road
P.O. Box 303
Kulpsville, PA 19443

RE: Derstine Run Study Area
Bursich Project No.: TOW-02/096441

Dear Rob:

We have reviewed the Hatfield Township Municipal Authority's (HTMA) attached February 8, 2010 letter, in regards to their request for sewer service to the Derstine Run Study Area (DRSA). See attached figures for study area. We offer the following comments and recommendations:

A. Hatfield Township & Hatfield Township Municipal Auth. Request

1. Sewer service to the Derstine Run development consisting of 240 EDU (67,200gpd). Planned connection to the UGTMA/TT sewer system would be Derstine Road at the Hatfield/Towamencin municipal boundary. Capacity is needed early 2010.

2. Sewer service to the existing homes with on-lot systems in Hatfield Township (HT) within the study area. Initially, ten existing homes (10 EDU, 2,800gpd) may connect to the HTMA sewer extension.

3. Future sewer extensions by HTMA, along with development of vacant lands, could result in an additional 220 EDU (61,600gpd) of required sewer capacity for the DRSA.

4. HT and HTMA are therefore requesting TT and UGTMA consider accepting the DRSA into the overall UGTMA sewer service area. HT and HTMA needs are summarized as follows:

Year	# EDU	Average Daily	Peak Flow Rate PF = 4.0
2010	250/EDU	70,000gpd	0.280mgd
Future	220 EDU	61,600gpd	0.246mgd
Totals	470 EDU	131,600gpd	0.526mgd

B. Comments

1. The UGTMA and TT have sufficient capacity at the UGTMA wastewater treatment plant for the 131,600gpd average daily flow, based on the 2009 WWTP capacity report.

2. The sewer collection and conveyance system from the proposed connection point on Derstine Road to the UGTMA wastewater treatment plant will need to be studied and analyzed for capacity. The scope of work will include a review of the existing sewer flows and calculation of future TT flows tributary to the sewer system. The flow metering of existing flows will require the hiring of a flow meter subcontractor. The flow metering duration will need to encompass at least three significant wet weather events. It appears three flow meter locations will be required as follows:

   a. On interceptor sewer near Allentown Road
   b. On interceptor sewer near Tomlinson Road
   c. On interceptor sewer near Wambold Road/Detwiler Road intersection

   In addition, data from the existing flow meters at the Rittenhouse Road pump station and UGTMA wastewater treatment would be utilized in the capacity study. Assuming the flow meters will only be installed for a two month period, we estimate the subcontractor's cost for the metering to be $5,000.

3. If the developer/HTMA wants TT to solicit for flow metering quotes, coordinate the flow meter installation and assist with meter data downloads, we can provide those services for TT. This would be similar to the capacity study completed for the development near the North Penn Water Authority.

4. The overall time frame for the study would be three months, assuming a two month flow meter data gathering period. If insufficient wet weather occurs during the two months, the study duration and cost would increase proportional to the gathering of the data.

5. We estimate the engineering costs for the capacity study to be in the range of $8,000 to $10,000 range. These costs are in addition to the subcontract flow meter estimated costs of $5,000.

6. The study will identify if the TT sewer system has sufficient capacity for the peak flow rates above. If there is insufficient capacity, the study will provide a preliminary recommendation on the necessary sewer system improvements to provide capacity along with estimated costs to handle the 2010 flows as Phase 1 and for future flow capacity as Phase 2.

7. If sewer service is provided to the DRSA, then the municipalities should develop a sewer service agreement. The agreement should include a requirement for a flow meter at the municipal boundary along with flow limit criteria.

C. Recommendations

1. TT/UGTMA should obtain a funding commitment for the capacity study.

2. Complete the sewer capacity study for the DRSA.

3. Develop a sewer service agreement with HT/HTMA.

4. Upon satisfactory completion of the above items, review planning module Chapter 94 sewer capacity requirements for developments within the DRSA.

We are available to meet with you to discuss the above comments.

Very truly yours,

William K. Dingman

William K. Dingman, P.E.
Senior Managing Engineer
Bursich Associates, Pottstown Office

Enclosures

pc: Mr. Geoff Smith, UGTMA Executive Director (w/encl)
Mr. Dick Smith, Bursich Associates, Inc. (w/encl)

RESOLUTION 10-

RESOLUTION AUTHORIZING THE PROPER OFFICERS TO EXECUTE THE AGREEMENT WITH HATFIELD TOWNSHIP MUNICIPAL AUTHORITY, HATFIELD TOWNSHIP, AND THE UPPER GWYNEDD TOWAMENCIN MUNICIPAL AUTHORITY PROVIDING FOR THE SALE OF THE SEWER CAPACITY, THE PROVISION OF SEWER SERVICE TO THE DERSTINE WATERSHED AREA AND THE TRANSFER OF MAINTENANCE OBLIGATIONS

A Resolution authorizing the proper officers to execute the agreement with Hatfield Township Municipal Authority, Hatfield Township, and the Upper Gwynedd Towamencin Municipal Authority providing for the sale of the sewer capacity, the provision of sewer service to the Derstine Watershed Area and the transfer of maintenance obligations

WHEREAS, there are certain geographical areas located within Hatfield Township with contours which make it preferable to provide public sanitary service by gravitational flow into the UGTMA Treatment Plant; and

WHEREAS, previously, Hatfield Township and the Hatfield Township Municipal Authority assigned and released certain sanitary sewer flows to Towamencin and the UGTMA; and

WHEREAS, in order to continue to facilitate gravitational flow and sewer treatment, Hatfield Township and the Hatfield Township Municipal Authority have requested that flows from certain additional areas (the "Derstine Watershed Area") be accepted by Towamencin and the UGTMA; and

WHEREAS, Towamencin is desirous of releasing the maintenance obligations for certain sewer lines existing in Hatfield Township to the Hatfield Township Municipal Authority;

WHEREAS, the parties have prepared an agreement setting forth the terms for the sale of sewer capacity as well as the delineation of certain other obligations amongst the parties.

NOW, THEREFORE, BE IT RESOLVED that the proper officers of the Township are authorized to execute the Agreement a copy of which is attached to this Resolution provided all other parties to the Agreement have previously approved said Agreement.

RESOLVED this ___day of _____, 2010.

BOARD OF SUPERVISORS
TOWAMENCIN TOWNSHIP

BY: _____
Daniel M. Littley, Jr., Chairman

ATTEST: _____
James P. Sinz, Secretary

September 17, 2010

AGREEMENT

THIS AGREEMENT ("Agreement") made this day of, 2010, among **HATFIELD TOWNSHIP MUNICIPAL AUTHORITY** ("HTMA"), **HATFIELD TOWNSHIP** ("Hatfield"), **TOWAMENCIN TOWNSHIP** ("Towamencin") and **UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY** ("UGTMA").

RECITALS

A. There are certain geographical areas located within Hatfield Township whose contours make it preferable to provide public sanitary sewer service by gravitational flow into the UGTMA treatment plant.

B. HTMA, Hatfield, Towamencin and the UGTMA entered into an agreement on or about January 16, 1979 whereby Hatfield and the HTMA assigned and released the sanitary sewer flows from a certain area then known as the "Towamencin Watershed District in Hatfield Township" to Towamencin and the UGTMA and which called for the construction of sanitary sewer lines in and along Welsh Road to service those residential properties in the area. The 1979 Agreement is incorporated herein by reference.

C. By Stipulation to Montgomery County Court Docket No. 85-07822, certain sanitary sewer lines were constructed in and along Welsh Road with numerous conditions, including:

i). The sanitary sewer lines would be dedicated to the UGTMA and the UGTMA would be responsible for maintenance of the lines.

ii). The residential properties located in Hatfield Township which would discharge into the UGTMA treatment plant would be billed by HTMA at the HTMA rates,

plus $15 per EDU, per year.

iii). With the exception of the free standing restaurant, the sanitary sewer flows from the Ralph's Corner Shopping Center were reassigned to Hatfield and HTMA. A copy of the Stipulation and Order is incorporated herein by reference.

D. HTMA, Hatfield, Towamencin and the UGTMA entered into an agreement around January, 2001, regarding the sanitary sewer flows from the Vernon Court Subdivision. A copy of the 2001 Agreement is incorporated herein by reference.

E. Pursuant to the Agreement, Hatfield and the HTMA assigned and released the sanitary sewer flows from the Vernon Court Subdivision to Towamencin and the UGTMA subject to numerous conditions, including:

i). The sanitary sewer lines would be owned by the UGTMA and Towamencin would be responsible for the maintenance of the lines.

ii). The properties located within the Vernon Court Subdivision would be billed by Towamencin at the rates determined by Towamencin.

F. The parties in order to continue to facilitate gravitational flow and sewer treatment, have identified that certain area within Hatfield Township within the vicinity of Derstine Road and identified as Basin 16 on the plan attached hereto and made a part hereof as Exhibit "A" for assignment and release to Towamencin and the UGTMA ("Derstine Watershed Area").

G. The parties desire to detail the obligations of each party relating to the Derstine Watershed Area and the imminent construction of an age-restricted community in the Derstine Watershed Area.

H. The age-restricted community will consist of a phased 240 unit subdivision.

The developer ("Developer") of that project and the HTMA have entered into an agreement for construction of sewer lines ("Construction Agreement"), a copy of which is attached hereto and made part hereof as Exhibit "B".

I. The parties further desire to amend certain obligations of the parties relating to the Vernon Court Subdivision and the Welsh Road Watershed Area.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, and intending to be legally bound hereby, the parties agree as follows:

1. The recitals are incorporated herein by reference.

2. Hatfield and the HTMA agree to assign and release the Derstine Watershed Area to Towamencin and the UGTMA for the purpose of collection and treatment of waste waters.

3. Towamencin and the UGTMA affirm that there is presently sufficient capacity in the UGTMA treatment plant to accept 470 EDUs of capacity, the potential build out of the Derstine Watershed Area.

4. All properties located within the Derstine Watershed Area, including the proposed 240 unit age-restricted community, shall be direct customers of HTMA and shall be billed by HTMA at the Towamencin duly adopted rate, as amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

5. The proposed sewer lines which will connect the Derstine Watershed Area to the Towamencin interceptor line (the "improvements") shall be constructed in accordance with the stricter construction rules, regulations and requirements of the HTMA or Towamencin, as detailed in the Construction Agreement, as well as in accordance with all

applicable federal, state and local laws and ordinances. HTMA and Towamencin each reserve the right to inspect the improvements during all stages of construction. HTMA shall promptly reimburse Towamencin for any invoices for engineering or legal review fees from the escrow fund established between HTMA and the developer.

6. Pursuant to the Construction Agreement, the developer must construct the Improvements in such a manner that the flows generated from the Derstine Watershed Area can be routinely monitored. The manner in which the flows will be monitored shall be determined by the HTMA and Towamencin engineers. A five feet diameter manhole shall be installed on the proposed sewer in Derstine Road within fifty feet of the Towamencin/ Hatfield municipal boundary. The purpose of the manhole is to allow for future flow monitoring of the sewage flows from the Derstine Watershed Area. Unless otherwise detailed herein, the maximum allowable monthly average flow rate from the Derstine Watershed Area shall be 216 gpd times the purchased number of EDUs tributary to the Derstine Road Hatfield/ Towamencin sewer connection point. The maximum allowable instantaneous flow rate shall be three times the maximum allowable monthly average flow rate from the Derstine Watershed Area.

The maximum allowable monthly average flow rate from the Vernon Court Subdivision shall be established by monitoring the existing flows from those areas to establish a baseline flow rate for each area. The method for determining the baseline flow rate shall be determined by the HTMA and Towamencin engineers. The maximum allowable instantaneous flow rate shall be three times the maximum allowable monthly average flow rate from the Vernon Court Subdivision. All costs related to the monitoring shall be split equally amongst HTMA and Towamencin.

The maximum allowable monthly average flow rate from the Welsh Road Watershed Area (identified as Basin 15 on the plan attached hereto and made a part hereof as Exhibit "A") shall be 216 gpd times the purchased number of EDUs attributed to the sanitary sewer on Welsh Road at the municipal boundary between Hatfield Township and Towamencin Township. The maximum allowable instantaneous flow rate from the Welsh Road Watershed Area shall be three (3) times the maximum allowable monthly average flow rate from the Welsh Road Watershed Area.

If the total allowable flow rate is exceeded, HTMA shall be responsible for taking those steps necessary to reduce the flows, including implementing any necessary inflow and infiltration reduction measures. HTMA shall be responsible for paying to Towamencin or the UGTMA any surcharge rates established by resolution imposed by Towamencin or the UGTMA.

7. Upon completion, inspection and dedication of the improvements, HTMA shall own and maintain the Improvements located within Hatfield Township. UGTMA shall own the improvements within Towamencin Township and Towamencin Township will maintain the improvements within Towamencin Township.

8. In accordance with the Construction Agreement, the Developer shall be obligated to pay HTMA tapping fees for 250 EDUs. 240 EDUs for the age-restricted community and 10 EDUs to connect those properties located adjacent to the age-restricted community. A list of the adjacent properties is attached hereto and made a part hereof as Exhibit "C". The payments for such fees shall due and owing in accordance with the phasing of the project. The first phase of the project shall account for 70 EDUs and HTMA acknowledges receipt from the Developer of the sums necessary for such purchase. Upon

execution of this Agreement, HTMA shall promptly pay Towamencin Forty-Seven Thousand Three Hundred Twenty Dollars ($47,320.00) (70 x $676.00) to cover Towamencin's tapping fee charge and promptly pay the UGTMA Seventy-Two Thousand Four Hundred Fifty Dollars ($72,450.00) (70 x $1035.00) to cover the UGTMA's tapping fee charge. For subsequent phases, upon receipt of tapping fees from the Developer, HTMA shall promptly pay Towamencin and the UGTMA their then current tapping fee rate for the total number of EDUs connecting to the system. In accordance with the Construction Agreement, the developer shall be entitled to no recapture.

9. Towamencin and the UGTMA agree to reserve the remaining 400 EDUs ("Excess EDUs"") of capacity for the future development of the Derstine Watershed Area for a period of two years from the date of this Agreement. Towamencin and the UGTMA agree that no tapping fees or any other charges shall be due until such time as individual properties connect to the sewer system and at such time only the tapping fees and charges due for the number of EDUs connected shall be due. After two years, Towamencin and the UGTMA agree that for a period of three years HTMA shall have a right of first refusal to purchase any and all remaining Excess EDUs.

10. Upon the subsequent connection of any of the properties in the Derstine Watershed Area not detailed in paragraph 8, HTMA shall promptly pay Towamencin and the UGTMA its then current tapping fee for each Excess EDU connected. Notwithstanding anything detailed herein, Towamencin and the UGTMA acknowledge that HTMA can pay the tapping fees for any of the reserved Excess EDUs at any time at the then current tapping fee. HTMA must provide a copy of all future plans for sanitary sewer construction within the Derstine Watershed Area, the Vernon Court Subdivision area and the Welsh Road

materials utilized in therein.

14. HTMA shall be responsible for billing the customers located in the Vernon Court Subdivision and such customers shall be the direct customers of HTMA. For each customer, HTMA shall pay Towamencin in an amount equal to Towamencin's duly adopted rate as shall be amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

15. HTMA shall continue to be responsible for billing the Welsh Road Watershed Area. For each customer, HTMA shall pay Towamencin in an amount equal to Towamencin's duly adopted rate as shall be amended from time to time. HTMA reserves the right to establish a special rate district to recoup administrative fees associated with billing.

16. Towamencin shall periodically bill HTMA at Towamencin's then duly adopted rate for the total number of EDUs connected to the sewer system by the Vernon Court Subdivision, Welsh Road Watershed Area and the Derstine Watershed Area. HTMA agrees to pay all bills within 45 days of receipt of same.

17. HTMA shall be solely responsible for filing sewer rental liens on those customers covered by this Agreement.

18. All existing agreements relating to the Welsh Road Watershed Area or the Vernon Court Subdivision, including the 1979 Agreement and the 2001 Agreement, are hereby terminated. The terms and conditions of this Agreement shall govern those areas.

19. This Agreement shall be interpreted and enforced in accordance with the laws of the Commonwealth of Pennsylvania.

20. Should any paragraph, term or provision of this Agreement hereafter be declared to be invalid or unenforceable for any reason, such declaration shall not affect or

impair the validity or enforceability of the remainder of this Agreement, it being the intention of the parties hereto that this Agreement would have been made and entered into had not such illegal or invalid provision been incorporated herein.

21. Neither this Agreement nor any provisions hereof may be waived, modified, amended, discharged or terminated except by an instrument in writing signed by the parties and then only to the extent set forth in such instrument.

22. This Agreement shall extend to and bind the parties and their respective successors in interest. This Agreement may not be assigned.

23. This Agreement embodies and constitutes the entire understanding between the parties with respect to the transaction contemplated herein and all prior and contemporaneous agreements, understandings, representations and statements, oral or written, is merged into this Agreement.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date first hereinabove written.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: Charles Murgia

HATFIELD TOWNSHIP

By:_____

TOWAMENCIN TOWNSHIP

By:_____

impair the validity or enforceability of the remainder of this Agreement, it being the intention of the parties hereto that this Agreement would have been made and entered into had any such illegal or invalid provision been incorporated herein.

21. Neither this Agreement nor any provisions hereof may be waived, modified, amended, discharged or terminated except by an instrument in writing signed by the parties and then only to the extent set forth in such instrument.

22. This Agreement shall extend to and bind the parties and their respective successors in interest. This Agreement may not be assigned.

23. This Agreement embodies and constitutes the entire understanding between the parties with respect to the transaction contemplated herein and all prior and contemporaneous agreements, understandings, representations and statements, oral or written, is merged into this Agreement.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date first hereinabove written.

BATTERED TOWNSHIP UNIFIED SCHOOL DISTRICT

By: _____

BATTERED TOWNSHIP

By: _____

TOWNSHIP OF BATTERED

By: _____

6

impair the validity or enforceability of the remainder of this Agreement, it being the intention of the parties hereto that this Agreement would have been made and entered into had not such illegal or invalid provision been incorporated herein.

21. Neither this Agreement nor any provisions hereof may be waived, modified, amended, discharged or terminated except by an instrument in writing signed by the parties and then only to the extent set forth in such instrument.

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IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the date first hereinabove written.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

_____ By:_____

HATFIELD TOWNSHIP

_____ By:_____

TOWAMENCIN TOWNSHIP

_____ By:_____

UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

By: _____

1985 Stipulation and Order

Montgomery County Docket 85-07822

HAMBURG, RUBIN, MULLIN & MAXWELL
BY: J. SCOTT MAXWELL, ESQUIRE
IDENTIFICATION NO. 09449
800 EAST MAIN STREET
LANSDALE, PA 19446-3098
(215) 368-3600

ATTORNEY FOR
PLAINTIFF

IN THE COURT OF COMMON PLEAS
OF MONTGOMERY COUNTY, PENNSYLVANIA
CIVIL ACTION - LAW

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	:	NO. 85-07822
vs.	:	
TOWAMENCIN TOWNSHIP	:	IN EQUITY

O R D E R

AND NOW, this 31st day of DECEMBER, 1988, upon consideration of the foregoing Stipulation, it is hereby ORDERED THAT:

1. The request of Hatfield Township and Upper Gwynedd-Towamencin Municipal Authority to intervene is granted and they are hereby made parties to this action.

2. The foregoing Stipulation is approved and all parties are hereby bound by its terms.

3. The Prothonotary shall mark the docket in this action "Settled, Discontinued and Ended".

BY THE COURT:

/S/ ANITA BRODY J.

IN THE COURT OF COMMON PLEAS
OF MONTGOMERY COUNTY, PENNSYLVANIA
CIVIL ACTION - LAW

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY	:	No. 85-07822
	:	
	:	IN EQUITY
v.	:	
	:	
TOWAMENCIN TOWNSHIP	:	

STIPULATION OF COUNSEL RE: SETTLEMENT AND INTERVENTION

TO THE HONORABLE, THE JUDGES OF THE SAID COURT:

Undersigned counsel, with the consent of their respective clients, do hereby STIPULATE and AGREE as follows:

1. Upon approval of this Stipulation and entry of an appropriate Order by this Honorable Court, Hatfield Township and the Upper Gwynedd-Towamencin Municipal Authority shall be permitted to intervene in this litigation and become parties to it, and shall be bound by the terms of this Settlement Stipulation.

2. Hatfield Township and Towamencin Township agree to take such action as is required to revise their respective Act 537 Plans to reflect the terms of this settlement Stipulation.

3. Towamencin Township will take that action necessary to cause the developer of the Grist Mill Run Subdivision to install sewer lines to the south edge of Welsh Road in the approximate location depicted on Exhibit "A" which is attached hereto and incorporated herein by reference as if set forth in extenso.

4. Hatfield Township Municipal Authority will install the remaining portions of the collection lines required to provide sanitary sewer service to

residents in Hatfield Township located along the north side of Welsh Road. Prior to construction of the lines, the Engineers for the Hatfield Township Municipal Authority and Upper Gwynedd-Towamencin Municipal Authority will meet and agree on the design, materials, construction and inspection procedures for the lines.

5. Hatfield Township Municipal Authority will have sole discretion in determining the method and amount of assessing costs of constructing the collection lines which it installs, and shall have the right to collect and retain any assessment fees, capital contribution fees, tapping fees, connection fees or sewer rental charges it imposes upon Hatfield Township residents.

6. Hatfield Township Municipal Authority will dedicate the sewer lines which it constructs in Welsh Road to the Upper Gwynedd-Towamencin Municipal Authority which agrees to be responsible for the maintenance of these sewer lines.

7. Towamencin Township and/or the Upper Gwynedd-Towamencin Municipal Authority will determine the best method and timing of providing sanitary sewer service to Towamencin Township residents located along the south side of Welsh Road.

8. The Upper Gwynedd-Towamencin Municipal Authority shall determine the method of assessment and shall have the right to collect and retain any assessment fees, capital contribution fees, tapping fees, connection fees, or sanitary sewer rentals imposed on residents of Towamencin Township.

9. Towamencin Township and the Upper Gwynedd-Towamencin Municipal Authority agree to forgive any unpaid sanitary sewer rentals due it from Hatfield Township Municipal Authority as a result of providing sanitary sewer service to the Ralph's Corner Shopping Center.

10. The Upper Gwynedd-Towamencin Municipal Authority agrees to provide sanitary sewer service to the Ralph's Corner Shoping Center, without charge

to Hatfield Township Municipal Authority, until such time as the existing connection is terminated and sewage flows from the Ralph's Corner Shopping Center are directed to the Treatment Plant of the Hatfield Township Municipal Authority, or for a period of six (6) months from the date of this Stipulation, whichever first occurs.

11. Towamencin Township and the Upper Gwynedd-Towamencin Municipal Authority agree to give up the existing Ralph's Corner Shopping Center as a sewer customer and hereby grant all rights to it and the proposed Ralph's Corner Shopping Center Expansion to the Hatfield Township Municipal Authority with the exception of the proposed restaurant that will front Welsh Road just east of the existing shopping center. Hatfield Township agrees to amend its Act 537 Official Sewage Facilities Plan in accordance with this Agreement and to adopt an amendment to its Resolution accepting the Towamencin Township Act 537 Official Sewage Facilities Plan, to provide that the parcel upon which the proposed restaurant is to be located shall be included within the service area of Towamencin Township.

12. The proposed restaurant to be constructed on Welsh Road, just east of the existing Ralph's Corner Shopping Center, shall connect to the gravity sewer which is immediately adjacent to the proposed restaurant and flows to the Upper Gwynedd-Towamencin Treatment Plant.

13. Hatfield Township Municipal Authority and Hatfield Township grant Towamencin Township and Upper Gwynedd-Towamencin Municipal Authority the right to impose their fees and charges on the developer of the restaurant, but sewer rentals will be billed to Hatfield Township Municipal Authority at a rate equal to those rates charged by Hatfield Township Municipal Authority to similar customers plus Fifteen Dollars ($15.00) per equivalent dwelling unit.

14. The properties located in Hatfield Township which are to be served by the sewers to be installed pursuant to Paragraph 4 hereof draining to the Upper Gwynedd-Towamencin Municipal Authority treatment plant, shall be under and subject to all of the terms and conditions of the Towamencin Township Sewer Use Ordinance, as amended, in effect from time to time except as to the imposition of sewer rentals; in which case, said properties shall be billed by Towamencin Township to the Hatfield Township Municipal Authority for sewer service at the Hatfield Township Municipal Authority rate, together with Fifteen ($15.00) per property per year.

15. Towamencin Township and/or Upper Gwynedd-Towamencin Municipal Authority shall satisfy any and all sewer rental liens which may have been filed as a result of Hatfield Township Municipal Authority withholding payment for sewer rentals related to the Ralph's Corner Shopping Center.

16. The prior Agreement between the parties relating to the Ralph's Corner Shopping Center is hereby terminated.

17. By execution of this Stipulation, and the court approval thereof, this matter shall be marked in the Prothonotary's docket as "Settled, Discontinued and Ended".

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: _____
Hamburg, Rubin, Mullin & Maxwell, Solicitor

HATFIELD TOWNSHIP

By: _____
Pearlstine-Salkin Associates, Solicitor

UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

By: _____
Landis, Kerns & Hopkins, Solicitor

TOWAMENCIN TOWNSHIP

By: _____
Jenkins, Tarquini & Jenkins, Solicitor

2001 Agreement Among HTMA

Hatfield, Towamencin, and UGTMA

AGREEMENT AMONG HATFIELD TOWNSHIP HATFIELD TOWNSHIP MUNICIPAL AUTHORITY TOWAMENCIN TOWNSHIP AND UPPER GWYNEDD-TOWAMENCIN MUNICIPAL AUTHORITY

WHEREAS, there are certain areas located in Hatfield Township, north of Welsh Road, including the Vernon Court Development Tract, particularly set forth in a plan thereof made by T.H. Properties, Inc. ("Developer") dated May 10, 2000, last revised October 23, 2000 ("Plans"), which flow, by gravity, into the Upper Gwynedd-Towamencin sewer area; and

WHEREAS, by a prior undated agreement among the parties, Hatfield Township ("Hatfield") and the Hatfield Township Municipal Authority ("HTMA") agreed to assign this area of Hatfield Township's sewer capacity to Upper Gwynedd-Towamencin Municipal Authority ("UGTMA") and Towamencin Township ("Towamencin") in order to facilitate gravitation of flow and sewer treatment.

WHEREAS, Hatfield and HTMA, in order to continue to facilitate gravitational flow and sewer treatment, hereby assign to Towamencin and UGTMA the area designated as the Vernon Court Development on the Plans proposed by Developer; and

WHEREAS, all parties to the agreement desire to spell out the procedure of facilitating the installation of sewers and to properly initiate sewer coverage for the proposed homes in the Vernon Court Development.

NOW, THEREFORE, for and in consideration of the mutual covenants, promises and benefits to all parties, the parties hereby agree as follows:

1. Hatfield and HTMA agree to assign the area of the Vernon Court Development in Hatfield Township, as set forth in the Plans to Towamencin and UGTMA for the purpose of collection and treatment of waste waters.

2. The customers to be served in Vernon Court shall be residential customers only. The parties agree that as the customers within Vernon Court connect to the sewer collection lines, they shall be billed for annual sewer rental by Towamencin at such rate as Towamencin shall determined from time to time.

3. The parties agree that the individual properties will be direct customers of Towamencin.

4. The proposed sewer lines shall be constructed by the Developer of the property and Developer shall pay all of the necessary tapping fees for the purchase of the required

EDU's (50 EDU's from Towamencin at One Thousand Five Hundred Dollars ($1,500.00) per EDU and 50 EDU's from UGTMA at Three Thousand Four Hundred Fifty Dollars ($3,450.00) per EDU). The tapping fees shall be in addition to all costs involved in the construction of any collection lines, laterals, manholes, and any other sewage facilities required by Towamencin and UGTMA to be constructed within the development or are necessary to connect the development to the UGTMA's sewage system. Developer shall be solely responsible for the cost of construction of all sewer lines and equipment necessary to connect the development to UGTMA's sewer system.

5. Upon completion, inspection and certification of the lines, the sewer lines shall be owned by UGTMA and maintained by Towamencin regardless of the location of the lines, within or immediately adjacent to the right-of-way of Welsh Road.

6. Towamencin shall have the right to file assessment and/or sewer rental liens against customers connected to the proposed sewer lines serving Vernon Court.

7. The contemplated project shall be completed within two (2) years from the date of execution of this Agreement. Contemporaneously with the execution of this Agreement, the Developer of the tract shall post with Towamencin financial security and shall execute a financial security agreement for the construction of the sanitary sewer improvements shown on the Plans, all of which shall be in the form acceptable to the Solicitor for the parties hereto. Said financial security shall secure completion of the proposed sewer lines in accordance with the Plans and specifications approved by the Towamencin Township Engineer. In the event that the sewer lines are not completed in accordance with said plans and specifications within the two (2) year time limit established in this paragraph, Towamencin shall have the right to drawn down on the aforementioned financial security to the extent necessary to complete said lines. The amount of the financial security shall be equal to 110% of the estimated construction cost of the proposed sewer lines to be installed.

8. Developer shall be legally liable for the completion of said lines, even if the actual cost for the installation of said line exceeds the amount secured by the financial security. Towamencin agrees to continually update construction cost estimates and Developer agrees to add to the financial security any amounts sufficient to reflect the then current construction costs.

9. This Agreement shall not be constructed as providing for a reservation of any sewer capacity by and/or for the benefit of Developer unless and until Developer pays the tapping fees specified in paragraph 4 hereinabove.

10. The parties agree that any properties served within Hatfield Township as a result of this Agreement relating to Vernon Court shall be bound by those ordinances, rules and regulations of Towamencin and/or UGTMA relating to quality of waste, methods of

connection, inflow and infiltration, etc. HTMA and Hatfield, if necessary, shall enact or cause to be enacted such ordinances and regulations or amendments thereto as may be necessary to effectuate fully the intent of this paragraph.

11. The existing undated Agreement between the parties referred to in the second WHEREAS of this Agreement shall remain in full force and effect, unaltered by the terms of this Agreement. To the extent this Agreement or any of its terms is inconsistent with the provisions of the undated Agreement, a copy of which is attached hereto as Exhibit "A," the provisions of this Agreement shall control.

11. This Agreement shall be interpreted in accordance with the laws of the Commonwealth of Pennsylvania and may be modified only by a written document executed by all parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be duly executed, the day and year first above written.

HATFIELD TOWNSHIP

By: _____

Attest: _____

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: _____

Attest: _____

TOWAMENCIN TOWNSHIP

By: _____

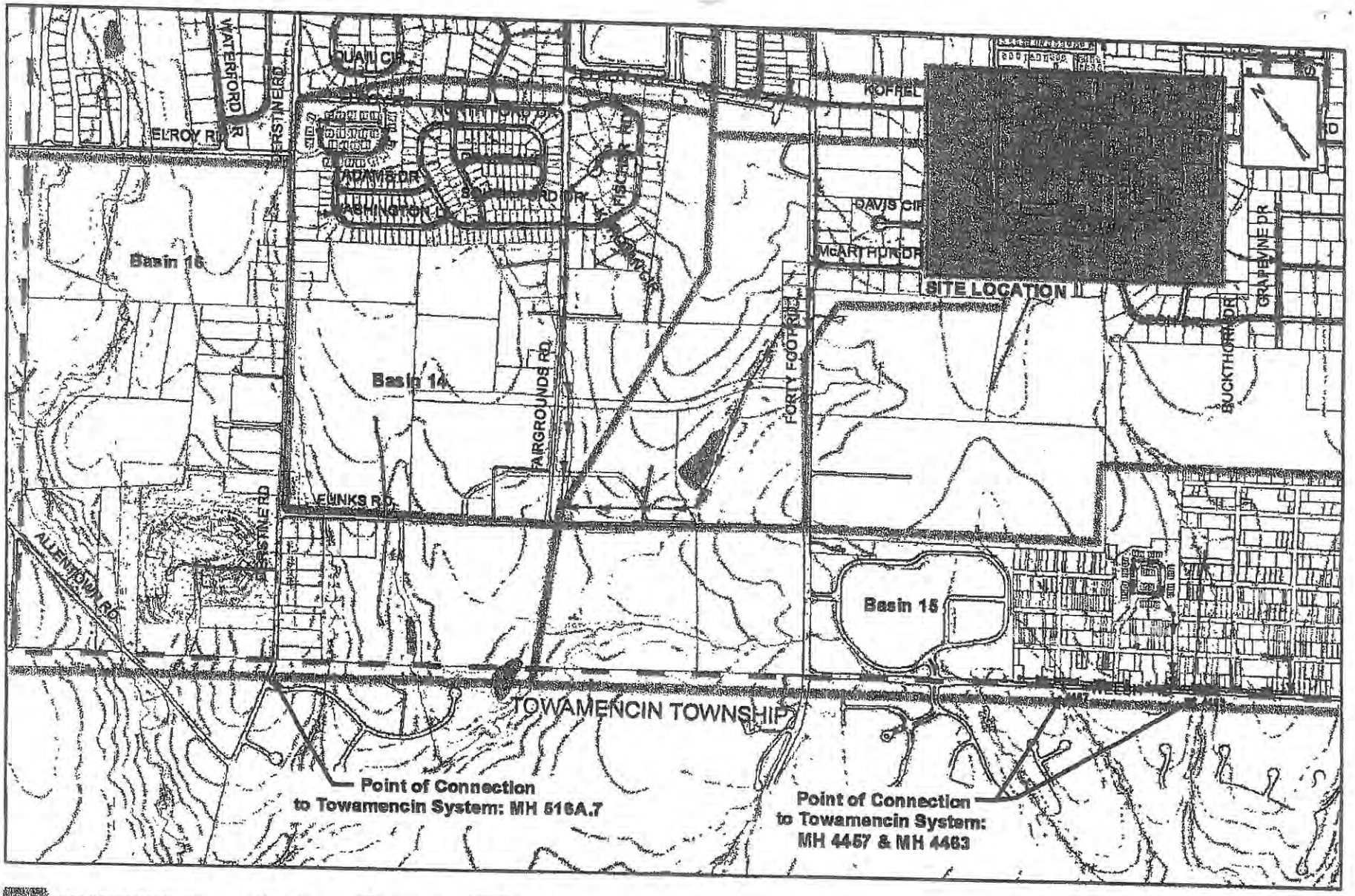
Attest: _____

UPPER GWYNEDD-TOWAMENCIN
MUNICIPAL AUTHORITY

By: _____

Attest: _____

Exhibit A



DERSTINE & WELSH RD DRAINAGE AREA

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania
CET ENGINEERING SERVICES
Hamburg, Pennsylvania

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Date: 6/30/2010
Path: J:\Hatfield Township Municipal Authority (0592)\6800 - Act 537\GIS\Derstine_and_Welsh_Rd.mxd

Exhibit B

Prepared by/Return to:
Paul G. Mullin, Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin
375 Morris Road, P.O. Box 1479
Lansdale, PA 19446-0773
215-661-0400

Parcel Numbers: 35-00-02842-00-3

AGREEMENT FOR CONSTRUCTION OF SEWER LINES

THIS AGREEMENT ("Agreement"), made this _____ day of _____, 2010 between **HATFIELD TOWNSHIP MUNICIPAL AUTHORITY** (hereinafter referred to as "Authority") and **DERSTINE RUN LIMITED PARTNERSHIP**, its successors and assigns (hereinafter referred to as "Developer").

WITNESSETH:

WHEREAS, Authority is duly incorporated under the provisions of the Municipality Authorities Act, as amended, (the "Act") and has been designated as the agency within Hatfield Township, Montgomery County ("Township") responsible for providing sanitary sewer capacity and sanitary sewer service; and

WHEREAS, Developer is a corporation organized and existing under the laws of the Commonwealth of Pennsylvania with the principal office for the conduct of business located at 1292 Allentown Road, Lansdale, Pennsylvania 19446; and

WHEREAS, Developer presently owns or will shortly acquire ownership of certain real estate in Municipality known as Derstine Run Condominium, Unit #1 , 84 Derstine Road, Hatfield Township, Montgomery County Pennsylvania and consisting of approximately 5.4035 acres of land (the "Property"); being tax parcel no. _____ as more specifically

described in plans, prepared by Czop/Specter, Inc., dated September 2, 2009 and last revised June 21, 2010, said Plans being incorporated herein by reference as if set forth in extenso; and

WHEREAS, the Developer is utilizing the Property to construct a phased age restricted community and this Agreement shall cover phase 1 of the project; and

WHEREAS, Developer has agreed to construct and install sanitary sewer lines, sewer trunk lines, mains, laterals, and other appurtenances thereto, both on and leading to and from the aforesaid site, collectively referred to as the "Improvements", the quantities and costs of same being more specifically described in Exhibits "A" and "B", which is attached hereto and made part hereof, and the Authority is willing to provide such sanitary sewer service; and

WHEREAS, Developer and Authority acknowledge that the sanitary sewer flows shall be released by Hatfield Township and the Authority and will be treated by Towamencin and the Upper Gwynedd- Towamencin Municipal Authority ("UGTMA"); and

WHEREAS, Developer has agreed to pay to the Authority connection fees, tapping fees and certain sums of money to reimburse Authority for engineering, legal and administrative fees, and other related costs of said development.

NOW, THEREFORE, in consideration of the mutual covenants and promises hereinafter set forth, and intending to be legally bound hereby, the parties agree as follows:

1. Developer agrees that all construction shall be in accordance with the Plans and further agrees that prior to commencement of construction, Plans prepared for the aforesaid construction shall be submitted to the Authority, Towamencin and the UGTMA for their review and approval. Developer further agrees that should Authority, Towamencin or UGTMA Rules, Regulations, and/or Specifications change between the date of this Agreement and commencement of construction, Developer will construct in accordance with "then current"

Rules, Regulations, and Specifications. No construction shall commence unless and until the Authority, Towamencin and the UGTMA have approved such Plans and specifications.

2. Developer shall construct and install the Improvements as are more specifically set forth in Exhibit "A" in accordance with the Plans.

3. Developer agrees to employ a responsible, experienced contractor (the "Contractor") and to employ a sufficient workforce and equipment to complete construction of the Improvements.

4. Developer agrees that construction of the Improvements shall be pursued diligently and shall be made under the supervision of the Authority's and Towamencin's engineers, who shall be compensated for all costs of its employees engaged in the inspection of said project, and further agrees that said Improvements shall not be used until the construction is approved by the engineers, indicating that the required specifications have been met.

5. Developer will require its paving contractor to schedule the paving so that sanitary sewer lines and all their respective appurtenances are installed prior to hard surfacing of streets and will require its paving contractor to exercise due care in paving over any of the Improvements. If because of the non-observance of the above requirements, any part of the Improvements or any of the Authority's facilities are damaged or repaving is required, Developer will repair or replace such facilities to the reasonable satisfaction of the Authority or, upon receipt of the Authority's billing, reimburse the Authority in full for repairs or costs thus incurred.

6. Developer may install the sanitary sewer collection system prior to the installation of curbing only upon the condition that Developer agrees to be responsible for, and to pay promptly upon request of the Authority, all costs and expenses, including legal and engineering fees, associated with any repair, replacement or relocation of any portion of such sanitary sewer

lines or related, laterals or other appurtenances caused in any way by the final grading of streets or installation or curbs, including settlement and insufficient ground cover, in order the meet the Authority's specifications. If lines are installed prior to installing curbs, Developer will be responsible for damage attributable to settling or relocation. Developer agrees that until and unless (i) all curbs are installed; (ii) all streets are finally graded and paved; and (iii) all portions of the sanitary sewer system including lines, laterals, manholes, pump stations and other appurtenances to the sewer Improvements are repaired, replaced or relocated and have been paid for in full by Developer, the Improvements will not be deemed to be "complete" or acceptable for dedication to the Authority.

7. In accordance with the Authority's specification and as set forth in the approved Plans, Developer will construct the individual building sewers between the lateral and the structures. Such construction will be subject to approval and inspection of the Authority's engineer and no trench will be backfilled or other work obscured prior to inspection. Whether billed by the Authority in advance based on estimated costs or whether billed after the Authority conducts the inspection, Developer will pay the cost of such inspection upon the Authority's written demand. If any defect in workmanship or material is found, the Authority will not render service until such defect is remedied.

8. Upon application by Developer, and upon payment of the current charge for each building, the Authority will furnish sanitary sewer service, as and when available, for Developer's use during construction on the Property.

9. On discovery of any defect in the construction of the Improvements or material utilized therein, or any variations from the Plans and materials utilized therein, or any variations from the Plans and specifications approved by the Authority, Towamencin or the UGTMA, the appropriate engineer or representative shall: (i) give notice of such defect or variations to the

Authority, Towamencin or UGTMA and the Developer; and (ii) unless Developer shall have forthwith corrected or caused to be corrected any such defect or variation, withhold authorization of further payments under construction contracts from the deposit with the Authority or held in escrow; provided that no failure on the part of one of the municipal engineers to discover any such defects or variations, or to give notice as required by this Paragraph, or to cause further disbursements from deposited funds to be withheld, shall operate as a waiver of any such defects or variations on the part of the Authority, Towamencin or UGTMA; and provided further that no such failure on the part of the appropriate municipal engineer shall limit the right of the Authority, Towamencin or UGTMA, as hereinafter provided, to reject any offer to dedicate and convey the completed Improvements to the Authority, or to refuse to provide sanitary sewer service. Developer shall be responsible for all phases of construction including the physical connection of the Improvements to the Authority's existing sewer system.

10. Developer agrees that all inspections of the construction of said Improvements or sections or phases thereof shall be made by the Authority and Towamencin through their engineers. After completion of construction, Developer shall request that a certificate be filed indicating that the construction has been completed in accordance with the approved Plans and the applicable rules and regulations.

11. Developer shall pay all costs of constructing and installing the Improvements, which shall be performed under the observation of the Authority's and Towamencin's engineer and shall pay all costs incurred by the Authority and Towamencin with respect thereto, all costs shall include, but are not limited to, all related supervisory, inspection, administrative, legal and engineering fees incurred by the Authority and Towamencin.

18. If Developer fails to complete construction of the Improvements within one (1) year after providing Security to the Authority, or if Developer fails to prosecute the construction with reasonable promptness and diligence, or if Developer, after written request fails to correct defective materials or workmanship, upon ten (10) days' written notice to Developer, the Authority may, but shall not be obligated to, complete the Improvements or any portion thereof, and in such case any Security shall be paid to the Authority upon written demand therefor to pay the costs associated with such construction. The Authority shall have the right, but not the obligation, to secure materials of the quality and quantity required by the Plans and the necessary numbers of workmen, mechanics and the required equipment on the open market at the then current market prices from any party to complete the construction of the Improvements, or any portion thereof. In the event the Authority proceeds with construction pursuant to this Paragraph, Developer shall be deemed to have assigned to the Authority all materials, tools and equipment on the construction site for use in completing the construction.

19. Upon written request to the Authority to certify completed portions of the Improvements, the Authority's engineer shall issue such certification within forty-five (45) days and the Authority will then authorize the release of Security in an amount equal to the amount of the certified Improvements for payment to the appropriate Contractor. If within forty-five (45) days the Authority's engineer in writing states that the Improvements have not been satisfactorily completed, no release shall be authorized until such time as the work has been satisfactorily completed. The Authority shall at all times have the right to retain ten percent (10%) of the total cost of Improvements as set forth in Exhibit A, pending final certification. Upon completion of all of the Improvements certified by the Authority's engineer, the balance of Security shall be returned to the Developer.

20. Developer agrees that prior to the commencement of construction, Developer will furnish the Authority and its engineer with a certificate of insurance indicating that Developer has obtained public liability insurance, including XCU coverage, with limits of $1,000,000 for any one occurrence, $2,000,000 for multiple accidents, and $500,000 for property damage liability, which insurance includes the Authority, the Authority's engineer and the Township as additional insureds for all purposes. Such insurance shall be written by an insurer qualified for business in Pennsylvania and which is satisfactory to the Authority, and shall be on an "occurrence basis". Insurance written on a "claims made" basis shall not satisfy the requirements of this Agreement. The Authority and its solicitor, engineer, and officers shall not have modified or waived, and shall not be estopped from enforcing the requirements that insurance policies be written on an "occurrence basis" by any failure to object to any policy secured and submitted by or for Contractor, or by any other conduct. The obligation of Contractor to secure and maintain insurance written on an "occurrence basis" shall remain with Contractor, and shall be enforceable against Contractor, at all times, including after a loss has occurred, excepting only if the Authority shall have in writing expressly agreed to accept insurance which is not written on an "occurrence basis", which writing must expressly recognize that such insurance is not written on an "occurrence basis." Developer agrees to indemnify, save and hold harmless and defend Authority, its officers and employees, from any and all liens, charges, claims, demands, losses, costs, including but not limited to legal fees and court costs, causes of action or suits of any kind or nature whatsoever, from any causes whatsoever, whether known or unknown, arising by reason of or during performance of any work of any kind or nature covered by this Agreement.

21. Developer agrees that after the Authority's engineer files a certificate of completion, Developer shall dedicate and convey by appropriate deed of dedication to the

Authority, all Improvements, rights of entry, and such further rights of way and/or easements, free and clear of all liens and encumbrances which the Authority's solicitor deems to be necessary or desirable to perfect the Authority's interests in the sanitary sewer system as extended, and as the Authority's engineer deems desirable to enable the Authority to connect the system to other portions of the Authority's sanitary sewage system so as to insure efficient flow of sewage throughout the system. Such connection points will be locations satisfactory to both parties. The Authority agrees, upon approval of the same, to accept said dedication of such Improvements as Authority normally accepts in order to maintain and operate same as part of its sanitary sewer system. In no event shall Developer retain any right to convey or dedicate the sanitary sewer system, or to take service from any other supplier of sanitary sewer service. Developer shall supply the Authority with all pertinent tax parcel numbers, written legal descriptions of the easements and rights-of-way, and all costs, fees and any expenses for the preparing, registering and recording by the Authority of any document contemplated herein shall be paid by Developer upon demand therefor.

Developer agrees that Authority, or anyone else with Authority's permission, may make connections with the Improvements constructed by Developer, notwithstanding the fact that such connection is made prior to an offer of dedication.

22. Prior to commencing work on the Improvements, Developer shall supply all deeds of easements and rights-of-way noted by the Authority's engineer as necessary or desirable. All necessary easements, rights-of-way and acquisitions required by Developer are the responsibility of Developer, who agrees to pay all costs associated therewith. The Authority may, but shall not be required to, assist in the acquisition of rights-of-way using the Authority's powers of eminent domain. The Authority shall cooperate, at Developer's expense, to assist Developer in securing permits required by the Pennsylvania Department of Transportation.

23. Prior to dedication, the Developer agrees to register the underground facilities with the Pennsylvania One Call System. In accordance with 73 P.S. § 176 et seq. (the "Act"), the Developer shall be responsible for any obligations required of a Facility Owner, as defined in the Act, until such facilities are dedicated to the Authority.

24. Developer agrees that after the Authority's engineer files a certificate of completion, Developer shall dedicate and convey by appropriate deed of dedication to the Authority, all Improvements, rights of entry, and such further rights of way and/or easements, free and clear of all liens and encumbrances which the Authority's solicitor deems to be necessary or desirable to perfect the Authority's interests in the sanitary sewer system as extended, and as the Authority's engineer deems desirable to enable the Authority to connect the system to other portions of the Authority's sanitary sewage system so as to insure efficient flow of sewage throughout the system. Such connection points will be locations satisfactory to both parties. The Authority agrees, upon approval of the same, to accept said dedication of such Improvements as Authority normally accepts in order to maintain and operate same as part of its sanitary sewer system. In no event shall Developer retain any right to convey or dedicate the sanitary sewer system, or to take service from any other supplier of sanitary sewer service. Developer shall supply the Authority with all pertinent tax parcel numbers, written legal descriptions of the easements and rights-of-way, and all costs, fees and any expenses for the preparing, registering and recording by the Authority of any document contemplated herein shall be paid by Developer upon demand therefore.

Developer agrees that Authority, or anyone else with Authority's permission, may make connections with the Improvements constructed by Developer, notwithstanding the fact that such connection is made prior to an offer of dedication.

25. The Authority shall not be obligated to accept any deed of dedication, easements or rights-of-way or to provide sanitary sewer service until (i) Developer has provided a certificate prepared by its consulting engineers verifying satisfactory testing of the Improvements so dedicated and completion thereof in full compliance with the Plans and specifications approved by the Authority; (ii) the Authority in its sole discretion, has determined that the intended use of the sanitary sewer system has not been materially altered since its approval of the Plans and specifications; (iii) Developer's contractor has executed a written confirmation of its guarantee of the system as hereinafter provided; and (iv) Developer is not in default of any other obligations imposed pursuant to this Agreement.

26. At the time of acceptance of dedication by the Authority, Developer's Contractor shall guarantee to the Authority that the Improvements shall be free of defects in workmanship and any variations from the approved Plans and specifications, as may be amended, with respect to materials to be used and the methods of construction and installation of the Improvements for a period of eighteen (18) months after such dedication. In the event that any defects in workmanship are required to be corrected within such eighteen (18) month period, Developer's Contractor agrees to make all necessary repairs to correct such defects after receipt of written notice from the Authority specifying such defects in workmanship and describing the extent of the repairs required. Developer's Contractor Developer shall use its best efforts to complete any such repairs within thirty (30) days after the receipt of such written notice from the Authority, provided, however, that in the event of any emergency which Authority determines is a health or safety hazard, Authority shall provide notice to Developer and Developer's Contractor by telephone, followed by facsimile communication, to immediately commence to make such repairs and shall complete same within five (5) days of the notice by telephone. If Developer's Contractor fails to correct any such defects in workmanship in accordance with the terms and

provisions hereof, Authority may, at its option, after expiration of the grace period hereinabove provided, enter into possession, complete the work with its own men or by contract, and the entire reasonable cost of such completion including engineering and legal expenses shall be paid to Authority by Developer upon written demand therefor.

27. In order to further protect Authority, or in the event any of the work described herein with regard to the Property shall be performed by any purchaser of Developer then, at the time of the acceptance of dedication by the Authority, Developer or purchaser of Developer or Developer's contractor shall furnish Authority with an escrow fund, letter of credit or maintenance bond, which shall guarantee the Authority for a period of eighteen (18) months after the acceptance of said dedication against defects in workmanship in all such matters dedicated to the Authority. The escrow fund, maintenance bond or letter of credit shall be in the amount of fifteen percent (15%) of the original construction costs and in form satisfactory to the Authority's solicitor.

28. After such dedication to and acceptance by the Authority, and subject to the eighteen (18) month warranty against defects and workmanship, Authority shall operate and maintain at its sole cost and expense all such matters included within the dedication. The Authority shall promptly release any remaining Security and/or return any unused cash escrow, without any interest accumulations, to Developer upon Developer's written request to the Authority.

29. Developer, after completion and prior to dedication contemplated herein, shall supply the Authority with an accurate plan showing the physical location and depth of all facilities constructed under the provisions of this Agreement. It is also agreed that no lots or property abutting the sanitary sewer lines and construction herein shall be connected to said sanitary sewer lines until written approval is received from the Authority.

30. After acceptance of dedication of the Improvements by the Authority, the Improvements shall be the sole property of the Authority and the Authority shall have the right to connect other users of the Authority's systems to the Improvements.

31. Developer acknowledges that in addition to all other amounts payable under this Agreement, Developer, or any purchaser, assignee, heir or successor upon execution of this Agreement, will pay to the Authority a sewer tapping fee of One Hundred Ninety Thousand Eight Hundred and Twenty Dollars ($190,820.00) ($2,726.00 x 70 EDUS). Tapping fees are imposed in accordance with Act 57 of 2003 and the Authority Fee Schedule and Resolution implementing tapping fees. Developer specifically acknowledges that Developer has been afforded the opportunity to review Authority's fees and charges set forth in this Agreement and specifically agrees to the validity of the same. Developer further acknowledges that in exchange for the Authority releasing the capacity from its service area to Towamencin and the UGTMA, among other things, the Developer is paying tapping fees for ten properties located within the area of its development. Those EDUs are included within the calculation detailed in this paragraph. Developer further acknowledges that it is responsible for posting a Three Thousand Dollar ($3,000.00) with the Authority to cover UGTMA's legal fees. The Authority shall be responsible for timely paying the UGTMA's invoices and shall promptly return any unused portion of the escrow to the Developer upon project close out. Developer acknowledges that it shall not be entitled to any recapture.

32. It shall be Developer's responsibility to give or cause to be given all notices and to comply or cause compliance with all laws, ordinances, municipal rules and regulation and requirements of public authorities applying to or affecting the conduct of the project work.

33. Developer acknowledges and agrees that Authority's obligation to provide sanitary sewer capacity shall be null and void in the event action by the Department of Environmental Protection or the Delaware River Basin Commission precludes the Authority from providing the capacity for which Developer has contracted with Authority.

34. Upon the purchase or lease of the land subject to this Agreement, and prior to settlement thereto, Developer shall supply to the Authority the name or names and addresses of prospective purchasers and/or lessees of the subject tract, or any portion thereof. Developer further agrees that the Deed to any individual lot within the Property which is subject to a water or sewer easement will contain a specific reference to the easement to which the lot is subject.

35. The covenants and conditions contained herein shall be covenants running with the land and shall bind the successors, heirs, and assigns of each of the parties hereto. The rights and obligations of the parties hereunder may not be assigned except with the written consent of the Authority.

36. Developer agrees that the term of this Agreement shall be subject to Authority review one (1) year from the date hereof. At the end of the applicable period, if the project or stated phase thereof has not been completed, the Agreement may, at the sole discretion of the Authority, be extended or terminated by written notice to Developer.

37. Developer acknowledges that the sewer capacity reserved herein is site specific and may be used only on the Property which is the subject of this Agreement.

38. Authority may, in its sole discretion, record this Agreement or a memorandum of this Agreement in the Office of the Recorder of Deeds for the County in which the Property is located.

39. This Agreement shall be interpreted in accordance with the laws of the Commonwealth of Pennsylvania, contains the entire understanding between the parties and may be amended only in a written document signed by all parties.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first written above.

Attest:

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

By: Charles Smargis

Attest:

DERSTINE RUN LIMITED PARTNERSHIP
By: Derstine Run, Inc., its General partner

By: Kenneth Klemm
PRESIDENT - DERSTINE RUN LIMITED PARTNERSHIP

Exhibit "A"

CZOP/SPECTER, INC.

DERSTINE RUN PHASE I

Date: 5/13/19

HATFIELD TOWNSHIP
PUBLIC IMPROVEMENT
CONSTRUCTION COST ESTIMATE FOR ESCROW

Description	Qty	Unit	Cost per unit	Sub-Total	Totals
2200 - Erosion & Sediment Controls - Entire Site					
Construction Entrance	1	EA	$ 1,500.00	1,500.00	
Sediment Trap Spillway	1	EA	$ 500.00	500.00	
Sediment Trap	1	LS	$ 800.00	800.00	
Silt Soxx	140	LF	$ 3.50	490.00	
Tree Protection Fence	225	LF	$ 3.00	675.00	
Rock Filter Berm	1	EA	$ 400.00	400.00	
Inlet Protection	4	EA	$ 90.00	360.00	
Temp Seed	6,500	SF	$ 0.07	455.00	
Tree Protection Fence	225	LF	$ 4.00	900.00	
				Total	6,080.00
2200 - Earthwork - Onsite					
Strip Topsoil	3,960	CY	$ 2.00	7,920.00	
Cut	440	CY	$ 3.00	1,320.00	
Fill	7,560	CY	$ 2.00	15,120.00	
Import Soil	8,000	CY	$ 4.00	32,000.00	
Rough Grade Site	285,975	SF	$ 0.03	8,579.25	
			$ -		
				Total	64,939.25
2500 - Storm Water Drainage					
6" SDR Pipe	1,170	LF	$ 15.00	17,550.00	
6" SOR Boots	80	EA	$ 20.00	1,600.00	
				Total	19,150.00
2500 - Detention Basin					
Excavation	576	CY	$ 2.25	1,296.00	
Planting Mix	506	CY	$ 4.00	2,024.00	
ERN Mix	10,000	SF	$ 0.15	1,500.00	
				Total	4,820.00
2551 - Water Distribution					
Escrowed with North Penn Water Authority					
				Total	-
2562 - Sanitary - Onsite					
8" DR-18	274	LF	$ 34.00	9,316.00	
6" DR-18	105	LF	$ 22.00	2,310.00	
Manhole	1	EA	$ 2,000.00	2,000.00	
Clean-Out / Wye	3	EA	$ 150.00	450.00	
MH Vacuum Test	1	EA	$ 75.00	75.00	
Mandrel Test Lines	274	LF	$ 0.50	137.00	
Air Test Lines	274	LF	$ 0.50	137.00	
TV Inspection	274	LF	$ 1.00	274.00	
				Total	14,699.00
2562 - Sanitary - ROW					
8" DR-18	996	LF	$ 34.00	33,864.00	
6" DR-18	410	LF	$ 65.00	26,650.00	
Manhole	3	EA	$ 2,000.00	6,000.00	
Wye	10	EA	$ 150.00	1,500.00	
MH Vacuum Test	3	EA	$ 75.00	225.00	
Mandrel Test Lines	996	LF	$ 0.50	498.00	
Air Test Lines	996	LF	$ 0.50	498.00	
TV Inspection	996	LF	$ 1.00	996.00	
Connect to Existing MH	1	LS	$ 1,500.00	1,500.00	
				Total	71,731.00

2610 - Paving - Onsite					
Fine Grade Paving	4,015	SY	$ 0.25	1,003.75	
6" 3A Stone Base	4,015	SY	$ 4.00	16,060.00	
4 1/2" Base Course	4,015	SY	$ 16.00	64,240.00	
1 1/2" Wear Surface	4,015	SY	$ 6.00	24,090.00	
Pavement Markings	1	LS	$ 575.00	575.00	
Street Signs	6	EA	$ 150.00	900.00	
				Total	106,868.75
2610 - Paving - Derstine Rd					
Fine Grade Paving	485	SY	$ 0.25	121.25	
6" 3A Stone Base	485	SY	$ 4.00	1,940.00	
5" Base Course	485	SY	$ 16.00	7,760.00	
1 1/2" Wear Surface	485	SY	$ 6.00	2,910.00	
Mill to Center Line	1,357	SY	$ 3.25	4,412.75	
1 1/2" Wear Surface	1,852	SY	$ 6.00	11,112.00	
Seal Curb Line	865	LF	$ 0.40	346.00	
Saw Cut	1,970	LF	$ 2.00	3,940.00	
Pavement Restoration	994	SY	$ 26.00	25,844.00	
Pavement Markings	1	LS	$ 5,000.00	5,000.00	
Street Signs	1	EA	$ 150.00	150.00	
Bumper Blocks	65	EA	$ 50.00	3,150.00	
Traffic Control	1	LS	$ 1,000.00	1,000.00	
				Total	67,710.00
2630 - Site Concrete - Onsite					
Sidewalks - 4" conc with 4" stone	3,640	SF	$ 3.00	10,920.00	
				Total	10,920.00
2620 - Curbing / 2630 - Site Concrete - Derstine Rd					
Sidewalk - Public- 4' W - Derstine Rd 4" conc with 4" stone	2,995	SF	$ 3.00	8,985.00	
18" Concrete Curb - Derstine Rd	865	LF	$ 12.00	10,380.00	
ADA Ramps - Derstine Rd	2	EA	$ 200.00	400.00	
				Total	19,765.00
2800 - Landscaping					
Trees & Shrubs	1	LS	$ 30,000.00	30,000.00	
Spread Topsoil	1,830	CY	$ 2.00	3,660.00	
Seed & Mulch	130,145	SF	$ 0.06	7,808.70	
				Total	41,468.70
Miscellaneous					
Parking Lot Lighting	22	EA	$ 1,450.00	31,900.00	
Retaining Wall	1,215	SF	$ 19.00	23,085.00	
Guard Rail	200	LF	$ 39.00	7,800.00	
Construction Stake-out	1	LS	$ 5,000.00	5,000.00	
Concrete Moaument R/W	6	EA	$ 150.00	900.00	
As Built Plans	1	LS	$ 1,500.00	1,500.00	
Inspection/Testing	1	LS	$ 5,000.00	5,000.00	
				Total	75,185.00
				Project Total	503,342.70
				10% Escalation	50,334.27
				Grand Total	553,676.97

Exhibit "B"

098441

DERSTINE RUN
PHASE 1
SANITARY SEWER ESTIMATE
TOWAMENCIN TOWNSHIP ONLY
JUNE 2010

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL COST
I. SANITARY SEWER				
1. 8" DR18 Lateral Pipe	20	LF	$40.00	$800.00
2. 8" DR 18 Main Pipe	210	LF	$70.00	$14,700.00
3. Wye	2	EA	$150.00	$300.00
4. 5' Dia. Manhole	1	EA	$4,000.00	$4,000.00
5. Standard Manhole	1	EA	$3,000.00	$3,000.00
6. Insertion Manhole	1	EA	$4,000.00	$4,000.00
7. Pressure Testing	250	LF	$1.45	$362.50
8. Manhole Testing	3	EA	$150.00	$450.00
9. Flushing and Televising	210	LF	$1.60	$336.00
10. Manhole Removal	1	LS	$1,000.00	$1,000.00
11. Manhole Plug and Cap	1	LS	$1,000.00	$1,000.00
12. Existing Sanitary Abandonment	1	LS	$1,000.00	$1,000.00
SUBTOTAL				$30,948.50
II. SANITARY TRENCH AND ROAD RESTORATION				
1. Fine Grading	170	SY	$0.25	$42.50
2. 6" Base Course	170	SY	$30.00	$5,100.00
3. Full Width Mill	560	SY	$5.00	$2,800.00
4. 1 1/2" Wearing Course (Full Width)	560	SY	$8.00	$4,480.00
5. Pavement Markings	1	LS	$500.00	$500.00
6. Seal Curb Line	210	LF	$0.40	$84.00
SUBTOTAL				$13,006.50
III. MISCELLANEOUS				
1. Lawn Restoration	1	LS	$1,000.00	$1,000.00
2. Survey Stakeout	1	LS	$1,400.00	$1,400.00
3. As-Built Drawings	1	LS	$735.91	$735.91
4. Engineering / Legal	1	LS	$10,000.00	$10,000.00
5. Traffic Maintenance and Protection	1	LS	$2,000.00	$2,000.00
SUBTOTAL				$15,135.91
SANITARY SEWER CONSTRUCTION COST ESTIMATE				$59,090.91
TOWNSHIP SECURITY (10%)				$5,909.09
TOTAL SANITARY SEWER ESCROW				$65,000.00

EXHIBIT "C"

To be Provided

Exhibit V-4

Tracey Engineers Re-rate Documentation

Hatfield Township, Montgomery County

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT

AND

ANALYSIS

ON

RE-RATING

OF

EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

HTMA
COPY

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT
AND
ANALYSIS
ON
RE-RATING
OF
EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

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TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

DESIGN ENGINEER'S REPORT
AND
ANALYSIS
ON
RE-RATING
OF
EXISTING ADVANCED WASTEWATER TREATMENT FACILITY

GENERAL

The Hatfield Township Municipal Authority has undertaken in the past decade, major wastewater treatment and sewage collection construction in response to growth pressures in both Hatfield Township and Montgomery Township, and to Regulatory requirements imposed by the Department of Environmental Resources (Pa DER) which set more stringent effluent limits for the treatment facility.

Hatfield Township constructed a new Sewage Collection System and an initial Sewage Treatment Plant in 1965-1967. Montgomery Township, at the same time, constructed limited initial Sewage Collection Lines, and connected to the Hatfield Township Sewage Treatment Plant. The initial Sewage Treatment Plant rated hydraulic capacity was 0.90 MGD, with incineration facilities sized to handle sludge from a 3.60 MGD future flow.

Regulatory imposition of strict Phosphorus limiting effluent criteria, in 1969, resulted in the construction in 1970-1972, of a 3.6 MGD Advanced Wastewater Treatment Facility, with sufficient capacity to meet anticipated growth in both Hatfield Township and Montgomery

Township to the year 1990. The strict Phosphorus limitation was not accompanied for this 1970-1972 construction by any nitrogen limiting criteria.

In 1973, Pa DER issued orders setting limiting effluent Nitrogen criteria, and further mandating Regional Wastewater Treatment, requiring all the communities in the Upper Neshaminy Basin to conduct joint planning. After some 2 years of meetings among the communities, Pa DER approved two (2) Regional Plants for the Upper Neshaminy Basin, one (1) in Lansdale, and the second at the HTMA existing facility site.

In the period 1975-1977, certain of the communities mandated to participate in the HTMA expansion project to a Regional Facility, petitioned Pa DER to withdraw from the project, and Pa DER in 1978 permitted such withdrawals to occur. The limiting effluent Nitrogen criteria remained as an Order, but enforcement was suspended pending the potential for an EPA Construction Grant to assist the Project.

With the withdrawal of several communities from the project in 1978, the design that had been developed to meet the Nitrogen Order was no longer viable due to the difference between the design capacity and the needs of the remaining communities.

Hatfield Township made repeated attempts in 1979-1981 to secure priority points for an EPA Construction Grant, but was unable to initiate a completed application due to constantly changing EPA grant application requirements. Finally, in 1982, HTMA was notified it must proceed to meet limiting Nitrogen requirements without Federal Grant Assistance.

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In 1982-1983, HTMA constructed extensive Relief and Interceptor Sewers throughout the Township, and in 1984-1985 constructed new Preliminary Treatment Units in the form of new Raw Sewage Screw Pumping, Mechanical Screening and Mechanical Grit and Grease Removal, sized for future Treatment Facility capacity then envisioned to meet the Nitrogen criteria, which were still in effect.

In 1986-1987, HTMA (with capital participation by Montgomery Township), constructed a new 6.43 MGD Counter-Current Low Load Aeration Facility, including additional 2nd-Stage Raw Sewage Screw Pumping and Primary Clarification.

This new Facility (the third treatment facility since 1967 at the site) was placed in operation in September 1987. Initial flows to this new facility in 1987 and early 1988 averaged 3.095 MGD, or 48.1% of design capacity.

In 1989, Hatfield Borough connected to the HTMA Collection and Treatment systems, phasing out-of-service their existing Sewage Treatment Plant. Montgomery Township has a committed capacity share in the existing 6.43 MGD facility of 2.14 MGD. Hatfield Borough has a maximum committed share of 0.75 MGD. The Hatfield Township capacity share is 3.54 MGD.

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CURRENT FLOWS AND LOADINGS

Continued growth in both Hatfield Township and Montgomery Township, and the connection in 1989 of Hatfield Borough to the AWTF, has greatly increased flows and loadings to the 6.43 MGD Facility, since it's start-up in 1987 at ±3.1 MGD average daily flow.

A "Preliminary Engineering Report" was developed in July 1990 to explore the possibility of re-rating the newly constructed 6.43 MGD Treatment Facility to some higher capacity. This "Preliminary Engineering Report" considered data on hydraulic and organic loadings for the period January 1990 through May 1990, which represented the highest level of hydraulic and organic loadings to the facility available for analysis.

The design of modifications necessary to re-rate the treatment facility has been completed and there is now available flow and loading data for an extended 16 month period from January 1990 through April 1991, on which to confirm original design considerations.

Exhibits 1 through 6 appended hereto summarize a variety of flow data for the 16 month period. Exhibit 7 summarizes organic loading data and Exhibits 8 and 9 summarize nutrient loading data. Exhibit 10 analyzes Q_{UP} peak hourly flow data for major flow days since June 1990.

When the design was being developed for the 6.43 MGD facility in 1984 and 1985, Primary Clarification-Flocculation was included to provide the capability of providing at least primary treatment to all of the influent flows, and for the purpose of subsequent solids handling

conditions, to utilize primary sludge periodically for increased dewatering capability prior to incineration.

The 1984-1985 design therefore did not contemplate continuous utilization of Primary Treatment, at least until later years when loadings increased significantly, but rather was based upon Secondary Treatment only in the new Counter-Current Low Load Aeration Facility.

Due to the significant increase in loadings since initial operation commenced in the new facility, the operation has included full Primary Treatment, and the efficiency of this Primary Treatment has been measurably greater than the original 1984-1985 design basis assumed.

This increased Primary efficiency, coupled with the very conservative design basis utilized in the 1984-1985 design has resulted in significantly different loadings currently than had been anticipated. The facility can, and has upon occasion, been demonstrated to have a much higher assimilative loading capability than the current hydraulic and organic loading limits.

In Table 1, the existing design basis is compared to actual current loadings, as average for the 16 month period through April 1991.

With respect to hydraulic flows, the 16 month flow average was 76.6% of current rated hydraulic capacity on an average daily flow basis; 83.9% on a peak 24 hour basis; and 68.6% on a Q_{UP} peak hourly rate basis.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
DESIGN ENGINEER'S REPORT AND ANALYSIS
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TABLE 1

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

EXISTING DESIGN BASIS

COMPARISON
WITH
CURRENT ACTUAL LOADINGS

		Existing Design Basis	January 1990 - April 1991 Actual Basis	% Of Existing Design
1.	Hydraulic Flows			
	Q_{A-24}	6.43 MGD - 1,012 m^3/h	4.926 MGD - 775 m^3/h	76.58%
	Q_{P-24}	13.65 MGD - 2,148 m^3/h	11.451 MGD - 1,802 m^3/h	83.87%
	Q_{UP} Rate	20.80 MGD - 3,272 m^3/h	14.256 MGD - 2,243 m^3/h	68.55%
2.	BOD_5	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	9,856 Lb/D - 4,480 kg/D (240 mg/l @ Q_A)	83.30% (108.79%)
3.	TSS	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	11,561 Lb/D - 5,255 kg/D (281 mg/l @ Q_A)	97.71% (127.38%)
4.	TKN	2,622 Lb/D - 1,192 kg/D (48.9 mg/l @ Q_A)	1,448 Lb/D - 658 kg/D (35.3 mg/l @ Q_A)	55.20% (72.19%)
5.	NH_3-N	1,929 Lb/D - 877 kg/D (36.0 mg/l @ Q_A)	755 Lb/D - 343 kg/D (18.5 mg/l @ Q_A)	39.11% (51.39%)
6.	N_{ORG}	693 Lb/D - 315 kg/D (12.9 mg/l @ Q_A)	693 Lb/D - 315 kg/D (16.8 mg/l @ Q_A)	100.0% (130.23%)
7.	NO_2-N + NO_3-N	62 Lb/D - 28 kg/D (1.15 mg/l @ Q_A)	97 Lb/D - 44 kg/D (2.4 mg/l @ Q_A)	157.14% (208.7%)
8.	Phosphorus (P)	462 Lb/D - 210 kg/D (8.6 mg/l @ Q_A)	251 Lb/D - 114 kg/D (6.1 mg/l @ Q_A)	54.29% (70.93%)

Organic loadings have averaged 83.3% of design for BOD_5 and 97.7% for TSS.

Nutrient loadings have averaged much less than design for the parameters of TKN, NH_3-N and P, at 55.2%, 39.1% and 54.3% respectively.

The Organic Nitrogen fraction has averaged 100% of design since the NH_3-N fraction has averaged less than 40% of design. The NO_2-N + NO_3-N fraction, while in excess of design values, is not a critical parameter, since the facility provides significant denitrification.

When the "Preliminary Engineering Report" was developed in July 1990, the 5 months of data available (January - May 1990) indicated higher flows, and BOD_5 and TSS loadings, as well as higher TKN loadings than shown in Table 1. At that time, it was indicated in the Report that flows and loadings were approaching a level where consideration of additional treatment capacity would be mandated by the requirements of Pa. DER Chapter 94.

Due to the significantly increased demonstrated Primary Treatment efficiency over the 16 month period tabulated in the Exhibits hereto, the application of Chapter 94 requirements to influent loadings would be misleading, since the critical loadings are to the Secondary Treatment Process.

In Table 2, the existing design basis for the Secondary Treatment Process units is compared to actual loadings after Primary Treatment. Hydraulic loadings and % of existing design are the

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TABLE 2

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COUNTER-CURRENT LOW LOAD AERATION PROCESS

EXISTING DESIGN BASIS AFTER PRIMARY CLARIFICATION
COMPARISON
WITH
CURRENT ACTUAL LOADINGS

		Existing Design Basis	January 1990 - April 1991 Actual Basis	% Of Existing Design
1.	Hydraulic Flows			
	Q_{A-24}	6.43 MGD - 1,012 m^3/h	4.926 MGD - 775 m^3/h	76.58%
	Q_{P-24}	13.65 MGD - 2,148 m^3/h	11.451 MGD - 1,802 m^3/h	83.87%
	Q_{UP} Rate	20.80 MGD - 3,272 m^3/h	14.256 MGD - 2,243 m^3/h	68.55%
2.	BOD_5	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	4,970 Lb/D - 2,259 kg/D (121.0 mg/l @ Q_A)	60.00% (78.32%)
3.	TSS	11,832 Lb/D - 5,378 kg/D (220.6 mg/l @ Q_A)	3,280 Lb/D - 1,491 kg/D (79.8 mg/l @ Q_A)	69.32% (90.48%)
4.	TKN	2,622 Lb/D - 1,192 kg/D (48.9 mg/l @ Q_A)	1,157 Lb/D - 526 kg/D (28.2 mg/l @ Q_A)	44.13% (57.67%)
5.	NH_3-N	1,929 Lb/D - 877 kg/D (36.0 mg/l @ Q_A)	704 Lb/D - 320 kg/D (17.1 mg/l @ Q_A)	36.49% (47.50%)
6.	N_{ORG}	693 Lb/D - 315 kg/D (12.9 mg/l @ Q_A)	453 Lb/D - 206 kg/D (11.0 mg/l @ Q_A)	65.40% (85.27%)
7.	NO_2-N + NO_3-N	62 Lb/D - 28 kg/D (1.15 mg/l @ Q_A)	152 Lb/D - 69 kg/D (3.7 mg/l @ Q_A)	246.43% (321.74%)
8.	Phosphorus (P)	462 Lb/D - 210 kg/D (8.6 mg/l @ Q_A)	158 Lb/D - 72 kg/D (3.9 mg/l @ Q_A)	34.29% (45.35%)

same as indicated in Table 1. Organic and nutrient loadings, however, are significantly reduced as to % of existing design, when only the Secondary Treatment units are considered.

For instance, BOD_5 loadings constitute 83.3% of design on a raw influent basis, but only 60.0% of design to the Secondary Process. Similarly, TSS loadings constitute 97.7% of design on a raw influent basis, but only 69.3% of design to the Secondary Process. Other comparisons are TKN at 55.2% and 44.1%; NH_3-N at 39.1% and 36.5%; N_{ORG} at 100% and 65.4%; and P at 54.3% and 34.3%.

Since the Secondary Treatment Process is the element that affects final effluent values, and total treatment efficiency, the current operating situation is considerably less critical than raw influent loading values would indicate.

It should be noted that with respect to hydraulic flows, there are two (2) influent meters, one (1) for Montgomery Township interceptor lines, and one (1) for Hatfield Township interceptor lines. There is, however, the situation that certain Hatfield Township collector sewers enter the Treatment Facility through the Montgomery Township interceptor, and certain Montgomery Township collector sewers enter the Treatment Facility through the Hatfield Township interceptor. For these reasons, flows for both Townships must be adjusted by additions and deductions for flows not originating in the respective Townships. Some of these adjustments are not internally metered, hence average values are utilized.

In Exhibit 1, adjusted flows are indicated, combined, to be slightly greater on average than the combined total of the two meters, and the plant effluent meter indicates lesser flows than either combined total adjusted values or combined meter values. This is due in part to plant recycle flows, but also reflects the fact that inherent meter inaccuracies and differences in metering accuracy when two meter values are combined will occur at various flow ranges.

Effluent meter values are utilized in monthly reports to Pa. DER, since the values reflect actual discharges to the receiving stream. On the other hand, adjusted meter values are utilized in Tables 1 and 2 for the purpose of developing organic and nutrient average loading values.

An important element affecting the operation of the Treatment Facility is the ratio of peak daily flows to average daily flows. In the existing Facility, the ratio of Q_{P-24} to Q_{A-24} was set at 2.12:1, and the ratio of Q_{UP} hourly rate to Q_{A-24} was set at 3.23:1.

In Table 3, there is a comparison of Q_{P-24} Peak Daily Flows to Q_{A-24} Average Daily Flows, for each of the three (3) communities involved, and for the adjusted total for all three.

There is not a marked difference between the Q_{P-24}:Q_{A-24} ratios for each community, since they range from 1.697:1 to 1.749:1. For the combined adjusted total, the ratio is 1.621:1 which reflects the fact that the peak values in Exhibit 2 normally do not occur on the same day each month for each community.

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TABLE 3

COMPARISON
OF
Q_{P-24} PEAK DAILY FLOWS
TO
Q_{A-24} AVERAGE DAILY FLOWS

	Hatfield Township Adjusted	Hatfield Borough Adjusted	Montgomery Township Adjusted	Total Adjusted
Q_{A-24} (From Exhibit 2)	2.756 MGD	0.657 MGD	1.513 MGD	4.926 MGD
Q_{P-24} (From Exhibit 2)	4.821 MGD	1.117 MGD	2.568 MGD	7.987 MGD[A]
Ratio Q_{P-24} To Q_{A-24}	1.749:1	1.700:1	1.697:1	1.621:1

A - Total Adjusted QP-24 Is Less Than Sum Of Peak Flows For Each Community Since Peaks In Each Community Occurred On Same Day Of Month In Only 2 Of 16 Months

This current (16 month) average ratio of 1.621:1 may be compared to the 2.12:1 design assumption for the existing Facility.

In Exhibits 3 and 4, a comparison is developed for both the Hatfield Township and Montgomery Township meters as to flow ratios for the peak 24 hour flow in a month, versus average dry-weather weekday and weekend flows, and average meter flow.

Exhibit 5 is an analysis of metered flows instead of adjusted metered flows, and results in a $Q_{P-24}:Q_{A-24}$ ratio of 1.64:1.

Exhibit 6 compares ratios for the effluent meter, which averaged 1.71:1 for the 16 month period.

It is evident that current $Q_{P-24}:Q_{A-24}$ ratio averages are much less than the design basis used in the existing Facility.

The Q_{UP} peak hourly rate of flow is an important design parameter in that the limiting Secondary Clarifier surface settling rate is limited to 1.60 $m^3/m^2/h$ (945 GPD/SF) at this Q_{UP} rate.

In Exhibit 10, Q_{UP} flow rates for days of highest flow over the past 10 months are tabulated from Hatfield Township daily hydraulic flow records. The combined Q_{UP} flow rate ratio to Q_P peak daily flow averaged 1.50:1, which may be compared to the current design value for $Q_{UP}:Q_P$ of 1.52:1. The highest combined meter Q_{UP} flow rate in Exhibit 10 was a rate of 14.256 MGD, which occurred on April 25, 1991.

This highest combined meter Q_{UP} flow rate of 14.256 MGD represents a $Q_{UP}:Q_A$ ratio of 2.89:1, as compared to the current design value of 3.23:1. The average of the highest Q_{UP} rates, at 12.271 MGD provides a ratio of 2.49:1, Q_{UP} to Q_A.

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PRIMARY TREATMENT

As indicated previously herein, the efficiency of the Primary Treatment (Flocculation-Clarification) is significantly greater than the 1984-1985 design assumed.

In Table 4, this Primary Treatment Efficiency is tabulated for seven (7) loading parameters.

TABLE 4

PRIMARY TREATMENT EFFICIENCY

	Influent mg/l	Influent kg/D	Primary Effluent mg/l	Primary Effluent kg/D	Primary Treatment Efficiency
BOD_5 (From Exhibit 7)	240	4,480	121	2,259	49.6%
TSS (From Exhibit 7)	281	5,255	80	1,491	71.6%
TKN (From Exhibits 8 & 9)	35.2	658	28.2	526	20.1%
NH_3-N (From Exhibits 8 & 9)	18.4	343	17.1	320	6.7%
N_{ORG}	16.8	315	11.1	206	34.6%
NO_2-N + NO_3-N (From Exhibits 8 & 9)	2.4	44	3.7	69	(156.8%)
P (From Exhibits 8 & 9)	6.1	114	3.9	72	36.8%

Organic removal efficiencies (BOD_5 and TSS) are well above normal ranges. Nutrient removal efficiencies for TKN and P are also higher than would be anticipated. NH_3-N removal efficiency is low, since NH_3-N is essentially unaffected by Primary Treatment only. N_{ORG} removal efficiency is a function of TKN efficiency.

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CAPACITY RE-RATING POTENTIAL

The existing 6.43 MGD AWTF was very conservatively designed, with factors-of-safety of 25 to 50% having been provided for most unit processes over design calculation requirements.

Instead of planning for additional process units to increase the capacity of the facility, it is first considered necessary to determine what level of re-rating the capacity can be achieved, and the modifications required to permit such a re-rating.

Both hydraulic and organic (and nutrient) loadings must be analyzed, to determine the highest level of re-rating that can satisfactorily be treated in the existing units. In Exhibit 11, calculations on limiting hydraulic flows for the existing Headworks are developed, and similar calculations are developed in Exhibit 12 for the existing Primary Treatment and Counter-Current Low Load Aeration Secondary Treatment Units.

In Table 5, a Summary of Limiting Hydraulic Unit Capacities - Headworks Units is tabulated. With respect to the Headworks, the major units (excluding the Raw Sewage Screw Pumps) are the Mechanical Screens and the Mechanical Grit/Grease Removal Units. At Q_{A-24} flows, the Grit/Grease Channel has a limiting flow of 10.89 MGD, and the Grit Channel has a limiting flow of 14.72 MGD. The limiting capacity for the combined Grit/Grease Channels is 14.72 MGD, with only a slightly diminished Grease Unit efficiency above 10.89 MGD.

TABLE 5

SUMMARY OF LIMITING HYDRAULIC UNIT CAPACITIES

HEADWORKS UNITS

		QA-24	QP-24	QUP-24
A.	Interceptor Sewers To WWTF			
	Hatfield Township	15.0 MGD		34.0 MGD
	Montgomery Township	6.1 MGD		14.6 MGD
	Combined	21.1 MGD		48.6 MGD
B.	Raw Sewage Flow Metering			
	Hatfield Township			15.90 MGD
	Montgomery Township			10.41 MGD
	Combined			26.31 MGD
C.	Screw P.S. No. 1 Discharge Channel To Headworks			98.8 MGD
D.	Influent Channel To Mechanical Screens			
	Modification No. 2			43.16 MGD
E.	Mechanical Screens			
	Modification No. 2			59.40 MGD

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TABLE 5 - CONTINUED

		QA-24	QP-24	QUP-24
F.	Exit Channel From Mechanical Screens			
	Modification No. 2			29.63 MGD
G	Grit Influent Channel			32.24 MGD
H.	Grit/Grease Unit Grit Channel	14.72 MGD	49.15 MGD	
I.	Grit/Grease Unit Grease Channel	10.89 MGD		
J.	Effluent Channel From Grit/ Grease Unit			68.49 MGD
K.	30" Diameter By-Pass Pipe Around Grit/Grease Unit			27.50 MGD*
L.	48" Diameter Pipe From Grit/ Grease Unit To Raw Sewage Screw Pump Station No. 2			27.00 MGD*

*Can Surcharge. Flow Will Be Greater

All other elements, including the Mechanical Screens, are limited at Q_{UP} flow rates, and not Q_{A-24} flows.

From Table 5, the limiting Q_{UP} flow rate is 27.0 MGD, the 48" Diameter Pipe from the Grit/Grease Unit to Raw Sewage Screw Pump Station No. 2, although a higher flow rate can occur in this line since it can surcharge.

The Raw Sewage Influent Screw Pumps (Screw P.S. #1) normally could be replaced in part with new 48" screw pumps but the pumps are no longer being manufactured hence no replacement pumps are available. Modifications in raw sewage pumping would be required to exceed the current Q_{UP} rate of 20.8 MGD.

Similar calculations are contained in Exhibit 12 for the existing Primary and Secondary Treatment Units and the Disinfection Units. In Table 6, a Summary of Limiting Hydraulic Unit Capacities - Process Units is tabulated. Differing units are subject to differing hydraulic limitations. The Primary Clarifiers and Internal Recirculation Pumping are Q_{A-24} limited; the Primary Flash Units, Secondary Clarifiers, Return Sludge Pumping, and Disinfection Units are Q_{P-24} limited; and Raw Sewage Metering, Secondary Clarifiers, 48" Effluent Pipe, Effluent Metering and 30" Effluent Pipe are Q_{UP} Rate limited.

With respect to the Process Units, the limiting flow rate would be a Q_{P-24} flow of 18.46 MGD for the Secondary Clarifiers.

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TABLE 6

SUMMARY OF LIMITING HYDRAULIC UNIT CAPACITIES

PROCESS UNITS

		QA-24	QP-24	QUP RATE
A.	Raw Sewage Metering (P.S. No. 2 Discharge)			31.80 MGD
B.	Primary Flash Mix Units		31.41 MGD	
C.	Primary Clarifiers			
	(1) Flocculation Sections	9.54 MGD		
	(2) Clarifier Sections	10.05 MGD		
D.	Aeration Reactors	8.44 MGD*		
E.	Secondary Clarifiers		18.46 MGD	29.54 MGD
F.	Return Sludge Pumping		18.88 MGD	
G.	Internal Recirculation Pumping	9.81 MGD		
H.	Disinfection Units		29.70 MGD**	
I.	48" Effluent Pipe			>90.0 MGD
J.	Effluent Metering			32.57 MGD
K.	30" Effluent Pipe			51.7 MGD

* - Hydraulic Not Critical To Process Operation

** - Including Additional Contact Time In Downstream Piping and Backwash Storage Units

As previously indicated, the Headworks limiting flow was a Q_{UP} Rate of 27.0 MGD in the piping between the Headworks and Screw Pump Station No. 2.

The maximum re-rating Q_{A-24} flow would be a function of the 27.0 MGD Q_{UP} Rate of Flow and the Q_{UP}:Q_{P-24} ratio and the Q_{P-24}:Q_{A-24} ratio selected.

In Exhibit 10, the Q_{UP} Rate to Q_{P-24} flow over the past 16 months averaged 1.50:1. This would therefore set the Q_{P-24} peak 24 hour flow at 18.0 MGD.

The Q_{A-24} average 24 hour flow would, from Table 6, be limited to 8.44 MGD, which is the maximum flow to the Aeration Reactors if a minimum 16 hours hydraulic retention time is desired. Although the Aeration Reactor is not an hydraulic design, but rather an organic/ nutrient design, prudent design considerations indicate a minimum 16 hour detention time to be desirable at Q_{A-24} flow.

The Q_{A-24} 24 hour average daily flow for re-rating the facility is arbitrarily set at 8.25 MGD, which must then be analyzed both hydraulically and organically for adequacy of design.

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BASIS OF DESIGN AT 8.25 MGD Q_{A-24}

In order to analyze the adequacy of the existing facility being re-rated to Q_{A-24} flow of 8.25 MGD, a basis of design including organic and nutrient loadings must be developed. In Table 7, this Basis of Design is provided.

With respect to hydraulic flows, the Q_{A-24} design flow is set at 8.25 MGD. The Q_{P-24} flow is set at 18.00 MGD, which provides a Q_{P-24}:Q_{A-24} ratio of 2.19:1. This may be compared to the actual average ratio for the past 16 months of 1.621:1, from Table 3.

The Q_{UP} Rate of Flow is set at 27.00 MGD, which provides a Q_{UP}:Q_{A-24} ratio of 3.27:1. At the highest recorded Q_{UP} rate in the past 16 months, the actual peak Q_{UP}:Q_{A-24} ratio was 2.89:1, and at the average of Q_{UP} combined meter peak flows from Exhibit 10, the ratio was 2.49:1.

The hydraulic Basis of Design, therefore, provides margins in anticipated Q_{P-24} and Q_{UP} flow rates well in excess of actual recorded values for the past 16 months.

With respect to organic loadings, raw influent loadings are set at concentrations of 240 mg/l BOD_5 and 280 mg/l TSS, per the average concentrations for the last 16 months from Exhibit 7.

With respect to nutrient loadings, raw influent loadings are set at concentrations of 40 mg/l TKN; 22 mg/l NH_3-N; 18 mg/l N_{ORG}; 3 mg/l NO_2 + NO_3-N; and 8 mg/l P. Average concentrations for the past 16 months have been 35.2 mg/l TKN; 18.5 mg/l NH_3-N; 16.8 mg/l

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TABLE 7

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
BASIS OF DESIGN
WWTF RE-RATING

I.	HYDRAULIC FLOWS	
	Q_{A-24}, Average Daily Flow	8.25 MGD - 1,298 m^3/h
		5,711 GPM - 360.5 l/s
	Q_{P-24}, Peak 24 Hour Flow	18.00 MGD - 2,832 m^3/h
		12,461 GPM - 786.7 l/s
		(219% of Q_{A-24})
	Q_{UP}, Peak Hourly Flow Rate	27.00 MGD - 4,248 m^3/h
		18,691 GPM - 1,180 l/s
		(327% of Q_{A-24})
II.	ORGANIC LOADINGS - RAW INFLUENT	
	BOD_5	16,513 Lb/D - 7,506 kg/D
		(240 mg/l @ Q_A)
	TSS	19,265 Lb/D - 8,757 kg/D
		(280 mg/l @ Q_A)
III.	NUTRIENT LOADINGS - RAW INFLUENT	
	TKN	2,752 Lb/D - 1,251 kg/D
		(40 mg/l @ Q_A)
	NH_3-N	1,514 Lb/D - 688 kg/D
		(22 mg/l @ Q_A)

N_{ORG}	1,328 Lb/D - 563 kg/D (18 mg/l @ Q_A)
NO_2-N + NO_3-N	206 Lb/D - 94 kg/D (3 mg/l @ Q_A)
P	550 Lb/D - 250 kg/D (8 mg/l @ Q_A)

IV. ORGANIC LOADINGS - SECONDARY INFLUENT

BOD_5 (35% Removal - Current 49.6%)	10,899 Lb/D - 4,954 kg/D (158 mg/l @ Q_A)
TSS (55% Removal - Current 71.6%)	9,247 Lb/D - 4,203 kg/D (134 mg/l @ Q_A)

V. NUTRIENT LOADINGS - SECONDARY TREATMENT

TKN (15% Removal - Current 20.1%)	2,339 Lb/D - 1,063 kg/D (34 mg/l @ Q_A)
NH_3-N (4.5% Removal - Current 6.7%)	1,445 Lb/D - 657 kg/D (21 mg/l @ Q_A)
N_{ORG} (27.8% Removal - Current 34.6%)	894 Lb/D - 406 kg/D (13 mg/l @ Q_A)
NO_2-N + NO_3-N (60% Increase - Current 56.8% Increase)	330 Lb/D - 150 kg/D (4.8 mg/l @ Q_A)
P (25% Removal - Current 36.8%)	413 Lb/D - 188 kg/D (6 mg/l @ Q_A)

N_{ORG}; 2.4 mg/l NO_2 + NO_3-N; and 6.1 mg/l P. Nutrient raw influent concentrations are therefore set higher than current average values.

The organic and nutrient loadings to the Counter-Current Low Load Aeration Secondary Treatment Process will be a function of the efficiency of Primary Treatment. For the past 16 months, Primary BOD_5 and TSS efficiencies have averaged 49.6% and 71.6% respectively. The average surface settling rate has been, at current Q_{A-24} flows, 481 GPD/SF. At 8.25 MGD Q_{A-24}, the surface settling rate would be 821 GPD/SF.

At Hatfield Township, the primary clarification is accomplished by Flocculating Clarifiers, which have a provision for chemical addition to promote higher solids removals, but current operation does not provide for pre-primary clarifier chemical use. The ability to add chemicals in the future exists, to offset, at least in part, the average surface settling rate increase at 8.25 MGD.

Notwithstanding this ability for future chemical addition, Secondary Influent organic loadings at 8.25 MGD are set at a BOD_5 primary efficiency of 35% and a primary TSS efficiency of 55%, or well below current average efficiencies.

With respect to Secondary Influent nutrient loadings at 8.25 MGD, primary efficiencies are set at 15% TKN removal (currently 20.1%); 4.5% NH_3-N removal (currently 6.7%); 27.8% N_{ORG} removal (currently 34.6%); 60% NO_2 + NO_3-N increase (currently 56.8% increase); and 25% P removal (currently 36.8%).

This revised Basis of Design at 8.25 MGD must be analyzed to determine existing plant modifications necessary to permit the re-rating of the facility.

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ANALYSIS OF EXISTING FACILITY AT 8.25 MGD

In Exhibit 13, Component Calculations are developed for each element of the existing plant at a re-rated 8.25 MGD, and associated organic and nutrient design loadings. Where modifications are required to existing units to meet the re-rated flows and loadings, they are indicated in Exhibit 13.

A listing of required modifications to permit the re-rating of the existing facility from 6.43 MGD to 8.25 MGD is contained in Table 8. With the exception of the modifications to Screw Pump Station Nos. 1 and 2, the modifications required are limited and not major cost items.

Additional diffusers in each Aeration Reactor (80 each) can be accomplished at scheduled maintenance periods on the diffusers.

The spare, unmounted 700 mm diameter Return Sludge Tube Screw Pump as a stand-by unit would require no interruption of plant operations.

Modifications to the channels in the Headworks would require units to be out-of-service only long enough to remove existing channel slabs, and to pour new curbing and install new grating. This work would be scheduled during the pump modifications to Pump Station No. 1.

The major modifications would be the increase at each Screw Pump Station to a capacity of 27.0 MGD, which would be the Q_{UP} Rate of Flow at a Q_{A-24} re-rated flow of 8.25 MGD.

TABLE 8

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

MODIFICATIONS REQUIRED

TO

RE-RATE HYDRAULIC CAPACITY

FROM

6.43 MGD TO 8.25 MGD

1. RAW SEWAGE SCREW PUMP STATION NO. 1

   Increase Maximum Pumping Capacity From 20.09 MGD To 27.0 MGD

2. INFLUENT CHANNEL TO MECHANICAL SCREENS

   Remove Existing Slab Over Channel And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

3. MECHANICAL SCREENS

   Remove Existing Slab Over Channels And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

4. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

   Remove Existing Slab Over Channel And Add 1'-4" High Curbing Along Channel, All Covered With New Grating

5. RAW SEWAGE SCREW PUMP STATION NO. 2

   Increase Maximum Pumping Capacity To 27.0 MGD

6. AERATION REACTORS

   Add 160 Additional Diffusers.

7. RETURN SLUDGE SCREW PUMPING

   Provide One (1) Unmounted 700 mm Diameter Tube Mounted Screw Pump For Standby Installation.

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Under normal circumstances, the existing Enclosed Screw Pumps might be replaced, one at a time, with 48" diameter pumps, with no interruption to existing operations. Unfortunately, however, this type of screw pump is no longer manufactured by the equipment maker who supplied the original pumps, and there is only one other manufacturer still making such pumps. Dimensions at the existing pump structures and discharge mountings appear to not be compatible with the required dimensions of the remaining enclosed screw pump manufacturer without major modifications.

Further, the existing enclosed screw pumps have had, since initial operations in 1984 at Pump Station No. 1, and later since 1987 in Pump Station No. 2, a history of failed lower bearings and some upper bearings, which has resulted in significant maintenance costs to repair.

After a thorough evaluation, the Authority has determined that it does not desire to replace the existing pumps with larger sized enclosed screw pumps.

Neither Screw Pump Station No. 1 or No. 2 can be modified without extended interruption of raw sewage pumping. It is therefore necessary to develop a temporary raw sewage pumping plan during the station modification period, since operation of the entire facility is dependent upon raw sewage pumping.

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MODIFICATIONS TO RAW SEWAGE PUMP STATIONS

As indicated in the prior section, modifications to the Treatment units to re-rate the facility to 8.25 MGD are limited in scope, excepting for modifications to Raw Sewage Screw Pump Stations 1 and 2.

The modifications in these pump stations would be extensive, and would require additional temporary or permanent raw sewage pumping capacity so that the operation of the Treatment Facility could proceed uninterrupted during the construction, excepting for minor, short-term periods.

The July 1990 Preliminary Engineering Report considered four (4) alternatives in providing the additional raw sewage pumping capacity.

Alternative No. 1

Alternative No. 1 would retain all the Enclosed Screw Pumps in both pump stations, and add supplemental pumps and pump structures outside each existing screw pump station.

The supplemental pumping capacity to each of the Screw Pump Stations would be 7.0 MGD, providing a permanent total pumping capacity of 27.8 MGD at Screw Pump Station No. 1 and 31.0 MGD at Screw Pump Station No. 2.

This alternative would not require temporary pumping during the construction of the supplemental pump stations, but would require two (2) new supplemental structures, one (1) at each screw pump station.

This alternative is dependent upon continuing reliability of the existing Enclosed Screw Pumps, which have shown a history of extensive problems since their original installation. The pumps in Screw Pump Station No. 1 initiated operation in December 1984, and each of the five (5) pumps had to be rebuilt due to separation of the torque tube from the pump enclosure. Further, each of the lower bearings has been replaced at least once, and several of the upper bearings have been replaced.

More recently, one of the repaired pumps in Screw Pump Station No. 1 has sheared at the upper coupling and there is a potential that the repairs done earlier were the same for all five (5) pumps, and are susceptible to failure for the remaining four (4) pumps.

A continuing problem with Enclosed Screw Pumps in Screw Pump Station No. 1 is the periodic submergence of the lower bearings, occasioned by very heavy flow rates in wet-weather periods. While these lower bearings have been lubricated immediately after each submergence, potential damage to the bearings cannot be accurately determined. There is no way to limit these periodic submergences, excepting to construct a permanent, separate pump station to handle all flows in excess of a submergence condition. The capacity of such a separate station would have to

be sufficient to prevent bearing submergence, and would reduce the capacity of the existing five (5) pumps in order to guarantee non-submergence. This separate permanent pumping would require duplicate pumps, each rated at a minimum of 8.0 MGD.

The pumps in Screw Pump Station No. 2, while not subject to submergence, have been troubled also with both upper and lower bearing failures since operation commenced in this Station in September 1987.

The original pump manufacturer, Schreiber Corporation, Inc., no longer makes and markets the Enclosed Screw Pump. The manufacturer has extended additional warranties on the pumps in both stations, but would not be able to replace pumps with new units in future years. There is only one (1) other manufacturer known to market an Enclosed Screw Pump, and similar problems with this manufacturer's pumps have been reported.

In short, there would appear to be a serious question as to the reliability of this type of Pump, and reliance on Enclosed Screw pumps for the next 15 - 20 years as the basic raw sewage pumping.

Alternative No. 2

Alternative No. 2 would be to replace the ten (10) Enclosed Screw Pumps in Screw Pump Station Nos. 1 and 2 with new Open Flight Screw Pumps. Such a program would require temporary pumping of ±15 MGD capacity during the construction and pump replacement period.

A total of six (6) new Open Flight Screw Pumps would be required, three (3) each at Station Nos. 1 and 2. All six (6) pumps would be identical, and would be 72" diameter pumps, each rated at 9,400 GPM (13.54 MGD). Design Q_{UP} of 27.0 MGD would be provided with one (1) pump out of service at each Station.

The Open Flight Screw Pumps would require modifications to the existing pump structures including construction of pedestals in the wet well to support the pumps, and the construction of channels along the sloping portions of the Stations into which the pump torque tubes and flights would be placed. Portions of the existing station concrete would have to be removed to permit the pump channels to be formed.

The Open Flight Screw Pump lower bearings would always be submerged, but a positive lubrication system would be provided such that the submergence of the bearings would not affect the bearings or the pump operation.

The Open Flight Screw Pumps would have the advantage of being able to sustain higher wet-weather flow rates than is possible with the existing Enclosed Screw Pumps.

Open Flight Screw Pumps are available from a number of manufacturers, and have a long history of consistent and reliable operation.

Alternative No. 3

Alternative No. 3 would be similar to Alternative No. 2 in that Open Flight Screw Pumps would be utilized, but the total of pumps would be four (4), two (2) in each existing Screw Pump Station. The pumps would be identical to those in Alternative No. 2, that is, 72" Diameter pumps, each rated at 9,400 GPM (13.54 MGD). As with Alternative No. 2, temporary pumping of ±15 MGD capacity would be required during the construction and pump replacement period.

With two (2) pumps only in each station, a third pump, an Immersible Pump, could be placed in the wet-well of Station No. 1 as a stand-by pump in the event one (1) of the Open Flight Screw Pumps were out-of-service. The Immersible Pump would also be rated at 9,400 GPM (13.54 MGD).

The Immersible Pump in existing Screw Pump Station No. 1 would be piped so that it would discharge to either the Headworks Influent Channel, or at the Effluent Channel at existing Screw Pump Station No. 2.

As a stand-by unit in Station No. 1, this pump would preserve full Preliminary Treatment in the Headworks Units. In the event of a failure of one of the two Open Flight Screw Pumps in Station No. 2, this stand-by unit in Station No. 1 could discharge at the Effluent Channel of Station No. 2. This single Immersible Pump would serve as a stand-by pump for both Stations.

An alternative to Alternative No. 3 would be to utilize a 5,000 GPM (7.20 MGD) Immersible Pump in existing Screw Pump Station No. 1 and to rehabilitate existing Centrifugal Pump Station No. 2 with it's three (3) 3,500 GPM Centrifugal Pumps serving as a back-up, with the Immersible Pump, to a failure of an Open Flight Screw Pump in Station No. 1. The discharge of existing Centrifugal Station No. 2 would have to be re-piped from the existing Surge Storage Tanks to the Effluent Channel of Screw Pump Station No. 2.

Alternative No. 3 would, in essence, reduce the need for one (1) 9,400 GPM Immersible Pump in Screw Pump Station No. 2, and reduce the total of Open Flight Screw Pumps from six (6) to four (4).

The alternative to Alternative No. 3 would utilize a smaller Immersible Pump in Screw Pump Station No. 1, together with a re-habilitated existing Centrifugal Station No. 2, re-piped to the Effluent Channel of Screw Pump Station No. 2.

Alternative No. 4

Alternative No. 4 would replace all ten (10) existing Enclosed Screw Pumps in both Stations with a total of six (6) Immersible Pumps, three (3) in each Station.

Each Immersible Pump would be rated at 9,400 GPM (13.54 MGD), providing full stand-by capability at each Station at the re-rated Q_{UP} rate of 27.0 MGD.

As with Alternative Nos. 2 and 3, temporary pumping of ±15 MGD capacity would be required during the construction and pump replacement period.

Temporary Pumping

Alternative Nos. 2, 3 and 4 all would require temporary pumping during the construction and pump replacement period. This temporary pumping requirement has been indicated at ±15 MGD capacity. This capacity would provide for a buffer over the highest Q_{UP} rate historically seen on April 25, 1991, at 14.292 MGD (Exhibit 10). This would provide a peak pumping capacity of ±10,417 GPM.

The period of temporary pumping required would appear to be a minimum of six (6) months. The Project would be scheduled such that no work on the Stations would be undertaken until all the new pumps and auxiliary equipment were on-site. Removal of the existing pumps and concrete removals in the existing Stations would require up to 2 months. New concrete channels (Alternative Nos. 2 and 3) would require, with curing time, up to 2 months. New Pump installation would require an estimated 1 to 2 months to complete all installation and the necessary electrical work.

It is obvious that ±15 MGD of temporary pumping would be expensive, and would require a construction period to prepare for service. Further, since the pumping would be temporary, for a ±6 month period, full stand-by temporary pumping should not be required.

The type of temporary pumping provided could vary significantly. An initial consideration was to excavate an area near the existing Screw Pump Station No. 1 and use a hypalon liner with concrete pump pedestals and a concrete retaining wall 76 feet long and 12 feet high. Such an excavation would require sloping sides to maintain an angle of repose, and initial sketches and calculations indicated a surface excavation of ±180 x 60 feet rectangle, and a bottom excavation ±16 feet square, with a total depth of 24 feet. The depth is controlled by the invert elevations of the interceptor sewers.

Such a temporary construction would be in an area in which rock is prevalent, and such a pumping arrangement would require new meter flumes on support columns, since the existing meters would be out of service during the temporary pumping period.

This initial approach was deemed too expensive and was discarded as a temporary pumping alternative.

A second consideration would be to construct a concrete pump and metering pit, similar to the meter and wet well area of Screw Pump Station No. 1, adjacent to Screw Pump Station No. 1. This would also be expensive construction and would have no use after the new pumps were in place in Stations 1 and 2.

Either of these temporary pumping considerations would utilize only one (1) pumping operation, directly to the Effluent Channel of Screw Pump Station No. 2, hence there would be no Screening and Grit and Grease Removal available during the temporary pumping period. The

only way to preserve Preliminary Treatment during portions of the construction period would be to provide additional ±15 MGD capacity at Screw Pump Station No. 2. In such a situation, the temporary pumping would be low head pumping at each Station versus high head pumping with one (1) set of temporary pumps at Pump Station No. 1 area only.

Construction of such duplicate temporary pumping would be expensive, and would not be a cost-effective consideration.

In the investigations of how best to provide temporary pumping, since it would be an expensive short-term cost, a review of piping in and around Screw Pump Station No. 1, together with future pumping considerations, for recycle flows after the new Incinerator became operational, led to consideration of combining temporary pumping with permanent future requirements, even to a plant capacity expansion beyond 8.25 MGD.

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ALTERNATIVE TEMPORARY/PERMANENT PUMPING

Future requirements indicate the need in 10 - 15 years to increase the Plant Capacity to some level beyond 8.25 MGD. The obvious design would be the construction of a third Train at ±4 MGD to increase total plant capacity to ±12 - 12.5 MGD.

The construction of the new Incinerator will result in recycle flows at 24 DT/D sludge processing of ±750,000 to 800,000 GPD. At lesser sludge processing levels, the recycle flows will be less, but the rate of sludge processing will be independent of HTMA plant capacity due to the potential of significant outside sources for sludge, hence sizeable recycle flows may be present before a third train expansion is required.

As a part of the Incinerator design, a separate Scrubber recycle-centrate return pump station would be utilized. The design capacity of such a station would be ±650 - 700 GPM, or 0.94 to 1.01 MGD.

Current plant recycle flows are all directed to Screw Pump Station No. 1 via a 36" diameter pipe in the area of Pump Station No. 1. This 36" diameter pipe is virtually at a flat grade in this area with a fall of ±2 inches in ±200 feet. This 36" recycle pipe could be intercepted near existing Centrifugal Pump Station No. 2 (Structure E-3 on Construction Drawings) and directed to this existing Centrifugal Station.

Station E-3 contains three (3) 3,500 GPM centrifugal pumps and was the main pump station for the prior 3.6 MGD Activated Sludge Plant, with a 20" force main to that plant's Surge Storage Basins. The maximum pumping capacity of this station was ±5,200 GPM, or ±7.5 MGD. The station is currently periodically exercised, and could be re-habilitated at a fairly moderate cost. The 20" force main from this Station E-3 could be intercepted near the existing Surge Basins, and continued to the Effluent Channel of Screw Pump Station No. 2.

This rehabilitation/pipe extension would permit Station E-3 to serve as the future plant recycle station, eliminating the need to construct a separate station as a part of the Incinerator Project.

At the same time, the flat slope on the 36" existing plant recycle line would permit this line to reverse flows from Screw Pump Station No. 1 to Centrifugal Station E-3, to serve as a part of the temporary pumping requirements.

Existing Centrifugal Pump Station E-3, is connected to existing Centrifugal Pump Station E-2, by a 30" diameter pipe such that the wet wells of the two (2) stations can serve both stations. Centrifugal Station E-2 was the original main pump station for the 1967 initial Sewage Treatment Plant, and had three (3) pumps, rated at 500 GPM, 1,000 GPM and 1,300 GPM. These pumps are no longer operational nor exercised. This Station E-2 pumps through a force main to the existing Surge Storage Basins, which are currently unused.

Centrifugal Station E-2 would not have sufficient wet well capacity, even with the interconnection to Station E-3 wet well, to enable it to be fitted with new pumps as additional temporary pumping. It is, however, an existing structure, and it could be gutted and the dry well area converted to a wet well, which would be sufficient to enable an Immersible Pump(s) to be installed to augment the temporary pumping capacity.

A new force main would be required from Station E-2 to the Effluent Channel of Screw Pump Station No. 2. The pumping capacity necessary to provide ±15 MGD temporary pumping (with Station E-3 and its separate force main) would be ±7.5 MGD, or ±5,200 GPM.

This rehabilitated Station E-2 would not, at ±7.5 MGD capacity, have sufficient capacity after temporary pumping was no longer necessary, to serve as a full standby to modified Screw Pump Station No. 1.

Instead, it was recommended in the Preliminary Engineering Report that this existing Station be fitted with 9,400 GPM (13.54 MGD) total effective capacity Immersible Pumps with 2-Speed motors. During temporary pumping, the pump would provide the full temporary requirements with one (1) of the 3,500 GPM pumps in Station E-3 (total 18.58 MGD), and after temporary pumping, would, at the lower speeds, provide the effective total 9,400 GPM to the discharge channel of Screw Pump Station No. 1.

In the future, when a plant expansion to ±12 - 12.5 MGD were required, this Station E-2 could become the main pump station for the third Process train of ±4 MGD. Since the existing Headworks could not absorb a Q_{A-24} flow of 12 - 12.5 MGD, a separate new Headworks would be required in conjunction with the third Process Train, including a third Primary Clarifier-Flocculator, and additional Chlorine Contact capacity at that time.

The utilization of existing Centrifugal Stations E-3 and E-2 for temporary pumping would be applicable to Alternative Nos. 2, 3 and 4 as discussed prior herein.

For Alternative No. 1, retaining all existing Enclosed Screw Pumps, and adding 7.0 MGD pumping capacity, a different, but similar, arrangement would be required. Existing Station E-2 would be gutted, as in the temporary pumping requirement, and would be fitted with a new Pre-Rotation Immersible Pump with a capacity of 5,000 GPM (7.2 MGD). Existing Station E-3 would be rehabilitated to serve as a recycle pump station. A new 36" line from Screw Pump Station No. 1 to Centrifugal Station E-2 would be required, and a new pump sump with weir would be required in Screw Pump Station No. 1. A new Immersible Pump sump would be required at Screw Pump Station No. 2, adjacent to the Station.

The Preliminary Engineering Report of July 1990 developed detailed construction requirements for the four (4) alternatives; detailed horsepower requirements for each alternative; and a Supplement to Preliminary Engineering Report (July 1990) developed detailed construction cost estimates for each alternative.

On the basis of a subjective review of these three (3) elements, it was recommended that Alternative No. 3 be selected, and that existing Centrifugal Pump Station Nos. E-2 and E-3 be renovated, to provide both the ±15 MGD Temporary Pumping requirement, and later, after installation of the two (2) 72" Open-flight Screw Pumps in the existing Screw Pump Stations, modified Station E-2 would serve as the stand-by for both Screw Pump Station Nos. 1 and 2 72" open-flight screw pumps. Renovated Station E-3 would then serve as the recycle-scrubber water-centrate pump station.

The Authority concurred in this recommendation, and Alternative No. 3 was selected as the design basis for modification of the existing Screw Pump Stations as a part of the re-rating of the facility from 6.43 MGD (current hydraulic capacity) to 8.25 MGD.

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SELECTED RAW SEWAGE PUMPING ALTERNATIVE NO. 3

The selected Raw Sewage Pumping Alternative No. 3 was slightly modified during the design period by the addition of a new flow diversion box between Existing Centrifugal Pump Stations E-2 and E-3, to enable future permanent diversion of stand-by pumping for Screw Pump Station Nos. 1 and 2 to modified Station E-2, without affecting the utilization of Station E-3 for separate recycle-scrubber water-centrate pumping around the Headworks.

A Flow Schematic for Alternative No. 3 is contained in Figure 1.

During the use of modified Existing Centrifugal Pump Station No. E-2 as the temporary pumping facility for installing the new open-flight screw pumps, Preliminary Treatment (i.e. Mechanical Screening and Mechanical Grit/Grease Removal) will not be available. During this period, modifications to Headworks structure channels will take place. Thereafter, when this Station E-2 serves as the stand-by pumping unit for either Screw Pump Station No. 1 or No. 2, Preliminary Treatment to 13.54 MGD will be available, but not beyond 13.54 MGD if a pump is out-of-service in either Screw Pump Station.

Alternative No. 3 provides the option for installation at some future date of a third 72" open flight screw pump in each Screw Pump Station, and the conversion of Station E-2 to the raw sewage pump station for a third Headworks-Primary Clarifier-Counter-Current-Disinfection Train at ±4 - 4.125 MGD.

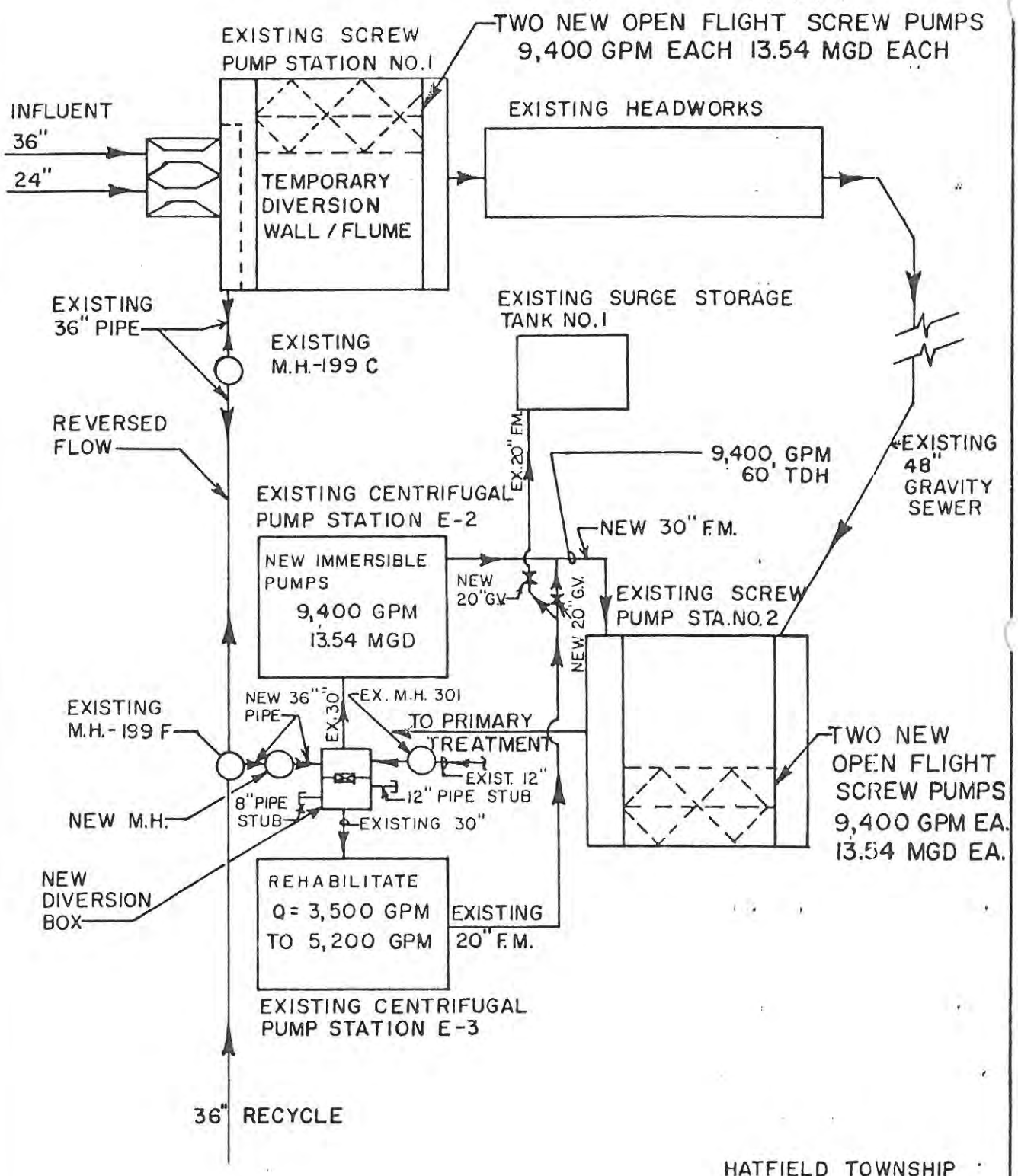

FIGURE NO. 1

TRACY ENGINEERS, INC., CAMP HILL, PA.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
DESIGN ENGINEER'S REPORT AND ANALYSIS
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ACTUAL OPERATING DATA - SINGLE COUNTER-CURRENT TRAIN

The calculations and analyses herein demonstrate that the existing 6.43 MGD Wastewater Treatment Facility can be re-rated to 8.25 MGD, with certain modifications and additions, the major items being the increase in raw sewage pumping at existing Screw Pump Station Nos. 1 and 2 from a peak rate of 20.8 MGD to 27.0 MGD.

While the calculations herein are sufficient to demonstrate the feasibility of the re-rating on a design basis, there is additional operating data available to support the design calculations.

On occasions, the existing two-train Secondary Treatment Facility has operated for extended periods with only one-train in service. One such operation occurred in the 47 day period extending from April 13, 1990 to May 29, 1990. Actual operations during this 47 day period are tabulated in Exhibit 14 for flow and influent/effluent concentrations. In Exhibit 14, efficiencies of treatment for BOD_5, TSS, NH_3-N, NO_2 + NO_3-N and P are also developed on a concentration basis.

While concentration limitations form a portion of NPDES PA 0026247 effluent discharge limitations, they do not depict actual operating conditions as accurately as influent loadings and effluent discharge loadings.

Therefore, the data tabulated in Exhibit 14 on a concentration basis has been converted in Exhibit 15 on an organic loading basis, in kg/D, and in Exhibit 16 on a nutrient basis, also in

kg/D. Also indicated in Exhibits 15 and 16 are the equivalent influent flows and loadings if both trains had been in service during the 47 day period, and the efficiencies obtained with the single-train operation.

It should be noted in both Exhibits 15 and 16, that averages are provided separately for the 18 days single train operation in April 1990, and the 29 days single-train operation in May 1990, since effluent limitations become more stringent for BOD_5 and NH_3-N commencing May 1 of each year. Also shown in Exhibits 15 and 16 are the averages for the full 47 day period on a continuous basis.

The data in Exhibits 14 , 15 and 16 is summarized in Table 9 on an Influent Loadings/ Concentrations basis. From Table 9, it can be seen that the % of design loadings for flow and critical parameters during the 47 day single-train operation were 167.8% of one-train design flow; 174.3% of BOD_5 design loading; 207.4% of TSS design loading; 79.0% of NH_3-N design loading; 378.6% of NO_2 + NO_3-N design loading; and 107.5% of P design loading.

In Table 10, the same data is summarized on an Effluent Discharge Loadings/Concentrations basis. In Table 10, for BOD_5 and NH_3-N, the data reflects the change in limitations for discharge commencing May 1 of each year.

Flows during the 47 day single-train operation period averaged 167.8% of one-train design, being 151.5% in April and 170.4% in May. Effluent BOD_5 discharge loading was 13.8% of permitted in April, and 46.2% of permitted in May.

TABLE 9

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

COMPARISON

OF

INFLUENT LOADINGS/CONCENTRATIONS

Parameter	Design Limitation	April 13 - 30, 1990 Actual	% Of Design	May 1 - 29, 1990 Actual	% Of Design	April 13 - May 29, 1990 Actual	% Of Design
Q_{A-24}, 24 Hour Average Daily Flow	3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%	5.245 MGD	167.8%
Q_{P-24}, 24 Hour Peak Daily Flow	6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%	9,108 MGD	133.4%
Q_{UP}, Ultimate Peak Flow Rate	10.400 MGD	NA	-	NA	-	NA	-
BOD_5 - kg/D	2,689	4,402	163.7%	4,862	180.8%	4,686	174.3%
mg/l	220.6	238.4	108.1%	234.1	106.1%	235.7	106.8%
TSS - kg/D	2,689	5,404	201.0%	5,686	211.4%	5,578	207.4%
mg/l	220.6	292.7	132.7%	273.8	124.1%	280.5	127.2%
NH_3-N - kg/D	438	332.9	76.8%	354.0	80.8%	345.9	79.0%
mg/l	36.0	18.0	50.0%	17.0	47.2%	17.4	48.3%
$NO_2 + NO_3$-N - kg/D	14	60.4	431.4%	48.4	345.7%	53.0	378.6%
mg/l	1.15	3.27	284.4%	2.33	202.6%	2.67	232.2%
P - kg/D	105	103.3	98.4%	118.8	113.1%	112.9	107.5%
mg/l	8.6	5.6	65.1%	5.7	66.3%	5.7	66.3%

NA - Not Available

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TABLE 10

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

COMPARISON

OF

EFFLUENT DISCHARGE LOADINGS/CONCENTRATIONS

Parameter			Permit/ Design Limitation	April 13 - 30, 1990 Actual	% Of Permit/ Design	May 1 - 29, 1990 Actual	% Of Permit/ Design	April 13 - May 29, 1990 Actual	% Of Permit/ Design
Q_{A-24}, 24 Hour Average Daily Flow			3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%	5.245 MGD	167.8%
Q_{P-24}, 24 Hour Peak Daily Flow			6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%	9,108 MGD	133.4%
Q_{UP}, Ultimate Peak Flow Rate			10.400 MGD	NA	-	NA	-	NA	-
BOD_5	-	kg/D 11/1 - 4/30	731.3	128.9	13.8%				
		mg/l	30	7.0	23.3%				
		kg/D 5/1 - 10/31	365.6			168.6	46.2%		
		mg/l	15			8.1	54.0%		
TSS	-	kg/D	731.3	186.1	25.4%	180.6	24.7%	182.7	25.0%
		mg/l	30	10.1	33.7%	8.7	29.0%	9.2	30.7%
NH_3-N	-	kg/D 11/1 - 4/30	146.3	62.1	42.4%				
		mg/l	6	3.4	56.7%				
		kg/D 5/1 - 10/31	48.8			62.0	127.0%		
		mg/l	2			3.1	155.0%		
$NO_2 + NO_3$-N	-	kg/D 7/1 - 10/31	219.4	154.2	70.3%	117.4	53.5%	131.5	59.9%
		mg/l	9	8.35	92.8%	2.33	62.8%	6.61	73.4%
P	-	kg/D	48.8	10.9	22.3%	12.5	25.6%	11.9	24.4%
		mg/l	2	0.6	30.0%	0.6	30.0%	0.6	30.0%

NA - Not Available

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Effluent TSS discharge loading averaged 25.0% of permitted for the 47 day period, and 25.4% in April and 24.7% in May. TSS has no seasonal differential.

Effluent NH_3-N discharge loading averaged 42.4% of permitted in April, but 127.0% of permitted in May, when the limitation changed from 146.3 kg/D to 48.8 kg/D.

Effluent NO_2 + NO_3-N discharge loading averaged 59.9% of permitted for the 47 day period, and 70.3% in April and 53.5% in May. Effluent NO_2 + NO_3-N limitations are effective only July 1 through October 31, and were not in force in April and May.

Effluent P discharge loading averaged 24.4% of permitted for the 47 day period, and 22.3% in April and 25.6% in May. As with TSS, there is no seasonal differential for P, as to effluent limitations.

The data in Tables 9 and 10 can be more easily compared as indicated in Table 11, for the two periods April and May. Flows were 151.5% of design for a single train in April and 170.4% in May.

BOD_5 effluent in April was 13.8% of permit, despite a loading of 163.7% of design. In May, the BOD_5 effluent was 54.0% of permit, despite a loading of 180.8% of design. The BOD_5 effluent limit reduced commencing May 1.

TABLE 11

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SINGLE-TRAIN OPERATION

INFLUENT/EFFLUENT LOADINGS

Parameter		Design/ Permit Limitation	April 13 - 30, 1990 Actual	% Of Design/ Permit	May 1 - 29, 1990 Actual	% Of Design Permit
Q_{A-24}, 24 Hour Average Daily Flow		3.215 MGD	4.870 MGD	151.5%	5.478 MGD	170.4%
Q_{P-24}, 24 Hour Peak Daily Flow		6.825 MGD	7.882 MGD	115.5%	9.108 MGD	133.4%
BOD_5 -	Influent	2,689 kg/D	4,402 kg/D	163.7%	4,862 kg/D	180.8%
	Effluent - April	731.3 kg/D	128.9 kg/D	17.6%[A]		
	Effluent - May	365.6 kg/D			168.8 kg/D	54.0%
TSS -	Influent	2,689 kg/D	5,404 kg/D	201.0%	5,686 kg/D	211.4%
	Effluent	731.3 kg/D	186.1 kg/D	25.4%[A]	180.6 kg/D	24.7%
NH_3-N -	Influent	438 kg/D	332.9 kg/D	76.0%	354 kg/D	80.8%
	Effluent - April	146.3 kg/D	62.1 kg/D	42.4%[A]		
	Effluent - May	48.8 kg/D			62.0 kg/D	127.0%[A]
$NO_2 + NO_3$-N -	Influent	14 kg/D	60.4 kg/D	431.4%	48.4 kg/D	345.7%
	Effluent	219.4 kg/D	154.2 kg/D	70.3%[A]	117.4 kg/D	53.5%[A]
P -	Influent	105 kg/D	103.3 kg/D	98.4%	118.8 kg/D	113.1%
	Effluent	48.8 kg/D	10.9 kg/D	22.3%[A]	12.5 kg/D	25.6%[A]

A - Of Permit Limitation

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TSS effluent was 25.4% of permit in April and 24.7% of permit in May, with corresponding influent loadings of 201.0% in April and 211.4% in May of design.

NH_3-N effluent was 42.4% of permit in April, against 76.0% loading of design. In May, when the limit changed, the NH_3-N effluent was 127.0% of permit, against 80.8% loading of design.

NO2 + NO3-N effluent was 70.3% of permit in April and 53.5% of permit in May, with corresponding design loadings of 431.4% and 345.7% respectively.

P effluent was 22.3% of permit in April and 25.6% of permit in May, despite respective loadings of 98.4% of design in April and 113.1% of design in May.

Table 11 indicates that despite influent loadings at or well above design for all parameters except NH_3-N, all permit limitations were met with the exception of NH_3-N in May.

It is to be noted in Table 11 that influent loadings in May averaged above influent loadings in April, with the exception of NO_2 + NO_3-N.

The hydraulic loading in April was equivalent to 9.74 MGD for a two-train operation, and the hydraulic loading in May was equivalent to 10.96 MGD for a two-train operation. These averages were well above the re-rating 8.25 MGD Q_{A-24} design flow.

The single exception to meeting effluent limitations in the 47 day period was the NH_3-N discharge loading (and concentration) for May.

The data in Tables 9, 10 and 11 (and Exhibits 14, 15 and 16) for each day in the 47 day single-train operational period must be affected by cumulative carry-overs from preceeding days, particularly very high flow days, which is the reason averages over an extended period are more representative of actual operation than is a single-day result.

Notwithstanding this situation, operations for flow days in the 47 day period ranging between 7.25 and 9.25 MGD are tabulated in Exhibits 17 and 18, to determine what the average results were on days in the single-train operation when the averages were close, hydraulically, to the re-rating hydraulic design of 8.25 MGD.

This data in Exhibits 17 and 18 is summarized in Table 12, in the same format as Table 11 for the full 47 day period of single-train operation. The hydraulic averages for these 22 days of flow between 7.25 and 9.25 MGD was 8.156 MGD for an equivalent two-train operation, with an average of 8.192 equivalent MGD in April, and 8.124 equivalent MGD in May. The hydraulic flows were 127.4% of design for April and 126.4% of design for May, as contrasted to 151.5% and 170.4% of design for the full 47 day period.

BOD_5 influent loadings were somewhat less, on average, in both April and May, than for the full 47 days, but only slightly so, being 160 to 170% of design. Effluent BOD_5 discharge loadings

TABLE 12
HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
SINGLE-TRAIN OPERATION
7.25 - 9.25 MGD
INFLUENT/EFFLUENT LOADINGS

Parameter	Design/ Permit Limitation	April 13 - 30, 1990 Actual	% Of Design/ Permit	May 1 - 29, 1990 Actual	% Of Design/ Permit
Q_{A-24}, 24 Hour Average Daily Flow	3.215 MGD	4.096 MGD	127.4%	4.062 MGD	126.4%
Q_{P-24}, Peak 24 Hour Flow	6.825 MGD	4.645 MGD	68.1%	4.568 MGD	66.9%
BOD_5 - Influent	2,689 kg/D	4,345 kg/D	161.6%	4,615 kg/D	171.6%
Effluent - April	731.3 kg/D	109.8 kg/D	15.0%A		
Effluent - May	365.6 kg/D			107.8 kg/D	29.5%A
TSS - Influent	2,689 kg/D	5,326 kg/D	298.1%	5,181 kg/D	192.7%
Effluent	731.3 kg/D	122.2 kg/D	16.7%A	98.2 kg/D	13.4%A
NH_3-N - Influent	438 kg/D	319.1 kg/D	72.8%	342.9 kg/D	78.3%
Effluent - April	146.3 kg/D	83.9 kg/D	57.4%A		
Effluent - May	48.8 kg/D			57.2 kg/D	117.2%A
$NO_2 + NO_3$-N - Influent	14 kg/D	45.3 kg/D	323.6%	19.6 kg/D	140.0%
Effluent	219.4 kg/D	123.6 kg/D	56.3%A	117.7 kg/D	53.6%A
P - Influent	105 kg/D	100.1 kg/D	95.3%	109.0 kg/D	103.8%
Effluent	48.8 kg/D	10.4 kg/D	21.3%A	10.0kg/D	20.5%A

A - Of Permit Limitation

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were less in both months, markedly so in May reducing from 54% of permit, to 29.5% of permit.

Influent TSS loadings were somewhat less than for the 47 day period, but were still almost double design values. Effluent discharge loadings reduced measurably for each month, especially in May to only 13.4% of permit.

Influent NH_3-N loadings were only slightly decreased from 47 day values and effluent discharge loadings in April rose to 57.4% of permit, but were only 117.2% of permit in May.

Influent NO_2 + NO_3-N loadings reduced markedly in both months, but especially so in May. Effluent discharge loading reduced measurably in April but was virtually the same in May.

Influent P loadings were only slightly less in each month, as were effluent discharge loadings, which were close to 20 - 21% of permit.

The data in Exhibits 17 and 18, and in Table 12, illustrates that at hydraulic conditions comparable in the period of single-train operation to the re-rating 8.25 MGD design, resulted in greater operating efficiencies than for the full 47 day period, with only the May NH_3-N effluent discharge loading being above current permit.

Margins-of-operating safety for all other parameters, at ±8.2 MGD equivalent actual operation were 46 - 80% of current permit conditions.

SINGLE TRAIN NH_3-N

The operating data for the 47 days of single-train operation indicate exceptional efficiencies for all parameters at overload conditions beyond an equivalent 8.25 MGD hydraulic flow, with the single exception of NH_3-N, in the summertime period when the concentration limitation reduces from 6 mg/l to 2 mg/l.

The NH_3-N loading in May 1990 was 80.8% of current design hence an initial observation might be that the re-rating could be suspect with respect to NH_3-N reduction. This observation would not, however, be an accurate depiction of the nitrification capability of the re-rating.

Nitrification is a function of supplying sufficient O_2 with sufficient MLVSS, to enable the nitrification activity to sustain. In a Counter-Current Low Load Aeration Reactor, the O_2 available is a competition between oxidizing bacteria (BOD_5) and nitrifying bacteria (NH_3-N). Where the amount of O_2 available to satisfy both demands is not present, the nitrifying activity will become less efficient, since the oxidizing bacteria will consume the available O2 at the expense of the nitrifying bacteria.

The waste at Hatfield Township over the 16 month period January 1990 - April 1991 indicated an average influent NH_3-N loading of 343 kg/D (Exhibit 8). This is not, however, the true ammonia nitrogen loading, since the influent TKN loading averaged 658 kg/D, and the N_{ORG} (organic nitrogen) loading averaged 315 kg/D.

A significant portion of the N_{ORG} will convert to NH_3-N, and be additive to the measured NH_3-N loading, thus increasing significantly the ammonia nitrogen requiring nitrification (conversion to NO_3-N).

In the re-rating analysis at 8.25 MGD (Exhibit 13), it was assumed that 90% of the N_{ORG} would ammonify. In the period May 1 - May 29, 1990, the influent BOD_5 averaged 4,615 kg/D, and the influent NH_3-N averaged 342.9 kg/D, or exactly the 16 month average (Exhibit 8). N_{ORG} in the influent averaged by interpolation, ±315 kg/D. The oxygen requirements for oxidation and nitrification for this period would be a function of required O_2 per kg of BOD_5 and NH_3-N to the Secondary Treatment process, and would also be a function of the actual Primary treatment efficiencies on each day.

Average Primary efficiencies for the 16 month period (Table 4) were 49.6% for BOD_5, 6.7% for NH_3-N and 34.6% for N_{ORG}. Data is not available for each of the 29 days in May 1990, but oxygen requirements can be estimated for this period, if the Primary average efficiencies are assumed to have occurred each day in the period. Since they must obviously not have been the same each day, the result must be only an approximation of oxygen requirements each day.

Loadings to Secondary Treatment would be assumed to average

4,615 kg BOD_5/D x 0.504	=	2,326 kg BOD_5/D
342.9 kg NH_3-N/D x 0.933	=	320 kg NH_3-N/D
315.0 kg N_{ORG}/D x 0.654	=	206 kg N_{ORG}/D

Oxygen requirements would have been assumed to average

2,326 kg BOD_5/D x 1.6 kg O_2/kg BOD_5	=	3,722 kg O_2/D
320 kg NH_3-N/D x 4.6 kg O_2/kg NH_3-N	=	1,472 kg O_2/D
206 kg N_{ORG}/D x 4.6 kg O_2/kg N_{ORG}	=	948 kg O_2/D
		6,142 kg O_2/D
	=	255.9 kg O_2/Hr

Air requirements, at an assumed α of 0.80 would have been assumed to average

$$Q_{AIR} = \frac{255.9 \text{ kg } O_2/\text{Hr}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/\text{m} \times 4.8 \text{ m}}$$

$$= 4{,}069 \text{ } m^3 \text{ Air/Hour}$$

$$= 67.8 \text{ } m^3 \text{ Air/Minute}$$

At an α of 0.75, the Q_{AIR} requirement would have been assumed to average 72.3 m^3 Air/Minute.

There are three (3) Blowers at each Reactor, each two-speed, with a high-speed out-put each at 34.3 m^3 Air/Minute. With one (1) blower stand-by, the air output would have been 68.6 m^3 Air/Minute, or virtually the same as the average air requirement.

Since the air requirement assumed a uniform Primary efficiency on a daily basis, and assumes an α on a constant basis, neither of which is static, but rather varies from day to day, and in the

case of α, from hour to hour, precise air requirements for each day in May 1990 cannot be determined. On an average basis, however, and utilizing the assumptions noted, Air Requirements on heavy loading days in May 1990 would have been estimated at

	kg O_2/D	kg O_2/Hr	m3 Air/Minute
May 1	9,750	406	107.6
May 5	8,406	350	92.7
May 10	8,077	337	89.3
May 11	6,869	286	75.8
May 18	8,466	353	93.5
May 19	7,516	313	83.0
May 23	6,860	286	75.7
May 24	7,717	322	85.2

It is evident that in May 1990, there were days when the calculated air requirements (utilizing Primary efficiency averages and an α of 0.80 on a constant basis) were significantly greater than the output of two blowers. The fact that these overload O_2 requirements resulted in only exceeding current effluent discharge loading limits by ±17% in May 1990 attests to the nitrification capability at loadings ±15% greater than will be design loadings in the re-rated 8.25 MGD.

NH_3-N discharge loading in May 1990 was the only parameter exceeding current discharge limits, and the limitation was Air capacity by reason of high overloads of BOD_5, NH_3-N and N_{ORG}, which were well beyond 8.25 MGD design loadings.

It is requested that PA DER approve the Re-Rating application of Hatfield Township Municipal Authority, to increase the capacity of the existing AWTF from

Q_{A-24} Average Daily Flow	6.43 MGD	To	8.25 MGD
Q_{P-24} Peak 24 Hour Flow	13.65 MGD	To	18.00 MGD
Q_{UP} Rate	20.80 MGD	To	27.00 MGD
Raw Influent BOD_5	5,378 kg/D	To	7,506 kg/D
Raw Influent TSS	5,378 kg/D	To	8,757 kg/D
Raw Influent TKN	1,192 kg/D	To	1,251 kg/D
Raw Influent NH_3-N	877 kg/D	To	688 kg/D
Raw Influent NO_2-N + NO_3-N	28 kg/D	To	94 kg/D
Raw Influent P	210 kg/D	To	250 kg/D
Primary Effluent BOD_5	3,765 kg/D	To	4,954 kg/D
Primary Effluent TSS	2,151 kg/D	To	4,203 kg/D
Primary Effluent TKN	1,192 kg/D	To	1,063 kg/D
Primary Effluent NH_3-N	877 kg/D	To	657 kg/D

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
DESIGN ENGINEER'S REPORT AND ANALYSIS
ON RE-RATING CAPACITY OF EXISTING
ADVANCED WASTEWATER TREATMENT FACILITY

Primary Effluent NO_2-N + NO_3-N	28 kg/D	To	150 kg/D
Primary Effluent P	210 kg/D	To	188 kg/D

It is further requested that the NPDES Permit PA 0026247, be revised to reflect the following:

Parameter	Permitted Discharge Concentration mg/l	Permitted Discharge Loading kg/D	Permitted Discharge Loading Lb/D
BOD_5 - 5/1 - 10/31	15	469	1,032
- 11/1 -4 /30	30	938	2,064
TSS	30	938	2,064
NH_3-N - 5/1 - 10/31	2	62.5	138
- 11/1 - 4/30	6	187.5	412
NO_2 + NO_3-N - 7/1 - 10/31	9	281.5	619
P	2	62.5	138

Respectfully submitted,

TRACY ENGINEERS, INC.
Consulting Engineers

Tracy W. Greenlund, P.E.

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TRACY W. GREENLUND
ENGINEER
3125-E

June 3, 1991

EXHIBITS

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

FLOW DATA - I

	Hatfield Township Adjusted MGD	Hatfield Borough MGD	Montgomery Township Adjusted MGD	Total Adjusted MGD	Hatfield Township Meter MGD	Montgomery Township Meter MGD	Combined Total MGD	Effluent Meter MGD	Deviation MGD	% Deviation
January 1990	3.430	0.746	1.579	5.755	4.073	1.597	5.670	4.912	0.758	13.4
February	3.235	0.680	1.479	5.394	3.825	1.496	5.321	4.664	0.657	12.3
March	2.641	0.559	1.221	4.421	3.119	1.239	4.358	3.810	0.548	12.6
April	3.245	0.679	1.449	5.373	3.832	1.467	5.299	4.667	0.632	11.9
May	3.336	0.682	1.647	5.665	3.903	1.665	5.568	4.597	0.971	17.4
June	2.680	0.658	1.414	4.752	3.227	1.432	4.658	3.920	0.738	15.8
July	2.035	0.499	1.128	3.662	2.416	1.145	3.561	3.319	0.242	6.8
August	2.131	0.537	1.067	3.735	2.544	1.085	3.629	3.588	0.041	1.1
September	1.756	0.476	1.068	3.300	2.122	1.085	3.207	2.953	0.254	7.9
October	1.974	0.560	1.283	3.817	2.410	1.301	3.711	3.043	0.668	18.0
November	1.707	0.677	1.277	3.661	2.268	1.294	3.562	3.130	0.432	12.1
December	3.042	0.758	1.758	5.558	3.694	1.775	5.469	4.780	0.689	12.6
January 1991	3.286	0.825	2.122	6.233	4.005	2.139	6.145	5.435	0.710	11.6
February	2.725	0.647	1.535	4.907	3.247	1.553	4.800	4.232	0.568	11.8
March	3.810	0.812	2.265	6.887	4.490	2.282	6.773	5.790	0.983	14.5
April	3.065	0.718	1.916	5.699	3.638	1.933	5.571	4.884	0.687	12.3
Averages	2.576	0.657	1.513	4.926	3.301	1.530	4.831	4.233	0.598	12.4

EXHIBIT 1

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

FLOW DATA - II

	Hatfield Township Adjusted MGD	Hatfield Township Adjusted Peak MGD	Hatfield Borough MGD	Hatfield Borough Peak MGD	Montgomery Township Adjusted MGD	Montgomery Township Adjusted Peak MGD	Total Adjusted MGD	Total Adjusted Peak MGD	Total of Peaks
January 1990	3.430	5.899 (10)	0.746	1.351 (25)	1.579	3.233 (25)	5.755	8.802 (10)	10.483
February	3.235	5.384 (24)	0.680	0.965 (4)	1.479	2.383 (4)	5.394	8.070 (24)	8.732
March	2.641	4.707 (17)	0.559	0.918 (20)	1.221	2.183 (17)	4.421	7.437 (17)	7.808
April	3.245	5.388 (4)	0.679	1.235 (3)	1.449	2.583 (3)	5.373	8.288 (4)	9.206
May	3.336	5.728 (30)	0.682	1.282 (30)	1.647	2.883 (29)		9.393 (30)	10.648
June	2.680	5.379 (19)	0.658	1.042 (19)	1.414	2.183 (15)	4.752	8.404 (19)	8.604
July	2.035	4.178 (21)	0.499	0.703 (13)	1.128	2.283 (21)	3.662	7.022 (21)	7.164
August	2.131	3.494 (6)	0.537	0.776 (6)	1.067	1.483 (6)	3.735	5.753 (6)	5.753
September	1.756	3.514 (22)	0.476	0.738 (22)	1.068	1.583 (22)	3.300	5.835 (22)	5.835

EXHIBIT 2
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - ANLAYSIS OF FLOW DATA - II

	Hatfield Township Adjusted MGD	Hatfield Township Adjusted Peak MGD	Hatfield Borough MGD	Hatfield Borough Peak MGD	Montgomery Township Adjusted MGD	Montgomery Township Adjusted Peak MGD	Total Adjusted MGD	Total Adjusted Peak MGD	Total of Peaks
October	1.924	3.434 (23)	0.560	0.854 (24)	1.283	1.793 (23)	3.817	6.029 (23)	6.081
November	1.707	2.797 (11)	0.677	1.224 (10)	1.277	2.263 (10)	3.661	6.161 (10)	6.284
December	3.042	5.832 (18)	0.758	1.544 (4)	1.758	3.873 (30)	5.558	9.107 (18)	11.249
January 1991	3.286	5.428 (10)	0.825	1.607 (12)	2.122	3.763 (16)	6.233	9.019 (16)	10.798
February	2.725	4.316 (7)	0.647	0.882 (7)	1.535	1.963 (7)	4.907	7.161 (7)	7.161
March	3.810	6.079 (4)	0.812	1.249 (23)	2.265	6.443 (6)	6.887	11.451 (6)	13.771
April	3.065	5.578 (22)	0.718	1.503 (21)	1.916	3.603 (21)	5.699	9.866 (21)	10.684
Averages	2.756	4.821	0.657	1.117	1.513	2.568	4.926	7.987	8.725
		1.75:1		1.70:1		1.70:1		1.62:1	1177:1

( ) - Day Of Month

EXHIBIT 2
- 2 -

Amended Attachment 21-B.1
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - III
HATFIELD TOWNSHIP METER

	Average Dry-Weather Weekday Flow MGD	Average Dry-Weather Week-End Flow MGD	Peak Flow In Month MGD	Ratio Peak Flow To Average Weekday Flow	Ratio Peak Flow To Average Weekend Flow	Ratio Peak Flow To Hatfield Twp. Average Meter Flow
January 1990	3.124	2.652	6.690	2.14:1	2.52:1	1.64:1
February	3.180	3.050	6.200	1.95:1	2.03:1	1.62:1
March	2.620	2.683	5.200	1.98:1	1.94:1	1.67:1
April	3.020	2.500	6.100	2.02:1	2.44:1	1.59:1
May	3.100	2.900	6.800	2.19:1	2.34:1	1.74:1
June	2.664	2.780	6.300	2.36:1	2.27:1	1.95:1
July	2.315	2.200	4.700	2.03:1	2.14:1	1.95:1
August	2.360	1.982	4.100	1.74:1	2.07:1	1.61:1
September	1.995	1.908	4.200	2.11:1	2.20:1	1.98:1
October	2.127	2.120	4.100	1.93:1	1.93:1	1.70:1
November	2.086	2.052	3.780	1.81:1	1.84:1	1.67:1
December	2.254	1.925	6.820	3.03:1	3.54:1	1.85:1
January 1991	2.730	2.745	6.240	2.29:1	2.27:1	1.56:1
February	2.803	2.850	5.060	1.81:1	1.78:1	1.56:1
March	2.938	2.770	6.960	2.37:1	2.51:1	1.55:1
April	2.470	2.720	6.480	2.62:1	2.38:1	1.78:1
Averages	2.612	2.490	5.608	2.15:1	2.25:1	1.70:1

EXHIBIT 3

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EXHIBIT 4

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - IV
MONTGOMERY TOWNSHIP METER

	Average Dry-Weather Weekday Flow MGD	Average Dry-Weather Week-End Flow MGD	Peak Flow In Month MGD	Ratio Peak Flow To Average Weekday Flow	Ratio Peak Flow To Average Weekend Flow	Ratio Peak Flow To Mont. Twp. Average Meter Flow
January 1990	1.206	1.070	3.250	2.69:1	3.04:1	2.04:1
February	1.100	1.200	2.400	2.18:1	2.00:1	1.60:1
March	1.060	1.150	2.200	2.08:1	1.91:1	1.78:1
April	1.140	1.250	2.600	2.28:1	2.08:1	1.77:1
May	1.400	1.325	2.900	2.07:1	2.19:1	1.74:1
June	1.309	1.391	2.200	1.68:1	1.58:1	1.54:1
July	1.090	1.017	2.390	2.19:1	2.35:1	2.09:1
August	1.066	1.098	1.500	1.41:1	1.37:1	1.38:1
September	1.007	1.006	1.500	1.49:1	1.49:1	1.38:1
October	1.128	1.278	1.810	1.60:1	1.42:1	1.39:1
November	1.162	1.326	2.280	1.96:1	1.72:1	1.76:1
December	1.386	1.352	3.890	2.81:1	2.88:1	2.19:1
January 1991	1.624	1.680	3.780	2.33:1	2.25:1	1.77:1
February	1.374	1.428	1.980	1.44:1	1.39:1	1.28:1
March	1.555	1.848	6.460	4.15:1	3.50:1	4.30:1
April	1.654	1.708	3.620	2.19:1	2.12:1	2.41:1
Averages	1.266	1.320	2.798	2.21:1	2.12:1	1.83:1

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TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
ANALYSIS
OF
FLOW DATA - V
HATFIELD TOWNSHIP METER
+
MONTGOMERY TOWNSHIP METER

	Average Daily Flow Hatfield Twp. Meter MGD	Average Daily Flow Montg. Twp. Meter MGD	Average Daily Combined Flow MGD	Peak Flow In Month MGD	Ratio Peak To Average
January 1990	4.073	1.597	5.670	8.700	1.53:1
February	3.825	1.496	5.321	8.000	1.50:1
March	3.119	1.239	4.358	7.400	1.70:1
April	3.832	1.467	5.299	8.200	1.55:1
May	3.903	1.665	5.568	9.200	1.65:1
June	3.227	1.432	4.659	8.300	1.78:1
July	2.416	1.145	3.561	7.000	1.97:1
August	2.544	1.085	3.629	5.600	1.54:1
September	2.122	1.085	3.207	5.800	1.81:1
October	2.410	1.301	3.711	5.910	1.59:1
November	2.268	1.294	3.562	6.060	1.70:1
December	3.694	1.775	5.469	9.930	1.82:1
January 1991	4.005	2.139	6.145	8.880	1.45:1
February	3.247	1.553	4.800	7.040	1.47:1
March	4.490	2.282	6.772	11.262	1.66:1
April	3.638	1.933	5.571	9.970	1.76:1
Averages	3.301	1.530	4.831	7.942	1.64:1

EXHIBIT 5

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
ANALYSIS
OF
FLOW DATA - VI
EFFLUENT METER

	Average Daily Effluent Flow MGD	Peak Flow In Month MGD	Ratio Peak To Average
January 1990	4.912	7.920	1.61:1
February	4.664	6.900	1.48:1
March	3.810	7.400	1.94:1
April	4.667	7.000	1.50:1
May	4.597	8.100	1.76:1
June	3.920	7.390	1.89:1
July	3.319	7.400	2.23:1
August	3.588	5.710	1.59:1
September	2.953	3.800	1.29:1
October	3.043	5.260	1.73:1
November	3.130	5.500	1.76:1
December	4.780	11.700	2.45:1
January 1991	5.435	7.950	1.46:1
February	4.232	6.300	1.49:1
March	5.790	8.350	1.44:1
April	4.884	9.140	1.87:1
Averages	4.233	7.239	1.71:1

EXHIBIT 6

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

ORGANIC DATA

	Combined Adjusted Influent MGD	Influent BOD_5 mg/l	Influent BOD_5 kg/D	Influent TSS mg/l	Influent TSS kg/D	Secondary Influent BOD_5 kg/D	Secondary Influent TSS kg/D
January 1990	5.755	252	5,498	281	6,131	3,612	1,852
February	5.394	240	4,908	288	5,889	2,758	1,661
March	4.421	247	4,140	342	5,732	2,231	1,485
April	5.373	226	4,603	277	5,642	2,209	1,879
May	5.665	238	5,111	272	5,841	2,300	1,571
June	4.752	282	5,080	325	5,855	2,774	1,171
July	3.662	399	5,539	476	6,608	2,721	1,097
August	3.735	395	5,593	463	6,556	1,954	1,288
September	3.300	312	3,903	434	5,429	1,576	901
October	3.817	315	3,941	371	4,641	1,614	826
November	3.661	238	3,303	235	3,261	2,012	1,416
December	5.558	161	3,392	181	3,814	1,728	1,412
January 1991	6.233	164	3,875	186	4,395	1,985	2,174
February	4.907	185	3,441	197	3,665	1,842	1,339
March	6.887	164	4,282	152	3,968	2,402	1,932
April	5.699	235	5,077	309	6,676	2,420	1,858
Averages	4.926	240	4,480	281	5,255	2,259	1,491
Primary Treatment Efficiency						49.6%	71.6%

EXHIBIT 7

Amended Attachment 21-B.1
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS

OF

NUTRIENT DATA - I

	Combined Adjusted Influent MGD	Influent TKN mg/l	Influent TKN kg/D	Influent NH_3-N mg/l	Influent NH_3-N kg/D	Influent NO_2-NO_3-N mg/l	Influent NO_2-NO_3-N kg/D	Influent P mg/l	Influent P kg/D
January 1990	5.755	24.5	528	14.2	310	3.3	72	5.5	120
Februry	5.394	28.8	589	15.5	317	3.5	72	5.2	106
March	4.421	39.9	669	16.1	270	3.4	57	5.4	90
April	5.373	29.6	603	16.0	326	2.8	57	5.4	110
May	5.665	35.0	752	17.4	374	2.2	47	5.7	122
June	4.752	37.0	666	17.9	322	1.2	22	6.4	115
July	3.662	58.0	805	27.8	386	2.5	35	8.6	119
August	3.735	51.9	735	28.0	396	1.5	21	8.2	116
September	3.300	58.2	728	30.1	377	2.8	35	9.1	114
October	3.817	48.3	699	23.8	344	1.6	23	7.8	113
November	3.661	43.7	606	23.7	329	1.5	21	9.7	135
December	5.558	29.7	626	16.7	352	2.2	46	5.4	114
January 1991	6.233	25.3	598	16.8	397	2.2	52	5.4	128
February	4.907	32.1	597	17.3	322	3.5	65	5.4	100
March	6.887	22.4	585	11.5	300	1.8	47	3.4	89
April	5.699	34.0	735	16.9	365	1.7	37	6.3	136
Averages	4.926	35.2	658	18.4	343	2.4	44	6.1	114

EXHIBIT 8

Amended Attachment 21-B.1
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
NUTRIENT DATA - II

	Combined Adjusted Influent MGD	Secondary Influent TKN mg/l	Secondary Influent TKN kg/D	Secondary Influent NH_3-N mg/l	Secondary Influent NH_3-N kg/D	Secondary Influent NO_2-NO_3-N mg/l	Secondary Influent NO_2-NO_3-N kg/D	Secondary Influent P mg/l	Secondary Influent P kg/D
January 1990	5.755	23.6	515	15.2	332	5.0	109	4.2	92
February	5.394	27.6	564	15.0	307	5.3	108	3.9	80
March	4.421	32.0	536	15.8	265	4.6	77	3.3	55
April	5.373	24.9	507	16.2	330	6.6	134	3.8	77
May	5.665	26.8	576	17.6	378	3.8	82	3.2	69
June	4.752	28.4	512	16.7	301	3.2	58	4.3	77
July	3.662	43.8	608	25.7	357	1.5	21	4.8	67
August	3.735	38.3	542	28.2	399	0.6	8	4.2	59
September	3.300	40.1	502	25.2	315	0.7	9	4.8	60
October	3.817	35.1	508	20.8	301	0.8	12	3.7	54
November	3.661	35.6	494	22.0	305	3.9	54	4.1	57
December	5.558	23.3	491	14.9	314	4.9	103	3.7	78
January 1991	6.233	21.7	513	12.5	295	3.3	78	3.2	76
February	4.907	25.4	472	14.5	270	6.2	115	4.2	78
March	6.887	21.8	569	12.5	326	3.6	94	3.6	94
April	5.699	23.9	516	15.0	324	2.0	43	3.7	80
Averages	4.926	28.2	526	17.1	320	3.7	69	3.9	72
Primary Treatment Efficiency			20.06%		6.71%		(54.17%)		36.84%

EXHIBIT 9

Amended Attachment 21-B.1
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

ANALYSIS
OF
FLOW DATA - VII
QUP FLOW RATES

Day	Hatfield Twp. Meter Average Daily Flow MGD	Hatfield Township Meter Peak Flow Rate MGD	Montgomery Twp. Meter Average Daily Flow MGD	Montgomery Twp. Meter Peak Flow Rate MGD	Combined Meter Average Daily Flow MGD	Combined Meter Peak Flow Rate MGDA	Effluent Meter Average Daily Flow MGD	Hatfield Township QUP Flow Rate To QP	Montgomery Township QUP Flow Rate To QP	Combined QUP Flow Rate To QP
6/16/90	4.928	12.384	2.193	4.320	7.121	13.392	6.570	2.51:1	1.97:1	1.88:1
6/19/90	4.646	9.936	1.932	4.032	6.578	13.104	5.890	2.14:1	2.09:1	1.99:1
6/20/90	6.276	8.208	2.010	3.024	8.286	10.800	7.390	1.31:1	1.50:1	1.30:1
6/23/90	2.911	7.488	1.280	3.600	4.191	11.088	3.520	2.57:1	2.81:1	2.65:1
1/9/91	5.060	8.928	3.061	4.464	8.121	12.096	7.320	1.76:1	1.46:1	1.49:1
1/10/91	6.328	10.080	2.548	7.056	8.786	12.672	7.690	1.59:1	2.77:1	1.44:1
1/11/91	4.741	7.488	2.511	4.320	7.252	11.232	6.680	1.58:1	1.72:1	1.55:1
1/12/91	5.051	10.512	3.654	4.464	8.705	14.112	7.770	2.08:1	1.22:1	1.62:1
1/13/91	5.741	9.648	2.852	4.176	8.593	11.808	7.650	1.68:1	1.46:1	1.37:1
1/16/91	5.091	8.784	3.779	4.464	8.870	12.672	7.550	1.73:1	1.18:1	1.43:1
1/17/91	5.856	10.080	3.011	6.768	8.867	13.824	7.950	1.72:1	2.25:1	1.56:1
1/21/91	5.177	8.064	2.392	3.312	7.569	10.800	6.870	1.56:1	1.38:1	1.43:1
3/3/91	3.655	7.362	2.046	3.456	5.701	11.088	4.980	2.01:1	1.69:1	1.94:1
3/4/91	6.958	8.352	2.425	3.744	9.383	11.232	8.350	1.20:1	1.54:1	1.20:1
3/6/91	4.836	7.488	2.269	3.456	7.105	10.656	6.460	1.55:1	1.52:1	1.50:1
3/7/91	6.098	8.784	2.320	3.456	8.418	11.520	7.580	1.44:1	1.49:1	1.37:1
3/18/91	5.659	8.208	3.390	4.608	9.049	12.240	8.100	1.45:1	1.36:1	1.35:1
3/19/91	6.209	11.808	2.553	3.600	8.762	13.680	7.960	1.90:1	1.41:1	1.56:1
3/23/91	5.314	7.776	3.100	4.320	8.414	10.512	7.730	1.46:1	1.39:1	1.25:1
3/24/91	6.315	8.640	2.482	3.312	8.797	10.800	8.110	1.37:1	1.33:1	1.23:1
3/25/91	4.894	7.632	2.142	6.048	7.036	12.960	6.610	1.56:1	2.82:1	1.84:1
3/30/91	6.234	8.064	2.628	3.600	8.862	11.664	8.070	1.29:1	1.37:1	1.32:1
4/21/91	6.171	9.360	3.618	4.896	9.789	13.689	9.140	1.52:1	1.35:1	1.40:1
4/22/91	6.483	8.640	2.506	3.888	8.989	11.952	8.470	1.33:1	1.55:1	1.33:1
4/24/91	6.223	9.936	2,823	4.176	9.046	13.536	8.230	1.60:1	1.48:1	1.50:1
4/25/91	5.834	11.520	2.447	3.456	8.281	14.256	7.610	1.97:1	1.41:1	1.72:1
5/6/91	6.250	9.072	3.374	4.320	9.624	12.672	8.830	1.45:1	1.28:1	1.32:1
5/7/91	6.283	8.784	2.665	6.336	8.948	13.536	8.130	1.40:1	2.38:1	1.51:1
Averages	5.544	9.052	2.643	4.310	8.184	12.271	7.672	1.63:1	1.63:1	1.50:1

A - Combind Meter Peak Flow-Rate Is Less Than Sum Of Meter Peak Flows Since Peaks Do Not Occur In Each Meter Simultaneously

EXHIBIT 10

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TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

LIMITING HYDRAULIC UNIT CAPACITIES

EXISTING AWTF

HEADWORKS UNITS

1. INTERCEPTOR SEWERS TO WWTF

A. From Hatfield Township To Influent Metering -

36" Diameter Pipes, 0.0062 Slope

Capacity Flowing Full - 34.0 MGD

Capacity Flowing 7/10 Full - 29.24 MGD

Allowable Design Capacity - 15.0 MGD

B. From Montgomery Township To Influent Metering -

24" Diameter Pipes, 0.0096 Slope

Capacity Flowing Full - 14.6 MGD

Capacity Flowing 7/10 Full - 12.56 MGD

Allowable Design Capacity - 6.13 MGD

C. To Influent Metering, Combined Total Flows -

Capacities Flowing Full -

34.0 MGD + 14.6 MGD = 48.6 MGD

Capacities Flowing 7/10 Full -

29.24 MGD + 12.56 MGD = 41.80 MGD

Allowable Design Capacities -

15.0 MGD + 6.13 MGD = 21.13 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

2. RAW SEWAGE FLOW METERING

A. Hatfield Township Flow Meter -

1'-6" Throat, Capacity Range 0.10 - 15.90 MGD

Meter Will Be At 94.3% Of Capacity At Interceptor Allowable Design Capacity

B. Montgomery Township Flow Meter -

1'-0" Throat, Capacity Range 0.07 - 10.41 MGD

Meter Will Be 58.9% Of Capacity At Interceptor Allowable Design Capacity

3. SCREW P.S. NO. 1 DISCHARGE COLLECTION BOX

Dimensions - 6'-0" W x 32'-0" L x 0'-9" Average D.

Volume - 144 Cu. Ft. = 1,080 Gallons

4. SCREW P.S. NO. 1 DISCHARGE CHANNEL TO HEADWORKS

$Q = AV$ Where $V = \frac{1.486}{n} R^{2/3} S^{1/2}$

$n = 0.016$

$R = 0.75$

$S = 0.112$

$Q = 6 \text{ Ft.} \times \frac{1.486}{0.016} \times 0.75^{2/3} \times 0.112^{1/2}$

$= 6 \text{ Ft}^2 \times 92.875 \times 0.819 \times 0.334$

$= 152.4 \text{ CFS}$

$= 1{,}143 \text{ Gal/Sec.} = 68.595 \text{ GPM}$

$= 98.8 \text{ MGD}$

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

5. INFLUENT CHANNEL TO MECHANICAL SCREENS

A. At Existing Dimensions -

Width, W = 1.83 m (6.00 Ft)
Depth, T = 0.52 m (1.706 Ft)
Area, A = 1.83 m x 0.52 m = 0.952 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.952 m^2 x 1 m/s x 3,600 Sec/Hour = 3,427.2 m^3/h
= 21.78 MGD

B. At Grating Replacement Of Existing Slab Over Channel -

Width, W = 1.83 m (6.00 Ft)
Depth, T = 0.625 m (2.05 Ft)
Area, A = 1.83 m x 0.625 m = 1.144 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.144 m^2 x 1 m/s x 3,600 Sec/Hour = 4,118.4 m^3/h
= 26.18 MGD

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Width, W = 1.83 m (6.00 Ft)
Depth, T = 1.030 m (3.38 Ft)
Area, A = 1.83 m x 1.030 m = 1.886 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.886 m^2 x 1 m/s x 3,600 Sec/Hour = 6,789.6 m^3/h
= 43.16 MGD

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

6. MECHANICAL SCREENS

A. At Existing Dimensions -

Gross Width, W_G = 3 Screens x 1.0 m/Screen = 3.00 m (9.84 Ft)
Clear Width, W_C = 3 Screens (42 Bars/Screen x 0.02 m Clear/Bar)
= 2.52 m (8.266 Ft)
Depth, T = 0.60 m (1.97 Ft)
Area, A = 2.52 m x 0.60 m = 1.512 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 1.512 m^2 x 1 m/s x 3,600 Sec/Hour = 5,443.2 m^3/h
= 34.60 MGD

B. At Grating Replacement Of Existing Slab Over Channel -

Clear Width, W_C = 2.52 m (8.266 Ft)
Depth, T = 0.625 m (2.05 Ft)
Area, A = 2.52 m x 0.625 m = 1.575 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 1.575 m^2 x 1 m/s x 3,600 Sec/Hour = 5,670 m^3/h
= 36.04 MGD

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Clear Width, W_C = 2.52 m (8.266 Ft)
Depth, T = 1.030 m (3.38 Ft)
Area, A = 2.52 m x 1.030 m = 2.596 m^2

Maximum Flow Through Screens @ 1.0 m/s Velocity -

Q = 2.596 m^2 x 1 m/s x 3,600 Sec/Hour = 9,346 m^3/h
= 59.40 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

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7. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

A. At Existing Dimensions -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 0.60 m (1.97 Ft)
Area, A = 1.20 m x 0.60 m = 0.720 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.720 m^2 x 1 m/s x 3,600 Sec/Hour = 2,592 m^3/h
= 16.47 MGD

16.47 MGD Is For 0.72 m (2.36 Ft) Length Only. Channel Will Surcharge At T > 0.60 m. Maximum Surcharge Is T = 0.75 m (2.46 Ft).

B. At Grating Replacement Of Existing Slab Over Channel -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 0.674 m (2.21 Ft)
Area, A = 1.20 m x 0.674 m = 0.809 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 0.809 m^2 x 1 m/s x 3,600 Sec/Hour = 2,912.4 m^3/h
= 18.51 MGD

18.51 MGD Is For 0.72 m (2.36 Ft) Length Only.

C. At Replacement Of Existing Slab Over Channel + 1'-4" Curb Covered By New Grating

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.079 m (3.54 Ft)
Area, A = 1.20 m x 1.079 m = 1.295 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.295 m^2 x 1 m/s x 3,600 Sec/Hour = 4,662 m^3/h
= 29.63 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

8. GRIT INFLUENT/GRIT BY-PASS PIPE CHANNEL

A. At Existing Dimensions -

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.174 m (3.85 Ft)
Area, A = 1.20 m x 1.174 m = 1.409 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 1.409 m^2 x 1 m/s x 3,600 Sec/Hour = 5,072.4 m^3/h
= 32.24 MGD

9. GRIT/GREASE UNIT

A. Grit Channel -

Width, W = 2.60 m (8.53 Ft)
Length, L = 35.70 m (117.10 Ft)
Area, A = 10.83 m^2 (116.53 SF)

Maximum Flow At Minimum Grit Channel Detention Time @ Q_{A-24} Of 10 Minutes -

$$Q = \frac{35.70\ m \times 10.83\ m^2}{0.167\ Hours} = 2{,}315\ m^3/h$$
= 14.72 MGD

Maximum Flow At Minimum Grit Channel Detention Time @ Q_{P-24} Of 3 Minutes -

$$Q = \frac{35.70\ m \times 10.83\ m^2}{0.050\ Hours} = 7{,}732.6\ m^3/h$$
= 49.15 MGD

B. Grease Channel

Width, W = 2.40 m (7.87 Ft)
Length, L = 35.70 m (117.10 Ft)
Area, A = 85.68 m^2

Maximum Flow At Maximum Q_{A-24} Hydraulic Surface Rate Of 20, $m^3/m^2/h$ -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - HEADWORKS UNITS

Q = 2.40 m x 35.70 m x 20 $m^3/m^3/h$ = 1,713.6 m^3/h
= 10.89 MGD

Beyond Hydraulic Surface Rate Of 20 $m^3/m^2/h$, Grease Flotation Efficiency Decreases. Maximum Grit Channel Flow Is Limiting Flows For Combined Grit/ Grease Unit.

10. EFFLUENT CHANNEL FROM GRIT/GREASE UNIT

Width, W = 2.60 m (8.58 Ft)
Depth, T = 1.151 m (3.78 Ft)
Area, A = 2.60 m x 1.151 m = 2.993 m^2

Maximum Channel Flow @ 1 m/s Velocity -

Q = 2.993 m^2 x 1 m/s x 3,600 Sec/Hour = 10,774.8 m^3/h
= 68.49 MGD

11. 30" DIAMETER BY-PASS PIPE AROUND GRIT/GREASE UNIT

30" Diameter Pipe @ 0.010 Slope

Capacity Flowing Full = 27.50 MGD w/No Surcharge

Pipe Will Surcharge Due To Physical Location, Hence Flow Will Be >27.50 MGD

12. 48" DIAMETER PIPE FROM GRIT/GREASE UNIT TO RAW SEWAGE SCREW PUMP STATION NO. 2

48" Diameter Pipe @ 0.0008 Slope

Capacity Flowing Full = 27.0 MGD w/No Surcharge

Pipe Can Surcharge Due To Influent Location, Hence Flow Can Be Greater Than 27.0 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF
COUNTER-CURRENT LOW LOAD AERATION UNITS
AND
DISINFECTION UNITS

1. RAW SEWAGE FLOW METERING (P.S. NO. 2 DISCHARGE)

   Two (2) Meters, One (1) To Each Train

   1-6" Throat, Each - Capacity Range 0.10 - 15.90 MGD

   Total Combined Flow Metering Capacity - 0.20 - 31.80 MGD

2. PRIMARY FLASH MIX UNITS

   Two (2) Units, One (1) To Each Train

   Length, L = 16'-0"
   Width, W = 16'-0"
   Water Depth, WD = 11.36 Ft.

   Volume, V = 16 Ft x 15 Ft x 11.36 Ft = 2,908.2 Cu. Ft.
   = 21,811 Gallons Each

   Maximum Flow Capacity At Minimum 2 Minute Detention -

   $$Q = \frac{21811 \text{ Gallons}}{2 \text{ Minutes}} = 10{,}906 \text{ GPM}$$
   = 15.704 MGD Each

   Maximum Combined Flow Capacity = 31.41 MGD

3. PRIMARY CLARIFIERS

   A. Flocculator Sections

   Two (2) Units, One (1) To Each Train

   Diameter, D = 45'-0" (13.72 m)
   Depth, T = 8'-4" (2.54 m)

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

Volume, V = 1,590.43 SF x 8.33 Ft = 13,248.3 Cu. Ft.
= 375.3 m^3
= 99,361 Gallons Each

Maximum Flow At 15 Minutes Minimum Detention (Q_{P-24}) -

$$Q = \frac{99361 \text{ Gallons}}{15 \text{ Minutes}}$$

= 6.224 GPM
= 9.539 MGD Each
= 19.078 MGD Total

Maximum Flow At 30 Minutes Minimum Detention (Q_{A-24}) -

$$Q = \frac{99361 \text{ Gallons}}{30 \text{ Minutes}}$$

= 3.312 GPM
= 4.769 MGD Each
= 9.538 MGD Total

B. Clarifier Sections

Two (2) Units, One (1) To Each Train

Diameter, D = 80'-0" (24.39 m)
Side Water Depth, SWD = 14'-0" (4.27 m)

Volume, V = 5,026.56 SF x 14 Ft = 70,371.8 Cu. Ft.
= 1,993.53 m^3
= 527,789 Gallons Each

Surface Area, A = 5,026.56 SF Each

Maximum Flow At Maximum Surface Settling Rate Of 1,000 GPD/SF (Q_{A-24}) -

Q = 5,026.56 SF x 1,000 GPD/SF = 5.027 MGD Each
= 10.054 MGD Total

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

4. AERATION REACTORS

Two (2) Units, One (1) Each Train

Diameter, D = 170'-0" (52.0 m) (Total Reactor Diameter)
Side Water Depth, SWD = 16'-5" (5.0 m)

Volume, V = 2,123.72 m^2 x 5 m = 10,618.6 m^3 Each
= 21,237.2 m^3 Total

Maximum Flow Capacity At Minimum Detention Time Of 16 Hours (Q_{A-24}) -

$$Q = \frac{21237.2\ m^3}{16\ Hours} = 1,327.3\ m^3/h$$
= 8.44 MGD

Aeration Detention Time Is Not A Critical Design Or Operational Criteria.

5. SECONDARY CLARIFIERS

Two (2) Units, One (1) At Each Train

Diameter, D = 141.04' (43.0 m)
Side Water Depth, SWD = 9.84' (3.0 m)

Volume, V = 1,452.20 m^2 x 3 m = 4,356.6 m^3 Each
= 8,713.2 m^3 Total

Surface Area, A = 1,452.20 m^2 Each
= 2,904.40 m^2 Total

Maximum Flow At Maximum Surface Settling Rate Of 1.00 $m^3/m^2/h$ At Q_{P-24} -

Q = 2,904.4 m^2 x 1.00 $m^3/m^2/h$
= 2,904.4 m^3/h
= 18.46 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

Maximum Flow At Maximum Surface Settling Rate Of 1.600 $m^3/m^2/h$ At $Q_{UP\ RATE}$ -

$Q = 2{,}904.4\ m^2 \times 1.600\ m^3/m^2/h$
$= 4{,}647\ m^3/h$
$= 29.54$ MGD

6. RETURN SLUDGE PUMPING

Six (6) Screw Pumps, Three (3) At Each Train

Pump Size - 700 mm (27") Diameter Each

Pump Capacity Range - 900 GPM @ 40° (56.8 l/s) To 1,560 GPM @ 30° Each (98.5 l/s)

RAS, Ratio, R_V = 0.714 @ Q_{P-24} Flow

Maximum Pumping Capacity @ 30° Angle -

w/6 Pumps = 6 x 98.5 l/s = 591 l/s (9,361 GPM) (13.48 MGD)

Q_{P-24} Flow @ 13.48 MGD and R_V = 0.714 -

$$\frac{13.48\ MGD}{0.714} = 18.88\ MGD$$

7. INTERNAL RECIRCULATION PUMPING

Six (6) Screw Pumps, Three (3) At Each Train

Pump Size - 900 mm (36") Diameter Each

Pump Capacity = 2,970 GPM (187.5 l/s) @ 30° Each
= 6 x 187.5 l/s = 1,125 l/s

Q_{A-24} @ RAS_{INT} = 1,125 l/s = 25.74 MGD and Efficiency = 0.800 -

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

$$\text{Efficiency} = \frac{RAS + RAS_{INT}}{Q + RAS + RAS_{INT}}$$

$$Q = \frac{RAS + RAS_{INT} - [0.80\ RAS + 0.80\ RAS_{INT}]}{0.80}$$

$$= \frac{13.48\ MGD + 25.74\ MGD - [10.78\ MGD - 20.59\ MGD}{0.80}$$

$$= 9.81\ MGD$$

8. DISINFECTION UNITS

Twelve (12) Channels

Width, W = 8 @ 10'-0", 4 @ 9'-0"
Length, L = 8 @ 31'-0", 4 @ 28'-0"
Side Water Depth, SWD = 8'-0"

Volume, V = 8(31' x 10' x 8') + 4(28' x 9' x 8')
= 19,840 Cu. Ft. + 8,064 Cu. Ft.
= 27,904 Cu. Ft.
= 209,280 Gallons

Volume, V, Downstream Piping and Structures

48" D. Pipe	41,467 Gallons
30" D. Pipe	10,303 Gallons
Existing Backwash Storage	48,306 Gallons
	100,076 Gallons

Maximum Flow At Minimum Detention Time Of 15 Minutes (Q_{P-24}) -

$$Q = \frac{309356\ Gallons}{15\ Minutes} = 20,624\ GPM$$
$$= 29.70\ MGD$$

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
LIMITING HYDRAULIC UNIT CAPACITIES
EXISTING AWTF - COUNTER-CURRENT LOW
LOAD AERATION UNITS AND DISINFECTION UNITS

9. 48" EFFLUENT PIPE

48" Diameter Pipe, 0.0126 Slope
Capacity Flowing Full - >90 MGD

10. EFFLUENT METERING FLUME

One (1) Meter
3'-0" Throat - Capacity Range 0.39 - 32.57 MGD

11. 30" EFFLUENT PIPE

30" Diameter Pipe, 0.0392 Slope
Capacity Flowing Full - 51.7 MGD

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

COMPONENT CALCULATIONS

EXISTING AWTF

AT

8.25 MGD

I. RAW SEWAGE FLOW METERING

A. Re-Rated Q_{UP} Rate of Flow - 4,248 m^3/h (27.0 MGD)

B. Total Metering Capacity - 0.17 MGD - 26.31 MGD

C. No Modifications Required At Q_{A-24} = 8.25 MGD

II. RAW SEWAGE SCREW PUMP STATION NO. 1

A. Existing - Three (3) 42" Diameter Enclosed Screw Pumps and Two (2) 36" Diameter Enclosed Screw Pumps

B. Existing Maximum Capacity - 20.09 MGD

C. Station Modification - Increase Maximum Capacity To 27.0 MGD

III. INFLUENT CHANNEL TO MECHANICAL SCREENS

A. Remove Existing Slab Over Channel And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Width, W = 1.83 m (6.00 Ft)

Depth, T = 1.030 m (3.38 Ft)

Depth of Flow @ 27.0 MGD -

$$\text{Area, A} = \frac{Q}{V} = \frac{4248\ m^3/h}{1.0\ m/Sec \times 3600\ Sec/Hr}$$

$$= 1.18\ m^2$$

Depth Of Flow = $\frac{1.18\ m^2}{1.83\ m\ Width}$ = 0.644 m

Freeboard = 1.030 m - 0.644 m = 0.386 m (15.20 Inches)

IV. MECHANICAL SCREENS

A. Remove Existing Slabs Over Channels And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Clear Width, Net After Deduction For Bar Widths = 2.52 m (8.266 Ft)

Depth, T = 1.030 m

Depth of Flow @ 27.0 MGD

Area, A = 1.18 m^2

Depth Of Flow = $\frac{1.18\ m^2}{2.52\ m\ Width\ Clear}$ = 0.468 m

Freeboard = 1.030m - 0.468 m = 0.562 m (22.13 Inches)

V. EXIT CHANNEL FROM MECHANICAL SCREENS (INFLUENT CHANNEL TO GRIT/GREASE UNIT)

A. Remove Existing Slab Over Channel And Add 1'-4" High Curbing, All Covered With New Grating.

B. Freeboard Provided At 27.0 MGD

Width, W = 1.20 m (3.94 Ft)
Depth, T = 1.079 m (3.54 Ft)

Depth of Flow @ 27.0 MGD -

Area, A = 1.18 m^2

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

Depth Of Flow = $\frac{1.18\ m^2}{1.20\ m\ Width}$ = 0.983 m

Freeboard = 1.079 m - 0.983 m = 0.096 m (3.78 Inches)

VI. GRIT INFLUENT/GRIT BY-PASS CHANNEL

A. Existing Capacity = 32.24 MGD

B. No Modifications Required At Q_{UP} = 27.0 MGD

VII. GRIT/GREASE UNIT

A. Grit Channel

1. Dimensions -

Width, W	=	2.60 m (8.53 Ft)
Length, L	=	35.70 m (117.10 Ft)
X-Sectional Area, A	=	10.83 m^2 (116.53 SF)

2. Detention At Q_{A-24} = 1,298 m^3/h -

$\frac{10.83\ m^2 \times 35.70\ m}{1298\ m^3/h}$ = 0.290 Hours (17.4 Minutes)

[Minimum Detention Required At Q_{A-24} = 10 Minutes]

3. Detention At Q_{P-24} = 2,832 m^3/h -

$\frac{386.63\ m^3}{2832\ m^3/h}$ = 0.137 Hours (8.2 Minutes)

[Minimum Detention Required At Q_{P-24} = 3 Minutes]

4. No Modification Required.

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

B. Grease Channel

1. Dimensions -

Width, W	=	2.40 m (7.87 Ft)
Length, L	=	35.70 m (117.10 Ft)
Surface Area, A	=	85.68 m^2

2. Hydraulic Surface Rate At Q_{A-24} = 1,298 m^3/h

$$HSR = \frac{1298\ m^3/h}{85.68\ m^2} = 15.15\ m^3/m^2/h$$

[Maximum Allowable At Q_{A-24} = 20 $m^3/m^2/h$]

3. No Modification Required.

VIII. EFFLUENT CHANNEL FROM GRIT/GREASE UNIT

A. Existing Capacity = 68.49 MGD

B. No Modification Required At Q_{UP} = 27.0 MGD

IX. 30" DIAMETER BY-PASS PIPE AROUND GRIT/GREASE UNIT

A. Existing Capacity Flowing Full w/No Surcharge = 27.50 MGD

B. No Modification Required At QUP = 27.0 MGD
With Gate To Grit Unit Closed, Flow Will Be Greater Than 27.50 MGD.

X. 48" DIAMETER PIPE FROM GRIT/GREASE UNIT TO RAW SEWAGE SCREW PUMP STATION NO. 2

A. Existing Capacity Flowing Full w/No Surcharge = 27.0 MGD

B. No Modification Required At Q_{UP} = 27.0 MGD.

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XI. RAW SEWAGE SCREW PUMP STATION NO. 2

A. Existing - Five (5) 42" Diameter Enclosed Screw Pumps

B. Existing Maximum Capacity = 24.4 MGD

C. Station Modification - Increase Maximum Capacity To 27.0 MGD

XII. SCREW PUMP STATION NO. 2 DISCHARGE METERING

A. Existing - Two (2) 1'-6" Throat Flumes, One (1) To Each Primary Train

B. Existing Capacity -

0.10 - 15.90 MGD Each

0.20 - 31.80 MGD Total

C. No Modification Required At Q_{UP} = 27.0 MGD

XIII. PRIMARY FLASH MIX UNITS

A. Existing - Two (2) Units, One (1) To Each Primary Train

B. Existing Capacity And Detention At Q_{UP} = 27.0 MGD -

$$\frac{2 \times 21811 \text{ Gallons}}{27.0 \text{ MGD}} = 0.0016 \text{ Days} \quad (2.33 \text{ Minutes})$$

C. Detention At $Q_{P\text{-}24}$ = 18.00 MGD -

$$\frac{43622 \text{ Gallons}}{18.0 \text{ MGD}} = 0.024 \text{ Days} \quad (3.49 \text{ Minutes})$$

D. Detention At $Q_{A\text{-}24}$ = 8.25 MGD -

$$\frac{43622 \text{ Gallons}}{8.25 \text{ MGD}} = 0.0052 \text{ Days} \quad (7.6 \text{ Minutes})$$

E. No Modification Required At $Q_{A\text{-}24}$ = 8.25 MGD and Q_{UP} = 27.0 MGD.

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XIV. PRIMARY CLARIFIER/FLOCCULATORS

A. Existing - Two (2) Units

B. Flocculation Sections -

1. Existing Capacity = 99,361 Gallons, Each
= 198,722 Gallons Total

2. Detention At Q_{P-24} = 18.0 MGD -

$$\frac{198722 \text{ Gallons}}{18.0 \text{ MGD}} = 0.011 \text{ Days} \quad (15.90 \text{ Minutes})$$

3. No Modification Required At Q_{P-24} = 18.0 MGD.

C. Clarifier Sections -

1. Existing Capacity = 527,789 Gallons Each w/o Center Core
= 1,055,578 Gallons Total

2. Existing Surface Area = 5,026.56 SF Each
= 10,053 SF Total

3. Detention At Q_{A-24} = 8.25 MGD -

$$\frac{1055578 \text{ Gallons}}{8.25 \text{ MGD}} = 0.128 \text{ Days} = 3.07 \text{ Hours}$$

4. Detention At Q_{P-24} = 18.0 MGD -

$$\frac{1055578 \text{ Gallons}}{18.0 \text{ MGD}} = 0.059 \text{ Days} = 1.41 \text{ Hours}$$

5. Surface Settling Rate At Q_{A-24} = 8.25 MGD -

$$\frac{8.25 \text{ MGD}}{10053 \text{ SF}} = 821 \text{ GPD/SF}$$

6. Surface Settling Rate At Q_{P-24} = 18.0 MGD -

$$\frac{18.0 \text{ MGD}}{10053 \text{ SF}} = 1{,}791 \text{ GPD/SF}$$

7. No Modification Required At Q_{A-24} = 8.25 MGD And Q_{P-24} = 18.0 MGD. Assumed BOD_5 Primary Efficiency At 35% (Current 49.6%) And TSS Primary Efficiency At 55% (Current 71.6%).

XV. AERATION REACTORS

A. Existing - Two (2) GR-D Reactors, Each 52 m Diameter (170.56 Ft) x 5 m (16.4 Ft) SWD And 25 m Diameter (82.0 Ft) x 5 m (16.4 Ft) SWD

B. Existing Volume = 21,237.2 m^3 Total (749,673 Cu. Ft.) (5,622,549 Gallons)

C. Reactor MLSS @ 4,000 mg/l MLSS -

21,232 m^3 x 4.0 kg/m^3 = 84,928 kg MLSS

D. Food To Mass Ratio @ 4,000 mg/l MLSS -

$$\frac{4879 \text{ kg } BOD_5}{84928 \text{ kg MLSS}} = 0.0579 \text{ kg } BOD_5/\text{kg MLSS}$$

(Normal Low Load Aeration F/M = 0.050 - 0.075 kg BOD_5/kg MLSS)

E. Denitrification -

1. N Loading To Denitrification Zone (Anoxic Zone) -

(0.75 NH_3-N Concentration @ 21.0 mg/l) + (90% N_{ORG} Concentration @ 13.0 mg/l) + (NO_2-NO_3-N Influent Concentration @ 4.8 mg/l) - (Effluent NO_3 Concentration @ 5 mg/l) = 32.25 mg/l NO_3-N Including 25% NH_3-N Synthesis In Sludge

32.25 mg/l NO_3-N x 1,000 l/m^3 x 1,298 m^3/h = 41,860,500 mg NO_3-N/Hr

2. Total MLVSS -

$$\frac{5000 \text{ mg/l [DN Zone]} \times 0.70 \text{ Volatile} \times 1000 \text{ l/m}^3 \times 4909 \text{ m}^3}{1000 \text{ mg/g}}$$

= 17,181,500 g MLVSS

3. Maximum Denitrification At Maximum DN Conversion Rate Of

$$\frac{1.875 \text{ mg } NO_3\text{-N}}{\text{g MLVSS-Hr}}$$

$$\frac{41860500 \text{ mg } NO_3\text{-N}}{17181500 \text{ g MLVSS-Hr}} = \frac{2.436 \text{ mg } NO_3\text{-N}}{\text{g MLVSSS-Hr}}$$

$$\frac{1.875}{2.436} \times 100 = 76.97\%$$

4. Anticipated DN Efficiency w/o O_2 Minimizers = ±75.0%

5. Anticipated DN Efficiency w/O_2 Minimizers = ±85.0%

F. Nitrification -

1. Current Plant BOD_5 Efficiency (Secondary Treatment Only) -

$$\frac{121.0 \text{ mg/l} - 6.0 \text{ mg/l}}{122.0 \text{ mg/l}} = 0.9504$$

2. SRT At 8.25 MGD $Q_{A\text{-}24}$ -

$$\frac{84928 \text{ kg MLSS}}{0.9504 \times 4879 \text{ kg/D Input } BOD_5} = 18.32 \text{ Days}$$

3. Total mg NH_3-N -

(0.75 NH_3-N Concentration @ 21.0 mg/l) + (90% N_{ORG} Concentration @ 13.0 mg/l) = 27.45 mg/l NH_3-N

27.45 mg/l NH_3-N x 1,000 l/m^3 x 1,298 m^3/h = 35,630,100 mg NH_3-N/Hr

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AT 8.25 MGD

4. Total MLVSS -

$$\frac{4000 \text{ mg/l} \times 0.70 \text{ Volatile} \times 1000 \text{ l/m}^3 \times 21232 \text{ m}^3}{1000 \text{ mg/g}}$$

= 59,449,600 g MLVSS

5. Minimum Nitrification Conversion Rate Required -

$$\frac{35630100 \text{ mg } NH_3\text{-N}}{59449600 \text{ g MLVSS-Hr}} = \frac{0.599 \text{ mg } NH_3\text{-N}}{\text{g MLVSSS-Hr}}$$

6. Nitrification Conversion Rates Available -

@ 7.5° C $\quad \frac{1.100 \text{ mg } NH_3\text{-N}}{\text{g MLVSS-Hr}}$

@ 15° C $\quad \frac{1.600 \text{ mg } NH_3\text{-N}}{\text{g MLVSS-Hr}}$

G Reactor Detention Times -

@ $Q_{A\text{-}24}$ = 1,298 m^3/h -

$$\frac{21232 \text{ m}^3}{1298 \text{ m}^3/\text{h}} = 16.35 \text{ Hours}$$

@ $Q_{P\text{-}24}$ = 2,832 m^3/h -

$$\frac{21232 \text{ m}^3}{2832 \text{ m}^3/\text{h}} = 7.50 \text{ Hours}$$

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{21232 \text{ m}^3}{4248 \text{ m}^3/\text{h}} = 5.02 \text{ Hours}$$

H. No Modification Required To Aeration Reactors At $Q_{A\text{-}24}$ = 8.25 MGD.

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XVI. SECONDARY CLARIFIERS

A. Existing - Two (2) Clarifiers, Each 43.0 m Diameter (141.04 Ft) x 3.0 m SWD (9.84 Ft)

B. Capacity And Surface Area -

Capacity = 8,713.2 m^3 Total (2,306,820 Gallons)

Surface Area = 2,904.40 m^2 Total (31,635 Sq. Ft.)

C. Detentions -

@ Q_{A-24} = 1,298 m^3/h -

$$\frac{8713.2\ m^3}{1298\ m^3/h} = 6.71 \text{ Hours}$$

@ Q_{P-24} = 2,832 m^3/h -

$$\frac{8713.2\ m^3}{2832\ m^3/h} = 3.08 \text{ Hours}$$

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{8713.2\ m^3}{4248\ m^3/h} = 2.05 \text{ Hours}$$

D. Surface Settling Rates -

@ Q_{A-24} = 1,298 m^3/h -

$$\frac{1298\ m^3/h}{2904.4\ m^2} = 0.447\ m^3/m^2/h \quad (264 \text{ GPD/SF})$$

@ Q_{P-24} = 2,832 m^3/h -

$$\frac{2832\ m^3/h}{2904.4\ m^2} = 0.975\ m^3/m^2/h \quad (576 \text{ GPD/SF})$$

[Maximum Allowable = 1.000 $m^3/m^2/h$ (591 GPD/SF)]

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COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

@ Q_{UP} Rate = 4,248 m^3/h -

$$\frac{4248\ m^3/h}{2904.4\ m^2} = 1.463\ m^3/m^2/h \quad (864\ GPD/SF)$$

[Maximum Allowable = 1.600 $m^3/m^2/h$ (945 GPD/SF)]

E. MLSS Floor Loading -

$$\frac{21232\ m^3 \times 4\ kg/m^3}{2904.4\ m^2} = 29.24\ kg/m^2$$

$$= 5.98\ Lb/SF$$

F. No Modification Required To Secondary Clarifiers At Q_{A-24} = 8.25 MGD.

XVII. RETURN SLUDGE PUMPING

A. Existing - Six (6) Tube Mounted Adjustable Inclination Screw Pumps, Three (3) At Each Reactor. Each 700 mm (27" Diameter), Adjustable 30° To 40°.

B. Existing Capacity -

56.8 l/s	To	98.5 l/s Each
(900 GPM	To	1,560 GPM Each)
(204.5 m^3/h	To	295.5 m^3/h Each)

C. RAS, Ratio, R_v = $\frac{TS_R[\text{MLSS In Reactor}]}{TS_{RS}[\text{MLSS In RAS}] - TS_R}$

$$= \frac{4000\ mg/l}{12000\ mg/l - 4000\ mg/l} = 0.50$$

D. RAS Required At Q_{16} Peak Sanitary Flows = 1,947 m^3/h (12.38 MGD)

1,947 m^3/h x 0.50 = 974 m^3/h

@ Q_{A-24} -

$$\frac{974\ m^3/h}{1298\ m^3/h} = 0.750{:}1 \text{ Recirculation}$$

@ Q_{P-24} -

$$\frac{0.50 \times 2832\ m^3/h}{2832\ m^3/h} = 0.500{:}1 \text{ Recirculation}$$

E. RAS Pumping Capacity Range Required @ 4,000 mg/l MLSS And 12,000 mg/l RAS-TSS (SVI = 100 mg/l) -

974 m^3/h To 1,432 m^3/h

F. Capacities Available, Each Range -

@ 30°	-	295.5 m^3/h
@ 31°	-	286.4 m^3/h
@ 32°	-	277.3 m^3/h
@ 33°	-	268.2 m^3/h
@ 34°	-	259.1 m^3/h
@ 35°	-	250.0 m^3/h
@ 36°	-	240.9 m^3/h
@ 37°	-	231.8 m^3/h
@ 38°	-	222.7 m^3/h
@ 39°	-	213.6 m^3/h
@ 40°	-	204.5 m^3/h

G. Capacities Provided With Existing Pumps -

4 Pumps @ 35°	=	1,000 m^3/h
4 Pumps @ 30°	=	1,182 m^3/h
6 Pumps @ 36°	=	1,445 m^3/h

H. At 5,000 mg/l Maximum Reactor MLSS And Operating SVI = 75 ml/l -

1. RAS, Ratio, R_V = $\frac{5000\ mg/l}{16000\ mg/l - 5000\ mg/l}$ = 0.455

2. RAS Required At Q_{16} Peak Sanitary Flow = 1,947 m^3/h (12.38 MGD)

1,947 m^3/h x 0.455 = 886 m^3/h

@ Q_{P-24} -

0.455 x 2,832 m^3/h = 1,289 m^3/h

I. RAS Pumping Capacity Range Required @ 5,000 mg/l MLSS Maximum And 16,000 mg/l RAS-TSS (SVI = 75 ml/l) -

886 m^3/h To 1,289 m^3/h

J. Capacities Provided With Existing Pumps -

4 Pumps @ 38° = 891 m^3/h

4 Pumps @ 30° = 1,182 m^3/h

6 Pumps @ 38° = 1,336 m^3/h

K. Modifications Required - Provide One (1) Unmounted 700 mm Diameter Tube Mounted Screw Pump For Standby. Installation Time ±4 Hours.

XVIII. INTERNAL RECIRCULATION PUMPING

A. Existing - Six (6) Tube Mounted Adjustable Inclination Screw Pumps, Three (3) At Each Reactor. Each 900 mm (36") Diameter. Adjustable 25° To 40°.

B. Existing Capacity -

110.5 l/s	To	187.5 l/s Each
(1,750 GPM	To	2,970 GPM Each)
(398 m^3/h	To	675 m^3/h Each)

C. Pumping Capacity Required @ Q_{A-24} = 8.25 MGD And DN Efficiency Of ±82.5%

$$RAS_{INT} = \frac{[Efficiency \times Q] + [Efficiency \times RAS] - RAS}{0.175}$$

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AT 8.25 MGD

$$= \frac{[0.825 \times 1298\ m^3/h] + [0.825 \times 974\ m^3/h] - 974\ m^3/h}{0.175}$$

$$= 5{,}145\ m^3/h \quad (34.96\ MGD)$$

D. Capacities Available, Each Pump -

@ 25°	-	675.0 m^3/h
@ 26°	-	656.5 m^3/h
@ 27°	-	638.0 m^3/h
@ 28°	-	619.5 m^3/h
@ 29°	-	601.0 m^3/h
@ 30°	-	582.5 m^3/h
@ 31°	-	564.0 m^3/h
@ 32°	-	545.5 m^3/h
@ 33°	-	527.0 m^3/h
@ 34°	-	508.5 m^3/h
@ 35°	-	490.0 m^3/h
@ 36°	-	471.5 m^3/h
@ 37°	-	453.0 m^3/h
@ 38°	-	434.5 m^3/h
@ 39°	-	416.0 m^3/h
@ 40°	-	398.0 m^3/h

E. Capacities Provided With Existing Pumps -

6 Pumps @ 25° = 4,050 m^3/h

F. Maximum Theoretical DN Efficiency w/o O_2 Minimizers -

$$\text{Efficiency} = \frac{RAS + RAS_{INT}}{Q + RAS + RAS_{INT}}$$

$$= \frac{974\ m^3/h + 4050\ m^3/h}{1278\ m^3/h + 974\ m^3/h + 4050\ m^3/h}$$

$$= 0.797$$

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AT 8.25 MGD

G. Maximum Theoretical DN Efficiency w/O_2 Minimizers -

0.797 + 0.075 = 0.872

H. Theoretical Effluent NO_3-N -

31.25 mg/l NO_3-N x 0.872 = 27.25 mg/l Removed

Effluent NO_3-N = 4.0 mg/l NO_3-N

I. No Modification Required At Q_{A-24} = 8.25 MGD In Internal Recirculation Pumping

XIX. AERATION BLOWERS

A. Existing - Six (6) Rotary Lobe Positive Displacement 2-Speed Blowers, Three (3) At Each Aeration Reactor. Each GMb/GLb 14.9 @ 600 m Bar Pressure (8.70 psi)

B. Existing Blower Capacity, At Each Reactor -

1. Blower #1 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 21.1 m^3 Air/Min (744 CFM) At Low Speed

   Blower #2 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 21.1 m^3 Air/Min (744 CFM) At Low Speed

   Blower #3 - 34.3 m^3 Air/Min (1,212 CFM) At High Speed
   - 14.4 m^3 Air/Min (510 CFM) At Low Speed

2. Blower Combinations, At Each Reactor -

   a. Minimum Blower Operations -

   (1) Blower #3 @ Low Speed - 14.4 m^3 Air/Min - 510 CFM

   (2) Blower #2 (Or #1) @ Low Speed - 21.1 m^3 Air/Min - 744 CFM

   b. Intermediate Blower Operations -

   (1) Blower #1 @ High Speed - 34.3 m^3 Air/Min - 1,212 CFM

(2) Blower #3 @ Low Speed + Blower #2 (Or #1) @ Low Speed - 35.5 m^3 Air/Min - 1,254 CFM

(3) Blower #1 + Blower #2 @ Low Speeds - 42.2 m^3 Air/Min - 1,488 CFM

(4) Blower #3 @ Low Speed + Blower #2 (Or #1) @ High Speed - 49.7 m^3 Air/Min - 1,754 CFM

(5) Blower #2 (Or #1) @ Low Speed + Blower #1 (Or #3) @ High Speed - 55.4 m^3 Air/Min - 1,956 CFM

(6) Blowers #3, #2 and #1 @ Low Speeds - 56.6 m^3 Air/Min - 1,998 CFM

c. Normal Blower Operation @ 8.25 MGD Loading -

(1) Blower #2 And Blower #1 (Or #3) @ High Speeds - 68.7 m^3 Air/Min - 2,424 CFM

d. Maximum Blower Operations -

(1) Blower #2 And Blower #1 @ High Speed + Blower #3 @ Low Speed - 83.1 m^3 Air/Min - 2,934 CFM

(2) Blower #2 (Or #1) And Blower #3 @ High Speed + Blower #1 (Or #2) @ Low Speed - 89.7 m^3 Air/Min - 3,168 CFM

(3) Blowers #3, #2 and #1 @ High Speeds - 103.0 m^3 Air/Min - 3,636 CFM

3. Diffuser Throughput Rates -

a. Maximum Diffuser Taps - 960 Diffusers @ Each Aeration Reactor

b. Length Of Each Diffuser - 2.5 Ft.

c. Maximum Length Of Installed Diffusers - 2,400 L.F. @ Each Aeration Reactor

d. Throughput Rates -

@ 510 CFM	-	0.212 CFM/Ft.
@ 744 CFM	-	0.310 CFM/Ft.
@ 1,212 CFM	-	0.505 CFM/Ft.
@ 1,254 CFM	-	0.522 CFM/Ft.
@ 1,488 CFM	-	0.620 CFM/Ft.
@ 1,754 CFM	-	0.731 CFM/Ft.
@ 1,956 CFM	-	0.815 CFM/Ft.
@ 1,998 CFM	-	0.832 CFM/Ft.
@ 2,424 CFM	-	1.010 CFM/Ft.
@ 2,934 CFM	-	1.222 CFM/Ft.
@ 3,168 CFM	-	1.320 CFM/Ft.
@ 3,636 CFM	-	1.515 CFM/Ft.

e. Recommended Throughput Rates -

Minimum Recommended	-	0.540 CFM/Ft.
Optimum	-	1.080 to 1.610 CFM/Ft.
Maximum Continuous Operation	-	1.790 CFM/Ft.
Maximum 2 Hour Throughput Rate	-	2.690 CFM/Ft.
Ultimate Maximum 5 Minute Throughput Rate	-	3.590 CFM/Ft.

C. Aeration Capacity Required -

1. O_2 Required, Gross -

1.6 kg O_2/kg BOD_5 x 4,879 kg BOD_5	=	7,806 kg O_2
4.6 kg O_2/kg NH_3-N x 1,022 kg NH_3-N*	=	4,703 kg O_2
Total O_2	=	12,509 kg O_2

*NH_3-N + 0.90 N_{ORG}

2. O_2 Required, Net -

a. Oxygen Credit For Nitrification Synthesis -

25% of NH_3-N Will Synthesize (Be Taken Up) In Sludge Without O_2 Requirement

b. Oxygen Credit For Denitrification -

There Will Be An O_2 Recovery As A Result Of The Denitrification Activity, Through The Breakdown Of NO_3-N to NO_2 and O_2. The O_2 Recovery As A Result Of DN May Be Expressed As

$$1\ g\ NH_4^+\text{-}N + 4.57\ g\ O_2 \xrightarrow{[N]} 1\ g\ NO_3\text{-}N$$

$$1\ g\ NH_4^+\text{-}N \xrightarrow{[N]} 1\ g\ N_2\text{-}N + 2.86\ g\ O_2$$

$$O2\ Recovery = \frac{2.86\ g\ O_2\ Recoverd}{4.57\ g\ O_2\ Utilized} \times 100 = 62.6\%$$

Use 60.0%

c. Net O_2 Required For Nitrification -

4,703 kg O_2/D x 0.75 x 0.60 x 0.872 Efficiency
= 1,845 kg O_2 Credit

d. Net Oxygen Required For Oxidation, Stabilization And Nitrification -

(4,703 kg O_2 - 1,845 kg O_2) + 7,806 kg O_2 = 10,664 kg O_2

D. Air Requirements -

1. O_2 Required -

10,664 kg O_2/Day = 444.3 kg O_2/Hour

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

2. Q_{AIR} -

$$\frac{\text{kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times \text{Transfer/meter} \times \text{Meter Immersion Depth}}$$

3. O_2 Transfer/Meter -

O_2 Transfer Per European Clean Water Transfer Tests @ 5.0 m SWD = 5.85%/m Diffuser Immersion Depth.

Assume $\alpha = 0.80$. α is Rate Of Transfer Of O_2 In Wastewater To O_2 Transfer In Clean Water.

O_2 Transfer/Meter In Wastewater -

0.80 x 5.85%/meter = 4.68%/meter

4. Q_{AIR} Required, Net Including Synthesis And DN Credit -

$$Q_{AIR} = \frac{444.3 \text{ kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/m \times 4.8 \text{ m}}$$

= 7,064 m^3 Air/Hour

= 117.7 m^3 Air/Minute (4,156 CFM) Total

= 58.85 m^3 Air/Minute (2,078 CFM) Each Reactor

5. Q_{AIR} Required, Gross w/o Synthesis And DN Credit -

$$Q_{AIR} = \frac{521.2 \text{ kg } O_2/\text{Hour}}{0.280 \text{ kg } O_2/m^3 \text{ Air} \times 0.0468/m \times 4.8 \text{ m}}$$

= 8,286 m^3 Air/Hour

= 138.1 m^3 Air/Minute (4,875 CFM) Total

= 69.05 m^3 Air/Minute (2,437 CFM) Each Reactor

6. Required Air Vs. Air Capacity -

Q_{AIR} Gross = 69.0 m^3 Air/Min (2,437 CFM) Each Reactor

Q_{AIR} Net = 58.8 m^3 Air/Min (2,078 CFM) Each Reactor

Air Capacity = 68.7 m^3 Air/Min (2,424 CFM) Each Reactor @ Normal Blower Operation (2 Blowers @ High Speed Each Reactor, 1 Blower Standby)

Diffuser Throughput Rate @ 68.7 m3 Air/Min (2,424 CFM) =

1.010 CFM/Ft.

Air Capacity Factor-Of-Safety At Net Requirements = 16.8%

E. Modifications Required @ 8.25 MGD Loading. No Blower Modifications Required. Original Number Of Diffusers Installed At 800 Must Be Increased To 960 Diffusers.

XX. WASTE SLUDGE THICKENING PITS

A. Existing - Two (2) Thickening Pits, One (1) At Each Reactor.

B. Existing Capacity -

25.0 Ft x 11.08 Ft x 13.04 Ft SWD = 3,613 CF Each
= 27,098 Gallons Each
= 54,196 Gallons Total

C. Waste Sludge Weight @ 8.25 MGD -

@ F/M = 0.0579 kg BOD_5/kg MLSS = 0.490 kg WS/kg BOD_5
@ 10°-12° C, With Nitrification And Chemical Sludge

0.490 kg WS/kg BOD_5 x 4,879 kg BOD_5/D = 2,391 kg WS/D

D. Waste Sludge Volume @ 8.25 MGD -

1. To Thickening Pits -

@ SVI = 75 ml/l, Maximum MLSS in WS = 16 g/l

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

Assume MLSS in WS @ 90% = 14.4 g/l

$$\text{Volume WS} = \frac{\text{kg WS/D}}{\text{1000 kg WS/m}^3 \times \text{MLSS in RAS As Decimal}}$$

$$= \frac{\text{2391 kg WS/D}}{\text{1000 kg WS/m}^3 \times 0.0144}$$

$$= 166.0 \text{ m}^3\text{/D}$$

$$= 43{,}960 \text{ Gallons/D}$$

2. From Thickening Pits, @ 2.5% Solids -

$$\text{Volume WS} = \frac{\text{2391 kg WS/D}}{\text{1000 kg WS/m}^3 \times 0.025}$$

$$= 95.6 \text{ m}^3\text{/D}$$

$$= 25{,}321 \text{ Gallons/D}$$

3. Average In Thickening Pits -

$$\frac{\text{43960 Gallons/D} + \text{25231 Gallons/D}}{2} = 34{,}640 \text{ Gallons/Day}$$

E. Waste Sludge Detention Available In Thickening Pits -

$$\frac{\text{54196 Gallons Capacity}}{\text{34640 Gallons/Day Waste Sludge}} = 1.56 \text{ Days}$$

F. No Modifications Required In Thickening Pits At 8.25 MGD.

XXI. DISINFECTION

A. Existing - Chlorine Contact Tanks, Duplicate Units, Six Channels Per Tank

B. Existing Capacity - 209,280 Gallons Total

C. Detention Provided At QP-24 = 18.0 MGD -

$$\frac{\text{209280 Gallons}}{\text{18.0 MGD}} = 0.0163 \text{ Days}$$

$$= 16.74 \text{ Minutes}$$

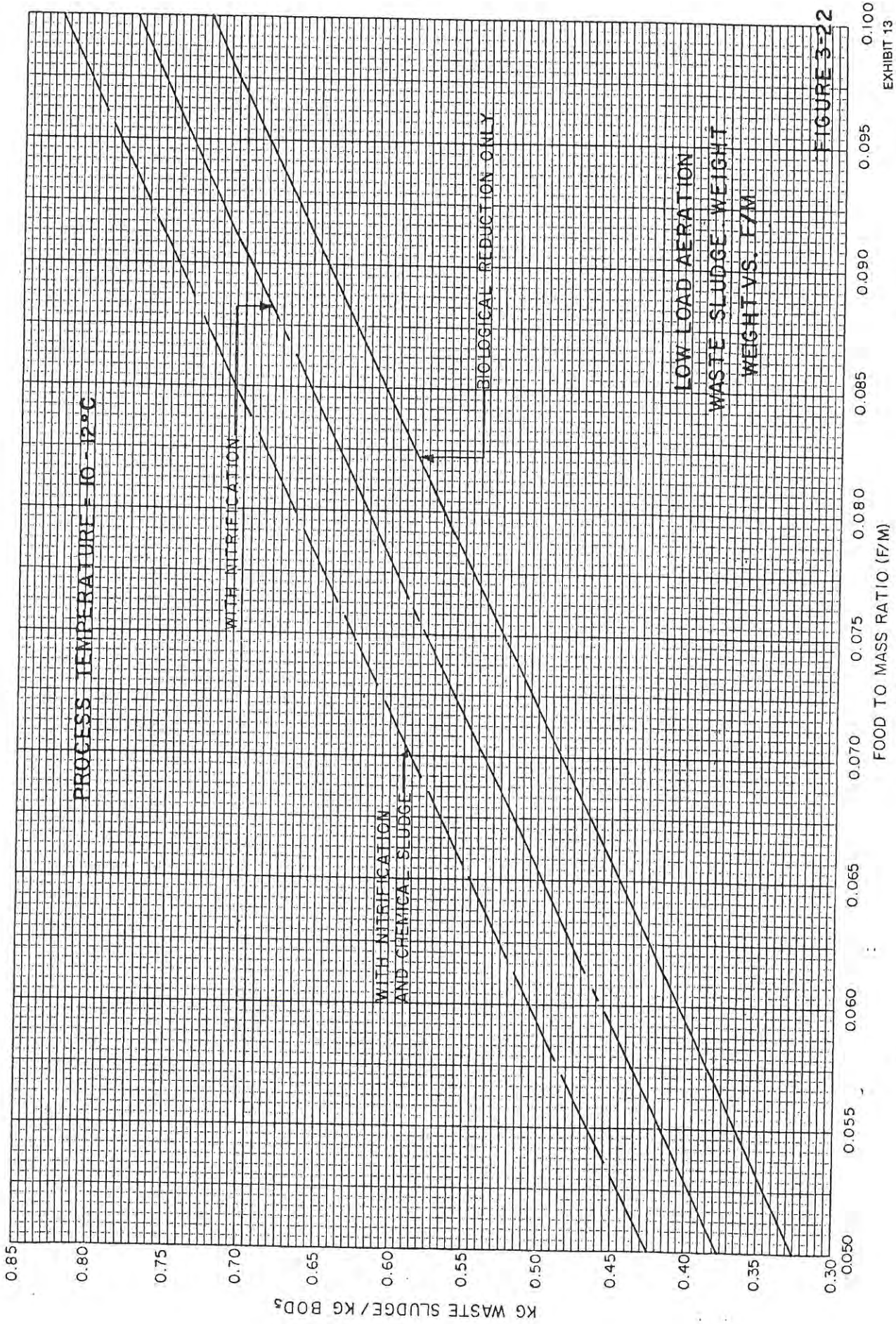

FIGURE 3-22

EXHIBIT 13
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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

D. Additional Detention Available In 48" Diameter And 30" Diameter Effluent Pipes, And In Existing Backwash Storage Tanks -

1. 48" Diameter Pipe, 440 LF -

12.566 SF x 440 Ft = 5,229 Cu. Ft.
= 41,467 Gallons

2. 30" Diameter Pipe, 280 LF -

4.906 SF x 280 Ft = 1,374 Cu. Ft.
= 10,303 Gallons

3. Existing Backwash Storage Tanks -

@ 28' Diameter x 5.23 SWD Each

615.752 SF x 5.23 Ft x 2 = 6,441 Cu. Ft.
= 48,306 Gallons

E. Total Chlorine Contact Detention Capacity Available -

209,280 Gallons + 41,467 Gallons + 10,303 Gallons + 48,306 Gallons
= 309,356 Gallons

F. Total Chlorine Contact Detentions Available -

1. @ Q_{P-24} = 18.0 MGD -

$$\frac{309356 \text{ Gallons}}{18.0 \text{ MGD}} = 0.0172 \text{ Days} = 24.7 \text{ Minutes}$$

2. @ QUP Rate = 27.0 MGD -

$$\frac{309356 \text{ Gallons}}{27.0 \text{ MGD}} = 0.0146 \text{ Days} = 16.49 \text{ Minutes}$$

G. No Modifications Required In Chlorine Contact Capacity At 8.25 MGD.

TRACY ENGINEERS, INC.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY
COMPONENT CALCULATIONS - EXISTING AWTF
AT 8.25 MGD

XXII. SLUDGE STORAGE SILO

A. Existing - One (1) Non-Mechanical Silo - 52 Ft. Diameter x 41 Ft. SWD With 14.25 Ft Cone Bottom

B. Existing Capacity -

$$(2{,}123.72 \text{ SF} \times 41 \text{ Ft}) + 0.33\left(\frac{3.1416 \times 52 \text{ Ft}^2 \times 14.25 \text{ Ft}}{4}\right)$$

$$= 87{,}073 \text{ Cu. Ft.} + 7{,}877 \text{ Cu. Ft.} = 94{,}960 \text{ Cu. Ft.}$$

$$= 712{,}200 \text{ Gallons}$$

C. Waste Sludge/Day From Thickening Pits = 25,321 Gallons/Day

D. Detention Available -

$$\frac{712200 \text{ Gallons}}{25321 \text{ GPD}} = 28.1 \text{ Days}$$

E. No Modifications Required To Sludge Storage Silo At 8.25 MGD.

XXIII. SLUDGE DEWATERING

A. Existing - Two (2) 1,000 Lb/Hour Centrifuges
One (1) 3,000 Lb/Hour Centrifuge Under Construction

B. Capacity Provided -

5,000 Lb/Hour = 2.5 Tons/Hour

C. Maximum Daily Capacity, All Three (3) Centrifuges -

2.5 Tons/H x 24 Hours/Day = 60 Tons/Day

D. Sludge Produced From Silo @ 8.25 MGD Loading -

2,391 kg/D = 5,260 Lb/Day = 2.63 Tons/Day

E. Sludge Produced From Primary Clarification -

4,816 kg/D = 10,519 Lb/Day = 5.30 Tons/Day

F. Total Daily Sludge -

2.63 Tons/Day + 5.30 Tons/Day = 7.93 Tons/Day

G. No Modifications Required In Centrifuges At 8.25 MGD.

XXIV. SLUDGE INCINERATION

A. Existing - 24 DT/Day New Incinerator Under Design

B. No Modifications Required In Incineration At 8.25 MGD.

HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING DATA

SINGLE TRAIN OPERATION

OF

COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
April 10, 1990	5.177	157	143	12.8	1.5	4.5	5	6	1.4	6.0	0.5
April 11	5.387	215	394	14.4	8.8	5.1	6	6	3.2	6.0	1.2
April 12	4.758	192	550	13.9	0.8	4.3	7	15	2.2	8.0	0.5
Commence Single Train Operation April 13											
April 13	4.260	215	411	13.9	0.8	4.3	7	15	2.2	8.0	0.5
April 14	5.072	224	371	18.6	0.8	4.5	7	15	2.2	8.0	0.5
April 15	7.882	141	186	13.2	0.8	4.2	7	15	2.2	8.0	0.5
April 16	7.205	138	200	13.5	10.4	3.9	5	13	0.6	12.0	0.5
April 17	5.683	113	135	11.4	2.3	3.7	8	16	1.5	10.1	0.4
April 18	5.491	280	239	16.4	3.4	5.8	5	11	1.6	5.9	0.4
April 19	4.832	301	405	18.7	4.8	5.6	7	10	1.0	8.9	0.5
April 20	4.645	287	275	16.4	2.8	6.0	13	9	0.8	12.2	0.6
April 21	5.213	231	306	17.3	2.8	5.9	13	9	0.8	12.2	0.6

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
April 22	4.410	313	415	16.9	2.8	6.3	13	9	0.8	12.2	0.6
April 23	5.316	256	224	20.3	2.4	6.0	4	5	2.7	3.7	0.8
April 24	4.180	185	186	16.2	2.8	5.6	5	6	6.7	2.4	1.4
April 25	4.113	309	325	24.8	3.1	6.9	7	6	10.1	9.0	0.9
April 26	3.884	302	483	29.8	7.6	7.1	10	7	17.6	1.7	1.0
April 27	3.773	330	478	22.6	1.0	7.5	4	7	4.9	8.4	0.4
April 28	3.870	287	268	24.2	1.1	7.5	4	7	4.9	8.4	0.4
April 29	3.728	326	341	21.4	1.0	7.6	4	7	4.9	8.4	0.4
April 30	4.097	255	266	21.4	6.1	6.1	2	5	2.7	7.6	0.5
May 1, 1990	8.186	192	205	23.6	0.9	5.9	3	4	4.8	5.7	0.4
May 2	3.680	397	432	24.2	2.2	7.8	2	4	2.3	8.6	0.4
May 3	3.674	405	438	29.4	1.9	8.9	4	6	4.4	5.5	1.3
May 4	4.568	184	301	16.2	1.2	4.8	4	8	5.0	4.7	0.3
May 5	6.275	218	273	16.0	1.1	4.9	4	8	5.0	4.7	0.3
May 6	4.541	168	223	15.7	1.2	4.2	4	8	5.0	4.7	0.3
May 7	4.333	244	200	24.3	0.9	5.9	5	6	2.5	9.5	0.4
May 8	3.898	374	259	25.3	1.0	8.1	7	6	2.8	10.3	0.4
May 9	3.679	342	321	24.5	1.6	6.6	6	7	2.5	9.6	0.3
May 10	7.827	195	277	13.5	6.6	4.4	14	13	2.5	10.4	0.4
May 11	6.629	206	206	15.2	3.6	6.2	10	15	1.7	6.9	0.5
May 12	5.144	213	220	15.4	3.4	6.2	10	15	1.7	6.9	0.5

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
May 13	6.310	212	218	15.3	3.4	6.2	10	15	1.7	6.9	0.5
May 14	7.235	198	232	16.3	2.2	4.8	7	9	1.0	4.7	0.6
May 15	5.794	245	317	16.2	6.0	6.5	6	7	2.0	6.9	0.6
May 16	7.650	135	258	9.6	3.3	3.6	8	11	1.8	8.6	0.5
May 17	9.108	180	196	8.2	2.6	3.3	7	17	0.6	5.9	0.6
May 18	6.813	263	205	16.4	1.0	4.7	13	8	4.8	5.6	0.8
May 19	5.760	285	320	15.9	1.1	5.4	13	8	4.8	5.6	0.8
May 20	5.034	179	126	13.7	1.0	3.7	13	8	4.8	5.6	0.8
May 21	5.019	120	198	16.8	3.8	4.4	6	6	2.8	10.1	0.6
May 22	4.945	260	273	16.1	1.7	6.5	5	5	0.6	10.4	0.7
May 23	4.201	349	348	20.7	1.3	6.4	13	8	4.9	8.4	1.3
May 24	4.507	361	539	22.8	1.6	8.1	9	5	3.1	6.9	1.1
May 25	4.023	346	427	23.5	0.8	8.9	10	6	3.9	6.8	0.6
May 26	4.657	242	286	21.3	0.9	7.3	10	6	3.9	6.8	0.6
May 27	3.715	251	304	21.6	0.9	7.4	10	6	3.9	6.8	0.6
May 28	3.929	220	259	21.5	0.8	7.0	10	6	3.9	6.8	0.6
May 29	7.719	187	341	6.7	3.9	4.9	9	6	0.8	9.0	0.8
Commence Two Train Operation - May 30											
May 30	9.393	75	100	4.1	3.5	1.9	9	7	0.3	7.2	0.7
May 31	7.458	125	138	9.9	1.4	3.0	5	12	1.1	5.3	0.8

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY - SUMMARY OF OPERATING DATA - SINGLE TRAIN OPERATION OF COUNTER-CURRENT LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT CONCENTRATIONS

Date	Influent Flow MGD	Influent BOD_5 mg/l	Influent TSS mg/l	Influent NH_3-N mg/l	Influent $NO_2 + NO_3$-N mg/l	Influent P mg/l	Effluent BOD_5 mg/l	Effluent TSS mg/l	Effluent NH_3-N mg/l	Effluent $NO_2 + NO_3$-N mg/l	Effluent P mg/l
Averages April 13 - April 30, 1990 (18 Days)	4.870	250	305	18.7	3.77	6.6	6.9	9.6	3.8	9.97	0.6
Average Efficiency							97.2%	96.9%	79.7%	(264.5%)	90.9%
Averages May 1 - May 29, 1990 (29 Days)	5.478	247	283	18.1	2.14	6.5	8.5	8.8	3.1	7.22	0.7
Average Efficiency							96.6%	96.9%	82.9%	(337.4%)	89.2%
Averages April 13 - May 29, 1990 (47 Days)	5.245	248	291	18.4	2.76	6.5	7.9	9.1	3.4	8.27	0.6
Average Efficiency							96.8%	96.9%	81.5%	(299.6%)	90.8%

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

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SINGLE TRAIN OPERATION

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COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT LOADINGS

EXHIBIT 15
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Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effluent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 10, 1990	5.177	5.177	3,081	3,081	98.1	96.8%	2,806	2,806	117.8	95.8%
April 11	5.387	5.387	4,391	4,391	122.5	97.2%	8,046	8,046	122.5	98.5%
April 12	4.758	4.758	3,463	3,463	126.3	96.4%	9,920	9,920	270.6	97.3%
Commence Single Train Operation April 13										
April 13	4.260	8.520	3,472	6,944	113.0	96.8%	6,637	13,274	242.2	96.4%
April 14	5.072	10.144	4,307	8,614	134.6	96.9%	7,133	14,266	288.4	96.0%
April 15	7.882	15.764	4,213	8,426	209.2	95.0%	5,558	11,116	448.2	91.9%
April 16	7.205	14.410	3,769	7,538	136.6	96.4%	5,463	10,925	355.1	93.5%
April 17	5.683	11.366	2,434	4,868	172.3	92.9%	2,908	5,816	344.7	88.2%
April 18	5.491	10.982	5,828	11,656	104.1	98.2%	4,975	9,950	229.0	95.4%
April 19	4.832	9.664	5,514	11,028	128.2	97.7%	7,419	14,838	183.2	97.5%

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SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 20	4.645	9.290	5,054	10,108	228.9	95.9%	4,842	9,684	158.5	96.7%
April 21	5.213	10.426	4,565	9,130	256.9	94.4%	6,047	12,094	177.9	97.1%
April 22	4.410	8.820	5,233	10,466	217.3	95.9%	6,938	13,876	150.5	97.8%
April 23	5.316	10.632	5,159	10,318	80.6	98.4%	4,514	9,028	100.8	97.8%
April 24	4.180	8.360	2,932	5,864	79.2	97.3%	2,947	5,894	95.1	96.8%
April 25	4.113	8.226	4,818	9,636	109.1	97.7%	5,067	10,134	93.6	98.2%
April 26	3.884	7.768	4,447	8,894	147.2	96.7%	7,112	14,224	103.1	98.6%
April 27	3.773	7.546	4,720	9,440	57.2	98.8%	6,837	13,674	100.1	98.5%
April 28	3.870	7.740	4,211	8,422	58.7	98.6%	3,932	7,864	102.7	97.4%
April 29	3.728	7.456	4,607	9,214	56.5	98.8%	4,819	9,638	98.9	98.0%
April 30	4.097	8.194	3,960	7,920	31.1	99.2%	4,131	8,262	77.7	98.1%
Averages April 13 - April 30, 1990 (18 Days)	4.870	9.740	4,402	8,804	128.9	97.1%	5,404	10,808	186.1	96.6%
May 1, 1990	8.186	16.372	5,958	11,916	93.1	98.4%	6,362	12,724	124.1	98.0%
May 2	3.680	7.360	5,538	11,076	27.9	99.5%	6,027	12,054	55.8	99.1%
May 3	3.674	7.348	5,641	11,282	55.7	99.0%	6,100	12,200	83.6	99.3%
May 4	4.568	9.136	3,186	6,372	69.3	97.8%	5,212	10,424	138.5	97.3%
May 5	6.275	12.550	5,816	10,372	95.2	98.2%	6,494	12,988	190.3	97.1%

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SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 5	6.275	12.550	5,816	10,372	95.2	98.2%	6,494	12,988	190.3	97.1%
May 6	4.541	9.082	2,892	5,784	68.9	97.6%	3,839	7,678	137.7	98.2%
May 7	4.333	8.666	4,008	8,016	82.1	98.0%	3,285	6,570	98.6	97.0%
May 8	3.898	7.796	5,527	11,054	103.4	98.1%	3,827	7,654	88.7	97.7%
May 9	3.679	7.358	4,770	9,540	83.7	98.2%	4,477	8,954	97.6	97.8%
May 10	7.827	15.654	5,786	11,572	415.4	92.8%	8,219	16,438	385.7	95.3%
May 11	6.629	13.258	5,177	10,354	251.3	95.2%	5,177	10,354	376.9	92.7%
May 12	5.144	10.288	4,154	8,308	195.0	95.3%	4,290	8,580	292.5	93.2%
May 13	6.310	12.620	5,071	10,142	239.2	95.3%	5,215	10,430	358.8	93.1%
May 14	7.235	14.470	5,431	10,862	192.0	96.5%	6,363	12,726	246.8	96.1%
May 15	5.794	11.588	5,381	10,762	131.8	97.6%	6,963	13,926	153.8	97.8%
May 16	7.650	15.300	3,915	7,830	232.0	94.1%	7,482	14,964	319.0	95.7%
May 17	9.108	18.216	6,215	12,430	241.7	96.1%	6,767	13,534	587.0	91.3%
May 18	6.813	13.626	6,793	13,586	335.5	95.1%	5,295	10,590	206.6	96.1%
May 19	5.760	11.520	6,223	12,446	283.9	95.4%	6,987	13,974	174.7	97.5%
May 20	5.034	10.068	3,416	6,832	248.1	92.7%	2,404	4,808	152.7	93.6%
May 21	5.019	10.038	2,283	4,566	114.2	95.0%	3,767	7,534	114.2	97.0%
May 22	4.945	9.890	4,874	9,748	93.7	98.1%	5,118	10,236	93.7	98.2%
May 23	4.201	8.402	5,558	11,116	207.0	96.3%	5,542	11,084	127.4	97.7%

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SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 24	4.507	9.014	6,168	12,336	153.8	97.5%	9,209	18,418	85.4	99.1%
May 25	4.023	8.046	5,277	10,554	152.5	97.1%	6,512	13,024	91.5	98.6%
May 26	4.657	9.314	4,272	8,544	176.5	95.9%	5,049	10,098	105.9	97.9%
May 27	3.715	7.430	3,535	7,070	140.8	96.0%	4,281	8,562	84.5	98.0%
May 28	3.929	7.858	3,277	6,554	148.9	95.5%	3,858	7,716	89.4	97.7%
May 29	7.719	15.438	5,472	10,944	263.4	95.2%	9,978	19,956	175.6	98.2%
Commence Two Train Operation - May 30										
May 30	9.393	9.393	2,671	2,671	320.5	88.0%	3,561	3,561	249.3	93.0%
May 31	7.458	7.458	3,534	3,534	141.4	96.0%	3,902	3,902	339.3	91.3%
Averages May 1 - May 29, 1990 (29 Days)	5.478	10.956	4,862	9,724	168.8	96.5%	5,686	11,318	180.6	96.8%
Averages April 13 - May 29, 1990 (47 Days)	5.245	10.490	4,686 (235.7 mg/l)	9,372	153.5 (7.7 mg/l)	96.7%	5,578 (280.5 mg/l)	11,156	182.7 (9.2 mg/l)	96.7%

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING NUTRIENT DATA

SINGLE TRAIN OPERATION

OF

COUNTER-CURRENT LOW LOAD AERATION UNITS

FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 10, 1990	5.177	5.177	251.2	251.2	27.5	89.0%	29.4	29.4	117.8	(400.7%)	88.3	88.3	9.8	88.9%
April 11	5.387	5.387	294.1	294.1	65.3	77.8%	179.7	179.7	122.5	31.7%	104.2	104.2	24.5	76.5%
April 12	4.758	4.758	250.7	250.7	39.7	84.2%	14.4	14.4	144.3	(1,002.1%)	77.6	77.6	9.0	88.4%
Commence Single Train Operation April 13														
April 13	4.260	8.520	224.5	449.0	35.5	84.2%	12.9	25.8	129.2	(1,001.6%)	69.4	138.8	8.1	94.2%
April 14	5.072	10.144	357.6	715.2	42.3	88.2%	15.4	30.8	153.8	(998.8%)	86.5	173.0	9.6	88.9%
April 15	7.882	15.764	394.4	788.8	65.7	83.3%	23.9	47.8	239.0	(1,001.1%)	125.5	251.0	14.9	88.1%
April 16	7.205	14.410	368.7	737.5	16.4	95.6%	284.1	568.2	327.8	(115.4%)	106.5	213.0	13.7	87.1%
April 17	5.683	11.366	245.6	491.2	32.3	86.8%	49.6	99.2	217.6	(438.7%)	79.7	159.4	8.6	89.2%
April 18	5.491	10.982	341.4	682.8	33.3	90.2%	70.8	141.6	122.8	(173.5%)	120.7	241.4	8.3	93.1%
April 19	4.832	9.664	342.5	685.0	18.3	94.7%	87.9	175.8	163.0	(185.5%)	102.6	205.2	9.2	91.0%
April 20	4.645	9.290	288.8	577.6	14.1	95.1%	49.3	98.6	214.8	(435.8%)	105.7	211.4	10.6	90.0%
April 21	5.213	10.426	341.9	683.8	15.8	95.4%	55.3	110.6	241.1	(436.0%)	116.6	233.2	11.9	89.8%
April 22	4.410	8.820	282.5	565.0	13.4	95.3%	46.8	93.6	204.0	(435.8%)	105.3	210.6	10.0	90.5%
April 23	5.316	10.632	409.1	818.2	54.4	86.7%	48.4	96.8	74.6	(154.1%)	120.9	241.8	16.1	86.7%

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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 24	4.180	8.360	256.7	513.4	106.2	58.6%	44.4	88.8	42.8	3.6%	88.7	177.4	22.1	75.1%
April 25	4.113	8.226	386.7	773.4	157.5	59.3%	48.3	96.6	140.3	(290.5%)	107.6	215.2	14.0	87.0%
April 26	3.884	7.768	438.8	877.5	259.1	41.0%	111.9	223.8	25.0	77.7%	104.5	209.0	14.7	85.9%
April 27	3.773	7.546	323.2	646.4	70.1	78.3%	14.3	28.6	120.1	(840.2%)	107.3	214.6	5.7	94.7%
April 28	3.870	7.740	355.0	710.0	71.9	79.8%	16.1	32.2	123.2	(765.4%)	110.0	220.0	5.9	94.6%
April 29	3.728	7.456	302.4	604.8	69.2	77.1%	14.1	28.2	118.7	(841.9%)	107.4	214.8	5.7	94.7%
April 30	4.097	8.194	332.4	664.8	41.9	87.4%	94.7	189.4	118.0	(124.6%)	94.7	189.4	7.8	91.8%
Averages April 13 - April 30, 1990 (18 Days)	4.870	9.740	332.9	665.8	62.1	81.4%	60.4	120.8	154.2	(255.3%)	103.3	206.6	10.9	89.4%
May 1, 1990	8.186	16.372	732.4	1,464.8	149.0	79.7%	27.9	55.8	176.9	(634.0%)	183.1	366.2	12.4	93.2%
May 2	3.680	7.360	337.6	675.2	32.1	90.5%	30.7	61.4	120.0	(390.8%)	108.8	217.6	5.6	94.8%
May 3	3.674	7.348	409.5	819.0	61.3	85.0%	26.5	53.0	76.6	(289.1%)	124.0	248.0	18.1	85.4%
May 4	4.568	9.136	280.5	561.0	86.6	69.1%	20.8	41.6	81.4	(391.3%)	83.1	166.2	5.2	93.7%
May 5	6.275	12.550	380.6	761.2	118.9	68.9%	26.2	52.4	111.8	(426.7%)	116.6	233.2	7.1	93.9%
May 6	4.541	9.082	270.3	540.6	86.1	68.2%	20.7	41.4	80.9	(390.9%)	72.3	144.6	5.2	92.8%
May 7	4.333	8.666	399.2	798.4	41.1	89.7%	14.8	29.6	156.0	(1,054.4%)	96.9	193.8	6.6	93.2%
May 8	3.898	7.796	373.9	747.8	41.4	88.9%	14.8	29.6	152.2	(1,028.4%)	119.7	239.4	5.9	95.1%
May 9	3.679	7.358	341.7	683.4	34.9	89.8%	22.3	44.6	133.9	(600.4%)	92.0	184.0	4.2	95.4%
May 10	7.827	15.654	400.6	801.2	74.2	81.5%	195.8	391.6	308.6	(157.6%)	130.6	261.2	11.9	90.9%
May 11	6.629	13.258	382.0	764.0	42.7	88.8%	90.5	181.0	173.4	(191.6%)	155.8	311.6	12.6	91.9%

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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
May 12	5.144	10.288	300.3	600.6	33.2	88.9%	66.3	132.6	134.6	(191.6%)	155.8	311.6	12.6	91.9%
May 13	6.310	12.620	366.0	732.0	40.7	88.9%	81.3	162.6	165.0	(203.0%)	148.3	296.6	14.4	90.3%
May 14	7.235	14.470	447.1	894.2	27.4	93.9%	60.3	120.6	128.9	(213.8%)	131.7	263.4	16.5	87.4%
May 15	5.794	11.588	355.8	711.6	43.9	87.7%	131.8	263.6	151.6	(115.0%)	142.8	285.6	13.2	90.8%
May 16	7.650	15.300	278.4	556.8	52.2	81.2%	95.7	191.4	249.4	(260.6%)	104.4	208.8	14.5	86.1%
May 17	9.108	18.216	283.1	566.2	20.7	92.7%	89.8	179.6	203.7	(226.8%)	113.9	227.8	20.7	81.8%
May 18	6.813	13.626	423.6	847.2	124.0	70.7%	25.8	51.6	144.6	(560.6%)	121.4	242.8	20.7	83.0%
May 19	5.760	11.520	347.2	694.4	104.8	69.8%	24.0	48.0	122.3	(509.5%)	117.9	235.8	17.5	85.4%
May 20	5.034	10.068	261.4	522.8	91.6	65.0%	19.1	38.2	106.9	(559.5%)	70.6	141.2	15.3	78.3%
May 21	5.019	10.038	319.6	730/5	53.3	83.3%	72.3	142.6	192.2	(265.8%)	83.7	167.4	11.4	86.4%
May 22	4.945	9.890	301.8	603.6	11.2	96.3%	31.9	63.8	195.0	(611.2%)	121.8	243.6	13.1	89.2%
May 23	4.201	8.402	329.7	659.4	78.0	76.3%	20.7	41.4	133.8	(646.3%)	129.0	258.0	20.7	80.9%
May 24	4.507	9.014	389.6	779.1	53.0	86.4%	27.3	54.6	117.9	(431.8%)	138.4	276.8	18.8	86.4%
May 25	4.023	8.046	358.4	716.8	59.5	83.4%	12.2	24.4	103.7	(850.0%)	135.7	271.4	9.2	93.2%
May 26	4.657	9.314	376.0	752.0	68.9	81.7%	15.9	31.8	120.0	(755.0%)	128.9	257.8	10.6	91.8%
May 27	3.715	7.430	304.2	608.4	54.9	82.0%	12.7	25.4	95.8	(754.1%)	104.2	208.2	8.4	91.9%
May 28	3.929	7.858	320.2	640.4	58.1	81.9%	11.9	23.8	101.3	(851.1%)	104.3	208.6	8.9	91.5%
May 29	7.719	15.438	196.1	392.2	23.4	89.4%	114.1	228.2	263.4	(230.8%)	143.4	286.8	23.4	83.7%
Commence Two Train Operation - May 30														
May 30	9.393	9.393	146.0	146.0	10.7	92.3%	124.6	124.6	256.4	(205.8%)	67.7	67.7	24.9	63.2%
May 31	7.458	7.458	279.9	279.9	31.1	88.9%	39.6	39.6	149.8	(378.4%)	84.8	84.8	22.6	73.4%

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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - COUNTER-CURRENT OPERATION OF LOW LOAD AERATION UNITS
FLOW AND INFLUENT/EFFLUENT LOADINGS

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
Averages May 1 - May 29, 1990 (29 Days)	5.478	10.956	354.0	708.0	62.0	82.5%	48.4	96.8	117.4	(242.5%)	118.8	237.6	12.5	89.5%
Averages April 13 - May 29, 1990 (47 Days)	5.245	10.490	345.9 (17.4 mg/l)	691.8	62.0 (3.1 mg/l)	82.1%	53.0 (2.67 mg/l)	106.0	131.5 (6.61 mg/l)	(248.1%)	112.9 (5.7 mg/l)	225.8	11.9 (0.6 mg/l)	89.5%

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING ORGANIC DATA

SINGLE TRAIN OPERATION

EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
April 13, 1990	4.260	8.520	3,472	6,944	113.0	96.8%	6,637	13,274	242.2	96.4%
April 20	4.645	9,290	5,054	10,108	228.9	95.9%	4,842	9,684	158.5	96.7%
April 22	4.410	8.820	5,233	10,466	217.3	95.9%	6,938	13,876	150.5	97.8%
April 24	4.180	8.360	2,932	5,864	79.2	97.3%	2,947	5,894	95.1	96.8%
April 25	4.113	8.226	4,818	9,636	109.1	97.7%	5,067	10,134	93.6	98.2%
April 26	3.884	7.768	4,447	8,894	147.2	96.7%	7,112	14,224	103.1	98.6%
April 27	3.773	7.546	4,720	9,440	57.2	98.8%	6,837	13,674	100.1	98.5%
April 28	3.870	7.740	4,211	8,422	58.7	98.6%	3,932	7,864	102.7	97.4%
April 29	3.728	7.456	4,607	9,214	56.5	98.8%	4,819	9,638	98.9	98.0%
April 30	4.097	8.194	3,960	7,920	31.1	99.2%	4,131	8,262	77.7	98.1%
Averages 10 Days	4.096	8.192	4,345	8,690	109.8	97.5%	5,326	10,652	122.2	97.7%
			(279.8 mg/l)		(7.1 mg/l)		(343.0 mg/l)		(7.9 mg/l)	

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SUMMARY OF OPERATING ORGANIC DATA - SINGLE TRAIN OPERATION - EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent Flow MGD	Equivalent Influent Flow Two Train Operation kg/D	Influent BOD_5 Loading kg/D	Equivalent Influent BOD_5 Loading Two Train Operation kg/D	Effuent BOD_5 Loading kg/D	BOD_5 Efficiency	Influent TSS Loading kg/D	Equivalent Influent TSS Loading Two Train Operation kg/D	Effluent TSS Loading kg/D	TSS Efficiency
May 2	3.680	7.360	5,538	11,076	27.9	99.5%	6,027	12,054	55.8	99.1%
May 3	3.674	7.348	5,641	11,282	55.7	99.0%	6,100	12,200	83.6	99.3%
May 4	4.568	9.136	3,186	6,372	69.3	97.8%	5,212	10,424	138.5	97.3%
May 6	4.541	9.082	2,892	5,784	68.9	97.6%	3,839	7,678	137.7	98.2%
May 7	4.333	8.666	4,008	8,016	82.1	98.0%	3,285	6,570	98.6	97.0%
May 8	3.898	7.796	5,527	11,054	103.4	98.1%	3,827	7,654	88.7	97.7%
May 9	3.679	7.358	4,770	9,540	83.7	98.2%	4,477	8,954	97.6	97.8%
May 23	4.201	8.402	5,558	11,116	207.0	96.3%	5,542	11,084	127.4	97.7%
May 24	4.507	9.014	6,168	12,336	153.8	97.5%	9,209	18,418	85.4	99.1%
May 25	4.023	8.046	5,277	10,554	152.5	97.1%	6,512	13,024	91.5	98.6%
May 27	3.715	7.430	3,535	7,070	140.8	96.0%	4,281	8,562	84.5	98.0%
May 28	3.929	7.858	3,277	6,554	148.9	95.5%	3,858	7,716	89.4	97.7%
Averages 12 Days	4.062	8.124	4,615 (297.7 mg/l)	9,230	107.8 (7.0 mg/l)	97.7%	5,181 (336.4 mg/l)	10,362	98.2 (6.4 mg/l)	98.1%
Averages 22 Days	4.078	8.156	4,492 (290.6 mg/l)	8,984	108.7 (7.0 mg/l)	97.6%	5,247 (339.4 mg/l)	10,494	109.1 (7.1 mg/l)	97.9%

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HATFIELD TOWNSHIP MUNICIPAL AUTHORITY

SUMMARY

OF

OPERATING NUTRIENT DATA

SINGLE TRAIN OPERATION

EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
April 13	4.260	8.520	224.5	449.0	35.5	84.2%	12.9	25.8	129.2	(1,001.6%)	69.4	138.8	8.1	94.2%
April 20	4.645	9.290	288.8	577.6	14.1	95.1%	49.3	98.6	214.8	(435.8%)	105.7	211.4	10.6	90.0%
April 22	4.410	8.820	282.5	565.0	13.4	95.3%	46.8	93.6	204.0	(435.8%)	105.3	210.6	10.0	90.5%
April 24	4.180	8.360	256.7	513.4	106.2	58.6%	44.4	88.8	42.8	3.6%	88.7	177.4	22.1	75.1%
April 25	4.113	8.226	386.7	773.4	157.5	59.3%	48.3	96.6	140.3	(290.5%)	107.6	215.2	14.0	87.0%
April 26	3.884	7.768	438.8	877.5	259.1	41.0%	111.9	223.8	25.0	77.7%	104.5	209.0	14.7	85.9%
April 27	3.773	7.546	323.2	646.4	70.1	78.3%	14.3	28.6	120.1	(840.2%)	107.3	214.6	5.7	94.7%
April 28	3.870	7.740	355.0	710.0	71.9	79.8%	16.1	32.2	123.2	(765.4%)	110.0	220.0	5.9	94.6%
April 29	3.728	7.456	302.4	604.8	69.2	77.1%	14.1	28.2	118.7	(841.9%)	107.4	214.8	5.7	94.7%
April 30	4.097	8.194	332.4	664.8	41.9	87.4%	94.7	189.4	118.0	(124.6%)	94.7	189.4	7.8	91.8%
Averages 10 Days	4.096	8.192	319.1 (20.6 mg/l)	638.2	83.9 (5.4 mg/l)	73.7%	45.3 (2.92 mg/l)	90.6	123.6 (7.96 mg/l)	(272.9%)	100.1 (6.4 mg/l)	200.2	10.4 (0.7 mg/l)	89.6%

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SUMMARY OF OPERATING NUTRIENT DATA - SINGLE TRAIN OPERATION - EQUIVALENT FLOWS 7.25 - 9.25 MGD

Date	Influent MGD	Equivalent Influent Flow Two Train kg/D	Influent NH_3-N kg/D	Equivalent Influent NH_3-N Loading Two Train kg/D	Effluent NH_3-N kg/D	Efficiency	Influent $NO_2 + NO_3$-N kg/D	Equivalent Influent $NO_2 + NO_3$-N Loading Two Train kg/D	Effluent $NO_2 + NO_3$-N kg/D	Efficiency	Influent P Loading kg/D	Equivalent Influent P Loading One Train kg/D	Effluent P Loading kg/D	P Efficiency
May 2	3.680	7.360	337.6	675.2	32.1	90.5%	30.7	61.4	120.0	(390.8%)	108.8	217.6	5.6	94.8%
May 3	3.674	7.348	409.5	819.0	61.3	85.0%	26.5	53.0	76.6	(289.1%)	124.0	248.0	18.1	85.4%
May 4	4.568	9.136	280.5	561.0	86.6	69.1%	20.8	41.6	81.4	(391.3%)	83.1	166.2	5.2	93.7%
May 6	4.541	9.082	270.3	540.6	86.1	68.2%	20.7	41.4	80.9	(390.9%)	72.3	144.6	5.2	92.8%
May 7	4.333	8.666	399.2	798.4	41.1	89.7%	14.8	29.6	156.0	(1,054.4%)	96.9	193.8	6.6	93.2%
May 8	3.898	7.796	373.9	747.8	41.4	88.9%	14.8	29.6	152.2	(1,028.4%)	119.7	239.4	5.9	95.1%
May 9	3.679	7.358	341.7	683.4	34.9	89.8%	22.3	44.6	133.9	(600.4%)	92.0	184.0	4.2	95.4%
May 23	4.201	8.402	329.7	659.4	78.0	76.3%	20.7	41.4	133.8	(646.3%)	129.0	258.0	20.7	80.9%
May 24	4.507	9.014	389.6	779.1	53.0	86.4%	27.3	54.6	117.9	(431.8%)	138.4	276.8	18.8	86.4%
May 25	4.023	8.046	358.4	716.8	59.5	83.4%	12.2	24.4	103.7	(850.0%)	135.7	271.4	9.2	93.2%
May 27	3.715	7.430	304.2	608.4	54.9	82.0%	12.7	25.4	95.8	(754.1%)	104.2	208.2	8.4	91.9%
May 28	3.929	7.858	320.2	640.4	58.1	81.9%	11.9	23.8	101.3	(851.1%)	104.3	208.6	8.9	91.5%
Averages 12 Days	4.062	8.124	342.9 (22.3 mg/l)	685.8	57.2 (3.7 mg/l)	83.3%	19.6 (1.27 mg/l)	39.2	112.8 (7.32 mg/l)	(575.5%)	109.0 (7.1 mg/l)	218.0	9.7 (0.6 mg/l)	91.1%
Averages 22 Days	4.078	8.156	332.1 (21.5 mg/l)	664.2	69.3 (4.5 mg/l)	79.1%	31.3 (2.02 mg/l)	62.6	117.7 (7.61 mg/l)	(376.0%)	105.0 (6.8 mg/l)	210.0	10.0 (0.6 mg/l)	90.5%

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Exhibit V-5

Preliminary Hydraulic Calculations

Hatfield Township, Montgomery County

	UNITS	DESIGN FLOWS Average Daily	Peak Hour Flow 1	Peak Hour Flow 2	Peak Hour Flow 3
	mgd	8.4	21.5	24.0	27.0
	gpm	5833	14931	16667	18750
	cfs	13.0	33.3	37.1	41.8
PS 2 to Grit Grease					
Assumed Water Surface in PS 2 Influent		271.36	271.36	271.36	271.36
Pipe Size (in)		48.00	48.00	48.00	48.00
Pipe velocity (ft/s) (*2 pipes*)		0.5	1.3	1.5	1.7
Pipe Headloss (ft/ft)		0.0000	0.0002	0.0002	0.0003
Pipe Length (ft)		702	702	702	702
Friction Losses (ft)		0.025	0.140	0.172	0.214
Minor Loss Coefficient		2.00	2.00	2.00	2.00
Minor Losses (ft)		0.008	0.054	0.068	0.086
Total Losses (ft)		0.033	0.195	0.240	0.300
Water Level in Grit / Grease Effluent Channel		271.39	271.55	271.60	271.66
Grit Grease TOW		278.00	278.00	278.00	278.00
Freeboard		6.61	6.45	6.40	6.34
Grit Grease Launder Weir Elev.		275.34	275.34	275.34	275.34
Freefall (Weir to WS)		3.95	3.79	3.74	3.68
Water Level in Grit Grease					
Water Level in Grit Grease Effluent Channel		271.39	271.55	271.60	271.66
Grit Grease Launder Weir Elev.		275.34	275.34	275.34	275.34
Weir Length (ft)		8.53	8.53	8.53	8.53
Head on weir (ft)		0.59	1.11	1.20	1.29
Water Surface in Grit Grease		275.93	276.45	276.54	276.63
Water Level in Exit Channel from Screens to GG					
Water Surface in Grit Grease		275.93	276.45	276.54	276.63
Water Surface in Exit Channel (after door)		275.93	276.45	276.54	276.63
Port under door Area (sf) (4' wide x 2.5' high)		10.00	10.00	10.00	10.00
Head loss through port ($h = (Q/cA)^2/2g$		0.07	0.45	0.56	0.71
Water Surface at Exit of screens (before door)		276.00	276.90	277.09	277.34
Head loss through screen		0.33	0.33	0.33	0.33
Water Surface at Influent of Screens		276.33	277.23	277.42	277.67
Top of Wall at Influent Channel		278.00	278.00	279.00	278.00
Freeboard		1.67	0.77	1.58	0.33
Water Level in Effleunt of PS 1					
Water Surface at Influent of Screens		276.33	277.23	277.42	277.67
Port under door Area (sf) (6' wide x 1.5' high)		9.00	9.00	9.00	9.00
Head loss through port ($h = (Q/cA)^2/2g$		0.08	0.55	0.69	0.87
Water Surface at Exit of PS 1		276.42	277.78	278.11	278.54
Top of Wall		278.00	278.00	278.00	278.00
Freeboard		1.58	0.22	-0.11	-0.54

Exhibit V-6

Onlot Management Ordinance

Hatfield Township, Montgomery County

ORDINANCE NO. 608

AN ORDINANCE ESTABLISHING REGULATIONS FOR THE INSPECTION, PUMPING, MAINTENANCE, OPERATION, REHABILITATION AND ADMINISTRATION OF ONLOT SEWAGE SYSTEMS AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF

WHEREAS, Hatfield Township (the "Township) has an obligation to provide for and/or insure adequate sewage treatment and protection of the public health by preventing the discharge of untreated or inadequately treated sewage as mandated by municipal codes, the Clean Streams Law (35 P.S. §691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. §750.1 et seq.).

WHEREAS, the Township Act 537 Official Wastewater Facilities Plan has evaluated the need to provide adequate sewage facilities and has found the formation of an On-Lot Sewage Management Program to be an effective method of preventing and abating water pollution and hazards to the public health.

WHEREAS, the purpose of this Ordinance is to: (1) keep the Township compliant with the requirements of the Clean Streams Law (Act of 1937, P.L. 1987, No. 394) and the Pennsylvania Sewage Facilities Act (Act of 1966 P.L. 1535, No. 537, as amended, known as Act 537); (2) provide for inspection, pumping, maintenance, and rehabilitation of on-lot sewage disposal systems; (3) establish penalties and appeal procedures necessary for the proper administration of such a management program.

WHEREAS, the Commissioners of the Township after due consideration of the proposed ordinance at a duly advertised public meeting, has determined that the health, safety and general welfare of the citizens and residents of Hatfield Township will be served by the passing of the within ordinance.

NOW, THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Hatfield Township, Montgomery County, Pennsylvania, as follows:

§I. Amendment of the Code.

Chapter 224, Sewers and Sewage Disposal, is hereby amended by adding the following Article IV, On-lot Sewage Management Program:

Section 224-34. APPLICABILITY

From the effective date of this Ordinance, its provisions shall apply to all properties utilizing on-lot sewer systems in Hatfield Township. The provisions of this Ordinance shall apply to all persons, and all other entities owning any property serviced by an on-lot sewage system or a community on-lot sewage system.

Section 224-35. DEFINITIONS

As used in this chapter, the following words and terms shall have the following definitions.

Act 537 – The Act of January 24, 1966, PL 1535, as amended, 35 P.S. §750.1 et. seq., known as the Pennsylvania Sewage Facilities Act.

Board – The Board of Commissioners, Hatfield Township, Montgomery County, Pennsylvania.

Department - shall mean the Department of Environmental Protection of the Commonwealth of Pennsylvania (DEP).

Individual Sewage System - shall mean a system of piping, tanks or other facilities serving a single lot and collecting and disposing of sewage in whole or in part into the soil or into any waters of this Commonwealth.

Malfunction shall mean a condition which occurs when an on-lot sewage disposal system discharges sewage onto the surface of the ground, into ground waters of this Commonwealth, into surface waters of this Commonwealth, backs up into a building connected to the system or in any manner causes a nuisance or hazard to the public health or pollution of ground or surface water or contamination of public or private drinking water wells. Systems shall be considered to be malfunctioning if any condition noted above occurs for any length of time during any period of the year.

Official Sewage Facilities Plan - shall mean a comprehensive plan for the provision of adequate sewage disposal systems, adopted by the Board and approved by the Pennsylvania Department of Environmental Protection, pursuant to the Pennsylvania Sewage Facilities Act.

On-lot Sewage System - shall mean any system for disposal of domestic sewage involving pretreatment and subsequent disposal of the clarified sewage into a subsurface soil absorption area or retaining tank; this term includes both individual sewage systems and community sewage systems.

Person - shall mean any individual, association, public or private corporation for profit or not for profit, partnership, firm, trust, estate, department, board, bureau of agency of the Commonwealth, political subdivision, municipality, district, authority, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties. Whenever used in any clause prescribing and imposing a penalty or imposing a fine or imprisonment, the term person shall include the members of an association, partnership or firm and the officers of any local agency or municipal, public or private corporation for profit or not for profit.

Rehabilitation - shall mean work done to modify, alter, repair, enlarge or replace an existing on-lot sewage disposal system.

Sewage - shall mean any substance that contains any of the waste products or excrement or other discharge from the bodies of human beings or animals and any noxious or deleterious substances being harmful or inimical to the public health, or to animal or aquatic life, or to the use of water for domestic water supply or for recreation or which constitutes pollution under the Act of June 22, 1937 (P.L. 1987, No. 394), known as "The Clean Streams Law," as amended.

Sewage Management Program - shall mean a comprehensive set of legal and administrative requirements encompassing the requirements of this ordinance, the Sewage Facilities Act, the Clean Streams Law, the regulations promulgated thereunder and such other requirements adopted by the Board to effectively enforce and administer this ordinance.

Section 224-35. PERMITS.

A. No person shall install, construct or alter an individual sewage system or community sewage system or construct or install or occupy any building or structure for which an individual sewage system or community sewage system is to be installed without first obtaining a permit from the Montgomery County Health Department ("MCHD") which permit shall indicate that the site and the plans and specifications of such system are in compliance with the provisions of the Clean Streams Law (35 P.S. §§691.1-691.1001) and the Pennsylvania Sewage Facilities Act (35 P.S. 750.1 *et seq.)* and the regulations adopted pursuant to those Acts.

B. No system or structure designed to provide individual or community sewage disposal shall be covered from view until approval to cover the same has been given by the MCHD. If 72 hours have elapsed, excepting Sundays and Holidays, since the MCHD received notification of completion of construction, the applicant may cover said system or structure unless permission has been specifically refused by the MCHD.

C. No building or occupancy permit shall be issued and no work shall begin on any alteration or conversion of any existing structure, if said alteration or conversion will result in the increase or potential increase in sewage flows from the structure, until either the structure's owner receives a permit for alteration or replacement of the existing sewage disposal system or until the structure's owner receives written notification from the MCHD that such a permit will not be required. The MCHD shall determine whether the proposed alteration or conversion of the structure will result in increased sewage flows.

Section 224-36. INSPECTIONS.

A. Any on-lot sewage system may be inspected by the Township at any reasonable time as of the effective date of this Ordinance and the Township shall have the right to enter upon land for the purposes of the inspections described herein.

B. Such inspections may include a physical tour of the property, the taking of samples from surface water, wells, other groundwater sources, the sampling of the contents of the sewage disposal system itself and/or the introduction of a traceable substance into the interior plumbing of the structure served to ascertain the path and ultimate destination of wastewater generated in the structure.

C. An initial inspection and subsequent periodic inspections of an on-lot sewage system shall be conducted when an on-lot sewage system is pumped. Inspections shall be conducted by a qualified pumper/hauler for the purpose of determining the functional status of a sewage system. The individual property or on-lot sewage system owner shall contact and make arrangements directly with the qualified pumper/hauler for the inspection of an on-lot sewage system. A copy of the report shall be provided to the Township within thirty (30) days of its completion.

D. The Township may inspect any on-lot sewage system known to be, or suspected to be malfunctioning. Should the Township's inspection reveal that the on-lot sewage system is malfunctioning, the Township shall notify the property owner of the corrective action that needs to be taken or the Township may take action to require the correction of the malfunction.

Section 224-37. OPERATION.

Only normal domestic wastes shall be discharged into any on-lot sewage disposal system. The following shall not be discharged into the system.

1. Industrial waste.

2. Automobile oil and other non-domestic oil.

3. Toxic or hazardous substances or chemicals, including but not limited to, pesticides, disinfectants (excluding household cleaners), acids, paints, paint thinners, herbicides, gasoline and other solvents.

4. Clean surface or groundwater, including water from roof or cellar drains, springs, basement sump pumps and french drains.

Section 224-38. MAINTENANCE.

A. The Township shall provide written notification to all owners of property served by an on-lot sewage system that their system must be pumped by the end of the calendar year in which the letter is received. The Township shall follow a schedule whereby all of the owners of properties within the Township served by an on-lot sewage system are notified once every four (4) years. The notified property owners must have the sewage system pumped within the time specified in the Township's letter, unless the owner(s) can provide the Township with a pumping certification indicating that the on-lot sewage system was pumped within one (1) year prior to the date of the Township's notice letter.

B. Commencing from the date of the pumping as prescribed in section 224-38(A), removal of septage or other solids from an on-lot sewage system shall be performed at least once every four (4) years thereafter. The property owner shall furnish a copy of the pumping certification to the Township within thirty (30) days of the date of the pumping.

C. The Township may allow an on-lot sewage system to be pumped out at less frequent intervals when the owner can demonstrate that the sewage system and/or uses thereof are unique and do not require pumping every four (4) years. In no case shall such period extend beyond eight (8) years. The Township shall solely determine if an extension of time will be granted and the length of the extension.

D. A sewage system shall be deemed to be pumped when all organic solids are removed and the total average liquid depth remaining in the tank is less than one inch.

E. The Township may require additional maintenance activity as needed including, but not limited to, cleaning and unclogging of piping, service of mechanical equipment, removal of obstructing roots or trees and/or the diversion of surface water away from the absorption area.

F. The required frequency of pumping may be increased at the discretion of the Township, if:

(1) An on-lot sewage system is found to be malfunctioning;

(2) An on-lot sewage system is found to be undersized;

(3) The treatment tanks are filled with solids in excess of 1/3 of the liquid depth of the tank or with scum in excess of 1/3 of the liquid depth of the tank;

(4) The hydraulic load on the system increases significantly above original permit or design average;

(5) A garbage grinder is used in the building; or

(6) Other good cause can be shown.

G. Any person owning a structure served by a sewage system containing an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. In no case may the service or pumping interval for aerobic treatment tanks exceed that required for septic tanks.

H. Any person owning a structure served by a cesspool shall have that system pumped according to the scheduled prescribed for septic tanks.

I. Holding tanks shall be pumped out at intervals that prevent the overflow, leakage, back-up, and other malfunction characteristic of an overload system.

J. The owner of a property upon which an on-lot sewage system is constructed shall maintain the area around such system so as to provide convenient access for inspection, maintenance, and pumping; and shall divert surface water and downspouts away from the absorption area and sewage system components.

K. Tanks shall only be pumped from or through the manhole/access port, i.e. the largest tank opening. Tanks shall not be pumped from or through the observation port.

Section 224-39. REHABILITATION.

Any on-lot sewage system or component thereof found to be malfunctioning shall be repaired, modified or replaced to correct the conditions causing the malfunction. Rehabilitation shall be performed in accordance with 25 Pa. Code Chapter 73, (Standards for Sewage Disposal System) and any other applicable rules and regulations of the Department. The rehabilitated sewage system may be inspected to certify its compliance with any applicable local and state standards.

Section 224-40. IMMINENT HEALTH HAZARD; LIENS.

When an imminent health hazard exists due to failure of a property owner to maintain, repair, or replace an on-lot sewage system as provided under the terms of this Ordinance, the Township shall have the right to perform, or contract to have performed, the work required to abate the health hazard, pollution, or nuisance. The property and/or system owner shall be charged for the work performed, and, if necessary, a lien shall be recorded against the property. The Township reserves the right to pursue all other lawful remedies in addition to and not exclusive of any abatement and lien process.

Section 224-41. DISPOSAL OF SEPTAGE.

A. All septage originating within the Township shall be disposed of at sites or facilities approved by the Pennsylvania Department of Environmental Protection for the acceptance of septage.

B. Only qualified pumpers/haulers shall be utilized by any owner in the Township.

Section 224-42. ADMINISTRATION.

A. The Township shall fully utilize those powers it possesses and that have been delegated through enabling statues and ordinances to effect the purposes of this Ordinance.

B. The Township shall utilize qualified individuals to carry out the provisions of this Ordinance.

C. All permits, records, reports, files and other written material relating to the installation, operation, maintenance, and malfunction of an on-lot sewage system in the Township shall become the property of the Township.

D. The Township may establish all administrative procedures necessary to properly carry out the provisions of this Ordinance.

E. The Township may establish and adopt a fee schedule and subsequently collect fees to cover the cost of administering the on-lot maintenance program.

Section 224-43. APPEALS.

A. Appeals from decisions made under this Ordinance shall be made to the Township in writing within fifteen (15) days from the date of the decision in question.

B. The appellant shall be entitled to a hearing before the Hatfield Township Board of Commissioners at its next regular scheduled meeting, if the appeal is received at least fourteen (14) days prior to that meeting. If the appeal is received within fourteen (14) days of the next regularly scheduled meeting, the Hatfield Township Board of Commissioners shall determine whether to hear the appeal at the pending meeting or wait to hear the appeal at the following meeting. The Township shall thereafter affirm, modify, or reverse the aforesaid decision. The hearing may be postponed for a good cause shown by the appellant or the Township.

Section 224-44. PENALTIES.

Any person failing to comply with any provision of this Ordinance shall be subject to a fine of One Thousand Dollars ($1,000.00). In default thereof, the Solicitor is authorized to pursue the violations as a summary offense and any person may be subject to imprisonment for a period of not more than thirty (30) days. Each day of noncompliance shall a constitute a separate offense.

§II. Repealer.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed, it being understood and intended that all ordinances and the Code of Ordinances for the Township of Hatfield such as are not otherwise specifically in conflict or inconsistent with this ordinance, shall remain in full force and effect, the same being reaffirmed hereby.

§III. **Severability.**

If any section, subsection, sentence, clause, phrase, or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such provisions shall be separate, distinct and independent, and such holding shall not effect the validity of the remaining portions of this Ordinance.

§IV. **Failure to Enforce not a Waiver.**

The failure of the Township to enforce any provision of this Ordinance shall not constitute a waiver by the Township of its rights of future enforcement hereunder.

§V. **Effective Date.**

This ordinance shall take effect within five (5) days of passage.

§VI. **Enactment.**

Under the authority conferred by the First Class Township Code and other relevant statutory law, the Commissioners of the Township of Hatfield in the County of Montgomery, Commonwealth of Pennsylvania do hereby enact and ordain this ordinance to the Code of Ordinances for the Township of Hatfield this 29th day of September 2010.

HATFIELD TOWNSHIP

Attest: _____
Andrew S. Haines, Manager

By: _____
Scott Brown, Present

Exhibit V-7

Example Public Education Handouts

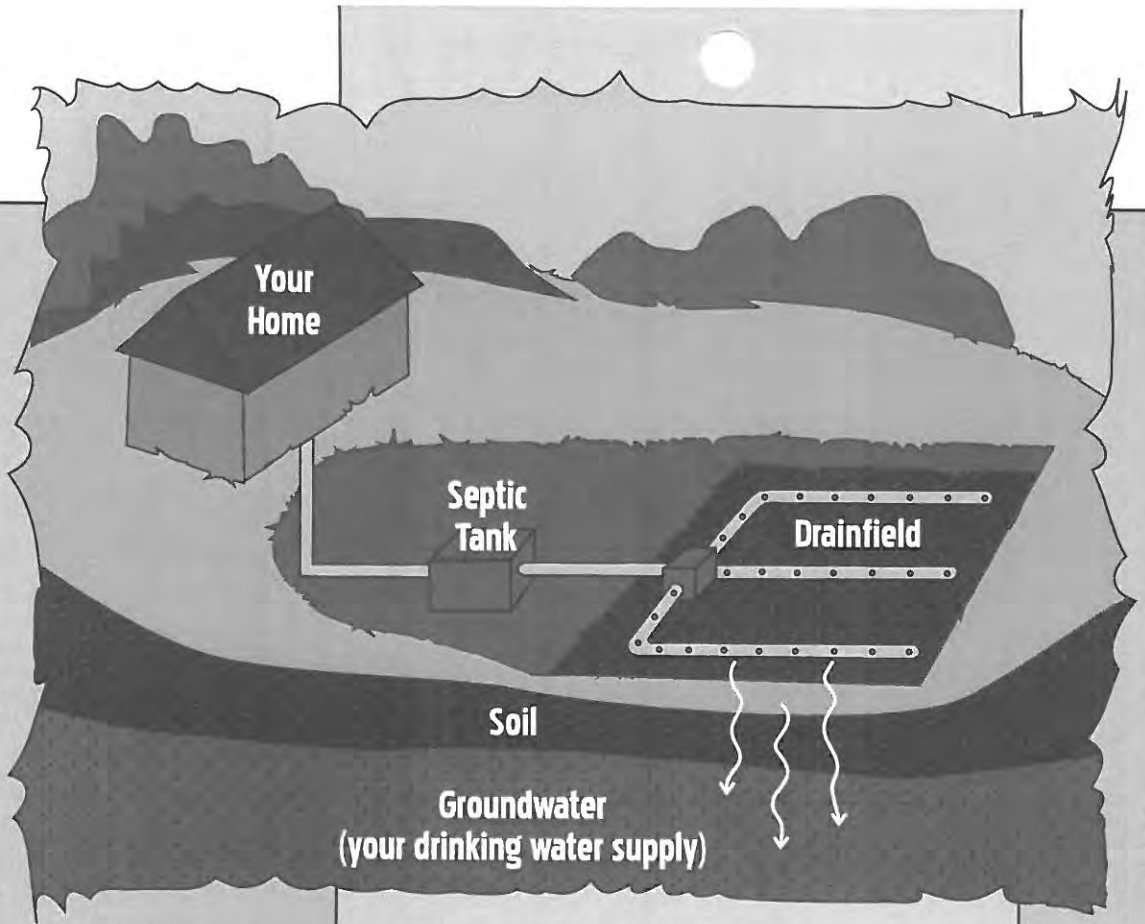
Hatfield Township, Montgomery County

How does it do that?

Septic systems treat household waste using:

- The septic tank
- The soil absorption field/ drainfield or lagoon

Wastewater from the bathroom, kitchen, and laundry flow to the tank, where heavy solids collect at the bottom and bacteria start decomposing the solids. Liquid effluent flows into the drainfield or lagoon where the soil provides a final treatment of the wastewater.



What if it doesn't work?

A septic system that **does not** work can have a negative impact on human and animal health. Inadequate treatment of wastewater allows bacteria, viruses and other disease-causing pathogens to enter surface and groundwater supplies. Protect your health, drinking water, and property value by properly maintaining your septic system.

How do I make sure it's working?

A properly functioning septic system will treat wastewater in a natural and safe way. Routine maintenance of your system will reduce both risks to human health and costs.

Septic owners should:

- Keep accurate septic system records (i.e. dates of inspection, pumping, problems).
- Have systems inspected and pumped every 2 to 3 years.
- Prevent vehicles and trailers from driving or parking on top of the drainfield.
- Avoid the use of additives. Save your money for an inspection or pumping.

Where is this thing?

Try finding your septic tank by:

- Going to the basement or area of the house that has sewer pipes going outside through the wall or floor. This will indicate the direction or location of the septic tank.
- Taking a metal rod and gently probing in the soil about 10 to 15 feet from the foundation of the house. Search for pipes or some sort of a metal, plastic, or concrete tank.

Find the system's drainfield by looking for:

- Areas where grass isn't growing well, grass is greener, or it grows faster.
- Areas where there is a slight depression or mound.
- Areas where the soil is soggy when the rest of the yard is dry.

Once you locate your system draw a simple map of the location to keep in your records. To prevent future malfunctions you may want to install a fence around the drainfield area.

If you **DO NOT** receive a sewage bill, then you own a septic system.

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Do I smell something?

Signs of a failing system are:

- Sewage in the yard.
- A foul smelling, blackish/grayish liquid in the drainfield area.
- Sewage backup in sinks, toilets, showers, and bath tubs.

Can septic systems affect communities?

- Septic systems are considered the 2nd most frequent source of groundwater pollution by state agencies.

  U.S. Environmental Protection Agency, National Water Quality Inventory Report to Congress (305(b) Report), 1998

- Almost 10,000 water body impairments are due to pathogen or nutrient contamination. Septic systems are contributors of these contaminants.

  U.S. Environmental Protection Agency, 1998 Section 303(d) List Fact Sheet: National Picture of Impaired Waters Highlights of the 1998 303(d) Lists (based on Tracking System data available 04/06/00)

What else should I know?

On the web

- University of Nebraska
  http://wastewater.unl.edu
- University of Minnesota
  http://septic.umn.edu
- National Environmental Services Center
  http://www.nesc.wvu.edu

Sponsors

The Groundwater Foundation is an international nonprofit organization based in Lincoln, Nebraska dedicated to educating the public about the nature and value of groundwater. For more information about The Groundwater Foundation and its programs, visit www.groundwater.org or call 1-800-858-4844.

Funding provided by the Nebraska Department of Environmental Quality, the Nebraska Health Care Cash Fund and the Nebraska Drinking Water State Revolving Fund through the Nebraska Department of Environmental Quality Source Water Protection Program. Additional support provided by the Water Systems Council.

Handle It.

Maintain Your Septic. Protect Your Health.

Maintain my what?

A septic system is an on-site structure that treats household waste with a septic tank and a soil absorption system. Failing septic systems can contaminate lakes, creeks, and shallow drinking water supplies.

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Why Do Septic Systems Fail?

The worst nightmare a homeowner with a septic system faces is the failure of their system. Failure of the system results in sewage backup in the household plumbing. In addition to the household, it can also emerge on the surface of the ground in the drain field which is damaging to the environment and unsafe for your family. Your well and nearby streams can become contaminated, which poses yet another costly and dangerous situation.

Some general warning signs of septic system failure are:

1. The alarm on your system goes off
2. Plumbing problems within the residence:
    - Clogged or sluggish drain lines
    - Sewage backup in the drain lines and appliances
    - Gurgling noises in the pipes and drain lines
3. Sewage or grey water on the surface of the ground in your drain field
4. Soft, mushy ground or thicker green grass around the system
5. Sewage odor outside of the residence

Failure of a system is normally caused by three factors:

1. Inadequate maintenance of the system
2. Improper design
3. Faulty installation

System Failures:

Factor #1 - Inadequate Maintenance

A correctly designed and installed system will not function without proper maintenance. It is vital to the life of your system that regular pumping and maintenance be performed on your system to help prevent system problems before they occur.

Your septic tank must be pumped on a regular basis. If it is not pumped, solids will accumulate within the tank and eventually flow into the drain field clogging the system. The baffles may also become damaged and eventually deteriorate within the tank allowing the scum to escape into the drain field.

The years between pumping are directly affected by the number of occupants in the household and the amount of water generated by items such as toilets, appliances and showers. Households with garbage disposals must be pumped more frequently due to the amount of solids that the disposal distributes into the tank. An average household with moderate water usage needs to be pumped approximately every two years.

Years between pumping

Tank Size (gal)	Household Size (number of people)									
	1	2	3	4	5	6	7	8	9	10
300	2.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50
500	4.00	2.50	1.50	1.00	1.00	0.60	0.50	0.25	0.25	0.25
1000	5.00	3.00	3.00	2.00	2.00	1.50	1.50	1.50	1.00	1.00
1250	5.00	5.00	4.00	3.00	2.50	2.00	1.50	1.50	1.00	1.00

Taking care of the area within and around your drain field can also help to prevent a system failure.

Most vegetation will seek a source of water if it does not receive the amount it needs to grow. In search of moisture, trees and shrubs with deep roots can wrap around the distribution lines leading to the bed, clogging and damaging them. Therefore, always keep your drain field free of harmful vegetation.

Another way to protect the drain field is to make sure no heavy vehicles or equipment are driven across the area. Excessive weight can crush the pipes and damage the drain field resulting in failure. It can also compact the soil beyond natural compaction and does not allow proper circulation or drainage within the soil.

Surface water problems can also occur. Distribution pipes should always remain buried at a safe level beneath the ground. If they become exposed to the surface, freezing can occur causing the pipes to become damaged and blocked.

Another step a homeowner should take to prevent failures is to monitor water usage. A system is designed specifically to handle a certain amount of water based on the number of occupants within a home. If the number of occupants or water usage increases, then the tank must be pumped more regularly to dispose of the extra waste within the tank. Also, the extra amount of detergent, chemicals and cleaners that are flushed through the system can change the quality of the water and kill the bacteria cultures within the tank. The tank will not function without the bacteria.

In general, a large number of occupants and a small, undersized septic tank that is not pumped regularly is a failure waiting to happen.

Factor #2 - Improper Design

The design of your system is based on soil percolation rates and the size of the household. It is important to have your percolation tests performed by a trained, licensed Sewage Enforcement Officer (SEO) to ensure that the results are accurate. Undersizing of any of the following items can be damaging to your system:

1. Septic tank
2. Groundwater drainage
3. Drain field

An undersized septic tank will become clogged and pass solids into the drain field. Current regulations required a minimum 900 gallon dual compartment tank with inlet and outlet baffles or tees. An effluent filter is also beneficial to retain solids in the tank.

The groundwater levels within your area also play an important role in the proper function of your system. If that factor is not taken into consideration, heavy periods of groundwater flow will cause the system to become saturated and can contaminate your wells and surrounding areas.

If percolation tests are not run properly, the drain field may not be sized or designed correctly. An undersized drain field will eventually lead to costly maintenance and an early system failure.

It should not take a backup of sewage within your home to show that there are problems with your system. Problems may already be occurring before you notice clogged pipes within your home. An improper design acts like a chain reaction resulting in one problem after another.

Factor #3 - Installation Failures

Again, it is vital that you have a trained, experienced professional install your system. Even if the tests are performed correctly by the SEO, the system can still malfunction if it is not installed properly. If the distribution lines are spaced unevenly or not placed on the right grade, the water will not be distributed evenly within the drain field. This imbalance can cause a hydraulic overload. As mentioned above, the weight from heavy machinery and vehicles can also damage the drain field. Be sure to rope off the area around your drain field when installing a new system or having work done on your existing system so that the ground is not disturbed.

Conclusion:

Proper knowledge, prompt, professional services and a little common sense can all help to prevent septic system failures. If you have any questions or would like to have your system inspected, call your service technician today. Preventative maintenance is the key to the extended life of your system.

What are the factors that can cause backups?

One factor is buildup such as soap residue, garbage disposal waste, hair, and grease. Buildup leads to unwanted backups, but can be the easiest to correct and control.

A second factor which can contribute to backups is the age and/or condition of your drain lines.

1. The oldest pipes were made of terra cotta or clay and usually are in sections 2 feet in length. Because an average line had many joints, the rate of failure increases due to poor grouting, root infiltration or pipe degradation.
2. Next, orangeburg pipe was introduced as a new concept in pipe manufacturing. Made of many layers of tar paper, the interior of this type of pipe tends to fail when the inner most layer bubbles and/or deforms from outside pressures such as rocks or bracing.
3. Then, cast iron was introduced as a strong and more durable pipe. The biggest problem with cast iron is rusting from the inside causing restriction.
4. Today, plastic pipe is commonly used proving itself to be very reliable when installed properly.

Finally, proper installation of your pipes is imperative to keep them free flowing. Improper bedding of drain lines can cause settlement resulting in improper slopes or dips, sunken joints, root infiltration or breaks. The result of these problems is improper flow and buildup.

How can I tell if my lines are flowing properly?

You may experience few or NO warning signals prior to your lines actually backing up. Although each situation may differ for each household, you may notice a slowing of the lines or drains prior to a complete blockage. Often you will hear gurgling or bubbling sounds in the lines, or you may smell an odor coming from your drains. If you experience any of these warning signs, call an experienced technician to come out and troubleshoot your drain line problem. There have several resources to diagnose and fix the problem, such as, cable or "snaking" machines, hydro-jetting units, and television inspection cameras. A quick diagnosis of the problems can save you time and money.

What is the difference between cabling and jetting services?

Cables or "snakes" can be used on lines or drains from 1-¼" to 6" in diameter. Some cables can reach inside a line up to 100 feet. If the line is longer than 100 feet, a high-pressure water jet can be used, and is effective on lines from 2" to 54" in diameter and up to 500 feet in length. The cable will remove debris eliminating the immediate blockage and opening the line. A high-pressure water jet will wash down the buildup on the inside of the pipe reducing the risk of further clogging problems due to buildup. With proper maintenance, you can keep your lines open and flowing.

I just had a back up problem last year. Why did the line back up again?

You may have defects in your plumbing lines. If you have a chronic problem with a particular drain line, you may need to repair or replace the problem line. A service technician can help you determine where the problem lies. A television camera inspection service and line locating

service can save you time and money over conventional excavation methods. Using a camera and locating equipment, they can look for isolated problems, check the condition of the entire line, and provide an estimate to correct the problem.

What is involved in removing roots from my line?

Roots can cause back ups in most types of pipe. Commonly, small fibrous roots can infiltrate any joint or crack in your pipe and grow thick enough to clog a line. The best solution is to cut the roots out using cutters or blades and then treat the line with a foaming root killer, such as Rootx ®. Rootx is a non-systemic chemical with the active ingredient Dichlobenil that retards any further root growth for up to one year. If you choose not to treat the line with a root killer, the roots will grow in thicker and heavier causing another blockage before long. In time, root growth will ultimately destroy the integrity of pipe leading to pipeline replacement.

What can I do to reduce the risk of my lines backing up?

A few simple practices can help to alleviate problems:

- Don't plant trees or shrubbery over or near the drain line or absorption area.
- Use a lighter weight toilet paper.
- Make sure there are baskets or screens on every drain.
- Limit the use of the garbage disposal. When using it, run plenty of water and have the blades sharpened often.
- Dispose of grease and oil in your residential trash.
- Use liquid soaps. Powdered soaps are made with wax that can leave behind a residue.
- Do not flush feminine products, baby wipes, paper towels, or nonbiodegradable materials.
- Make sure all outside drain caps are above-grade, fitted and secured properly.

I am thinking about purchasing a property. The former owner is not providing any information on previous problems or history of maintenance. How can I find out?

A service technician can locate and inspect drain lines for defects and determine:

- if it is a shared line with a neighbor
- if the line is excessively dirty
- evidence of root infiltration
- evidence of pipe deterioration

To be constructed, all onlot systems in the area had to be permitted by the County Health Department. A file search by tax parcel id number and address may provide construction and repair information.

Any information gathered may be put in report form and given to you with recommendations.

Helpful Hints

It is important for residents with septic systems to have a basic knowledge of how their system functions so they can maintain their systems and ensure it is functioning properly to save time and money, and to protect public health and the environment.

- NEVER enter a septic tank. The gasses within the tank can be toxic and fatal.
- Pump your septic tank regularly. Clogged drain fields are the leading reason for septic system malfunctions and failures.
- Conserve water. This prolongs the life of your system. Reducing the water flow into the system helps the solids within the tank to sink to the bottom, producing less agitation within the tank. The likelihood of solids passing into the drain field is then greatly diminished.
- Monitor your water consumption. Your system is designed to handle certain levels of water based on the number of occupants living at your residence. Make adjustments if the water usage increases drastically.
- Always promptly repair leaky fixtures, faucets and toilets. These leaks add up to extra water and agitation of solids in the tank which can lead to eventual system malfunctions.
- Showers require less water than baths.
- Front loading washers use 1/3 less water than top loading units.
- Only use the clothes washer and dishwasher when you have a full load. Think water conservation!
- Always use a trap in your sinks to help prevent larger solids from passing into your tank. These solids can eventually cause clogging problems if not contained.
- Always keep your drain field free of trees, roots, storm and surface water as well any other things that may obstruct and damage the area.
- Know the exact location of your septic tank and drain field. This can save time when the system needs to be pumped or repaired.
- Never drive heavy equipment or vehicles over your drain field. This can damage the area and cause a system failure.
- Always pump the tank through the large central manhole, not the baffle ports. A riser can be installed on the manhole to make it more accessible for pumping.
- Place a copy of your sewage permit and application for a new system in a safe place for possible future use.
- Always read product labels carefully to make sure they are safe for your septic system.
- Use white toilet tissue. It breaks down faster within the tank. The dye in colored tissue holds the fiber together longer and takes longer to break down in the tank.
- NEVER put harmful products or objects into your system.
- Periodically check the visible condition of your system and pump tank mechanisms.
- Make sure your system has been properly designed by a trained professional and meets all SEO (Sewage Enforcement Officer) and DEP (Department of Environmental Protection) regulations.
- Make sure drain lines are not exposed or placed too close to the surface of the ground. Freezing lines can cause serious damage to a system.
- Chemical or biological additives are not a substitute for regular pumping.
- Recognize changes in water quality.
- Know you septic system size, age and condition. If you do not know, have it pumped and inspected to determine these crucial factors.

Exhibit V-8

EPA Management Models

Hatfield Township, Montgomery County

Table 1: Summary of Management Models

TABLE 1: SUMMARY OF MANAGEMENT MODELS

TYPICAL APPLICATIONS	PROGRAM DESCRIPTION	BENEFITS	LIMITATIONS
MODEL 1 - HOMEOWNER AWARENESS MODEL			
• Areas of low environmental sensitivity where sites are suitable for conventional onsite systems.	• Systems properly sited and constructed based on prescribed criteria. • Owners made aware of maintenance needs through reminders. • Inventory of all systems	• Code-compliant system. • Ease of implementation; based on existing, prescriptive system design and site criteria. • Provides an inventory of systems that is useful in system tracking and area-wide planning.	• No compliance/problem identification mechanism. • Sites must meet siting requirements. • Cost to maintain database and owner education program.
MODEL 2 - MAINTENANCE CONTRACT MODEL			
• Areas of low to moderate environmental sensitivity where sites are marginally suitable for conventional onsite systems due to small lots, shallow soils, or low-permeability soils. • Small clustered systems.	• Systems properly sited and constructed. • More complex treatment options, including mechanical components or small clusters of homes. • Requires service contracts to be maintained. • Inventory of all systems. • Service contract tracking system.	• Reduces the risk of treatment system malfunctions. • Protects homeowner investment.	• Difficulty in tracking and enforcing compliance because it must rely on the owner or contractor to report a lapse in a valid contract for services. • No mechanism provided to assess effectiveness of maintenance program.
MODEL 3 - OPERATING PERMIT MODEL			
• Areas of moderate environmental sensitivity such as wellhead or source water protection zones, shellfish growing waters, or bathing/water contact recreation. • Systems treating high-strength wastes or large-capacity systems.	• Establishes system performance and monitoring requirements. • Allows engineered designs but may provide prescriptive designs for specific receiving environments. • Regulatory oversight by issuing renewable operating permits that may be revoked for noncompliance. • Inventory of all systems. • Tracking system for operating permit and compliance monitoring. • Minimum for large-capacity systems.	• Allows systems in more environmentally sensitive areas. • Operating permit requires regular compliance monitoring reports. • Identifies noncompliant systems and initiates corrective actions. • Decreases need for regulation of large systems. • Protects homeowner investment.	• Higher level of expertise and resources for regulatory authority to implement. • Requires permit tracking system. • Regulatory authority needs enforcement powers.
MODEL 4 - RESPONSIBLE MANAGEMENT ENTITY (RME) OPERATION AND MAINTENANCE (O&M) MODEL			
• Areas of moderate to high environmental sensitivity where reliable and sustainable system operation and maintenance (O&M) is required, e.g., sole source aquifers, wellhead or source water protection zones, critical aquatic habitats, or outstanding value resource waters. • Clustered systems.	• Establishes system performance and monitoring requirements. • Professional O&M services through RME (either public or private). • Provides regulatory oversight by issuing operating or NPDES permits directly to the RME. (System ownership remains with the property owner.) • Inventory of all systems. • Tracking system for operating permit and compliance monitoring.	• O&M responsibility transferred from the system owner to a professional RME that is the holder of the operating permit. • Identifies problems needing attention before failures occur. • Allows use of onsite treatment in more environmentally sensitive areas or for treatment of high-strength wastes. • Can issue one permit for a group of systems. • Protects homeowner investment.	• Enabling legislation may be necessary to allow RME to hold operating permit for an individual system owner. • RME must have owner approval for repairs; may be conflict if performance problems are identified and not corrected. • Need for easement/right of entry. • Need for oversight of RME by regulatory authority.
MODEL 5 - RESPONSIBLE MANAGEMENT ENTITY (RME) OWNERSHIP MODEL			
• Areas of greatest environmental sensitivity where reliable management is required. Includes sole source aquifers, wellhead or source water protection zones, critical aquatic habitats, or outstanding value resource waters. • Preferred management program for clustered systems serving multiple properties under different ownership (e.g., subdivisions).	• Establishes system performance and monitoring requirements. • Professional management of all aspects of decentralized systems through public/private RMEs that own or manage individual systems. • Qualified, trained, owners and licensed professional owners/operators. • Provides regulatory oversight by issuing operating or NPDES permit. • Inventory of all systems. • Tracking system for operating permit and compliance monitoring.	• High level of oversight if system performance problems occur. • Simulates model of central sewerage, reducing the risk of noncompliance. • Allows use of onsite treatment in more environmentally sensitive areas. • Allows effective area-wide planning/watershed management. • Removes potential conflicts between the user and RME. • Greatest protection of environmental resources and owner investment.	• Enabling legislation and/or formation of special district may be required. • May require greater financial investment by RME for installation and/or purchase of existing systems or components. • Need for oversight of RME by regulatory authority. • Private RMEs may limit competition. • Homeowner associations may not have adequate authority.

Note: If applicable NPDES requirements under the CWA or UIC requirements under the SDWA supercede any less stringent or inconsistent provision

Appendices

Hatfield Township, Montgomery County

Appendix A

Resolution(s) of Adoption

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION NO. 10-24

A RESOLUTION OF THE COMMISSIONERS OF HATFIELD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA, ADOPTING THE TOWNSHIP'S 537 PLAN.

RECITALS

A. Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection ("DEP") adopted pursuant thereto and being Chapter 71 of Title 25 of the Pennsylvania Code, requires the Hatfield Township ("Township") to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the Township.

B. Hatfield Township Municipal Authority ("Authority"), the entity responsible for the disposal and treatment of sewage wastes within the Township, through its engineer, CET Engineering Services, has prepared an "Act 537 Plan Update" which provides for the sewage facilities in a portion of Hatfield Township.

C. Based upon studies and available alternatives, the alternative of choice to be implemented is the re-rate of the existing Advanced Wastewater Treatment Facility to meet existing and future flow requirements and the implementation of a Sewage Management Program to provide oversight of the existing on-lot sewage disposal systems within the Township. The key implementation activities/ dates include the following:

- Adoption of Act 537 Plan Revision: October 2010
- Submission of Act 537 Plan Revision to DEP November 2010
- Approval of Act 537 Plan Revision: May 2011
- Implementation of Alternatives 1 and 2: June 2011

D. The Township finds that the Act 537 Plan Update described above conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Hatfield Township hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the Township, the above referenced Act 537 Plan Update. The Township hereby assures the Department of the complete and timely implementation of the said plan as required by law.

HATFIELD TOWNSHIP

BY: _____
Scott Brown, President

I, Andrew Haines, Secretary of Hatfield Township, hereby certify that the foregoing is a true copy of Township Resolution No. 10-22, adopted October 27, 2010.

ATTEST: _____
Andrew S. Haines
Township Manager/Secretary

HATFIELD TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
RESOLUTION NO. 10-24

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HATFIELD TOWNSHIP

BY: _____
Scott Brown, President

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ATTEST: _____
Andrew S. Haines
Township Manager/Secretary

Appendix B

Montgomery County Planning Commission and Health Department Comments

CET ENGINEERING SERVICES

November 23, 2010

Montgomery County Planning Commission
Montgomery County Courthouse
P.O. Box 311
Norristown, PA 19404
Attn: Jon A. Lesher

Re: Hatfield Township Act 537 Plan Revision
Montgomery County Planning Commission Review Comments

Dear Jon,

Hatfield Township has finalized and adopted the Act 537 Plan Revision reviewed by the County in May of this year. Thank you for your comments. As such, we are providing responses to these comments, to be included in the submission to PA DEP.

Comment 1: On-lot Management Ordinance – The County supports this measure and would be willing to assist Hatfield Township with this process.
Response 1: Thank you. The Township has passed an On-lot Management Ordinance (included in the Plan) and will contact the County for assistance upon approval by DEP.

Comment 2: Soil Survey Map – The proposed update revision using soil data gained from the Montgomery County Soil Survey. Please be aware that Montgomery County now uses the Web Soil Survey from USDA and NRCS for our soil mapping data.
Response 2: Soil information from all the sources listed above, and others, was used in the preparation of the Plan Revision.

A copy of the Plan Revision is available at Hatfield Township and HTMA for your review at any time.

Thanks very much, please don't hesitate to contact us should you have any concerns.

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

CET ENGINEERING SERVICES

March 24, 2010

Montgomery County Planning Commission
Montgomery County Courthouse
P.O. Box 311
Norristown, PA 19404

Re: Hatfield Township DRAFT Act 537 Plan Revision
Montgomery County Planning Commission Review

To Whom It May Concern:

Enclosed is a draft copy of the Hatfield Township Act 537 Sewage Facilities Plan Update, which the Township is prepared to adopt. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the county. We are forwarding the enclosed document to you on behalf of the Hatfield Township Board of Commissioners in order to meet this requirement. All County comments will be considered, with written responses provided to the County and included in the final plan.

The Hatfield Township Board of Commissioners would like to submit their plan as soon as possible. Any assistance in expediting the County's review, therefore, would be appreciated. Please contact us if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township (no enclosure)
Peter Dorney, Hatfield Township Municipal Authority (no enclosure)

MONTGOMERY COUNTY PLANNING COMMISSION
box 311 • norristown • pennsylvania • 19404-0311 • 610-278-3722
office location: suite 201 • one montgomery plaza • swede & airy streets • norristown pa
FAX 610-278-3941 • Website www.montcopa.org/plancom

SEWAGE FACILITIES PLANNING MODULE
COMPONENT 4b - COUNTY PLANNING AGENCY REVIEW

5/10/2010

MCPC 537 Number: 10-2027
Hatfield Township Act 537 Sewage Facilities Plan Update
Hatfield Township
Date revision received by the County Planning Commission:
3/25/2010

Andrew Haines, Manager
Hatfield Township
1950 School Rd.
Hatfield, PA 19440-1992

Dear Mr. Haines:

We have reviewed this application for a revision to the Township's Sewage Facilities Plan in accordance with regulations issued under Act 537, "The Pennsylvania Sewage Facilities Act," as requested. We are forwarding this letter as a report of our review and recommendations.

BACKGROUND

Hatfield Township has submitted an Act 537 Official Plan Update Revision for review. The purpose of the Update Revision is to evaluate the adequacy of existing sewage facilities, to identify on-lot sewage disposal needs areas and to identify and evaluate alternatives, as necessary, for the continued use of existing facilities. To achieve these purposes, the proposed Update Revision concludes the following actions should be taken. The necessary additional permitted capacity required at the Hatfield Township Municipal Authority Wastewater Treatment Plant would be provided through a hydraulic re-rate up to 7.5 MGD ADF and 11.55 MGD MMF. For on-lot sewage disposal needs in the Township, the Update Revision proposes two actions. In the Derstine Road Study Area (DRSA), an extension of the conventional collection system from the Towamencin system as part of a proposed development project would be preferable. The alternative for the DRSA would be to continue the use of the on-lot systems in the area and enact a Township sewage management program with an on-lot sewage disposal system ordinance.

COMMENTS

On-lot Management Ordinance – The County supports this measure and would be willing to assist Hatfield Township with this process.

Soil Survey Map – The proposed Update Revision using soil data gained from the Montgomery County Soil Survey. Please be aware that Montgomery County now uses the Web Soil Survey from USDA and NRCS for our soil mapping data.

RECOMMENDATION

Once these issues have been addressed to the satisfaction of the Township and DEP, we have no objection to this 537 Planning Module. Should there be any questions regarding the content of this letter, please contact me at (610) 278-3750.

Sincerely,

Jon A. Lesher
Environmental Planner
(610) 278-3750
jlesher@montcopa.org

c: Elizabeth Mahoney, DEP, SERO
Peter Dorney, HTMA Exec. Director
Joel Kostelac, CET Engineering Services

RECEIVED
MAY 12 2010
CET, INC.
HARRISBURG, PA

CET ENGINEERING SERVICES

March 24, 2010

Walter Higgins, SEO
Montgomery County Health Department
Montgomery County Human Services Center
P.O. Box 311
Norristown, PA 19404

Re: Hatfield Township DRAFT Act 537 Plan Revision
Montgomery County Health Department Review

Dear Walter,

Enclosed is a draft copy of the Hatfield Township Act 537 Sewage Facilities Plan Update, which the Township is prepared to adopt. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official health departments of the county. We are forwarding the enclosed document to you on behalf of the Hatfield Township Board of Commissioners in order to meet this requirement. All comments will be considered, with written responses provided to the County and included in the final plan.

The Hatfield Township Board of Commissioners would like to submit their plan as soon as possible. Any assistance in expediting the Department's review, therefore, would be appreciated. Please contact us if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Enclosure

Xc: Andrew Haines, Hatfield Township (no enclosure)
Peter Dorney, Hatfield Township Municipal Authority (no enclosure)

COUNTY OF MONTGOMERY

Commissioners
James R. Matthews
Chairman
Joseph M. Hoeffel Bruce L. Castor, Jr.

Joseph M. DiMino, DO
Director of Health/Medical Director

MONTGOMERY COUNTY HEALTH DEPARTMENT
1430 DeKalb Street, PO Box 311
Norristown, PA 19404-0311
Phone: 610-278-5117 Fax: 610-278-5167
TDD: 610-631-1211
www.health.montcopa.org

RECEIVED
APR 29 2010
CET, INC.
HARRISBURG, PA

April 22, 2010

Joel Kostelac, P.E.
CET Engineering Services
1240 N. Mountain Road
Harrisburg, PA 17112

Re: Hatfield Township DRAFT Act 537 Plan Revision
Hatfield Township, Montgomery County

Dear Mr. Kostelac:

The Montgomery County Health Department (MCHD) has reviewed the Hatfield Township DRAFT Act 537 Plan Revision for Hatfield Township, Montgomery County. MCHD has no objections at this time to the proposed revision of the Hatfield Township official plan.

If you have any further questions, please contact me at (610) 278-5117 ext 6729.

Sincerely,

Walter Higgins
Environmental Health Specialist/SEO
Division of Water Quality Management
whiggins@montcopa.org

Enclosures

xc: Department of Environmental Protection, SERO
Andrew S. Haines, Hatfield Township Manager
File

CET ENGINEERING SERVICES

March 30, 2010

Hatfield Township Planning Commission
1950 School Road
Hatfield, PA 19440

Re: Hatfield Township Act 537 Plan
Planning Commission Comment Request

Dear Planning Commission,

On behalf of the Hatfield Township Board of Commissioners, CET Engineering Services requests your review and comment of the Hatfield Township Act 537 Sewage Facilities Plan Update, a copy of which is available at the Township office. The Act 537 Plan Revision proposes a hydraulic re-rate of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain onlot systems, and to identify, repair or replace malfunctioning systems.

As you are aware, one of the requirements of the 537 Plan is to provide evidence that the municipality has requested, reviewed and considered comments by appropriate official planning agencies of the Township. All comments will be considered, with written responses provided to the Township Planning Commission and included in the plan.

Please feel free to contact CET Engineering Services if you have questions or need additional information

Sincerely,

Joel Kostelac, P.E.
Staff Engineer

Xc: Andrew Haines, Hatfield Township
Peter Dorney, Hatfield Township Municipal Authority

HATFIELD TOWNSHIP PLANNING COMMISSION MEETING MINUTES
April 20, 2010

I. CALL TO ORDER

Vice-Chair Miller called the meeting to order at 7:35pm. Other members present were Mr. Hughes and Mr. Rogers. Staff members present were Ms. Abromavitz and Mr. Amey.

II. MINUTES

Mr. Hughes made a motion to approve the minutes of March 16, 2010 as submitted. Mr. Rogers seconded the motion and it passed unanimously.

III. SUBDIVISIONS & LAND DEVELOPMENTS

A. Oak Tree Industrial Associates – (09-03)

Mr. Altemose appeared with his engineer, Shimon Guy, and explained the project and the improvements proposed for the Bergey Road frontage. Mr. Altemose noted that he is willing to improve the frontage of the Diaddezio property as well if the property owner will agree to allow the work to be done. Waivers have been requested for plan scale, 6" curb reveal, a narrower buffer than required along the Diaddezio property line, location of trees along the right of way of Bergey Road, and size of trees in the PPL right of way. The only waiver the Planning Commission had concern about was the buffer along the Diaddezio's line; they asked Mr. Amey to contact the property owners to be sure they agreed with the buffer plantings and the trail location.

The other outstanding issue is approval from PPL for work in their right of way. Mr. Altemose will return once he has approval from PPL and in the meantime Mr. Amey will contact the Diaddezio's to get their reaction to the plans.

Mr. Altemose will return once these issues are resolved.

IV. OTHER BUSINESS

A. Mr. Amey reviewed the new Act 537 Plan prepared by the HTMA and their engineer. He explained that Township staff has been working with the authority for over two years and the plan is now ready to be submitted to DEP. This plan will resolve issues of concern to DEP, will plan for the proper monitoring of on-site systems, and will

plan for service to areas of the Township currently not provided with sanitary sewer service. Mr. Hughes made a motion to endorse the new 537 Plan. Ms. Miller seconded the motion and it passed unanimously.

B. Mr. Hughes noted that after this meeting he would be stepping down as a member of the Planning Commission. The other members wished him well as he continues his service to the Township as the 3rd Ward Commissioner.

V. ADJOURNMENT

With no further business to transact, the meeting was adjourned at 8:45pm.

Appendix C

Proof of Public Notice

Bucks County, SS.

HATFIELD TWP MUNICIPAL
3200 ADVANCE LN
COLMAR, PA 18915

3-2158229300
0005831631-01

Laurie Clark being duly affirmed according to law, deposes and says that he/she is the Legal Billing Co-ordinator of the CALKINS NEWSPAPER INCORPORATED, Publisher of The Intelligencer, a newspaper of general circulation, published and having its place of business at Doylestown, Bucks County, Pa. and Horsham, Montgomery County, Pa.; that said newspaper was established in 1886; that securely attached hereto is a facsimile of the printed notice which is exactly as printed and published in said newspaper on

March 23, 2010

and is a true copy thereof; and that this affiant is not interested in said subject matter of advertising; and all of the allegations in this statement as to the time, place and character of publication are true.

Laurie Clark
LEGAL BILLING CO-ORDINATOR

Affirmed and subscribed to me before me this 23rd day of March 2010 A.D.

Karen McGovern

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Karen McGovern, Notary Public
Tullytown Boro, Bucks County
My Commission Expires Feb. 19, 2013
Member, Pennsylvania Association of Notaries

Ad Content Proof

NOTICE
HATFIELD TOWNSHIP, MONTGOMERY COUNTY
ACT 537 SEWAGE FACILITIES PLAN SPECIAL STUDY

Section 5 of Act 537 of January 24, 1966, P.L. 1535, known as the "Pennsylvania Sewage Facilities Act", as amended, and Chapter 71.31 of Title 25 of the Pennsylvania Code of the Pennsylvania Department of Environmental Protection Rules and Regulations, requires that this Public Notice be published as a service to the public.

Notice is hereby given that the Board of Commissioners of Hatfield Township (Township), Montgomery County, having prepared an Act 537 Sewage Facilities Plan Revision (Act 537 Plan) for the Township with the stated purpose to protect public health, to prevent sewage disposal problems and to protect groundwater and surface waters of the Commonwealth. The Act 537 Plan Revision proposes hydraulic relief of the Hatfield Township Municipal Authority's Advanced Wastewater Treatment Plant. The plan also addresses the management of sewage facilities in the Township including plans to maintain on-lot systems, and identify, repair or replace malfunctioning systems.

Publication of this notice establishes a 30-day comment period. Copies of the Act 537 Plan Revision are available for public inspection from 8:00 a.m. through 4:00 p.m. at the Hatfield Township Building, 1950 School Road, Hatfield, PA 19440 and at the Hatfield Township Municipal Authority at 3200 Advance Lane, Colmar, PA 18915. Residents of Hatfield Township and other interested parties should submit their comments to the Township on or before Friday, April 30, 2010.

If you are a person with a disability who wishes to review and comment on the proposed Plan and requires an accommodation to do so, please contact Hatfield Township Municipal Services at 215-368-5100 to discuss how the Township may best accommodate your needs.

1t M 23

PUBLIC NOTICE
HATFIELD TOWNSHIP, MONTGOMERY COUNTY
ACT 537 SEWAGE FACILITIES PLAN SPECIAL STUDY

Section 5 of Act 537 of January 24, 1966, P.L. 1535, known as the "Pennsylvania Sewage Facilities Act", as amended, and Chapter 71.31 of Title 25 of the Pennsylvania Code of the Pennsylvania Department of Environmental Protection Rules and Regulations, requires that this Public Notice be published as a service to the public.

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If you are a person with a disability who wishes to review and comment on the proposed Plan and requires an accommodation to do so, please contact the Hatfield Township Municipal Offices at 215-855-0900 to discuss how the Township may best accommodate your needs.

Appendix D

Comments and Responses

HATFIELD TOWNSHIP

Board of Commissioners
Scott Brown
President
Tom Zipfel
Vice President
Larry Hughes
Tom Landauer
John Thinnes

Township Manager
Andrew S. Haines

27 May 2010

Mr. Pete Dorney
Hatfield Township Municipal Authority
3200 Advance Lane
Colmar, PA 18915-9729

Re: 537 Plan Public Comment Period

Dear Pete,

The public comment periods on the Act 537 Plan update has closed, and please accept this letter to confirm that Hatfield Township did not receive any comments to the draft plan.

Should you have any questions or concerns, please do not hesitate to contact me at your convenience.

Sincerely,

Andrew S. Haines
Township Manager

Cc: Act 537 Plan File

Plates

Plates 1 – 6

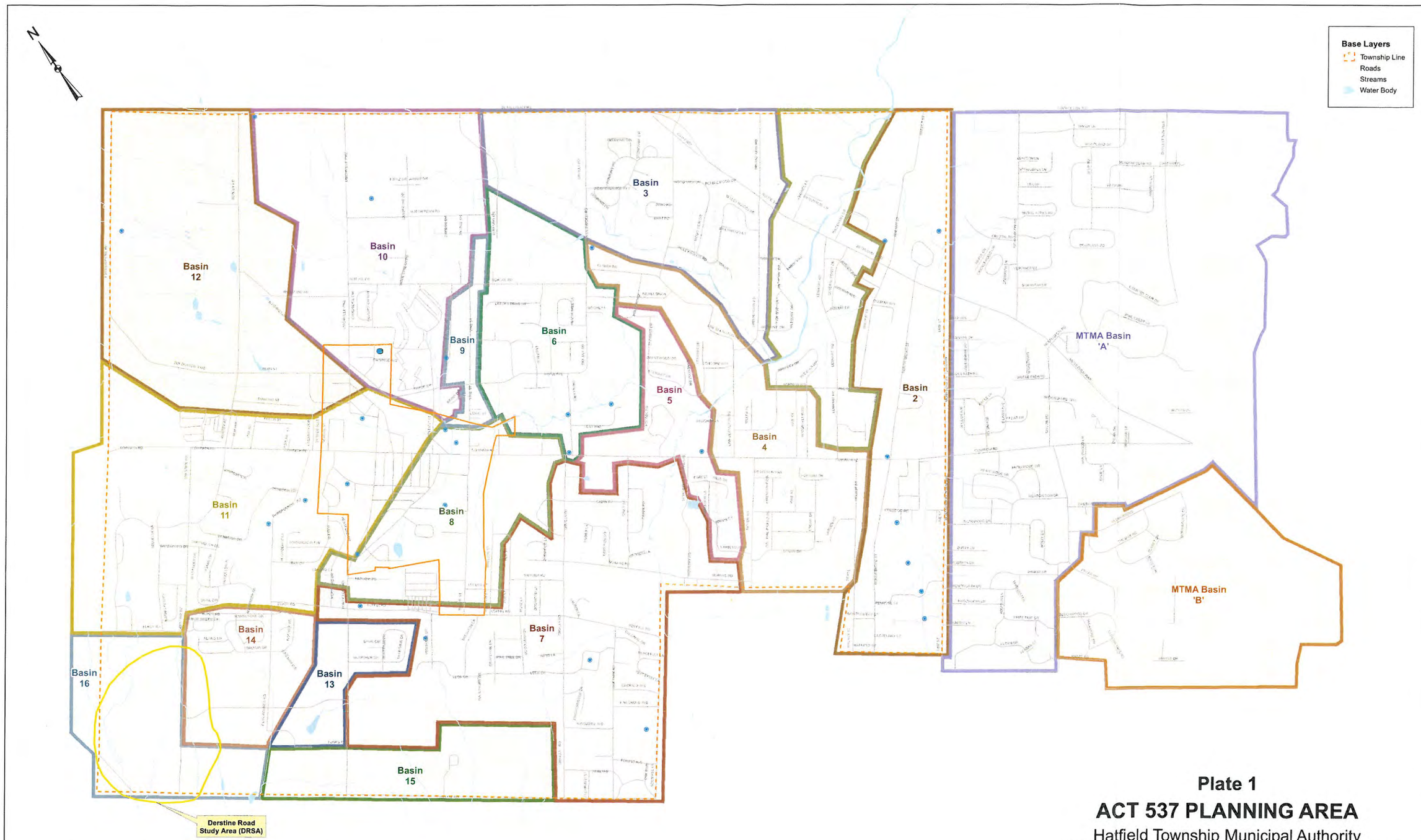

Plate 1

ACT 537 PLANNING AREA

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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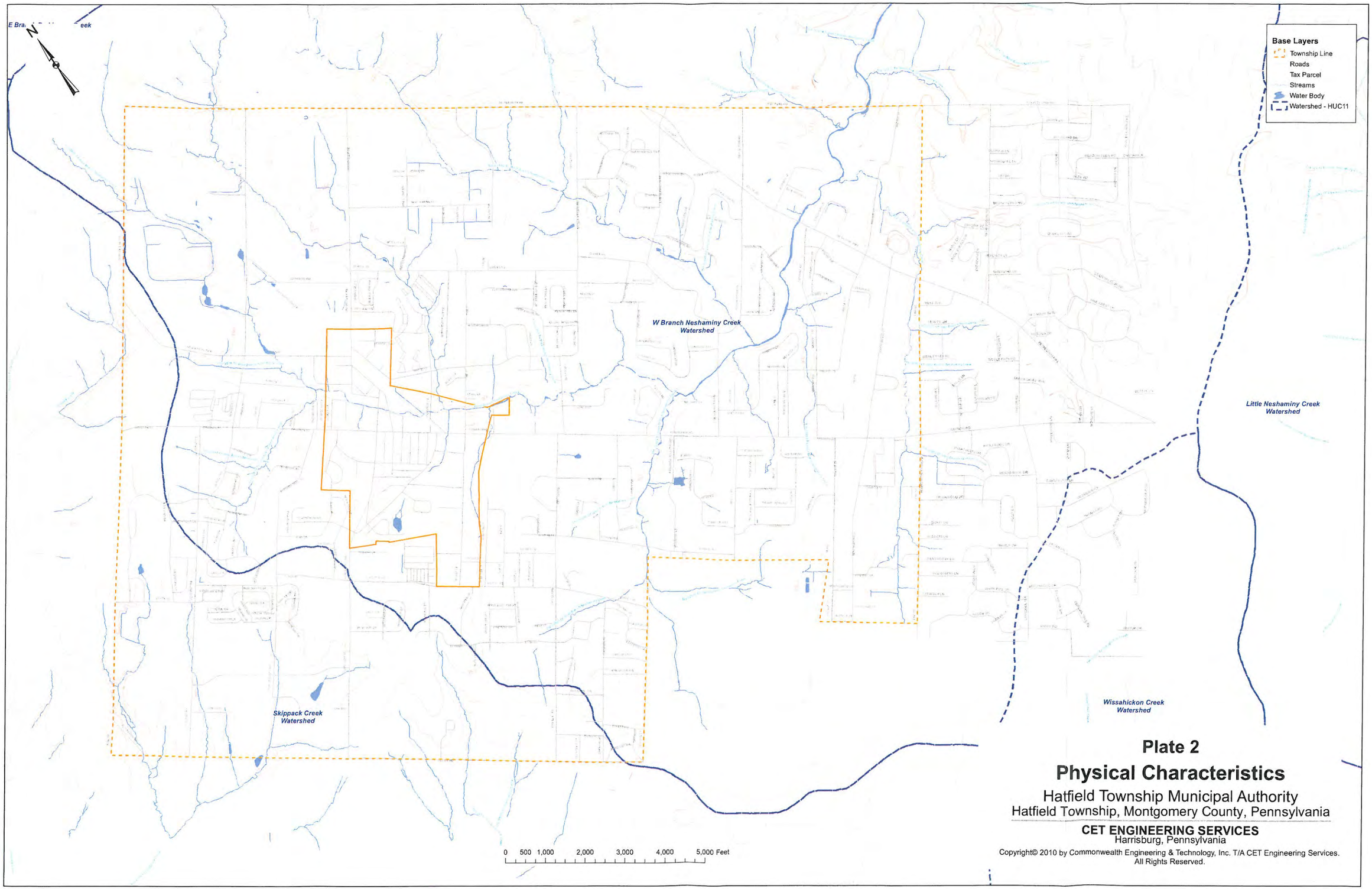

Plate 2

Physical Characteristics

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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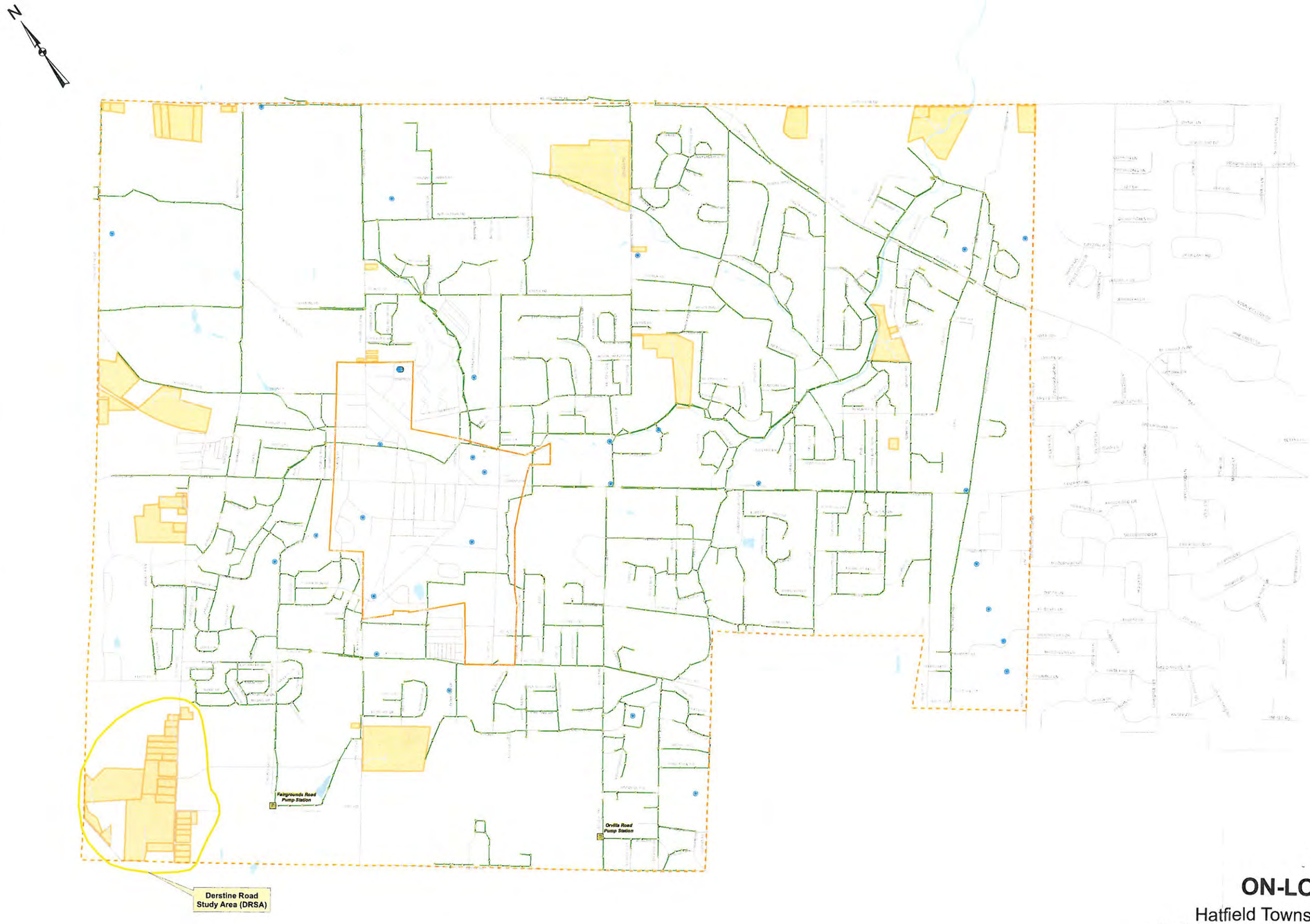

Plate 3

ON-LOT SYSTEMS

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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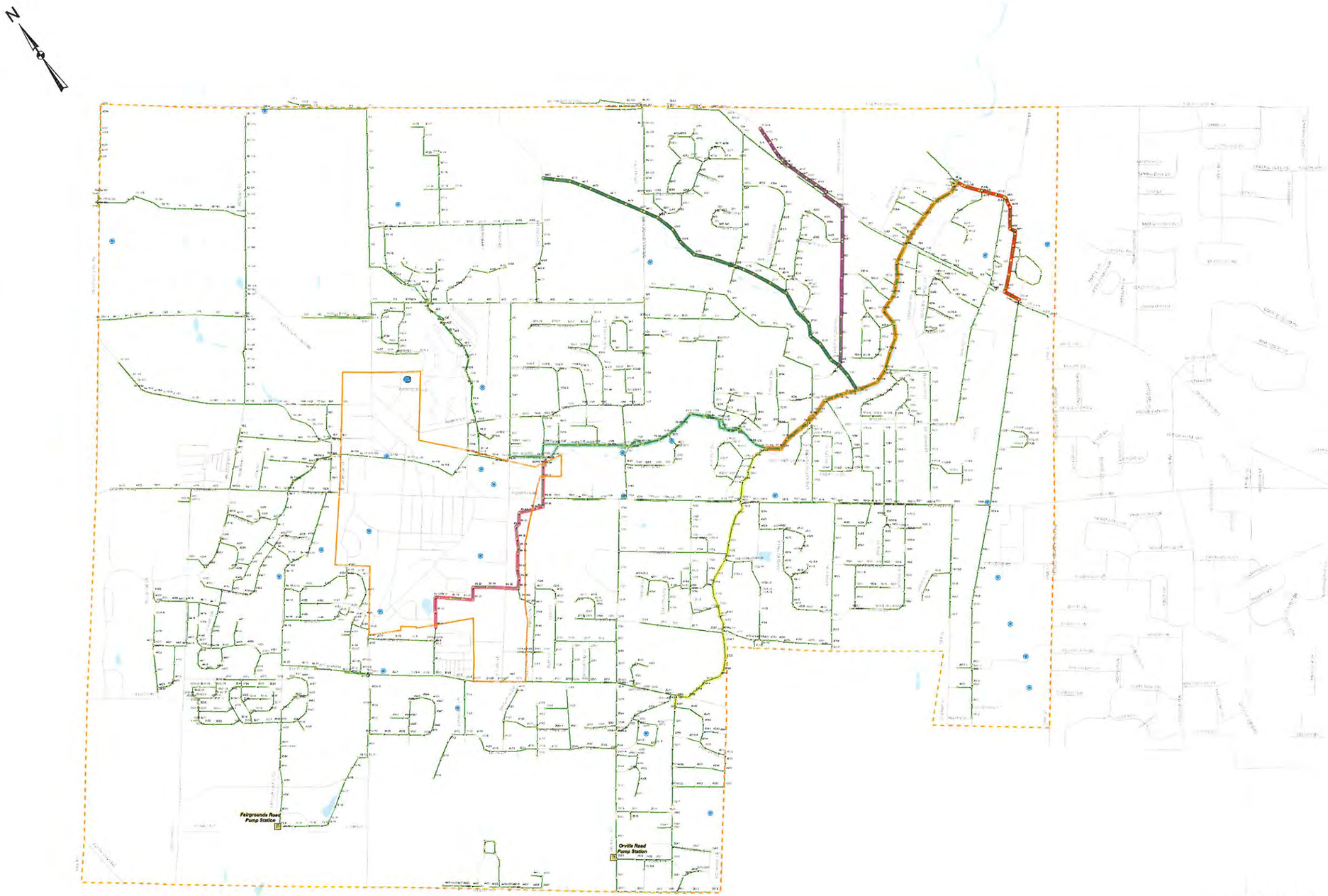

Plate 4

SANITARY SEWER SYSTEM

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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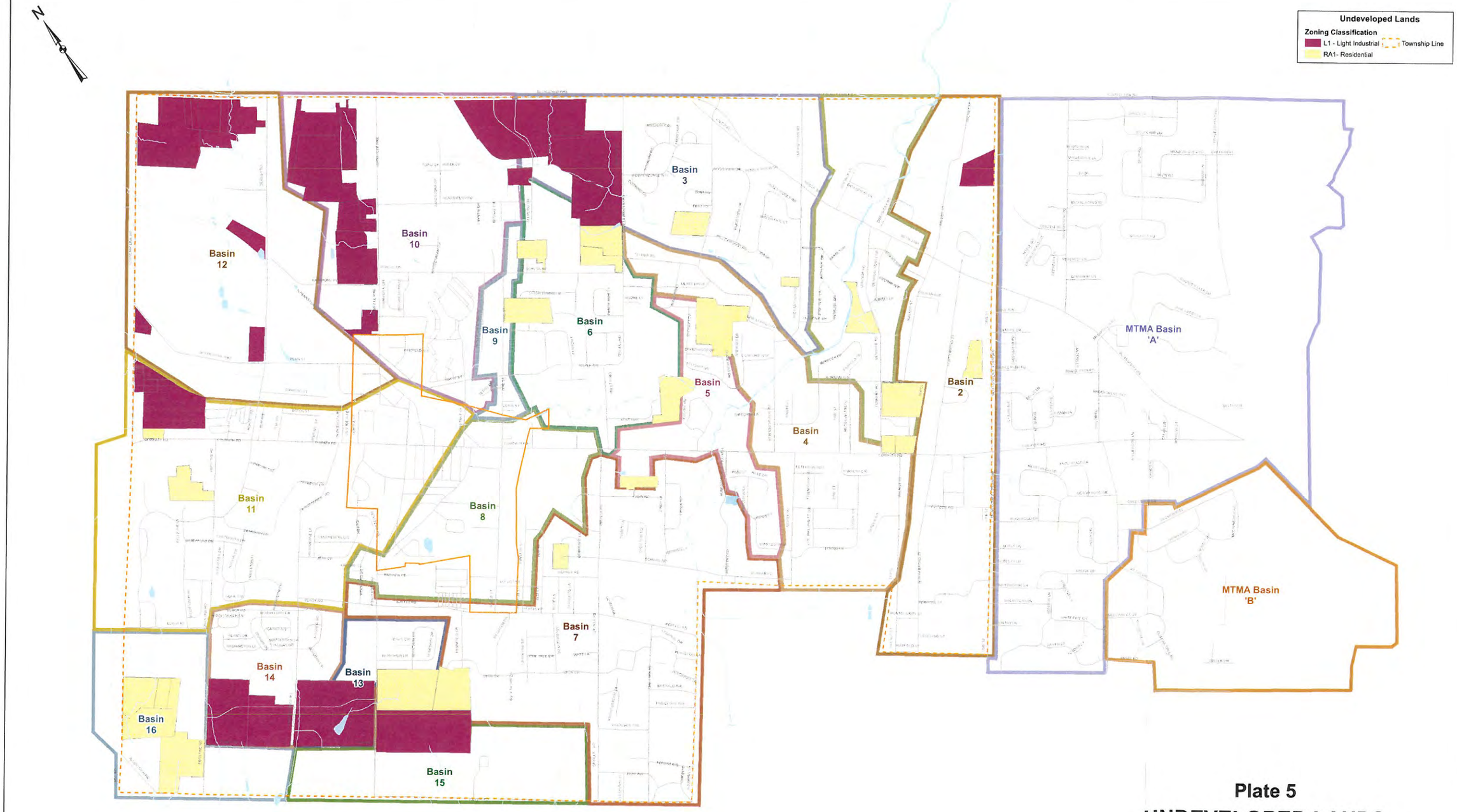

Plate 5

UNDEVELOPED LANDS

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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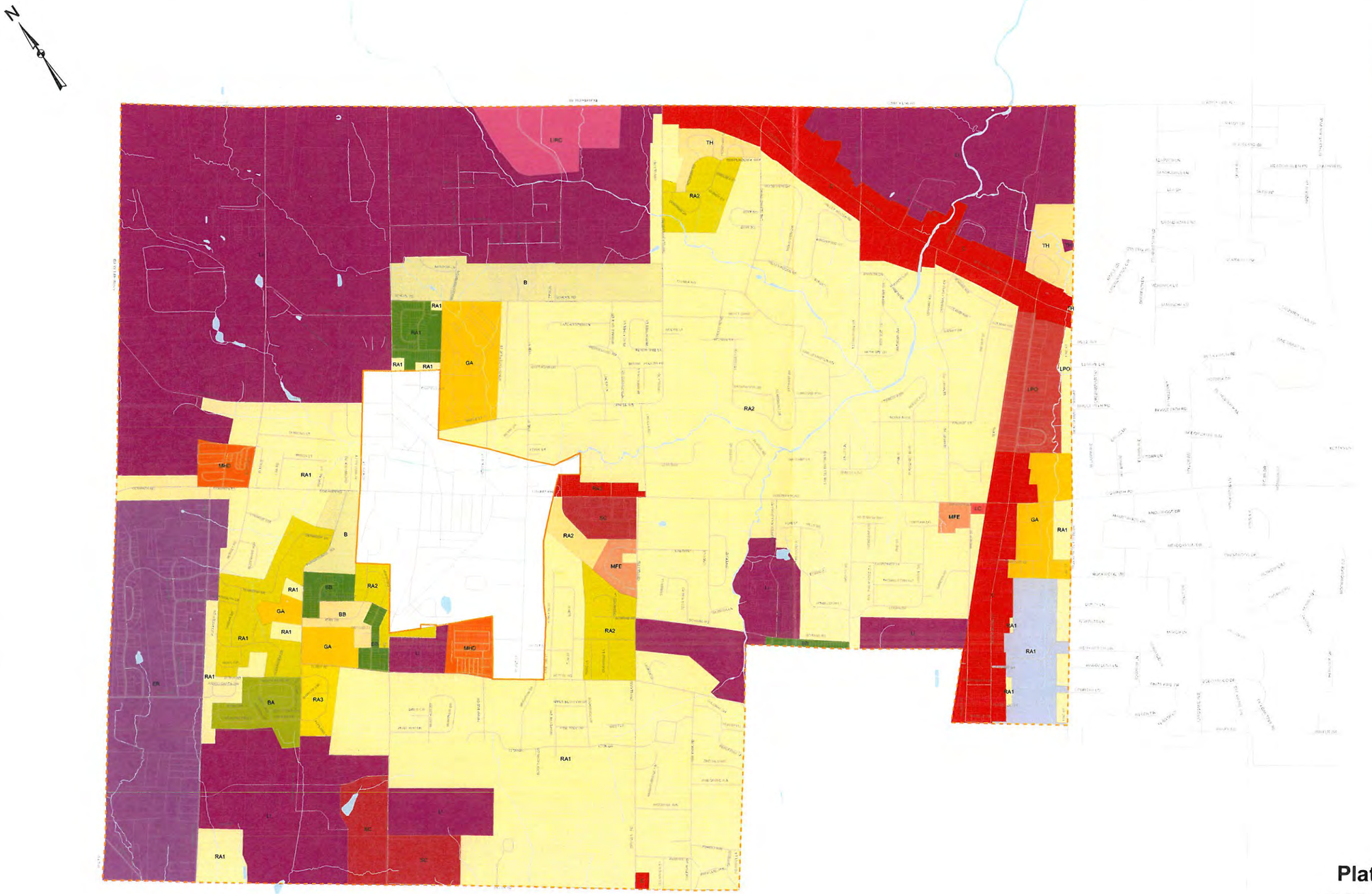

Plate 6
ZONING

Hatfield Township Municipal Authority
Hatfield Township, Montgomery County, Pennsylvania

CET ENGINEERING SERVICES
Harrisburg, Pennsylvania

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PLAN SUMMARY

INTRODUCTION

Upper Gwynedd Township (UGT or The Township) is currently served by two wastewater treatment plants (WWTP). These are the UGT WWTP and the Towamencin Municipal Authority (TMA) WWTP. The TMA WWTP was formerly known as the Upper Gwynedd Towamencin Municipal Authority (UGTMA) WWTP. UGT owns and operates the UGT WWTP. TMA owns and operates the TMA WWTP.

UGT has a sanitary sewer collection system that serves the entire Township. A ridge line runs mostly north south through UGT and divides the Township into two service areas. The ridge line starts just north of where Church Road intersects with Hancock Road and extends south to a point just west of the intersection of Broad Street and Morris Road. The UGT WWTP serves the portion of UGT that is east of this ridge line. The TMA WWTP serves the portion of UGT west of the ridge line. Reference is made to the map attached in Appendix A.

The UGT WWTP service area has two main interceptor sewer lines that collect flow. These are the Southwest Interceptor and the East Interceptor. The Kriebel Road Interceptor serves the portion of the UGT service area that flows to the TMA WWTP. Once again, reference is made to the map in Appendix A.

A. SERVICE AREA ISSUES

UGT feels that it will better serve the needs of its residents and other customers by treating all flow from the Township at the UGT WWTP. This consolidation of flow will lead to more efficiency for UGT and is in the best interests of its residents.

B. CORRECTIVE ALTERNATIVES

UGT will physically divert a significant majority of flow in the Township that currently goes to the TMA (formerly Upper Gwynedd Towamencin Municipal Authority (UGTMA)) WWTP, to the UGT WWTP. This will require modifications to the UGT collection system and the UGT WWTP. These modifications are described in Section V.

As will be documented in this Act 537 Plan-Special Study (Special Study or Act 537 Plan), an Agreement was negotiated and finalized between UGT and Towamencin Township (TT) to divert UGT flow that currently goes to the TMA WWTP, to the UGT WWTP. In this Agreement, TT agreed to support UGT's efforts to divert flow. This Agreement was the document which provided for UGT to leave the UGTMA. The Agreement is attached in Appendix B.

C. COST OF IMPLEMENTING CORRECTIVE ACTION ALTERNATIVES

Over the next approximately four years, it is estimated that diverting UGT's flow will cost $27,000,000 and require approximately fifteen million dollars in financing (reference is made to Section VI). However, there is significant, long term benefit that will accrue to UGT to help pay for this project.

Very significant expenditures will be required in the future to maintain and upgrade the TMA WWTP and the Kriebel Road Interceptor, and also to meet anticipated future, stricter Pennsylvania Department of Environmental Protection (PADEP) discharge limits. UGT's share of these costs would be significant. An independent study authorized by both UGT and TT was performed by a nationally recognized engineering consulting firm, Hazen & Sawyer. Based on this study, the UGT share of the cost is $33,800,000. Instead of spending money at the TMA WWTP and on the Kriebel Road Interceptor, UGT will invest in its own collection system and WWTP to better serve its customers.

In addition, UGT received $7,100,000 as part of the legal agreement included in Appendix B which will help pay for the Flow Diversion project.

D. MUNICIPAL COMMITMENT

As stated above, UGT has finalized a legal agreement with TT to provide for the flow diversion project. UGT is fully committed to this project. UGT is making a commitment to adopt annual budgets and secure the funding necessary to successfully implement the project. UGT plans on a bond issue to help finance the project.

E. IMPLEMENTATION SCHEDULE

The project schedule is attached as Appendix C. This schedule includes all significant milestones and incorporates all regulatory and other outside entity approval.

F. AGENCY AND PUBLIC COMMENT DOCUMENTATION

UGT will make sure that all required public and agency comments are solicited. This includes a 30 day public comment period, comments from the Montgomery County Planning Commission and Health Department, and the UGT and TT Planning Commissions. Evidence of soliciting comments will be provided including Proof of Publication for the public comment period. UGT will address all comments and will include both the comments and responses to comments prior to submission to the PADEP. After addressing comments, UGT and TT will adopt resolutions prior to sending the completed Special Study to the PADEP for review and approval.

G. REFERENCE TO APPENDICES OF SUPPORTING DOCUMENTATION

The following required supporting documentation has been included in Appendices to this Report:

- Appendix D - Montgomery County Planning Commission and Health Department notification
- Appendix E - UGT and TT Planning Commissions notification
- Appendix F - Proof of Publication of Public Notice
- Appendix G – Agency and Public Comments and the municipal response to comments
- Appendix H - Original signed and sealed Resolutions by UGT and TT
- Appendix I – PADEP Act 537 Plan Content Checklist

Please note that the documentation for Appendix G and Appendix H will not be available until after the comment periods.

I. PREVIOUS WASTEWATER PLANNING

I.A SEWAGE FACILITIES PLANNING

In order to establish wastewater facility planning objectives and needs, a review of previously completed wastewater planning information is necessary. In addition, existing and proposed wastewater treatment planning and projected growth for the service area must be considered.

Previous wastewater planning for Upper Gwynedd Township has included previous Act 537 Plans, two Act 537 Plan Special Studies, various Sewage Facilities Planning Modules for individual development projects, annual Chapter 94 Wasteload Management Reports, and a Corrective Action Plan (CAP).

The most recent Act 537 document on record is the Act 537 Plan - Special Study done as part of UGT's CAP. This Special Study was published for public comment in June 2016 and was submitted to PADEP in August 2016 for review and approval.

This Act 537 Plan - Special Study focuses on the Flow Diversion project which will divert flow from UGT that currently goes to the TMA WWTP, to the UGT WWTP.

II. PHYSICAL DESCRIPTION OF PLANNING AREA

II. A PLANNING AREA

Sewage collection in Upper Gwynedd Township is delineated into two service areas. (Refer to Appendix A). The service area east of the ridge line flows to the UGT WWTP. Flow to the west of the ridge line flows to the TMA WWTP.

A significant majority of the flow that currently goes to the TMA WWTP is proposed to be diverted to the UGT WWTP. The service area east of the ridge line will continue to flow to the UGT WWTP. Flow from the service area west of the ridge line is proposed to be diverted to the UGT WWTP.

II.B WETLANDS AND 100 YEAR FLOOD PLAIN

The diversion of flow that currently goes to the TMA WWTP, to the UGT WWTP will require two pump stations and two force mains. This will be described in greater detail in Section V. The proposed pump stations and force main routes are shown in Appendix A and Appendix J.

II.B.1 WETLANDS

Construction of the force main in the area adjacent to Musket Drive and in areas between North Wales Road and the UGT WWTP is expected to temporarily disturb existing wetlands. When the design is being prepared, a formal wetlands delineation for all disturbed areas will be performed. Any construction activity disturbing wetlands will be

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

The pump stations will be constructed outside the 100 year flood plain. Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

III. EVALUATION OF EXISTING WASTEWATER FACILITIES

III.A UPPER GWYNEDD TOWNSHIP WASTEWATER TREATMENT FACILITIES

Domestic and industrial wastewater generated within Upper Gwynedd Township is treated at the Upper Gwynedd Township Wastewater Treatment Plant and the Towamencin Municipal Authority Wastewater Treatment Plant.

The approximate dividing line for the two service areas within UGT is located on a ridge line shown in Appendix A. The flow east of the ridge line flows to the UGT WWTP and the flow to the west of the ridge line flows to the TMA WWTP. This Special Study includes a description of only the UGT WWTP. A flow schematic of the existing UGT WWTP is included in Appendix K.

The WWTP includes the following treatment unit operations:

- Headworks
- Flow Equalization
- Primary Clarification
- Activated sludge secondary treatment
- Tertiary phosphorus treatment
- Secondary clarification
- UV disinfection

The UGT WWTP has adequate capacity to handle the existing flow. Adequate capacity also exists for projected, future growth from new development. However, additional capacity will be needed for the Flow Diversion. This will be discussed further in Sections IV and V.

Using flow data from the UGT 2015 Chapter 94 report, the current, available capacity is 0.803 MGD and the projected five year future, available capacity is 0.643 MGD. The available capacity does not factor in capacity needed for the flow diversion.

There have been no operating problems with the UGT WWTP. There is no expansion or upgrade of treatment processes currently in progress. There will be treatment plant modifications that are needed to handle the flow being diverted. This will be discussed in Sections V and VI.

UGT WWTP

Location:	Township Line Road west of Swedesford Road Upper Gwynedd Township
NPDES Permit No.:	PA 0023256
Clean Streams Law Permit No.	WQM Permit #4691420
Receiving Stream & Classification:	Wissahickon Creek; TSF (Trout Stocking) MF (Migratory Fishes)
Hydraulic Design Capacity:	6.5 Million Gallons Per Day (MGD)

Annual Average Flow for Effluent

Limit Calculations: 5.7 MGD

A complete copy of the current NPDES permit for the Upper Gwynedd WWTP is included in Appendix L.

III.B UPPER GWYNEDD TOWNSHIP COLLECTION SYSTEM

The UGT collection system serves the entire Township. As stated earlier, UGT is currently served by two wastewater treatment plants. The portion of the UGT collection system that flows to the TMA WWTP is located west of the ridge line. The portion of the collection system that flows to the UGT WWTP is located east of the ridge line. The UGT collection system is located entirely within the Township and is owned by Upper Gwynedd. Reference is made to Appendix A which includes the UGT Collection System.

III.B.1 UGT WASTEWATER TREATMENT PLANT SERVICE AREA

The UGT WWTP service area is served by two main interceptors.

1. The Southwest Interceptor (known as the Northwest Interceptor north of Sumneytown Pike) service area includes the central and southwestern portions of the Township and includes flow from North Wales Borough and portions of Worcester, Whitpain, and Montgomery Townships. The Southwest Interceptor starts north of Sumneytown Pike as an

18” pipe. It changes to a 24” pipe once it crosses Sumneytown Pike and then gradually increases in size until it becomes a 42” sewer line before connecting to the UGT WWTP.

Most flow through the Southwest Interceptor is by gravity. There are also several pump stations which are used to get flow to this interceptor.

2. The East Interceptor service area serves the eastern portion of the Township and a small portion of Lower Gwynedd Township. Wastewater from a portion of the Foulkeways community in Lower Gwynedd Township is pumped via a force main to this interceptor. The East Interceptor starts out as a 10” sewer line, increases in size to a 15” line, and finally to an 18” sewer line. The East Interceptor flows to the Southwest Interceptor just upstream of where the Southwest Interceptor connects with the UGT WWTP.

III.B.2 TMA WASTEWATER TREATMENT PLANT SERVICE AREA IN UGT

The TMA service area in UGT is served by the Kriebel Road Interceptor (KRI). All flow from UGT to the TMA WWTP is by gravity.

The KRI starts in UGT, north of Sumneytown Pike and east of Route 363 (Valley Forge Road). The KRI starts as a 10” pipe and changes to a 15” pipe just before it crosses Sumneytown Pike. Once the KRI crosses Route 363, wastewater from Towamencin Township flows to the KRI. The pipe increases in size to 20” before ending at the TMA WWTP.

III.B.3 COLLECTION SYSTEM DIVERSION AREAS

There are four points where the flow from UGT crosses Valley Forge Road (Route 363) from UGT into TT. These four crossing points are shown in Appendix A on the UGT Collection System map.

The first crossing point is just south of the Sumney Forge Shopping Center located at the corner of Sumneytown Pike and Valley Forge Road. This crossing point contains approximately eighty to eighty five percent (80-85%) of the total flow from UGT to the TMA WWTP.

The second crossing point is at Jacks Lane. This contains approximately six percent (6%) of the total flow from UGT to the TMA WWTP.

The third crossing point is located at Anders Road. This contains the smallest amount of flow of the four crossing points, approximately one percent (1%) of the total flow.

The fourth crossing point is located just north of the Pennsylvania Turnpike bridge on Valley Forge Road. This crossing point contains approximately eleven percent (11%) of the total flow.

Flow from the first and the fourth crossing points is what is being proposed to divert to the UGT WWTP.

III.B.4 COLLECTION SYSTEM ISSUES

Sections of the UGT collection system that flow to the UGT WWTP and the TMA WWTP have experienced Sanitary Sewer Overflows (SSO) in the past. UGT has been working on reducing Infiltration & Inflow (I/I) for over 10 years. During this time, UGT has greatly reduced the quantity of I/I entering the system and has also greatly reduced the number of SSO. In fact, SSO have been eliminated at certain manholes that previously experienced SSO. The work done by UGT to improve the operation of its collection system is described in detail in a Corrective Action Plan (CAP) that UGT submitted to the PADEP. The most recent update was submitted to PADEP in February 2016. A copy of the UGT CAP is included in Appendix M.

In addition to the CAP submitted by UGT, TMA submitted two CAPs to the PADEP to address SSO issues in the Kriebel Road Interceptor and the TMA WWTP Influent Pump Station. This is relevant to UGT because the service area located in UGT that flows to the TMA WWTP flows through the KRI. The KRI has also experienced SSO. TMA is working on reducing I/I in the KRI and the TT collection system to work towards elimination of SSO in the KRI and TT collection system.

Diversion of UGT flow from the KRI and the TMA WWTP will greatly reduce the hydraulic loading on the KRI and will also greatly reduce, if not eliminate, SSO on the KRI. This is a significant environmental benefit associated with UGT diverting flow.

IV. FUTURE GROWTH AND LAND PLANNING

IV.A EXISTING PLANNING

As stated in Section I, previous wastewater planning for Upper Gwynedd Township has included previous Act 537 Plans, two Act 537 Plan Special Studies, various Sewage Facilities Planning Modules for individual development projects, annual Chapter 94 Wasteload Management Reports, and a Corrective Action Plan.

The most recent Act 537 document on record is the Act 537 Plan – Special Study done as part of UGT's CAP. This Special Study was published for public comment in June 2016 and was submitted to PADEP in August 2016 for review and approval.

IV.B GROWTH

Growth and new development in Upper Gwynedd Township are controlled and regulated by land use and zoning regulations. A copy of the current Upper Gwynedd Township Zoning map is included in Appendix N.

Upper Gwynedd Township is primarily built out and there is not much land available for development. There is, however, some development that is currently in progress and other development being planned in the future. Current and future development in UGT is contained in the Connection Management Plan (CMP) included in Appendix O. The CMP is a summary of existing and future development in the entire UGT service area, delineated by the individual

interceptor to which a particular development would flow. The CMP does not include the flow being diverted. This issue is addressed separately.

IV.B.1 EXISTING GROWTH

As described earlier, UGT is served by three main interceptors. The Southwest and East Interceptors currently flow to the UGT WWTP. The western section of the Township that flows to the TMA WWTP is served by the Kriebel Road Interceptor.

The CMP includes development in all three interceptor service areas. The CMP includes the name of the development, the number of connections (EDUs), the state of approval in the PADEP planning process, and the time frame for connection.

The CMP includes the following growth in each of the three interceptor service areas:

- East Interceptor – 50 EDUs
- Southwest Interceptor 32 - EDUs
- Kriebel Road Interceptor – 40 EDUs

The total existing growth is 122 EDUs. Using the UGT Act 537 flow number per EDU, the total projected flow is 28,914 gallons per day (GPD).

IV.B.2 FUTURE GROWTH

The CMP also includes other potential development projects that are not included in the previous section above because there are no plans at this point for these projects to request connection to the UGT system. However, for purposes of being conservative, the following is a more detailed discussion of these other projects with no near term plans to connect to the UGT system.

SOUTHWEST INTERCEPTOR

The Southwest Interceptor potential projects shown in yellow in the CMP include 1,203 potential EDUs (miscellaneous on lot systems are included in the 40 EDUs above). The Merck-Phase 5, Hancock Road, and Old Church Road projects are not being included because it is not felt that these EDUs will be connected in the next five years, if at all. The EDUs listed for Montgomery Township and Worcester Township are based on the legal agreements that UGT has with these two neighboring municipalities. At this point there are no new developments from Montgomery Township that are projected to request connection to UGT in the next five years. Once again, in the interest of being conservative, 50 EDUs are included for purposes of evaluating the capacity of the UGT WWTP.

KRIEBEL ROAD INTERCEPTOR

The CMP shows a total of 92 EDUs that are shown in yellow (the miscellaneous on lot systems are already included in the 40 EDUs listed above in Section IV.B.1 for the KRI). The 92 EDUs include the three Martin properties plus 20 EDUs for Lehigh Valley Dairy.

The total for future growth is 142 EDUs. Using the UGT Act 537 flow number per EDU, the total projected flow is 33,654 gallons per day (GPD).

IV.B.3 ULTIMATE BUILD OUT

As has been described above, there is the potential for additional EDU connections that are not included in Sections IV.B.1 and IV.B.2, but are included in the CMP. The additional build out EDUs are located in the Southwest Interceptor service area. These additional EDUs include the following:

- Old Church Road - 1 EDU
- Hancock Road -50 EDUs
- Worcester Township - 490 EDUs
- Montgomery Township -10 EDUs
- Merck Building 5-652 EDUs

The total of these ultimate build out EDUs is 1,203 EDUs. Regarding Merck and Montgomery Township, it is highly unlikely that these will be connected in the next five years.

Merck has already been allocated capacity that is not being used. This available capacity is already factored into the UGT WWTP available capacity in Section III.A. Even if Merck connected all of the 652 EDUs (154,524 GPD), Merck's unused, reserve capacity would still be over 1,500,000 GPD.

IV.B.4 GROWTH SUMMARY

The total for the existing (122 EDUs) and future (142 EDUs) growth is 264 EDUs. Using the Act 57 flow number of 237 GPD, the total projected flow for the next five years is 62,568 GPD. This growth is accounted for in the UGT Chapter 94 report. The current and five year available capacities referenced in Section III.A already reflect the 62,568 GPD of growth.

If the ultimate buildout potential connections from Old Church Road, Hancock Road, and Worcester Township are included, this is another 541 EDUs. However, 385 of the Worcester EDUs and 30 of the Hancock Road EDUs are already factored into the available capacity based on the 2015 Chapter 94 report. Therefore, the additional EDUs from ultimate build include Old Church Road (1), Hancock Road (20), and Worcester (105) which is 126 EDUs. This equates to 29,862 GPD. In addition, it is also noted that Montgomery Township has approximately 120,000 GPD of unused capacity that is included in the ultimate build out flow projection.

Therefore, the projected flow for ultimate build out is 29,862 GPD plus 120,000 GPD which equals 149,862 GPD. For purposes of this Special Study, to be conservative, the flow being used for ultimate build out, future growth is 250,000 GPD

As stated above in Section III.A, the UGT WWTP has current, available capacity of 803,000 GPD and a five year future, available capacity of 643,000 GPD. Subtracting 250,000 GPD leaves the UGT WWTP with 393,000 GPD of future, available capacity. Therefore, there is

adequate capacity to accommodate the projected ultimate build out. UGT wants to maintain this capacity, in addition to the capacity needed for the flow diversion.

The additional capacity needed for the Flow Diversion project is addressed in Section V.A.

V. ALTERNATIVES FOR WASTEWATER DISPOSAL FACILITIES

There are two alternatives for Upper Gwynedd Township to treat flow generated in the western part of the township that currently flows to the TMA WWTP. The best and preferred alternative is for UGT to divert a significant majority of flow that currently flows to the TMA WWTP, to the UGT WWTP. The second alternative is to continue to have UGT wastewater treated at the TMA WWTP. The following is a discussion of the two alternatives.

V.A DIVERT FLOW TO UGT WWTP

The UGT Flow Diversion project will divert a significant majority of wastewater generated in Upper Gwynedd Township and currently conveyed to the TMA WWTP, to the UGT WWTP. The average annual daily flow planned on being diverted is approximately 1.05 MGD, inclusive of 0.1 MGD Merck reserve capacity at the TMA WWTP. The remaining flow that will continue to go to the TMA WWTP is 0.12 MGD.

The Flow Diversion project will require additional capacity at the UGT WWTP as well as two pump stations and two force mains to convey the diverted wastewater to the UGT WWTP.

V.A.1 WASTEWATER TREATMENT PLANT

The current permitted capacity of the UGT WWTP is 5.7 MGD average annual daily flow and 6.5 MGD maximum monthly flow. Therefore, additional capacity needs to be added to the UGT WWTP to handle the increase in both average annual flow and maximum monthly flow.

Once again, it is noted that the additional capacity needed for the Flow Diversion project is in addition to the capacity discussed in Section IV.B.4.

The existing UGT WWTP is described in Section III.A. In order to accommodate the flow to be added with the flow diversion, additional capacity for several unit operations needs to be provided.

The unit operations requiring additional capacity are as follows:

- Influent pumping
- Headworks
- Secondary clarification
- UV Disinfection
- Effluent pumping

The following provides more detail on the UGT WWTP modifications needed to treat the additional flow being diverted.

Wastewater Treatment Plant Capacity

The WWTP is presently rated for an average annual flow of 5.7 MGD, a hydraulic design capacity of 6.5 MGD, a peak hour flow of 15 MGD and an organic design loading of 10,842 lbs. As part of the flow diversion project, Upper Gwynedd Township will be requesting an average annual flow of 7.0 MGD, a hydraulic design capacity of 8.0 MGD, a peak hour flow of 22.5 MGD and an organic design loading of 11,676 lbs. Note that the peak hour will be based on the combined hydraulic design capacity of the two pump stations.

Appendix K identifies the proposed modifications at the Upper Gwynedd WWTP.

Modifications at Headworks (Influent) Building

The existing Auger Monster will be replaced with a new screen. 20 MGD will be able to flow through the two indoor screens (one existing and one new), grit chambers and 24-inch parshall flume. Flows in excess of 20 MGD will flow by gravity to the existing screen outside the Headworks Building. The parshall flume can be calibrated up to 21.39 MGD. To measure all peak flows, a second flow meter will be installed upstream of the headworks building for utilization when flows exceed the rated capacity of the existing parshall flume. Additional grit removal equipment is not proposed because any flow not proceeding through the existing grit removal units will occur after the first flush has entered the WWTP and all that flow will proceed into primary clarifiers.

The new force main will connect into the existing headworks.

Modifications to Influent Pumping

Presently, the WWTP can pump 19 MGD with one (the largest) pump out of service. The influent pumping capacity will be increased by 5 MGD to convey the anticipated peak instantaneous flow.

Modifications to the Aeration Tanks and Clarifiers

The aeration tanks have adequate capacity to treat the projected organic load. An additional circular clarifier similar to the two existing 80' diameter circular clarifiers is proposed to treat peak flows from Aeration Tanks 3 through 6.

Modifications to Effluent Disinfection

The WWTP presently has two parallel channels with UV light disinfection. Each channel is capable of disinfecting in excess of 10 MGD. A third parallel channel with a capacity of 10 MGD is proposed for disinfecting peak flows.

Modifications to Effluent Pumping

Each existing effluent pump can pump 8.55 MGD. There are four pumps, so the capacity of the pump station with one pump out of service is 25.7 MGD. This exceeds the anticipated peak hour flow. The control panel and wiring do allow all four pumps to be operated for a capacity in excess of 34 MGD, which far exceeds any foreseeable

peak instantaneous flow. If a pump was out of a service, a portable self-priming pump could be placed at the effluent pump station.

Modification of the outfall pipe is anticipated to incorporate a second effluent flow meter to be utilized for measuring peak flows in excess of the rated capacity of the existing effluent flow meter.

Physical space is available at the existing WWTP to add the additional facilities required at the WWTP.

UGT proposes an annual average daily flow of 7.0 MGD and a maximum monthly flow of 8.0 MGD. The 7.0 MGD annual average daily capacity is 1.3 MGD more than currently exists. The 1.3 MGD figure includes 0.95 MGD of existing UGT flow being diverted from the TMA WWTP, plus 0.1 MGD of Merck reserve capacity at the TMA WWTP, plus 0.25 MGD of growth as summarized in Section IV.B.4.

As noted in the previous paragraph, the annual average flow being diverted is 0.95 MGD from the two crossing points referenced. For the other two crossing points at Jacks Lane and Anders Lane, the flow that will continue to flow to the TMA WWTP will be 0.11 MGD and 0.01 MGD, respectively. The total remaining flow from UGT to the TMA WWTP will be 0.12 MGD.

V.A.2 COLLECTION SYSTEM

The flow currently generated in UGT flows to the TMA WWTP by gravity. Therefore, to divert the flow to the UGT WWTP requires pump stations. As discussed in Section III.B.3, there are four points where flow from UGT crosses Valley Forge Road into Towamencin

Township. The flow from two of the four crossing points is being diverted. These are the points located just south of the Sumney Forge Shopping Center at the corner of Sumneytown Pike and Valley Forge Road and just north of the Pennsylvania Turnpike Northeast Extension on Valley Forge Road. Approximately 93% of the total flow that currently flows to the TMA WWTP is contained in these two crossing points.

V.A.2.1 PUMP STATIONS

The flow from each of the two crossing points from which flow will be diverted requires pump stations to pump the flow to the UGT WWTP. These pump stations are shown in Appendix J. The pump stations will be hereinafter referred to as the Valley Forge Road North (VFRN) Pump Station (just south of the Sumney Forge Shopping Center) and the Valley Forge Road South (VFRS) Pump Station (just north of the Turnpike). The VFRS Pump Station will be located in Towamencin Township.

The VFRN Pump Station will have a hydraulic design capacity of 6.0 MGD. The VFRS Pump Station will have a hydraulic design capacity of 1.5 MGD.

UGT has acquired the property needed for both the VFRN Pump Station and the VFRS Pump Station.

A list of all easements required for pump station and force main construction is included in Appendix J.

V.A.2.2 FORCE MAINS

The two pump stations will pump flow through separate force mains. Appendix A and Appendix J show the route of each of the two force mains.

The force main route from the VFRN Pump Station will be located mostly in existing Township easements. The force main route shown in Appendix A and Appendix J indicates the sections of the force main in private property and in existing Township easements. There is only a relatively small section of the force main that runs through private property and requires easements from the property owners. This force main is anticipated to be at most 24", but portions may be 20" diameter pipe.

As with the VFRN Pump Station, the VFRS Pump Station uses mostly existing Township easements. This force main is anticipated to be an 8" diameter pipe.

The Township will obtain easements for the force mains, where necessary, through agreements with property owners or, where necessary, by eminent domain proceedings.

To reduce construction costs, the two force mains combine on Garfield Avenue. The combined force main then continues to the UGT WWTP. This force main is anticipated to be at most 24", but portions may be 20" diameter pipe.

The capacity of the force main from the VFRN Pump Station is 6.0 MGD. The capacity of the VFRS Pump Station is1.5 MGD. The capacity of the force main that will handle the combined flow is 7.5 MGD.

We also note that UGT will continue with its I/I reduction program to reduce the amount of flow that currently flows to the UGT WWTP and the flow that will be diverted.

UGT's I/I program is described in detail in the UGT CAP attached as Appendix M. We note that the existing UGT collection system will not be used to convey the flow being diverted.

V.B CONTINUE TREATMENT AT TMA WWTP

The other option is effectively to do nothing and have UGT flow continue to be treated at the TMA WWTP. This option was determined to not be beneficial to UGT.

V.C LEGAL AGREEMENT TO DIVERT FLOW

Upper Gwynedd Township and Towamencin Township discussed and evaluated diverting flow for several years. The product of these discussions was execution of a legal agreement which provides for UGT to divert flow. Both Townships are party to this legal agreement. We note that the agreement does provide for continuing to treat UGT flow at the TMA WWTP should circumstances arise which would prevent flow diversion from occurring. UGT has determined that diverting flow is the best option and is proceeding with this option.

A copy of the legal agreement is included in Appendix B.

We make note of the fact that even with the Flow Diversion option, which UGT has chosen to implement, a small percentage of UGT wastewater will continue to be treated at the TMA WWTP. Diverting all flow was determined to not be cost effective or beneficial to UGT and its rate payers.

VI. EVALUATION OF WASTEWATER DISPOSAL ALTERNATIVES

As stated in Section V, Upper Gwynedd Township has chosen the alternative to divert flow from the TMA WWTP to the UGT WWTP. As will be discussed in this section, it has been determined that diverting flow is the most cost effective and beneficial option for UGT to pursue.

VI.A CONSISTENCY DETERMINATION AND RESOLUTION

As demonstrated throughout this Act 537 Plans – Special Study, the proposed alternative to divert flow is consistent with the following:

- **Clean Streams Law**-The Flow Diversion project will likely eliminate SSO from the Kriebel Road Interceptor and reduce the environmental impact of the SSO. UGT currently complies with its NPDES permit and construction of the additional facilities at the UGT WWTP will continue to allow UGT to maintain NPDES permit compliance after the flow is diverted

- **Clean Water Act**- UGT currently complies with its NPDES permit and construction of the additional facilities at the UGT WWTP will continue to allow UGT to maintain NPDES permit compliance after the flow is diverted
- **Municipal Wasteload Management Plans**-The additional facilities proposed for construction at the UGT WWTP will provide for UGT to treat the additional flow and loading resulting from the Flow Diversion project and maintain NPDES permit compliance.
- **UGT Corrective Action Plan**-The Flow Diversion project will improve operation of the UGT collection system by likely eliminating SSO on the Kriebel Road Interceptor and in the UGT collection system that feeds into the Kriebel Road Interceptor. The new force mains will be constructed using the latest technology and construction methods to minimize I/I in the new system.
- **UGT Chapter 94 Report**- The additional facilities proposed for construction at the UGT WWTP will provide for UGT to treat the additional flow and loading resulting from the Flow Diversion project and maintain NPDES permit compliance.
- **Comprehensive Plans developed under PA Municipalities Planning Code**-The Flow Diversion project is consistent with all Township planning documents.
- **Anti-degradation Requirements of Chapters 93, 95 and 102**-The additional facilities being constructed at the UGT WWTP will provide for continued NPDES permit compliance.
- **State Water Plan**-The additional facilities will continue to provide for discharge of a high quality effluent discharging to the Wissahickon Creek.

- **PA Prime Agricultural Land Policy**-This is not applicable to this project.
- **Plans adopted under the Storm Water Management Act-**All construction work for the WWTP, pump stations, and force mains will be in accordance with UGT and Montgomery County Storm Water Management Plans.
- **Wetland Protection under Chapter 105-**A wetlands delineation for the project is being performed. The construction will be done in a manner to comply with regulatory requirements, minimize the impact to wetlands, and provide for wetlands restoration.
- **Pennsylvania Natural Diversity Inventory (See Appendix P)** The PNDI for this project has already been performed and is included in Appendix P. No known conflicts were found.
- **Pennsylvania Historic Preservation Act**-This project will not have any impact related to this act.

VI.B ALTERNATIVE DISCUSSION

The following is a discussion of the alternatives evaluated:

a. Upper Gywnedd Township diverts approximately 950,000 gallons per day (0.95 MGD) that currently flows to the TMA WWTP, to the UGT WWTP

UGT diverting flow from the TMA WWTP to the UGT WWTP is the recommended alternative in this Act 537 Plan – Special Study. It is consistent with all the items listed in Section VI. A for the following reasons:

- The existing UGT WWTP has adequate capacity to handle the build out for all development included in the Connection Management Plan and as discussed in Section IV.B.4. The 0.95 MGD being diverted will require additional capacity at the existing UGT WWTP. UGT will construct the facilities necessary to handle the average annual and peak flows. This is discussed in Section V.A.1.

  Flow diversion also requires that two pump stations and two force mains be constructed to divert the flow that currently goes to the TMA WWTP, to the UGT WWTP. The property for both of the pump stations has already been acquired. This is discussed further in Section V.A.2

- The proposed force main routes utilizes mostly existing Township rights of way. There are very few additional permanent easements required. The required easements are listed in Appendix J. The largest easement will be through Wissahickon Valley Watershed Association (WVWA) property. UGT has already met with the WVWA and they are supportive of the Flow Diversion project. We note that UGT already has sewer lines in WVWA property that were previously negotiated.
- The proposed force main routes involve a minimal amount of environmental impact and construction on private property.
- All permits and approvals will be obtained for construction of the WWTP facilities, the dedicated force mains, and the two pump stations.

- Flow Diversion will greatly reduce the hydraulic loading in the Kriebel Road Interceptor. In turn, this will greatly reduce, if not eliminate, the SSO that have occurred in the past on the KRI.
- The additional flow being diverted to the UGT WWTP will provide significant economies of scale at the UGT WWTP and will reduce rate increases for UGT customers that could occur in the future.
- Flow Diversion will give UGT control over almost all of the wastewater treatment needs of the UGT community.
- The alternative to divert flow will be supportive of growth in UGT. Although UGT is mostly built out, there is growth that is projected. In addition, should certain existing properties be re-developed this would create additional growth. In the UGT service area that flows to the TMA WWTP, there is a connection prohibition due to SSO on the KRI. By diverting flow UGT will construct the new pump stations and force mains with adequate capacity to likely eliminate SSO in the new system, eliminate the connection prohibition, and facilitate future growth in UGT.
- Several years of negotiation went into the legal agreement to provide for UGT to divert flow. This required considerable time and effort on the part of both UGT and TT. All of this led to UGT determining that diverting flow was the best alternative for UGT.

We also note that UGT diverting flow will provide the TMA with the opportunity to better serve their customers in the future. Given the future facilities that will be

needed at the TMA WWTP to upgrade the WWTP and meet stricter, future permit limits, TMA will be able to tailor the size of the new facilities to its future customer base.

b. UGT does nothing and UGT flow that is currently treated at the TMA WWTP will continue to be treated there.

Although this alternative is feasible and is addressed in the legal agreement providing for UGT to divert flow, it does not support the long term best interests of Upper Gwynedd Township and its rate payers for a number of reasons:

- UGT will continue to not have control over a significant portion of the wastewater treatment needs of the UGT community
- Without a significant expense to increase the capacity of the KRI, SSO would likely continue to occur. This would continue to result in regulatory problems with the PADEP.
- The project is economically beneficial to UGT in the long run. This is discussed further in Sections VI. D and VI. E below.

VI.C ALTERNATIVE EVALUATION TO APPLICABLE STANDARDS

All proposed construction for the UGT WWTP, the two new pump stations, and the new force mains will be in accordance with the Upper Gwynedd Township "Construction

Repair and Replacement Requirements for Sanitary Sewers and Appurtenances and Detail Drawings", dated October 2016, and the Pennsylvania Department of Environmental Protection "Domestic Wastewater Facilities Manual", 362-0300-001, October 1997".

The existing UGT WWTP has an excellent record of compliance with the requirements of its existing NPDES permit. After construction of the additional UGT WWTP facilities to handle the diverted flow is completed, UGT will comply with a new NPDES permit issued by PADEP.

VI.D CAPITAL COST AND FUNDING EVALUATION

a. As stated above in this Section, the diversion of flow is the alternative chosen by UGT. This alternative requires the construction of additional treatment facilities at the UGT WWTP, two new pump stations, and new force mains.

1. The capital cost analysis for the Flow Diversion project is included in Appendix Q. The cost includes engineering and a 20% contingency. Construction of the new facilities needed to divert flow is scheduled to be completed within approximately four years. This is discussed further in Section VIII.

2. UGT plans on funding the cost through two means. Work on the Engineering and regulatory aspects of the project has already been started. UGT plans on funding this work through inclusion in its annual budgeting process. Once the project gets to the construction phase, the remaining Engineering cost will be included with the construction cost. This will be funded by a 15 to 25 year (depending on market conditions) bond issue that UGT will obtain in the amount of approximately fifteen million dollars. Spreading the cost of the project over 15 to 25 years will reduce the economic impact on customers. Therefore, even though construction is scheduled to be completed in approximately four years, the cost to UGT's customers will be spread out over 15 to 25 years.

3. There are two other significant funding sources for the project available to UGT. First, as part of the legal agreement between UGT and TT, UGT was paid $7,100,000 upon leaving the TMA (formerly UGTMA). The second source is $4,900,000 in sewer reserve funds held by UGT.

b. Do nothing and continue to treat UGT flow at TMA WWTP.

1. Although there are no costs to divert flow for this option, there are still very significant costs associated with UGT continuing to have their flow treated at the TMA WWTP. UGTMA, prior to becoming the TMA, was jointly owned and operated by UGT and TT. When the UGTMA was defeased, UGT was

no longer an owner, but rather just a customer. If UGT stays as part of the TMA it would incur very significant future, long term costs for upgrade of the TMA WWTP and the Kriebel Road Interceptor. An independent engineering study authorized by UGT and TT was performed by the nationally recognized engineering consulting firm of Hazen & Sawyer in 2013. The results of the study were accepted by both UGT and TT. This study provided cost estimates for the long term needs of the then UGTMA (now TMA) WWTP and collection system. Considering the age of the existing facility, the need to replace existing equipment and facilities, and the need to upgrade the WWTP to meet stricter, anticipated future permit limits, a cost estimate was generated. The UGT share of this cost is estimated to be $33,800,000. This means that over an extended period of time, UGT would have incurred this cost. This was a key reason that UGT decided to no longer be part of the UGTMA and to divert flow.

VI.E ECONOMIC IMPACT OF FLOW DIVERSION

As a result of flow being diverted to the UGT WWTP, the long term cost to operate the UGT WWTP and collection system will be affected in a positive way. Once the flow is diverted, there will be a significant number of additional UGT customers which will provide long term economies of scale for operation of the UGT WWTP. This will reduce rate increases for UGT customers that could occur in the future.

The additional customers will also help to pay for the bond issue that will be used to fund the capital cost. The bond issue will be paid for in 15 to 25 years, but the additional annual revenue increase from a greater number of UGT customers will continue long after the bond is paid off. This represents a significant, long term financial benefit to UGT and its rate payers.

Financing a 25 year bond issue will not result in any rate increase to UGT customers.

Depending on market conditions, UGT may decide to finance the project with a 15 year bond issue, which would pay off the bond 10 years sooner than a 25 year bond and reduce the interest paid over the life of the bond. This would also mean that the extra revenue coming from the additional customers will be available 10 years sooner for purposes other than to pay debt service on the bond.

Should UGT decide to use a 15 year bond, a single rate increase of $15 to each customer's semi-annual bill would result. As an example, the current semi-annual customer payment of $185 would increase to $200 to finance a 15 year bond.

If UGT does not divert flow, any costs to replace and upgrade the existing facilities at the TMA WWTP will be incorporated into the future sewer rates paid by UGT residents in the TMA service area. Therefore, by not diverting flow, UGT does not have long term control of the rates to be charged to the significant number of UGT customers served by the TMA. However, once UGT diverts flow, it will have control of the rates it charges to customers

whose flow is being diverted. We note that the sewer rates for UGT customers in the TMA service area will continue to be the same as sewer rates for UGT customers that currently flow to the UGT WWTP.

VI.F CONSTRUCTION PHASING

The flow can't be diverted until all of the WWTP, pump station, and force main construction is completed. There is no compelling reason for constructing any of the new facilities before the other(s). The project schedule was developed to provide the most economic benefit to UGT in terms of project bidding and facilitation of construction. A more detailed discussion of the project schedule is included in Section VIII.

VI.G LEGAL AUTHORITY

As stated earlier, UGT negotiated and finalized a legal agreement that provides for UGT diverting flow. Part of that agreement states that Towamencin Township will support UGT's efforts to divert flow. Other than this agreement, UGT plans on obtaining all regulatory approvals and permits necessary to successfully execute the project

VII. INSTITUTIONAL EVALUATION

VII. A UPPER GWYNEDD TOWNSHIP

UGT owns and operates its own WWTP and collection system. It has the authority to secure funding, operate and maintain its sanitary sewer treatment and collection system,

and regulate all users. The chosen alternative to divert flow can be implemented and incorporated into the UGT sanitary sewer system without any additional staff, departments, or authorities. UGT will have full ownership and operating responsibility for the additional WWTP facilities, the two new pump stations, and the new force mains.

Based on the legal agreement between Upper Gwynedd Township and Towamencin Township, UGT has the legal authority to divert flow to the UGT WWTP.

With the exception of the few functioning on-site systems, all wastewater within Upper Gwynedd Township will continue to be treated at publicly owned, NPDES permitted, wastewater treatment plants.

VIII. IMPLEMENTATION

VIII. A RECOMMENDATION

The chosen alternative is the following:

Upper Gywnedd Township diverts approximately 950,000 gallons per day (0.95 MGD) that currently flows to the TMA WWTP, to the UGT WWTP is the recommended alternative in this Act 537 Plan – Special Study

The chosen alternative meets all of the following important UGT goals:

- The existing UGT WWTP has adequate capacity to handle the build out for all development as shown in the Connection Management Plan discussed in Section IV.B.4. The 0.95 MGD being diverted will require additional capacity at the existing UGT WWTP. UGT will construct the facilities necessary to handle the average annual and peak flows. This is discussed in Section V.A.1.

Flow diversion also requires that two pump stations and two force mains be constructed to divert the flow that currently goes to the TMA WWTP, to the UGT WWTP. This is discussed in Section V.A.2. The property for both pump stations has already been acquired.

- The proposed route utilizes mostly existing Township rights of way. There are very few additional permanent easements required. The required easements are listed in Appendix J. The largest easement will be through Wissahickon Valley Watershed Association (WVWA) property. UGT has already met with the WVWA and they are supportive of the flow diversion project. We note that UGT already has sewer lines in WVWA property that were previously negotiated.
- The proposed force main routes involve a minimal amount of environmental impact and construction on private property.
- All permits and approvals will be obtained for the construction of the WWTP facilities, the force mains, and the two pump stations.
- Flow Diversion will greatly reduce the hydraulic loading in the Kriebel Road Interceptor. In turn, this will greatly reduce, if not eliminate, the many SSO that have occurred in the past on the KRI.
- The additional flow being diverted to the UGT WWTP will provide significant, long term economies of scale at the UGT WWTP and will reduce rate increases to UGT customers that could occur in the future.
- Flow Diversion will give UGT control over almost all of the wastewater treatment needs of the UGT community.
- The flow diversion alternative will be supportive of growth in UGT. Although UGT is mostly built out, there is some growth that is projected. In addition, certain existing properties have the potential to be re-developed that would

create additional growth. In the UGT service area that flows to the TMA WWTP, there is a connection prohibition due to SSO on the KRI. By diverting flow UGT will construct the new pump stations and force mains with adequate capacity to likely eliminate SSO, eliminate the connection prohibition, and facilitate growth in UGT

- Several years of negotiation went into the legal agreement to provide for UGT to divert flow. This required considerable time and effort on the part of both UGT and TT. All of this led to UGT determining that diverting flow was the best alternative for UGT.

We also note that UGT diverting flow will provide the TMA with the opportunity to better serve their customers in the future. Given the future facilities that will be needed at the TMA WWTP to upgrade the WWTP and meet stricter, future permit limits, TMA will be able to tailor the size of the new facilities to its future customer base.

VIII.B IDENTIFICATION OF COSTS AND FUNDING

The diversion of flow is the alternative chosen by UGT. This alternative requires the construction of additional treatment facilities at the UGT WWTP, two new pump stations, and new force mains.

UGT plans on funding the cost through two means. Work on Engineering and regulatory aspects of the project have already been started. UGT plans on funding this work through

inclusion in its annual budgeting process. Once the project gets to the construction phase, the remaining Engineering cost will be included with the construction cost, and this will be funded by a 15 to 25 year (depending on market conditions) bond issue in the amount of approximately fifteen million dollars. Spreading the cost of the project over 15 to 25 years will reduce the economic impact on customers. Therefore, even though construction is scheduled to be completed in approximately four years, the cost to UGT's customers will be spread out over 15 to 25 years.

There are two other significant sources of funding for the project for UGT. As part of the legal agreement between UGT and TT, UGT was paid $7,100,000 upon leaving the TMA (UGTMA). The other source is 4,900,000 in sewer reserve funds held by UGT

VIII.C PROJECT SCHEDULE

The Project Schedule is included in Appendix C. The schedule is formatted using PADEP approval of the Act 537 Plan as the start date (Time T=0). As the schedule indicates, work on several tasks has already begun. There are tasks that cannot proceed or be completed until PADEP Act 537 Plan approval is obtained and the schedule is consistent with this.

Meetings have been held with all regulatory agencies and other parties key to successful implementation of the project. Survey work and preliminary engineering is well underway. Property for both the VFRN Pump Station and the VFRS Pump Station has been acquired.

Work on obtaining easements for the force mains is underway. This Special Study is a key component of the project and provides an opportunity for public input.

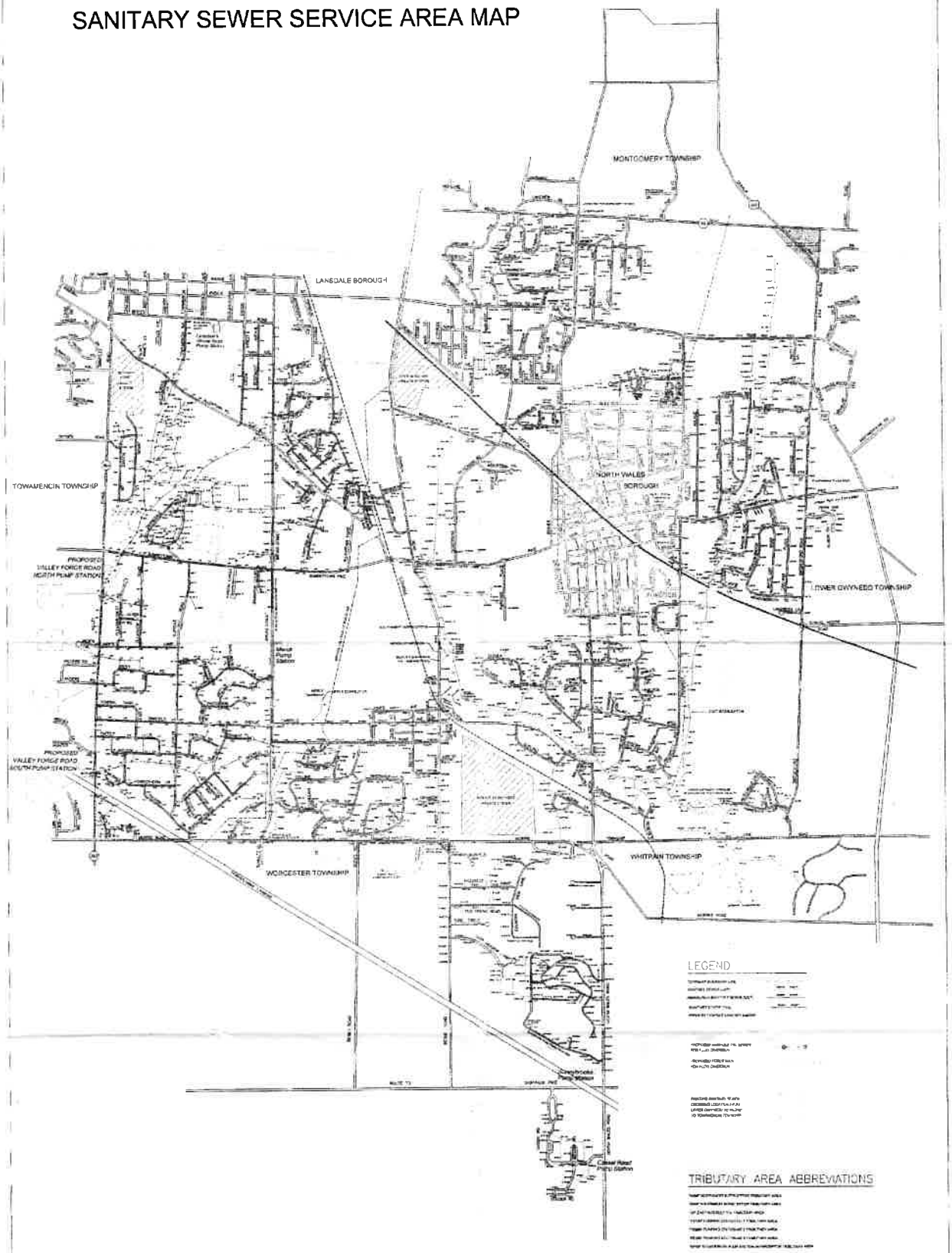
The project is anticipated to take approximately four years and be completed in 2020. Obtaining regulatory or other agency approvals, obtaining permits, and logistical issues associated with construction have the potential to impact the project schedule.

APPENDIX A

UPPER GWYNEDD TOWNSHIP
COLLECTION SYSTEM MAP

FIGURE 1

UPPER GWYNEDD TOWNSHIP
SANITARY SEWER SERVICE AREA MAP



SCALE 1"=1000'

JULY 2016

APPENDIX B

UPPER GWYNEDD TOWNSHIP/ TOWAMENCIN TOWNSHIP LEGAL AGREEMENT

CUSTOMER SERVICE AGREEMENT
BY AND BETWEEN
TOWAMENCIN TOWNSHIP
AND
UPPER GWYNEDD TOWNSHIP

THIS CUSTOMER SERVICE AGREEMENT made and concluded this 2nd day of March, 2015, by and between **TOWAMENCIN TOWNSHIP,** Montgomery County, Pennsylvania ("Towamencin"), and **UPPER GWYNEDD TOWNSHIP,** Montgomery County, Pennsylvania ("Upper Gwynedd").

WHEREAS, the parties will finalize a "Withdrawal Agreement" agreement which will result in the withdrawal of Upper Gwynedd Township from the Upper Gwynedd Towamencin Municipal Authority ("UGTMA") and provide for the continued operation of the Treatment Plant and an associated interceptor known as the Kriebel Road Interceptor by and through Towamencin and/or its assigns. Also, by such Agreement, Upper Gwynedd will commit to a redirection of at least eighty-five (85) percent of the existing sewage flow from the UGTMA service area located in Upper Gwynedd Township to a sewage treatment plant owned and operated by Upper Gwynedd ("the Project"); and

WHEREAS, Towamencin and Upper Gwynedd have agreed that Upper Gwynedd shall become a bulk customer of Towamencin for sanitary sewer treatment until such time that aforementioned redirection of sewage flow to a sewage treatment plant other than the Towamencin wastewater collection and treatment facilities; and

WHEREAS, a portion of Upper Gwynedd flows may remain tributary to Towamencin after the redirection of sewage flow, and for such remaining flows Upper Gwynedd shall continue to be a bulk customer of Towamencin for sanitary sewer treatment; and

WHEREAS, the UGTMA and/or its assigns owns and operates a sanitary sewer system that provides sanitary sewer service to the public in Towamencin Township and a portion of Upper Gwynedd Township, Montgomery County, Pennsylvania; and

NOW, THEREFORE, in consideration of the mutual promise herein contained and intending to be legally bound hereby, the parties hereby agree as follows:

1. **Defined Terms.** The terms defined in this Section, whenever used or referred to in this Agreement, shall have the respective meanings indicated unless a different meaning clearly appears from the context.

(a) Annual Average Daily Flow (AADF) shall mean the total flow received at the Wastewater Treatment Plant or discharged from a development or Municipality during any one (1) calendar year, divided by the number of days in the respective calendar year.

(b) Authority shall mean the Upper Gwynedd Towamencin Municipal Authority (UGTMA).

(c) Capacity shall mean the quantity of Sewage Flow measured in the manner described herein or, as calculated in the manner approved by governmental bodies having jurisdiction, measured in GPD or MGD.

(d) Common Transportation Facilities shall mean any underground pipeline or pipelines, operated and maintained by the UGTMA and used, inter alia, for the transportation of Sewage, regardless of its concomitant use by Towamencin Township to collect Sewage within the Towamencin Township Sewage Collection System, now or hereafter used in common by the UGTMA and Towamencin Township for the transportation of Sewage.

(e) Commonwealth shall mean the Commonwealth of Pennsylvania.

(f) Corrective Action Plan (CAP) shall mean a Plan required to address the planning, design, financing, construction and operation of the Sewage Facilities that may be necessary to provide Capacity that will meet anticipated demands for a reasonable time in the future and resulting in a project that is consistent with this Agreement and applicable official Plans approved under the Pennsylvania Sewage Facilities Act (Act 537). A CAP shall include, but not be limited to setting forth steps to be taken by the contributing Municipality to prevent the Capacity from being exceeded, and a Schedule showing the dates each step toward the compliance with the Agreement shall be completed. If necessary, to address exceedance of the Capacity, it will include limitations on, and a program for control of, new connections to the Sewage Facilities. A CAP may include a projection of the anticipated flow reduction. Where flow reduction projections

are applicable, they shall be determined by Agreement of the Towamencin Township Engineer and the Upper Gwynedd Township Engineer. The Municipality will be required to provide data, as requested, to the Towamencin Township Engineer to assist in the determination of the flow reduction. Upon completion of elements of a CAP, a Municipality shall receive the flow reduction credit associated with the improvements, as listed in the CAP, and the Capacity shall be modified for planning purposes.

(g) DEP shall mean the Department of Environmental Protection of the Commonwealth of Pennsylvania.

(h) Fiscal Year shall mean the fiscal year of the applicable Municipality as provided by the laws of the Commonwealth which, unless otherwise stated, shall be a calendar year.

(i) GPD shall mean gallons of Sewage per day.

(j) Maximum Month Flow (MMF) shall mean the highest monthly flow during a calendar year.

(k) MGD shall mean millions of gallons of Sewage per day.

(l) Person or Persons means an individual, a partnership, an association, a corporation, a joint stock company, a trust, an unincorporated association, a governmental body, a political subdivision, a municipality, a municipality authority, or any other group or entity.

(m) Projected Flow shall mean:

(i) Projected Flow will be the calculated flow from developments with approved planning modules, either during or prior to construction. The Projected Flow is the sum of residential and non-residential flows for the development.

(ii) Residential flow projections will be based on flow per Equivalent Dwelling Unit ("EDU"). Typically, the residential per EDU AADF at the property will be 200 gallons per day (GPD) and 280 GPD wastewater flows with I/I at the WWTP. If deemed necessary by the Towamencin Township Engineer, the Municipality will determine specific AADF GPD/EDU rates for the proposed development. These rates will be backed up by water meter data and/or metered sewage flows (3 year history) from developments of a similar age and type of property usage or, if requested, by an

alternative method deemed suitable by Towamencin Township. The Residential per EDU AADF at the WWTP is 280 GPD.

(iii) Non-residential flow projections will be based on water consumption data (3 year history) from an existing similar facility. This data will be used to predict AADF for the proposed development at 200 GPD per EDU.

(n) Service Agreement shall mean this document and any amendments and/or supplements hereto.

(o) Sewage shall mean domestic sanitary sewage and/or industrial wastes as such phrases usually and customarily are used by sanitary engineers.

(p) Sewage Collection System shall mean the Sewage collection and transportation system facilities existing or hereafter to be acquired and/or constructed by each respective township, for use and operation by it, together with all appurtenant facilities and properties which have been acquired or hereafter shall be acquired in connection therewith, excluding the UGTMA Sewage Collection System and the Common Transportation Facilities.

2. **Mutual Cooperation**. Towamencin and Upper Gwynedd agree to cooperate with each other in the obtaining of any and all permits, approvals and authorizations from DEP and any other regulatory, municipal or governmental agency which now has or may have jurisdiction over any aspect of the Project, in the obtaining of any necessary Act 537 Plan amendments, and in the obtaining of any available grants or other funding advantageous to the Project.

3. **Permitting Costs**. Upper Gwynedd shall bear all costs associated with obtaining all permits, approvals and authorizations from DEP and any other regulatory, municipal or governmental agency which now has or may have jurisdiction over any aspect of this Agreement pertaining to the Project, except that Towamencin shall bear all costs associated with preparation of any Act 537 Plan required of it and approval thereof by DEP.

4. **Acceptance of Sewage Flow**. Towamencin shall accept all sanitary sewer flow from Upper Gwynedd's service area that is located in the previous UGTMA service area located within Upper Gwynedd Township until completion of the Project. As of the

execution of this Agreement, Upper Gwynedd represents that it provides service to 4,000 Equivalent Dwelling Units (EDUs). The parties agree that this number is based in part upon Merck usage of 48,335 GPDs and Lehigh Valley Diaries' usage of 141,659 GPDs (for the purpose of audit). Any new residential purchase capacity would automatically (without the use of the audit) be added to the agreed 4,000 number upon connection. After completion of the Project, Towamencin shall continue to accept all sanitary sewer flow from those portions of Upper Gwynedd's service area from which service flows will not be redirected pursuant to the Project. Upper Gwynedd will be permitted to serve additional physical connections or more intense uses subject to the payment of additional per EDU tapping fees, the payment of the applicable annual sewer rental per EDU, and allocation of additional flow credits from DEP per any CAP and Connection Management Plan. Each residential unit will represent one EDU. Non-residential units will represent the number of EDUs derived by dividing the anticipated annual average daily water use by 200 gallons per day. These numbers may be amended in the future. Increases in sanitary sewer flow are limited to 2% per year with a maximum future additional capacity limited to 300 EDUs.

In the event that Upper Gwynedd Township exceeds the flow limits set forth herein, Upper Gwynedd Township agrees to immediately prohibit any further connections as directed by PADEP to the system until such time as Upper Gwynedd Township, Towamencin Township, and the Pennsylvania Department of Environmental Protection agree and implement a Corrective Action Process and/or Connection Management Plan.

5. **Sewer Charges and Surcharges**.

(a) Prior to completion of the Project Upper Gwynedd shall pay to Towamencin, in consideration of the acceptance by Towamencin of sewage flow as provided in paragraph 4 hereinabove an annual sewer rental of $1,125,000.00, calculated as follows: 4,000 EDUs x $375.00 per EDU x a treatment factor of 0.75. The Treatment Factor of 0.75 adjusts the Towamencin rate to eliminate the portion of Towamencin's rate associated with the cost of wastewater collection services, which are not provided by Towamencin to Upper Gwynedd. This rental shall be increased on an EDU basis as additional EDUs of sewage flow are either assigned to a property by Upper Gwynedd in its sole discretion or are purchased by Upper Gwynedd.

This annual sewer rental shall be paid in quarterly installments in advance on January 15, April 15, July 15, and October 15. Upper Gwynedd will be entitled to a 2 percent discount, however, should Upper Gwynedd pay the total annual rental prior to April 30th of each year. The per-EDU rate used to calculate this annual sewer rental shall not be changed by Towamencin, without the prior written consent of the Upper Gwynedd until January 1, 2018.

Beginning on the date six (6) months from the date of this Agreement and continuing once annually thereafter, an audit of the number of EDU's in use in Upper Gwynedd will be performed with the resulting number to be applied to determine the correct rental charge. For the purposes of this audit, each independent living unit shall be one EDU and each 200 GPD of metered water consumption for a non-residential customer shall be considered one EDU for billing purposes.

(b) From and after completion of the Project, the aforesaid annual sewer rental shall be calculated by using the lowest per-EDU rate then charged by Towamencin to any of its residential customers, multiplied by the Treatment Factor of 0.75. Said annual sewer rental shall continue to be paid in quarterly installments in advance on January 15, April 15, July 15, and October 15. Upper Gwynedd will be entitled to a 2 percent discount, however, should Upper Gwynedd pay the total annual rental prior to April 30th of each year.

(c) Prior to completion of the Project, Upper Gwynedd will pay no surcharges for excessive flows. Following completion of the Project or upon abandonment of the Project by Upper Gwynedd, Upper Gwynedd will pay a surcharge if the average daily flow for a month exceeds 400 gallons per day per EDU times the number of EDUs that remain within the UGTMA Collection System. The surcharge on such excess will be two times the per thousand gallon rate then charged by Towamencin to its non-residential customers multiplied by the treatment factor of 0.75 for volume overage in a month. Said surcharge shall be paid by the 15th day of the month following the month for which a surcharge is due. For example, for a surcharge occurring in September, Towamencin would expect to provide a bill to Upper Gwynedd for this calculated amount in October with payment expected within thirty (30) days of the invoice.

(d) In the event that Upper Gwynedd chooses not to complete the Project, Upper Gwynedd agrees to pay a Capital Contribution for use by Towamencin Township for the completion of the expansion of the Kriebel Road Interceptor Facilities and an installation of up to three (3) MG of equalization at the Treatment Plant. Such expansion and equalization projects are to be designed and constructed to accommodate flows from Upper Gwynedd Township and Towamencin Township as anticipated by this Agreement. Such contribution shall be equal to fifty percent of the cost for such improvements with such sum not to exceed the amount of $6,791,000 (as adjusted over the life of the Agreement by an inflation factor using ENR Construction Costs Index). The date that this payment must be made will be based upon the schedule contained in the Authority's Corrective Action Plan as approved by DEP.

(e) Billing Disputes. If Upper Gwynedd disputes a bill in good faith, Upper Gwynedd must, on or before the bill due date, (a) pay the undisputed portion of the bill, and (b) notify Towamencin in writing of the basis for the dispute. If the dispute is regarding meter accuracy, a meter test will be performed by the R. G. Malden Company or any other qualified firm acceptable to both parties. If the meter test proves that the meter is within 4% (four percent) accuracy, Upper Gwynedd shall, within two business days of such meter test, pay to Towamencin the disputed portion of the bill, together with accrued interest from the invoice date, and the cost of the meter test. If the meter test proves that the meter is not within 4% (four percent) accuracy, a billing adjustment will be made to reflect the volume that would have been transmitted had the meter been reading at 100% (one-hundred percent) accuracy for the billing period in question, Towamencin will pay for the cost of the meter test and the meter will be replaced or recalibrated at Towamencin's option.

(f) In instances where volume of discharge, or portions thereof, by Upper Gwynedd cannot be accurately measured by a particular flow meter by reason of malfunction of the meter, the volume of Sewage discharge shall be measured by estimates using one (1) of the following methods: (a) according to the number of "Equivalent Dwelling Units," as that term shall be defined, from time to time, constituting improved properties served by the particular Sewage Collection System, or portion thereof,

discharging Sewage through such flow meter or point of discharge; (b) measured or estimated water consumption by the applicable customers of Upper Gwynedd; (c) based upon a monthly average of Sewage flow measured at such location during a preceding twelve (12) month period; or (d) use of Graphical Correlation of flows based on the prior four (4) quarters of recorded date. The use of Graphical Correlation of flows shall be the preferred method of estimating flows whenever sufficient suitable historic data is available with which to develop the graph. Subject to the requirement for estimates described above, the readings set forth at said flow meters shall constitute conclusive evidence of the amount or volume of Sewage flow discharged by Upper Gwynedd into Towamencin.

6. **Meters**

(a) Meters shall continue to be *Palmer Bowlus Flume* with Bubbler Level measuring instrumentation and located at the following locations where Upper Gwynedd sanitary sewer flows cross in to Towamencin:

i. MH 24A near Bancroft Road
ii. MH 21.2 near Hillside Road
iii. MH 336 on Anders Road
iv. MH 236 on Valley Forge Road near PA Turnpike

(b) Meters shall be tested semi-annually at intervals of approximately six months by Towamencin according to industry standards for the type of meter in service. Towamencin shall provide Upper Gwynedd with copies of certified reports of test(s) on the accuracy of meter(s) commencing on the Effective Date of the Agreement, and once each year thereafter until termination of this Agreement, or any renewal terms hereof. If requested in writing by Upper Gwynedd, Upper Gwynedd shall have the right to be present when meter testing is performed. Upper Gwynedd may obtain access to inspect metering facilities upon written request made to Towamencin. Meter tests requested by Upper Gwynedd, in excess of the two semi-annual tests provided herein and not in connection with bill disputes pursuant to paragraph 6(d) hereof, shall be performed at the sole expense of Upper Gwynedd. Upper Gwynedd reserves the right to electronically monitor through its SCADA system or other similar means and to perform its own readings and tests on the accuracy of meter(s) at any time at Upper Gwynedd's expense.

7. **Records**. Upper Gwynedd represents that it maintains accurate records of connections to Upper Gwynedd's sewer system, estimated gallons of sewage contributed to said system by commercial and/or industrial customers based on the Upper Gwynedd's water meter records and any other records necessary for the accurate calculation of the sewer rates due and payable by Upper Gwynedd to Towamencin as described in paragraph 5 herein. As of March 1 of each year, Upper Gwynedd shall submit a report to Towamencin setting forth the number of connections made up through December 31st of the previous calendar year and, if different, the number of EDU's contributory to its service area at the beginning and at the end of such year. Upper Gwynedd shall include in its report the number of gallons assigned to each connection. It is understood by and agreed to by Towamencin, that notwithstanding the number of gallons assigned to each connection or EDU, that Towamencin shall be entitled to additional tapping fees for new connections only. There shall be no tapping fees paid for additional flow where surcharges are paid per paragraph 5.

8. **Maintenance and Repair**. Upper Gwynedd represents that it maintains and will continue to maintain all connections by its customer to its collection system, its collection lines and interceptors up to the point where the sewer system of Upper Gwynedd crosses the Towamencin Township boundary. All decisions regarding the repair, maintenance or replacement of any physical asset comprising Upper Gwynedd's collection system will remain the exclusive right of Upper Gwynedd.

9. **Wastewater Quality**

(a) Upper Gwynedd agrees to implement and operate a pretreatment program with respect to its commercial and industrial contributors consistent with that implemented and operated from time to time by Towamencin to the extent required by Towamencin, the Pennsylvania Department of Environmental Protection or the United States Environmental Protection Agency.

(b) Uniform Standards. Towamencin has uniform Sewage effluent quality standards which comply with the requirements of regulatory authorities. Upper Gwynedd will not discharge or permit the discharge of Sewage from its Sewage Collection System into the Common Transportation Facilities or the Treatment Plant that would violate any of

such standards. Towamencin will make no changes in said standards except upon ninety (90) days prior notice to Upper Gwynedd, and all such changes will apply equally to Towamencin and Upper Gwynedd.

(c) Compelling Compliance with Standards. Upper Gwynedd shall enact or cause to be enacted an ordinance, in a form acceptable to Towamencin, and will keep such ordinance in full force and effect at all times, prohibiting, and providing adequate penalties for, the discharge into its Sewage Collection System of anything violating the above-mentioned effluent quality restrictions of Towamencin and hereby covenants to enforce, and request the enforcement of, as applicable, the provisions thereof when brought to its attention. Such ordinance shall also prohibit and/or regulate the discharge into its Sewage Collection System by any Person of industrial waste, as defined in the applicable regulations of Towamencin. Upper Gwynedd will not permit any discharge into its Sewage Collection System except in the manner and in accordance with the provisions of said ordinance, as applicable.

(d) Treatment of Harmful Wastes. If any Sewage discharged by Upper Gwynedd into the Treatment Plant is in violation of Towamencin's standards as determined by this Article and requires special treatment or would be harmful to the Treatment Plant, then Upper Gwynedd will pay the entire cost of any special treatment as a separate charge, and, Upper Gwynedd, on written notice of violation from Towamencin, shall immediately act to enforce or obtain the enforcement of those quality standard Ordinances by connection ban or by providing or requiring pretreatment of such waste in such manner as is provided by said Ordinances or compel disconnection from the Sewage Collection System of the property from which harmful waste is being discharged. Failure by Upper Gwynedd to compel disconnection or pretreatment upon thirty (30) days written notice to same, shall entitle Towamencin to recover the Costs of any upgrading, enhancements or other remedial action deemed necessary by Towamencin as a result of such discharge and collect the same.

(e) Reimbursement For Damages From Improper Discharge. Upper Gwynedd will pay the cost of any damage to the Treatment plant or the Common Transportation Facilities resulting from discharge of improper waste from its Sewage Collection System in

violation of the above-mentioned quality standards and restrictions, within sixty (60) days after notice by Towamencin, and shall indemnify and hold harmless Towamencin with respect thereto.

10. **Infiltration and Inflow**. Upper Gwynedd represents that it will continue an inflow and infiltration abatement program during the life of this Agreement. Upper Gwynedd agrees to provide Towamencin, by March 1 of each calendar year, an annual report summarizing its efforts to monitor and reduce the quantities of inflow and infiltration from its sewerage system that flows in to Towamencin's system. If and to the extent that the sanitary sewage flow contributed by Upper Gwynedd to Towamencin's sewage system prior to completion of the Project exceeds any of the peak hourly flow rates in Appendix "A", or if required by the Pennsylvania Department of Environmental Protection, Upper Gwynedd agrees to revise and implement its infiltration and inflow program in an effort to reduce infiltration and inflow such that the peak hourly flow rate does not exceed said amount, said action to be accomplished within a time specified by required by the Pennsylvania Department of Environmental Protection, if applicable, or within a reasonable time. From and after completion of the Project, the threshold requiring said implementation shall be a peak hourly flow rate equal to 4.0 times the then number of EDU's contributory to the Towamencin sanitary sewer system times 280 gallons per EDU.

11. **Fines and Penalties**

(a) Sanitary Sewer Overflows ("SSOs"). In the event of the occurrence of any SSO in a line carrying flows from Upper Gwynedd, Upper Gwynedd agrees to pay 22.537 percent of any fines, penalties and assessment assessed by DEP and any other regulatory municipal or governmental agency having jurisdiction related to such SSO from February 19, 2015, until the completion of the Project. This contribution will be for SSOs in the KRI and not at the WWTP. Following completion of the Project, Upper Gwynedd will bear no responsibility for contribution to these costs.

(b) Upper Gwynedd shall not be responsible for any fines, penalties or assessments, or any percentage thereof, assessed by DEP and any other regulatory,

municipal or governmental agency which now has or may have jurisdiction over any aspect of the Project, for sanitary sewer overflows within Towamencin's sewer system.

12. **Hold Harmless**. Towamencin shall indemnify, defend and hold Upper Gwynedd harmless from and against any and all claims, suits, actions liabilities, losses, damages and expenses (including, without limitation, reasonable outside attorney's fees and court costs), whether relating to injury to property or to person (including death), arising solely from or in connection with the actions of Towamencin related to this Agreement.

Upper Gwynedd shall indemnify, defend and hold Towamencin harmless from and against any and all claims, suits, actions liabilities, losses, damages and expenses (including, without limitation, reasonable outside attorney's fees and court costs), whether relating to injury to property or to person (including death), arising solely from or in connection with the actions of Upper Gwynedd related to this Agreement.

13. **Miscellaneous**.

(a) The parties agree to defend the validity of this Agreement and to take no action to defeat or frustrate the intent and purposes of this Agreement.

(b) Towamencin and Upper Gwynedd may proceed to protect and enforce their respective rights hereunder under the laws of the Commonwealth of PA by such suits, actions or special proceedings in equity or at law, in the Court of Common Pleas of Montgomery County, Pennsylvania, whose jurisdiction shall be deemed exclusive, either for the specific performance of any covenant or agreement contained herein or in aid of execution of any power herein granted or for the enforcement of any proper legal or equitable remedy.

(c) All notices required or contemplated by this Agreement shall be personally served, sent by overnight delivery service or mailed, postage prepaid, with return receipt requested, or faxed to the parties addressed as follows:

To Towamencin:

If forwarded by U.S.P.S. mail to:

Towamencin Township
Attention: Township Manager
P.O. Box 303
Kulpsville, PA 19443

OR DELIVERED TO:

Towamencin Township
Attention: Township Manager
1090 Troxel Road
Lansdale, PA 19446

To Upper Gwynedd:

Upper Gwynedd Township
Parkside Place
P. O. Box 1
West Point, PA 19486
Attention: Township Manager
Fax Number: 215-699-8846

Notice given by personal delivery, overnight delivery service or mail shall be effective upon actual receipt. Any party may change any address to which notice is to be given to it by giving notice as provided above of such change of address.

(d) The authority of the officials of Towamencin and Upper Gwynedd to execute this Agreement shall be evidenced by a resolution properly passed by the Towamencin Township Board of Supervisors and the Upper Gwynedd Township Board of Commissioners prior to the execution hereof.

(e) A waiver of any breach of any provision of this Agreement shall not either constitute or operate as a waiver of any other breach of such provision or of any other provisions, nor shall any failure to enforce any provision hereof operate as a waiver of such provision or any other provision.

(f) Towamencin and Upper Gwynedd agree that the laws of the

Commonwealth of Pennsylvania shall govern the rights, obligations, duties and liabilities of the parties to this Agreement and shall govern the interpretation of this Agreement.

(g) No amendment to this Agreement shall be effective unless it is in writing, signed by the authorized representatives of both parties and certified as to the availability of an appropriation.

(h) The invalidity of one or more of the phrases, sentences, clauses or sections contained in this Agreement shall not affect the validity of the remaining portion of the Agreement so long as the material purposes of this Agreement can be determined and effectuated.

(i) If any provision of this Agreement is held to be illegal, invalid or unenforceable, that provision shall be enforced to the maximum extent permissible so as to affect the intent of the parties, and the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby. If necessary to effect the intent of the parties, the parties shall negotiate in good faith to amend this Agreement to replace the illegal, invalid or unenforceable language with legal, valid and enforceable language that as closely as possible reflects such intent. In any event, this Agreement shall be enforced to the fullest extent permitted by law.

(j) This Agreement shall be binding upon the parties hereto, their successors and permitted assigns.

(k) This is the entire agreement of the parties concerning the subject matter of this Agreement and supersedes all prior agreements between the parties, oral or written, to the extent they relate to the subject matter hereof.

(l) Any delays or failure of performance by Towamencin or Upper Gwynedd shall not constitute a default hereunder or give rise to any claims for damages if and to the extent that such delay or failure is caused by one or more occurrences which are beyond the reasonable control of the delaying or failing party including, but not limited to, terrorism strikes or other labor difficulties, war, riots, act of governmental authorities, abnormal weather (including blizzards, hurricanes or other severe storms that may adversely impact safe collection or facility operation) fire, flood, unavoidable casualties or delays in transportation.

(m) Arbitration. If any claims, controversies or disputes shall arise out of or be related to this Agreement or the breach thereof, the Parties agree to submit the said claim, controversy or dispute to binding arbitration in accordance with the prevailing rules of the American Arbitration Association. Said arbitration shall be held in the County of Montgomery, each Party to bear its own costs and the costs of the arbitrators to be borne equally by both Parties. As to any arbitration, each Party shall select one arbitrator, within ten (10) days of the event requiring said arbitration, and the two arbitrators so selected shall promptly select the third. If said arbitrators are unable to select a third arbitrator, one shall be assigned by the American Arbitration Association. If the claim, controversy or dispute concerns a termination of the Agreement based upon an event of default or otherwise, the termination shall be automatically stayed pending completion of the arbitration proceedings, including any appeal of the decision and award rendered by the arbitration panel.

IN WITNESS WHEREOF, the parties hereto have caused this Indenture to be properly executed the day and year above written.

UPPER GWYNEDD TOWNSHIP

Date: 3/2/2015 By: _____
President

Date: 3-2-2015 _____
Witness

TOWAMENCIN TOWNSHIP

Date: 3/2/2015 By: _____
Chair

Date: 3/2/2015 _____
Witness

March 2, 2015 Draft

APPENDIX "A"

24-Feb-15

FLOW RATE LIMITS

MH #	Location	# EDU	Flow /EDU	AADF	MMADF	Peak Hourly Rate
		#	GPD	MGD	MGD	MGD
24A	Bancroft Ct	3286	280	0.920	1.314	3.680
21.2	Hillside Rd	220	280	0.062	0.088	0.246
336	Anders Rd	60	280	0.017	0.024	0.067
236(35)	Valley Forge Rd (PA Turnpike)	434	280	0.122	0.174	0.486
	Totals	4000	280	1.120	1.600	4.480

Criteria:

AADF = # EDU * 280 GPD/EDU
5 Yr Avg MM/ADF UGTMA ratio= 1.323
Peak Hourly Rate= 4.0* AADF
MMMADF = #edu * 400/GPD/EDU 400 GPD/EDU

Note:

1 AADF is Annual Average Daily Flow
2 MMADF is Maximum Month Average Daily Flow
3 # EDU as agreed to by UGT and TT based on negotiations and available data from 12/31/13.
4 The 3286 EDU at MH 24A includes a Merck flow of 48,335 GPD and a Lehigh Valley Dairy flow of 141,659 GPD.
5 All non-residential EDU assumed to be tributary to MH 24A.

APPENDIX C

PROJECT SCHEDULE

UPPER GWYNEDD TOWNSHIP
TMA DIVERSION SCHEDULE
October 18, 2016

MONTH (Act 537 Plan Approval is month "zero")

-24 -23 -22 -21 -20 -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

ACT 537 PLAN

537 Plan - Plan of Study
537 Plan Draft
537 Plan Review
537 Plan Public Notice & Planning Agencies
537 Plan Response to Comments
537 Plan Submit to PADEP
537 Plan Review & Approval by PADEP

CONCEPTUAL ENGINEERING

Conceptual Engr. Surveying
Conceptual Engr. Subsurface Invest.
Conceptual Engr. Layout
Part 1 Permit Preparation - WWTP
Part 1 Permit Approval - WWTP

OBTAIN EASEMENTS

PRELIMINARY ENGINEERING

Preliminary Engr. - WWTP
Preliminary. Engr. Collection System
Preliminary Engr. Pump Stations

PADEP/DRBC PERMITS

Part II Permit Preparation - WWTP
Part II Permit Approval - WWTP
Permit Preparation - P.S. + Coll. System
Permit Approval - P.S. + Coll. System
E&S and Stormwater Approval

ENGINEERING DESIGN

Engineering Design - WWTP
Engineering Design Collection System
Engineering Design Pump Stations

BIDDING

Bidding - WWTP
Bidding - P.S. + Collection System

CONSTRUCTION

Construction - WWTP
Construction - P.S. + Collection System

APPENDIX D

MONTGOMERY COUNTY PLANNING COMMISSION AND HEALTH DEPARTMENT NOTIFICATION

October 24, 2016

Mr. Drew Shaw, Section Chief
Montgomery County
Planning Commission
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3297
Return Receipt Requested

Dear Mr. Shaw:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

In accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period. You are being provided a copy of the Plan to facilitate your review.

Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact me with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Montgomery County
Health Department
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3303
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township, Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

In accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period. You are being provided a copy of the Plan to facilitate your review.

Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact me with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

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City, State, ZIP+4® West Point, PA 19486

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

November 21, 2016

Mr. Drew Shaw, Section Chief
Montgomery County
Planning Commission
P.O. Box 311
Norristown, PA 19404

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3402
Return Receipt Requested

Dear Mr. Shaw,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

The revised Plan is being reissued for public comment. Therefore, in accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period.

We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

As will be discussed in Section V.A.2, there are two pump stations required for this project. One of these will be located in Towamencin Township. This pump station will be constructed outside the 100 year flood plain.

The second pump station will be located in Upper Gwynedd Townsbip. This pump station may or may not be located in the 100 year flood plain. This will be determined in the engineering design phase of work yet to be done.

Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

November 21, 2016

Montgomery County
Health Department
P.O. Box 311
Norristown, PA 19401

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3372
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

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II.B.2 100 YEAR FLOOD PLAIN

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The second pump station will be located in Upper Gwynedd Township. This pump station may or may not be located in the 100 year flood plain. This will be determined in the engineering design phase of work yet to be done.

Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

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City, State, ZIP+4® Norristown, PA 19404

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Sent To MR. Lenkerone - Twp. MANAGER-UGT
Street and Apt. No., or PO Box No. P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

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APPENDIX E

UPPER GWYNEDD TOWNSHIP & TOWAMENCIN TOWNSHIP PLANNING COMMISSIONS NOTIFICATION

October 24, 2016

Upper Gwynedd Township
Planning Commission
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3266
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project.

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Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Mr. Len Perrone
Township Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3310
Return Receipt Requested

Dear Mr. Perrone:

Environmental Engineering and Management Associates (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Plan-Special Study (Plan) for the Flow Diversion project.

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Please provide your comments, if any, to EEMA. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

October 24, 2016

Towamencin Township
Planning Commission
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3273
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion project.

In accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period. You are being provided a copy of the Plan to facilitate your review.

Please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager
Rob Ford, Towamencin Township Manager

October 24, 2016

Mr. Rob Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3280
Return Receipt Requested

Dear Mr. Ford:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) encloses for your review and comment the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion project.

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Please direct your comments, if any, to Len Perrone, UGT Township Manager. Please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Upper Gwynedd Township Manager

Environmental Engineering & Management Associates, Inc.
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Sent To Mr. Rod Ford - Township Manager Towamencin Township
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City, State, ZIP+4® Kulpsville PA 19443

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Sent To Upper Gwynedd Twp. Planning Commission
Street and Apt. No., or PO Box No. P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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Postage $10.00
Total Postage and Fees $14.65

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OCT 24 2016
KULPSVILLE PA 19443
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10/24/2016

Sent To Mr. Len Perrone Twp. Manager
Street and Apt. No., or PO Box No. Upper Gwynedd Township, P.O. Box 1
City, State, ZIP+4® West Point, PA 19486

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

November 21, 2016

Upper Gwynedd Township
Planning Commission
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3358
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

The revised Plan is being reissued for public comment. Therefore, in accordance with Pennsylvania Department of Environmental Protection requirements, notice has been published this date, thereby commencing the 30-day public comment period.

We still request that you please direct your comments, if any, to Len Perrone, UGT Township Manager, no later than December 23, 2016. We thank you for your efforts and please do not hesitate to contact us with any questions.

Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

As will be discussed in Section V.A.2, there are two pump stations required for this project. One of these will be located in Towamencin Township. This pump station will be constructed outside the 100 year flood plain.

The second pump station will be located in Upper Gwynedd Township. This pump station may or may not be located in the 100 year flood plain. This will be determined in the engineering design phase of work yet to be done.

Some force main construction will occur within the flood plain. Any manholes located within the flood plain will have water-tight covers or will be raised to a height above the 100 year flood plain elevation.

November 21, 2016

Mr. Len Perrone
Township Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3396
Return Receipt Requested

Dear Mr. Perrone,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

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November 21, 2016

Towamencin Township
Planning Commission
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3365
Return Receipt Requested

Sir/Madam:

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

II.B.2 100 YEAR FLOOD PLAIN

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November 21, 2016

Mr. Rob Ford
Township Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Re: Upper Gwynedd Township
Act 537 Sewage Facilities Plan-
Special Study-Revision
UGT Flow Diversion Project

Certified Mail No. 7016 0910 0002 0575 3389
Return Receipt Requested

Dear Mr. Ford,

On behalf of the Commissioners of Upper Gwynedd Township (UGT), Environmental Engineering and Management Associates, Inc. (EEMA) sent you a copy of the Upper Gwynedd Township Act 537 Sewage Facilities Plan-Special Study (Plan) for the UGT Flow Diversion Project on October 24, 2016. We want to make you aware of one revision we are making to the Plan. Enclosed is a corrected Page 7 to be inserted into Section II.B.2. The revision is intended to provide UGT with the flexibility as to the location of one of the proposed pump stations.

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Very truly yours,
Environmental Engineering &
Management Associates, Inc.

John V. Interrante, P.E.
Principal Engineer

Cc: Len Perrone, Township Manager, Upper Gwynedd Township

Environmental Engineering & Management Associates, Inc.
P.O. Box 232 • Kulpsville, PA 19443 • (215) 368-3375 • Fax: (215) 368-6739

performed in accordance with the Permit conditions issued by the Montgomery County Conservation District. Construction will be done while minimizing the impact to wetlands. Wetlands will be restored after construction is completed to minimize impact on the environment.

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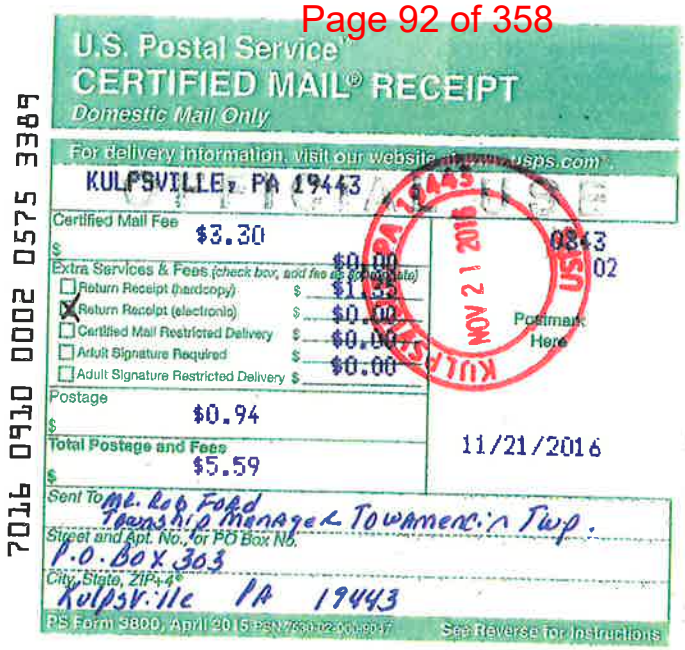

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APPENDIX F

PROOF OF PUBLICATION OF PUBLIC NOTICE

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UPPER GWYNEDD TOWNSHIP/LEGALS
P.O. BOX 1
WEST POINT, PA 19486
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF MONTGOMERY

The undersigned Nina O'Leary, being duly sworn the he/she is the principal clerk of The Reporter, The Reporter Digital, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

UPPER GWYNEDD TOWNSHIP/LEGALS

Published in the following edition(s):

The Reporter	10/24/16
The Reporter Digital	10/24/16

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN SCHMID, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 31, 2017

Sworn to the subscribed before me this 10/31/2016.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

LEGAL NOTICE

Notice is hereby given that Upper Gwynedd Township is proposing a Special Study to the Upper Gwynedd Township Act 537 Sewage Facilities Plan (hereinafter the 'Act 537 Plan – Special Study') for submission to the Pennsylvania Department of Environmental Protection for approval.

Comments concerning the Act 537 Plan – Special Study may be submitted for a period of 30 days following the date of publication of this Legal Notice. The particulars of the Act 537 Plan - Special Study and the place for submitting comments are as follows:

1. Name of Project: Upper Gwynedd Township Act 537 Sewage Facilities Plan – Special Study.

2. Type of project: Act 537 Plan - Special Study to the existing Upper Gwynedd Township comprehensive Act 537 Sewage Facilities Plan.

3. Location or areas of the municipalities affected: Upper Gwynedd Township and Towamencin Township.

4. Major recommendations of the new sewage facilities planning: Upper Gwynedd Township will divert a significant majority of flow from the western section of UGT that is currently served by the Towamencin Municipal Authority, to the UGT Wastewater Treatment Plant. UGT will construct two pump stations and two force mains to route the diverted flow to the UGT WWTP.

5. Where and when the Plan can be seen for review and comments: Upper Gwynedd Township municipal building, One Parkside Place, North Wales, Pennsylvania, 19454, telephone (215) 699-7777.

6. Comments on the Plan must be submitted in writing to the municipal offices as follows: Township Manager, Upper Gwynedd Township, P. O. Box 1, Parkside Place, West Point, PA 19486.

Leonard Perrone
Upper Gwynedd Township Manager
LAN 10/24 1-a

Advertisement Information

Client Id: 881232 **Ad Id:** 1159092 **PO:** Flow Div act 537 **Sales Person:** 093304

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AFFIDAVIT OF PUBLICATION

307 Derstine Avenue • Lansdale, PA 19446

UPPER GWYNEDD TOWNSHIP/LEGALS
P.O. BOX 1
WEST POINT, PA 19486
Attention:

STATE OF PENNSYLVANIA,
COUNTY OF MONTGOMERY

The undersigned Nina O'Leary, being duly sworn the he/she is the principal clerk of The Reporter, The Reporter Digital, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

UPPER GWYNEDD TOWNSHIP/LEGALS

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The Reporter	11/21/16
The Reporter Digital	11/21/16

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
MAUREEN SCHMID, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 31, 2017

Sworn to the subscribed before me this 11/30/2016.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

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2. Type of project: Act 537 Plan - Special Study to the existing Upper Gwynedd Township Comprehensive Act 537 Sewage Facilities Plan.
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Leonard Perrone
Upper Gwynedd Township Manager
LAN 11/21 1-a

Advertisement Information

Client Id: 881232 **Ad Id:** 1185458 **PO:** Flow Div act 537 **Sales Person:** 093304

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Leonard Perrone
Upper Gwynedd Township Manager

APPENDIX G

AGENCY AND PUBLIC COMMENTS AND MUNICIPAL RESPONSE TO COMMENTS

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

November 10, 2016

File No. 16-01076T

Rob Ford, Manager
Towamencin Township
P.O. Box 303
Kulpsville, PA 19443

Reference: Upper Gwynedd Twp. Act 537 Plan Special Study Oct 2016
Plan Review 1

Dear Rob:

In accordance with the Township's request, we have reviewed the Upper Gwynedd Township (UGT) Act 537 Sewage Facilities Plan, Special Study, dated October 2016 as prepared by Environmental Engineering & Management Associates, Inc. We offer the following comments for your consideration:

1. The UGT Act 537 Plan, Special Study, is consistent with the March 2, 2015 intermunicipal agreement for the planned diversion of flows from the Towamencin Municipal Authority (TMA) Kriebel Road Interceptor service area to the Upper Gwynedd Township sewer service area. Flows are proposed to be diverted at two locations along Valley Forge Road, Valley Forge Road North (VFRN) near Sumneytown Pike and Valley Forge Road South (VFRS) near the Pa Turnpike. Flows from approximately 3700 EDU of the estimated 4000 EDU served by TMA are proposed to be diverted via the construction of two pump stations. The VFRM pump station is proposed to be constructed in UGT the VFRS pump station is located in Towamencin Township (TT).

2. The projected is anticipated to be completed in 2020.

3. The remaining flows from UGT to TT are tributary to TMA sewers at Hillside Avenue and Anders Road. The estimated average daily flows from these two locations total approximately 120,000 gallons per day.

4. Technical items we recommend be addressed in the plan are as follows:

   a. We suggest the Customer Service Agreement in Appendix B also include the March 2, 2015 Intermunicipal Agreement, as well as the attachments to the customer service agreement.

   b. An additional detailed map should be provided that clearly identifies the properties in UGT that will be serviced by TT. The overall collection system map in the plan is at scale that makes the specific service area boundary difficult to

184 W. Main Street, Suite 300 | Trappe, PA 19426 Phone: 610-489-4949 | Fax: 610-489-8447
www.gilmore-assoc.com

identify relative to specific properties. The number of EDU that exist on each property served by TT should be identified. The projected future flows from vacant property to be served by TT should be estimated. The map should also identify the two remaining intermunicipal meter locations.

c. The collection system map in the report should be updated to indicate the sewers in UGT tributary to TMA are not owned or maintained by TMA. These sewers along with the PA Turnpike trunk sewer from Valley Forge Rd to MH 30 in TT were transferred to UGT in 2015.

d. All sewers tributary to the VFRS pump station that are located in UGT or TT should be owned and maintained by UGT. The five properties in TT served by those sewers should be identified with the number of EDU associated with each property (See attached map, Exhibit C of the intermunicipal agreement).

e. The plan should indicate that their will remain no interceptor or pump station bypass flow connection from UGT to TT sewer system in either sewer service area being diverted to UGT. UGT should remove a portion of the KRI upstream of MH 30 located in Towamencin Township and permanently plug the UGT sewer connection into MH 30. The flow meter at VFRS pump station site shall be removed and returned to TMA (See attached map, Exhibit C of the intermunicipal agreement). UGT should remove the UGT sewer tributary to TT last manhole on the KRI (MH 24A) near the VFRN pump station site and permanently plug the UGT sewer connection into the manhole.

f. The plan should address the planned KRI upgrades in Towamencin Township relative to timing and UGT payment of a portion of the costs per the intermunicipal agreement. The intermunicipal agreement targets substantial completion of the KRI upgrades for May 2018.

The above comments are made with the understanding that all information is accurately represented in the plan.

Should you have any questions or need further information, please feel free to contact me at 610-489-4949 or wdingman@gilmore-assoc.com.

Very truly yours,

William K. Dingman

William K. Dingman, P.E.
Senior Municipal Engineer
Gilmore & Associates, Inc.

cc: Jennifer Guckin, Director of Community Planning, Towamencin Township (email only)
Tom Zarko, P.E., CKS Engineers, Inc., Township Engineer (email only)
Brent Wagner, Manager, TMA (email only)

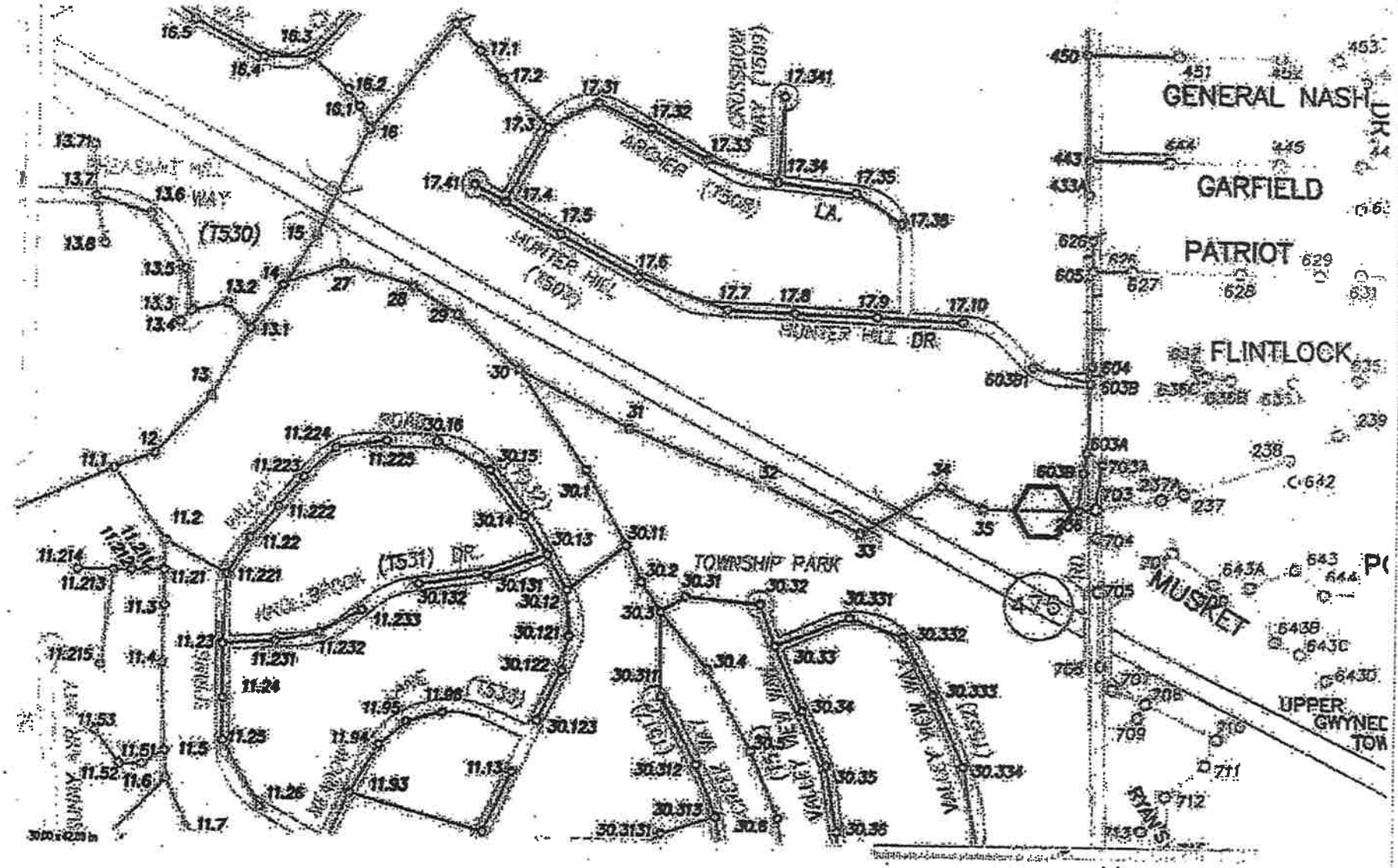


Exhibit "C"

Amended Attachment 21-B.2
Page 100 of 358

AGENCY AND PUBLIC COMMENTS AND MUNICIPAL RESPONSE TO COMMENTS

Upper Gwynedd Township (UGT) published Legal Notices on October 24, 2016 and November 21, 2016 soliciting public comments for the Act 537 Plan – Special Study Dated October 2016. The second notice was published to include one relatively minor revision that was discussed with PADEP. The first 30 day public comment period ran from October 24, 2016 to November 23, 2016. The second public comment period ran from November 21, 2016 to December 21, 2016. The Legal Notice and Proofs of Publication are included in Appendix F.

In addition to the Legal Notice for public comment, UGT also sent, via certified mail, notice to six entities notifying them, on two different dates, of publication of the Legal Notice (and the revision which prompted the second Legal Notice), and requesting their review and approval of the Act 537 Plan – Special Study Dated October 2016. The six entities to which certified mail letters were sent are:

Upper Gwynedd Township Board of Commissioners

Upper Gwynedd Township Planning Commission

Towamencin Township Board of Supervisors

Towamencin Township Planning Commission

Montgomery County Planning Commission

Montgomery County Health Department

Certified mail receipts are included in this appendix G.

Responses were received from four of these entities. Included in this Appendix G are the response letters. Of the four responses, only one of them, Towamenicn Township included comments. These comments are addressed herein.

RESPONSE TO TOWAMENICN TOWNSHIP COMMENTS

Towamencin Township's comments are included in their November 10, 2016 letter included in this Appendix G. The responses are being addressed in the order in which they are presented in paragraph 4 of the comments letter.

Comment 4 a: The March 2, 2015 Intermunicipal Agreement has been included in Appendix B. The attachment to the Customer Service agreement was already included in Appendix B.

Comment 4 b: Figure 2 has been added to Appendix A. Figure 2 is an enlargement of a section of the collection system included in Figure 1. Figure 2 highlights the two crossing points that will not be diverted. These crossing points are described in Section III.B.3, Page 12 of the Act 537 Plan. Crossing Point 2 is at Jacks Lane and Crossing Point 3 is at Anders Road. Based on discussions with Towamencin Township's Engineer, it was agreed that the properties which define the perimeter of each of these service areas would be included.

The properties for the Jacks Lane crossing point are as follows:

1816 Broad Street (Manhole 1038)

1888 Steuben Drive (Manhole 1016)

1837 & 1840 Supplee Road (Manhole 654)

1637 Valley Forge Road (Manhole 471 A)

1632 Clearview Road (Manhole 432

1634 & 1635 Clearbrook Road (Manhole 440)

The properties for the Anders Road crossing point are as follows:

864 Garfield Avenue (Manhole 1002)

1892 & 1895 Steuben Drive (Manhole 1003)

1901 General Nash Drive (Manhole 447)

1900 General Nash Drive (Manhole 446)

1901 Valley Forge Road (Manhole 443 A)

A note has been added to Figure 1 stating that each UGT property that will continue to be served by the Towamencin Municipal Authority (TMA) contains one Estimated Dwelling Unit (EDU). A note has also been added to Figure 1 stating that no additional flow is projected to come from the service areas that will continue to be served by the TMA.

Figure 2 includes the location of the two remaining meter locations. These meter locations are for the Jacks Lane and Anders Road crossing points service areas.

Comment 4 c: A note has been added to Figure 1 stating that the sewers in UGT tributary to TMA are now owned and maintained by UGT.

Comment 4 d: A note has been added to Figure 1 stating that all sewers tributary to the Valley Forge Road South (VFRS) Pump Station that are located in UGT or TT are owned and maintained by UGT. The note also includes that there are five properties in TT located on Valley Forge Road that will be tributary to the VFRS pump station and be served by UGT.

There are four residential properties and the church located just north of the PA Turnpike North East Extension. Reference is made to Attachment C in the Intermunicipal Agreement included in Appendix B.

Comment 4 e: An additional sentence has been added to Section V.A.2.2, Page 26 as follows: "There will be no interceptor or pump station bypass flow connection from the UGT sewer system to the TT sewer system in either sewer service area being diverted to UGT".

When the project is put out for public bid, the project plans will include the work necessary to remove a section of pipe upstream of each of Manholes 24A and 30 so that a plug can be inserted permanently preventing any flow from being diverted from UGT to TT. The plans will also include the work necessary to remove the flow meter at the VFRS pump station location and return the meter to TMA.

Comment 4 f: The Intermunicipal Agreement references the "Kriebel Road Interceptor Bottleneck Project" on Pages 5 and 6. It is TMA's decision as to how this project is addressed. UGT will abide by the terms of the Intermunicipal Agreement.

Upper Gwynedd Township
Planning Commission

P. O. BOX #1 • WEST POINT, PA. 19486

December 20, 2016

Board of Commissioners
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Act 537 Plan Revision – Diversion Project

Dear Commissioners:

At its December 5, 2016 meeting, the Planning Commission voted to recommend that the Board of Commissioners approve the above-noted plan as submitted.

Sincerely,

John Klein
Secretary

/ct

MONTGOMERYCOUNTY
BOARD OF COMMISSIONERS
VALERIE A. ARKOOSH, MD, MPH, CHAIR
JOSH SHAPIRO, VICE CHAIR
JOSEPH C. GALE

MONTGOMERY COUNTY
PLANNING COMMISSION
MONTGOMERY COUNTY COURTHOUSE • PO BOX 311
NORRISTOWN, PA 19404-0311
610-278-3722
FAX: 610-278-3941 • TDD: 610-631-1211
WWW.MONTCOPA.ORG
JODY L. HOLTON, AICP
DIRECTOR

RECEIVED
DEC 12 2016
BY:

December 8, 2016

MCPC 537 Number: 16-2186
UGT Flow Diversion Project
Upper Gwynedd Township
Date revision received by the County
Planning Commission: 10/25/16

Mr. Leonard T. Perrone, Manager
Upper Gwynedd Township
1 Parkside Place
North Wales, PA 19454

Dear Mr. Perrone:

We have reviewed the proposed UGT Flow Diversion Project in accordance with regulations issued under Act 537, "The Pennsylvania Sewage Facilities Act," as requested. We are forwarding this letter as a report of our review and recommendations.

BACKGROUND

The Township is proposing to divert approximately 0.95 MGD of sewage flows from the Towamencin Municipal Authority WWTP (TMA WWTP, formerly the UGTMA WWTP) to the Upper Gwynedd Township WWTP (UGT WWTP). The Special Study indicates that the proposed diversion will have environmental and economic benefits: the diversion will likely eliminate the SSO from the Kriebel Road Interceptor, and it avoids the costs associated with what would have been the Township's share of the cost for future upgrades of the TMA WWTP and Kriebel Road interceptor.

COMMENTS/ISSUES

Flow Diversion and Capacity: The Special Study indicates that 0.95 MGD of existing flow is to be diverted to the UGT WWTP. A 0.1 MDG reserve for Merck and a projected 0.25 MGD for future growth is added to the existing flow for a total of 1.3 MGD capacity needed. We understand that the Township is proposing an Annual Average Daily Flow of 7.0 MGD.

Growth Impacts: The Special Study indicates that limited growth (122 EDUs) may occur in Upper Gwynedd Township, and that the available capacity resulting in the TMA WWTP may

also encourage development. We note that the county comprehensive plan indicates that the majority of both townships are designated as developed land or potential development area, with the exception of the Towamencin 'panhandle'. Any extension of public sewers to serve growth that occurs as a result of the flow diversion project would likely be consistent with the County Comprehensive Plan, so long as it is outside of the 'panhandle' area.

RECOMMENDATION:

We have no objections to approval of this Special Study, provided it conforms to all applicable DEP requirements.

Should you have questions on the comments contained in this letter, please contact me. My contact information is provided below.

Sincerely,

Drew Shaw, AICP
Environmental Planning Section Chief
dshaw@montcopa.org
(610) 278-3733

Montgomery County Planning Commission
P. O. Box 311
Norristown, PA 19404-0311
www.planning.montcopa.org

c. Elizabeth Mahoney
John V. Interrante, P.E.

MONTGOMERY COUNTY
BOARD OF COMMISSIONERS
JOSH SHAPIRO, CHAIR
VALERIE A. ARKOOSH, MD, MPH, VICE CHAIR
JOSEPH C. GALE

HEALTH DEPARTMENT
PO Box 311
NORRISTOWN, PA 19404-0311

TEL: 610-278-5117
FAX: 610-278-5167
WWW.HEALTH.MONTCOPA.ORG

VALERIE A. ARKOOSH, MD, MPH
INTERIM MEDICAL DIRECTOR
IRSHAD A. SHAIKH, MD, PHD, MPH
HEALTH ADMINISTRATOR

November 4, 2016

Leonard T. Perrone, Manager
Upper Gwynedd Township
P. O. Box 1
West Point, PA 19486

Re: Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study
Sewage Facilities Planning Module Component 4C
Upper Gwynedd Township, Montgomery County, PA

Dear Mr. Perrone:

The Montgomery County Health Department (MCHD) has reviewed the Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study. MCHD has no objections at this time to the proposed revision of the Upper Gwynedd Township official plan to include this plan update.

If you have any further questions, please contact me at (610) 278-5117 extension 6730.

Sincerely,

Tori McQueen
Environmental Health Specialist/SEO
Division of Water Quality Management
tmcqueen@montcopa.org

Enclosures

xc: Department of Environmental Protection
Environmental Engineering & Management Associates, Inc.
File

3800-FM-BPNPSM0362C 11/2012

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

DEP Code #:

SEWAGE FACILITIES PLANNING MODULE
COMPONENT 4C - COUNTY OR JOINT HEALTH DEPARTMENT REVIEW

Note to Project Sponsor: To expedite the review of your proposal, one copy of your completed planning module package and one copy of this ***Planning Agency Review Component*** should be sent to the county or joint county health department for their comments.

SECTION A. PROJECT NAME (See Section A of instructions)

Project Name

Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study

SECTION B. REVIEW SCHEDULE (See Section B of instructions)

1. Date plan received by county or joint-county health department. October 26, 2016

   Agency name Montgomery County Health Department

2. Date review completed by agency November 4, 2016

SECTION C. AGENCY REVIEW (See Section C of instructions)

Yes	No		
☒	☐	1.	Is the proposed plan consistent with the municipality's Official Sewage Facilities Plan? If no, what are the inconsistencies?
☐	☒	2.	Are there any waste water disposal needs in the area adjacent to the new land development that should be considered by the municipality? If yes, describe
☐	☒	3.	Is there any known groundwater degradation in the area of the proposed subdivision? If yes, describe
☒	☐	4.	The county or joint county health department recommendation concerning this proposed plan is as follows: MCHD has no objections to Upper Gwynedd Township Act 537 Sewage Facilities Plan Special Study.
		5.	Name, title and signature of person completing this section:

Name: Tori McQueen

Title: Environmental Health Specialist/SEO

Signature: [signature]

Date: November 4, 2016

Name of County Health Department: Montgomery County Health Department

Address: 1430 DeKalb Street, P.O. Box 311, Norristown, Pa 19404

Telephone Number: 610-278-5117

SECTION D. ADDITIONAL COMMENTS (See Section D of instructions)

This Component does not limit county planning agencies from making additional comments concerning the relevancy of the proposed plan to other plans or ordinances. If additional comments are needed, attach additional sheets.

The county planning agency must complete this Component within 60 days.
This Component and any additional comments are to be returned to the applicant.

APPENDIX H

ORIGINAL SIGNED AND SEALED RESOLUTIONS BY UPPER GWYNEDD TOWNSHIP AND TOWAMENCIN TOWNSHIP

RESOLUTION NO. 18-2016 FOR PLAN REVISION

RESOLUTION OF THE BOARD OF COMMISSIONERS OF UPPER GWYNEDD TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA (hereinafter "the municipality").

WHEREAS, Section 5 of the Act of January 24, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, UPPER GWYNEDD TOWNSHIP has prepared an ACT 537 PLAN – SPECIAL STUDY which provides for revisions to the sewage facilities in a portion of UPPER GWYNEDD TOWNSHIP.

The alternative of choice to be implemented is ESTABLISHMENT OF AVERAGE ANNUAL FLOW CAPACITIES FOR THE EAST INTERCEPTOR, BRIAR GLEN PUMP STATION, AND CONRAD AVENUE PUMP STATION, AN EVALUATION OF THE FLOW PER ESTIMATED DWELLING UNIT FOR PLANNING PURPOSES, AND A DISCUSSION OF THE TEMPORARY LARGER PUMPS AT THE ABOVE REFERENCED PUMP STATIONS.

WHEREAS, UPPER GWYNEDD Township finds that the Facility Plan (Act 537 PLAN – SPECIAL STUDY) described above conforms to Upper Gwynedd's Connection Management Plan, Corrective Action Plan, applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management.

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of UPPER GWYNEDD Township hereby adopts and submits to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the municipality, the above referenced Facility Plan. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law. (Section 5, Pennsylvania Sewage Facilities Act as amended).

I, LEONARD T. PERRONE, Secretary, UPPER GWYNEDD Township Board of Commissioners hereby certify that the foregoing is a true copy of the Township's Resolution No. 18-2016, adopted AUGUST 22, 2016.

Attest:

BOARD OF COMMISSIONERS OF UPPER GWYNEDD TOWNSHIP MONTG. CO. PA

Leonard T. Perrone
Secretary

BOARD OF COMMISSIONERS
UPPER GWYNEDD TOWNSHIP

By: Kenneth E. Kroberger
Kenneth E. Kroberger
President

APPENDIX I

PADEP ACT 537 PLAN CHECKLIST

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

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 the Department of Environmental Protection (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 25 *Pa. Code* 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 (UER) process 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 *Guidelines for the Uniform Environmental Review Process in Pennsylvania* (381-5511-111) is available electronically in DEP's eLibrary online at www.dep.pa.gov.

After Municipal Adoption by Resolution, submit 3 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.

3850-FM-BCW0003 6/2016
Checklist

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

ACT 537 PLAN CONTENT AND ENVIRONMENTAL ASSESSMENT CHECKLIST

PART 1 GENERAL INFORMATION

A. Project Information

1. Project Name: Upper Gwynedd Township Act 537 Plan Revision - Special Study

2. Brief Project Description:

Flow Diversion from TMA WWTP to UGT WWTP

B. Client (Municipality) Information

Municipality Name	County	City	Boro	Twp
Upper Gwynedd Township	Montgomery	☐	☐	☒

Municipality Contact Individual - Last Name	First Name	MI	Suffix	Title
Perrone	Leonard	T		

Additional Individual Last Name	First Name	MI	Suffix	Title

Municipality Mailing Address Line 1	Mailing Address Line 2
P.O. Box 1	

Address Last Line – City	State	ZIP+4
West Point	PA	19486

Phone + Ext.	FAX (optional)	Email (optional)
215-699-7777	215-699-8846	lperrone@uppergwynedd.org

C. Site Information

Site (or Project) Name: Upper Gwynedd Township (Municipal Name) Act 537 Plan

Site Location Line 1	Site Location Line 2

D. Project Consultant Information

Last Name	First Name	MI	Suffix
Interrante	John	V.	P.E.

Title	Consulting Firm Name
Principal Engineer	Environmental Engineering & Management Associates, Inc.

Mailing Address Line 1	Mailing Address Line 2
P.O. Box 232	

Address Last Line – City	State	ZIP+4	Country
Kulpsville	PA	19443	USA

Email	Phone + Ext.	FAX
jinterrante@eema-inc.com	215-368-3375	215-368-6739

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 DEP. Incomplete plans may be ***denied*** unless the municipality is clearly requesting an advisory review.
____	i	1. **Table of Contents**
		2. **Plan Summary**
____	2	A. Identify the proposed service areas and major problems evaluated in the plan (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	2	C. Present the estimated cost of implementing the proposed alternative (including the user fees) and the proposed funding method to be used. (Reference - 25 *Pa. Code* §71.21(a)(7)(ii)).
____	3	D. Identify the municipal commitments necessary to implement the Plan. (Reference - 25 *Pa. Code* §71.21(a)(7)(iii)).
____	3	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 - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.31(f)) Section V.F. of the Planning Guide.
____	App. D & G	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 - 25 *Pa. Code* §71.31(b)) Section V.E.1 of the Planning Guide.
____	App. F	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 - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	App. G	6. **Comments and Responses:** Copies of ***all*** written comments received and municipal response to ***each*** comment in relation to the proposed plan. (Reference - 25 *Pa. Code* §71.31(c)) Section V.E.2 of the Planning Guide.
____	42	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 - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.21(c)).
____	27-32	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 25 *Pa. Code* §71.21 (a)(5)(i-iii). (Reference - 25 *Pa. Code* §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
	~~5~~	I.	**Previous Wastewater Planning**
	5		A. Identify, describe and briefly analyze all past wastewater planning for its impact on the current planning effort:
	N/A		1. Previously undertaken under the Pennsylvania Sewage Facilities Act (Act). (Reference - Act 537, 35 P.S. §750.5(d)(1)).
	5 & App.M		2. Has not been carried out according to an approved implementation schedule contained in the plans. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A-D)). Section V.F of the Planning Guide.
	~~5 &~~ App.O		3. Is anticipated or planned by applicable sewer authorities or approved under a Chapter 94 Corrective Action Plan. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A&B)). Section V.D. of the Planning Guide.
			4. Through planning modules for new land development, planning "exemptions" and addenda. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(A)).
	6 ~~& App. I~~ A		**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).
	6 & App.A		A. Identification of planning area(s), municipal boundaries, Sewer Authority/Management Agency service area boundaries. (Reference – 25 *Pa. Code* §71.21(a)(1)(i)).
	N/A		B. Identification of physical characteristics (streams, lakes, impoundments, natural conveyance, channels, drainage basins in the planning area). (Reference - 25 *Pa. Code* §71.21(a)(1)(ii)).
	N/A		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 (IRSIS), and areas unsuitable for soil dependent systems. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)). Show Prime Agricultural Soils and any locally protected agricultural soils. (Reference - 25 *Pa. Code* §71.21(a)(1)(iii)).
	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(iii)).
	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(ii)).
	N/A		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 - 25 *Pa. Code* §71.21(a)(1)(vi)). Section V.C. of the Planning Guide.
	6 & App. J.		G. Wetlands-Identify wetlands as defined in 25 *Pa. Code* Chapter 105 by description, analysis and mapping. Include National Wetland Inventory mapping and potential wetland areas per the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) 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 - 25 *Pa. Code* §71.21(a)(1)(v)). Appendix B, Section II.I of the Planning Guide.

8 & App. A

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:

8-11 & App. A

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 - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

App. K & App. L

2. A narrative and schematic diagram of the facility's basic treatment processes including the facility's National Pollutant Discharge Elimination System (NPDES) permitted capacity, and the Clean Streams Law permit number. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(A)).

13 & App.M

3. A description of problems with existing facilities (collection, conveyance and/or treatment), including existing or projected overload under 25 *Pa. Code* 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 - 25 *Pa. Code* §71.21(a)(2)(i)(B)).

14-23 App. C & App. M

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 - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

N/A

5. A detailed description of the municipality's operation and maintenance (O & M) 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 (SMPs). (Reference – 25 *Pa. Code* §71.21(a)(2)(i)(C)).

N/A

6. Disposal areas, if other than stream discharge, and any applicable groundwater limitations. (Reference - 25 *Pa. Code* §71.21(a)(4)(i & ii)).

N/A

B. Using DEP's publication titled *Act 537 Sewage Disposal Needs Identification* (3800-BK-DEP1949), 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:

N/A

1. The types of onlot systems in use. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(A)).

N/A

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 Act, the Clean Stream Law or regulations promulgated thereunder. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

N/A

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 25 *Pa. Code* Chapter 73 (relating to standards for sewage disposal facilities). (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A

4. An individual water supply survey to identify possible contamination by malfunctioning onlot sewage disposal systems consistent with DEP's *Act 537 Sewage Disposal Needs Identification* publication. (Reference – 25 *Pa. Code* §71.21(a)(2)(ii)(B)).

N/A

5. Detailed description of O & M 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 SMPs. (Reference - 25 *Pa. Code* §71.21(a)(2)(i)(C)).

N/A

C. Identify wastewater sludge and septage generation, transport and disposal methods. Include this information in the sewage facilities alternative analysis including:

N/A

1. Location of sources of wastewater sludge or septage (Septic tanks, holding tanks, wastewater treatment facilities). (Reference – 25 *Pa. Code* §71.71).

N/A

2. Quantities of the types of sludges or septage generated. (Reference - 25 *Pa. Code* §71.71).

N/A

3. Present disposal methods, locations, capacities and transportation methods. (Reference - 25 *Pa. Code* §71.71).

14-18

IV. Future Growth and Land Development

A. Identify and briefly summarize all municipal and county planning documents adopted pursuant to the Pennsylvania Municipalities Planning Code (Act 247) including:

App. N

1. All land use plans and zoning maps that identify residential, commercial, industrial, agricultural, recreational and open space areas. (Reference - 25 *Pa. Code* §71.21(a)(3)(iv)).

N/A

2. Zoning or subdivision regulations that establish lot sizes predicated on sewage disposal methods. (Reference – 25 *Pa. Code* §71.21(a)(3)(iv)).

N/A

3 All limitations and plans related to floodplain and stormwater management and special protection (25 *Pa. Code* Chapter 93) areas. (Reference - 25 *Pa Code* §71.21(a)(3)(iv)) Appendix B, Section II.F of the Planning Guide

14-19 & App. O

B. Delineate and describe the following through map, text and analysis.

App. O

1. Areas with existing development or platted subdivisions. Include the name, location, description, total number of equivalent dwelling units (EDUs) in development, total number of EDUs currently developed and total number of EDUs remaining to be developed (include time schedule for EDUs remaining to be developed). (Reference - 25 *Pa. Code* §71.21(a)(3)(i)).

N/A

2 Land use designations established under the Pennsylvania Municipalities Planning Code (35 P.S. 10101-11202), including residential, commercial and industrial areas (Reference - 25 *Pa. Code* §71.21(a)(3)(ii)) Include a comparison of proposed land use as allowed by zoning and existing sewage facility planning (Reference - 25 *Pa. Code* §71.21(a)(3)(iv))

14-19

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 - 25 *Pa. Code* §71.21(a)(1)(iv) and (a)(3)(iii)).

N/A

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 - 25 *Pa. Code* §71.21(a)(3)(iv)).

--public ground/surface water supplies
--recreational water use areas
--groundwater recharge areas
--industrial water use
--wetlands

14-19 App.O

5. Sewage planning necessary to provide adequate wastewater treatment for 5 and 10-year future planning periods based on projected growth of existing and proposed wastewater collection and treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(3)(v)).

19 **V. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities**

A. Conventional collection, conveyance, treatment and discharge alternatives including.

N/A 1. The potential for regional wastewater treatment. (Reference - 25 *Pa. Code* §71.21(a)(4))

N/A 2. The potential for extension of existing municipal or non-municipal sewage facilities to areas in need of new or improved sewage facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(i))

3. The potential for the continued use of existing municipal or non-municipal sewage facilities through one or more of the following: (Reference - 25 *Pa Code* §71.21(a)(4)(ii)).

N/A a. Repair. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

N/A b. Upgrading. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

App.M c. Reduction of hydraulic or organic loading to existing facilities. (Reference - 25 *Pa. Code* §71.71).

N/A d. Improved O & M. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(C)).

N/A e. Other applicable actions that will resolve or abate the identified problems. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(D))

App.M 4. Repair or replacement of existing collection and conveyance system components. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(A)).

N/A 5. The need for construction of new community sewage systems including sewer systems and/or treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iii))

N/A 6. Use of innovative/alternative methods of collection/conveyance to serve needs areas using existing wastewater treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(ii)(B)).

N/A B. The use of individual sewage disposal systems including IRSIS systems based on:

N/A 1. Soil and slope suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 3. The establishment of a SMP. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)). See also Part "F" below.

N/A 4. The repair, replacement or upgrading of existing malfunctioning systems in areas suitable for onlot disposal considering: (Reference - 25 *Pa. Code* §71.21(a)(4)).

N/A a. Existing technology and sizing requirements of 25 *Pa. Code* Chapter 73. (Reference - 25 *Pa. Code* §73.31-§73.72).

N/A b. Use of expanded absorption areas or alternating absorption areas. (Reference - 25 *Pa. Code* §73.16).

N/A c. Use of water conservation devices. (Reference - 25 *Pa. Code* §71.73(b)(2)(iii)).

N/A

C. The use of small flow sewage treatment facilities or package treatment facilities to serve individual homes or clusters of homes with consideration of. (Reference - 25 *Pa. Code* §71.64(d)).

N/A 1. Treatment and discharge requirements. (Reference - 25 *Pa. Code* §71.64(d)).

N/A 2. Soil suitability. (Reference - 25 *Pa. Code* §71.64(c)(1)).

N/A 3. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.64(c)(2)).

N/A 4. Municipal, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §71.64(d)). See Part "F" below

N/A D. The use of community land disposal alternatives including:

N/A 1. Soil and site suitability. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 2. Preliminary hydrogeologic evaluation. (Reference - 25 *Pa. Code* §71.21(a)(2)(ii)(C)).

N/A 3. Municipality, Local Agency or other controls over O & M requirements through a SMP. (Reference - 25 *Pa. Code* §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.

N/A E. The use of retaining tank alternatives on a temporary or permanent basis including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

N/A 1. Commercial, residential and industrial use. (Reference - 25 *Pa. Code* §71.63(e)).

N/A 2. Designated conveyance facilities (pumper trucks). (Reference - 25 *Pa. Code* §71.63(b)(2)).

N/A 3. Designated treatment facilities or disposal site. (Reference - 25 *Pa. Code* §71.63(b)(2)).

N/A 4. Implementation of a retaining tank ordinance by the municipality. (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.63(c)(2)).

N/A F. SMPs to assure the future O & M of existing and proposed sewage facilities through:

N/A 1. Municipal ownership or control over the O & M of individual onlot sewage disposal systems, small flow treatment facilities, or other traditionally non-municipal treatment facilities. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv)).

N/A 2. Required inspection of sewage disposal systems on a schedule established by the municipality. (Reference - 25 *Pa. Code* §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 - 25 *Pa. Code* §71.73(b)(2)).

N/A 4. Repair, replacement or upgrading of malfunctioning onlot sewage systems. (Reference - 25 *Pa. Code* §71.21(a)(4)(iv) and §71.73(b)(5)) through:

N/A a. Aggressive pro-active enforcement of ordinances that require O & M and prohibit malfunctioning systems. (Reference - 25 *Pa. Code* §71.73(b)(5)).

N/A b. Public education programs to encourage proper O & M and repair of sewage disposal systems.

N/A 5. Establishment of joint municipal SMPs. (Reference - 25 *Pa. Code*

§71.73(b)(8)).

6. Requirements for bonding, escrow accounts, management agencies or associations to assure O & M for non-municipal facilities. (Reference - 25 *Pa. Code* §71.71).

G. Non-structural comprehensive planning alternatives that can be undertaken to assist in meeting existing and future sewage disposal needs including: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Modification of existing comprehensive plans involving:

a. Land use designations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

b. Densities. (Reference - 25 *Pa. Code* §71.21(a)(4)).

c. Municipal ordinances and regulations. (Reference - 25 *Pa. Code* §71.21(a)(4)).

d. Improved enforcement. (Reference - 25 *Pa. Code* §71.21(a)(4)).

e. Protection of drinking water sources. (Reference - 25 *Pa. Code* §71.21(a)(4)).

2. Consideration of a local comprehensive plan to assist in producing sound economic and consistent land development. (Reference - 25 *Pa. Code* §71.21(a)(4)).

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 - 25 *Pa. Code* §71.21(a)(4)).

4. Evaluation of existing local agency programs and the need for technical or administrative training. (Reference - 25 *Pa. Code* §71.21(a)(4)).

H. A no-action alternative which includes discussion of both short-term and long-term impacts on: (Reference - 25 *Pa. Code* §71.21(a)(4)).

1. Water quality/public health. (Reference - 25 *Pa. Code* §71.21(a)(4)).

2. Growth potential (residential, commercial, industrial). (Reference - 25 *Pa. Code* §71.21(a)(4)).

3. Community economic conditions. (Reference - 25 *Pa. Code* §71.21(a)(4)).

4. Recreational opportunities (Reference - 25 *Pa. Code* §71.21(a)(4)).

5. Drinking water sources (Reference - 25 *Pa. Code* §71.21(a)(4)).

6. Other environmental concerns (Reference - 25 *Pa. Code* §71.21(a)(4))

27-33

VI. Evaluation of Alternatives

A. Technically feasible alternatives identified in Section V of this checklist must be evaluated for consistency with respect to the following: (Reference - 25 *Pa. Code* §71.21(a)(5)(i)).

27-28

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 - 25 *Pa. Code* §71.21(a)(5)(i)(A)). Appendix B, Section II.A of the Planning Guide.

28

2. Municipal wasteload management **Corrective Action Plans or Annual Reports** developed under 25 *Pa. Code* Chapter 94. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(B)). The municipality's recent Wasteload Management (25 *Pa. Code* 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.

28

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 - 25 *Pa. Code* §71.21(a)(5)(i)(C)). Appendix B, Section II.E of the Planning Guide.

28 4 **Comprehensive plans developed under the Pennsylvania Municipalities Planning Code.** (Reference - 25 *Pa. Code* §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.

28 5. **Antidegradation requirements** as contained in 25 *Pa. Code* Chapters 93, 95 and 102 (relating to water quality standards, wastewater treatment requirements and erosion control) and the Clean Water Act. (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(E). Appendix B, Section II.F of the Planning Guide.

28 6. **State Water Plans** developed under the Water Resources Planning Act (42 U.S.C.A. 1962-1962 d-18). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(F)). Appendix B, Section II.C of the Planning Guide.

29 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 - 25 *Pa. Code* §71.21(a)(5)(i)(G)). Appendix B, Section II.G of the Planning Guide.

29 8. **County Stormwater Management Plans** approved by DEP under the Storm Water Management Act (32 P.S. 680.1-680.17). (Reference - 25 *Pa. Code* §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.

29 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 - 25 *Pa. Code* §71.21(a)(5)(i)(I)) Appendix B, Section II.I of the Planning Guide.

29 10. **Protection of rare, endangered or threatened plant and animal species** as identified by the Pennsylvania Natural Diversity Inventory (PNDI). (Reference - 25 *Pa. Code* §71.21(a)(6)(i)(J)). Provide DEP with a copy of the completed *PNDI Manual Project Submission Form*. Also provide a copy of the response letters from the 4 jurisdictional agencies regarding the findings of the PNDI search. Appendix B, Section II.J of the Planning Guide.

29 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 (PHMC). (Reference - 25 *Pa. Code* §71.21(a)(5)(i)(K)). Provide DEP with a completed copy of a *Cultural Resource Notice* and a return receipt for its submission to PHMC. Provide a copy of the response letter or review stamp from the Bureau of Historic Preservation (BHP) indicating the project will have no effect on, or that there may be potential impacts on, known archaeological and historical sites and any avoidance and mitigation measures required. Appendix B, Section II.K of the Planning Guide.

N/A

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 - 25 *Pa. Code* §71.21(a)(5)(ii)) Appendix B of the Planning Guide.

27-28

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 - 25 *Pa. Code* §71.21(a)(5)(iii)).

33-36 & App. Q

D. Provide cost estimates using present worth analysis for construction, financing, ongoing administration, O & M 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 5 years from the date of plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(iv)).

33,34,41-42 & App. Q

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 5 years from the date of the plan submission. (Reference - 25 *Pa. Code* §71.21(a)(5)(v)).

37

F. Analyze the need for immediate or phased implementation of each alternative proposed in Section V of this checklist including: (Reference - 25 *Pa. Code* §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 SMPs. (Reference - 25 *Pa. Code* §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 SMP justifying time schedules for each phase. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(B)).

36

G. Evaluate administrative organizations and legal authority necessary for plan implementation. (Reference - 25 *Pa. Code* §71.21(a)(5)(vi)(D)).

37-38

VII. Institutional Evaluation

A. Provide an analysis of all existing wastewater treatment authorities, their past actions and present performance including:

37-38

1. Financial and debt status. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

2. Available staff and administrative resources. (Reference - 25 *Pa. Code* §71.61(d)(2))

37-38

3. Existing legal authority to:

37-38

a. Implement wastewater planning recommendations. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

b. Implement system-wide O & M activities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

c. Set user fees and take purchasing actions. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

d. Take enforcement actions against ordinance violators. (Reference - 25 *Pa. Code* §71.61(d)(2)).

37-38

e. Negotiate agreements with other parties. (Reference - 25 *Pa. Code* §71.61(d)(2)).

33-37

37-38

37-38

N/A

N/A

37-38

N/A

37-38 & App. B

24-25

N/A

App. B

App. C

29-31,37,38

42-43

f. Raise capital for construction and O & M of facilities. (Reference - 25 *Pa. Code* §71.61(d)(2)).

B. Provide an analysis and description of the various institutional alternatives necessary to implement the proposed technical alternatives including:

1. Need for new municipal departments or municipal authorities. (Reference - 25 *Pa. Code* §71.61(d)(2)).
2. Functions of existing and proposed organizations (sewer authorities, onlot maintenance agencies, etc.). (Reference - 25 *Pa. Code* §71.61(d)(2)).
3. Cost of administration, implementability, and the capability of the authority/agency to react to future needs. (Reference - 25 *Pa. Code* §71.61(d)(2)).

C. Describe all necessary administrative and legal activities to be completed and adopted to ensure the implementation of the recommended alternative including:

1. Incorporation of authorities or agencies. (Reference - 25 *Pa. Code* §71.61(d)(2)).
2. Development of all required ordinances, regulations, standards and inter-municipal agreements. (Reference - 25 *Pa. Code* §71.61(d)(2)).
3. Description of activities to provide rights-of-way, easements and land transfers. (Reference - 25 *Pa. Code* §71.61(d)(2)).
4. Adoption of other municipal sewage facilities plans. (Reference - 25 *Pa. Code* §71.61(d)(2)).
5. Any other legal documents. (Reference - 25 *Pa. Code* §71.61(d)(2)).
6. Dates or timeframes for items 1-5 above on the project's implementation schedule.

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 - 25 *Pa. Code* §71.61(d)(2)).

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:

38-41

39-41

N/A

33-37 & 41-42

N/A

41-42 & App. Q

28-29

1 Existing wastewater disposal needs. (Reference - 25 *Pa. Code* §71.21(a)(6)).
2. Future wastewater disposal needs. (5 and 10 year growth areas). (Reference - 25 *Pa. Code* §71.21(a)(6))
3. O & M considerations. (Reference - 25 *Pa. Code* §71.21(a)(6))
4. Cost-effectiveness. (Reference - 25 *Pa. Code* §71.21(a)(6))
5 Available management and administrative systems. (Reference - 25 *Pa. Code* §71.21(a)(6)).
6 Available financing methods. (Reference - 25 *Pa. Code* §71.21(a)(6)).
7. Environmental soundness and compliance with natural resource planning and preservation programs (Reference - 25 *Pa. Code* §71.21(a)(6))

41-42

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 - 25 *Pa. Code* §71.21(a)(6))

42 & App.C

C. Designate and describe the implementation schedule for the recommended alternative, including justification for any proposed phasing of construction or implementation of a SMP. (Reference – 25 *Pa. Code* §71.31(d))

N/A

N/A

IX. Environmental Report (ER) generated from the UER Process:

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.***

PENNVEST I.D. No. _____

ADDITIONAL REQUIREMENTS FOR PENNVEST PROJECTS

Municipalities that propose to implement their official sewage facilities plan updates with PENNVEST funds must meet 6 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
____	N/A	1. Environmental Impact Assessment (Planning Phase) The UER replaces the Environmental Impact Assessment that was a previous requirement for PENNVEST projects.
____	N/A	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)

IIA 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

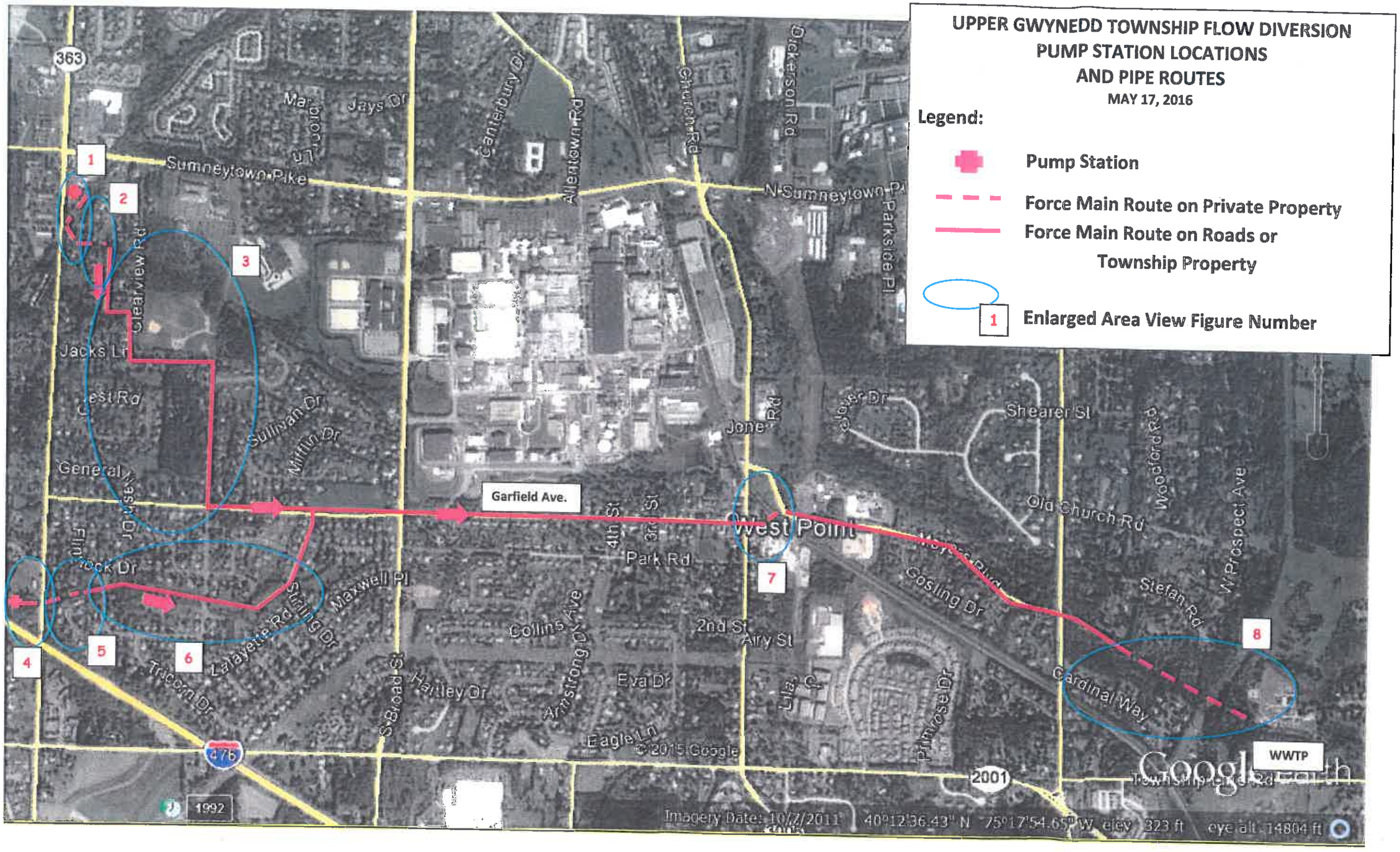
Anaerobic Digestion with more than 90 percent Methane Recovery
Cogeneration of Electricity
Self-Sustaining Incineration

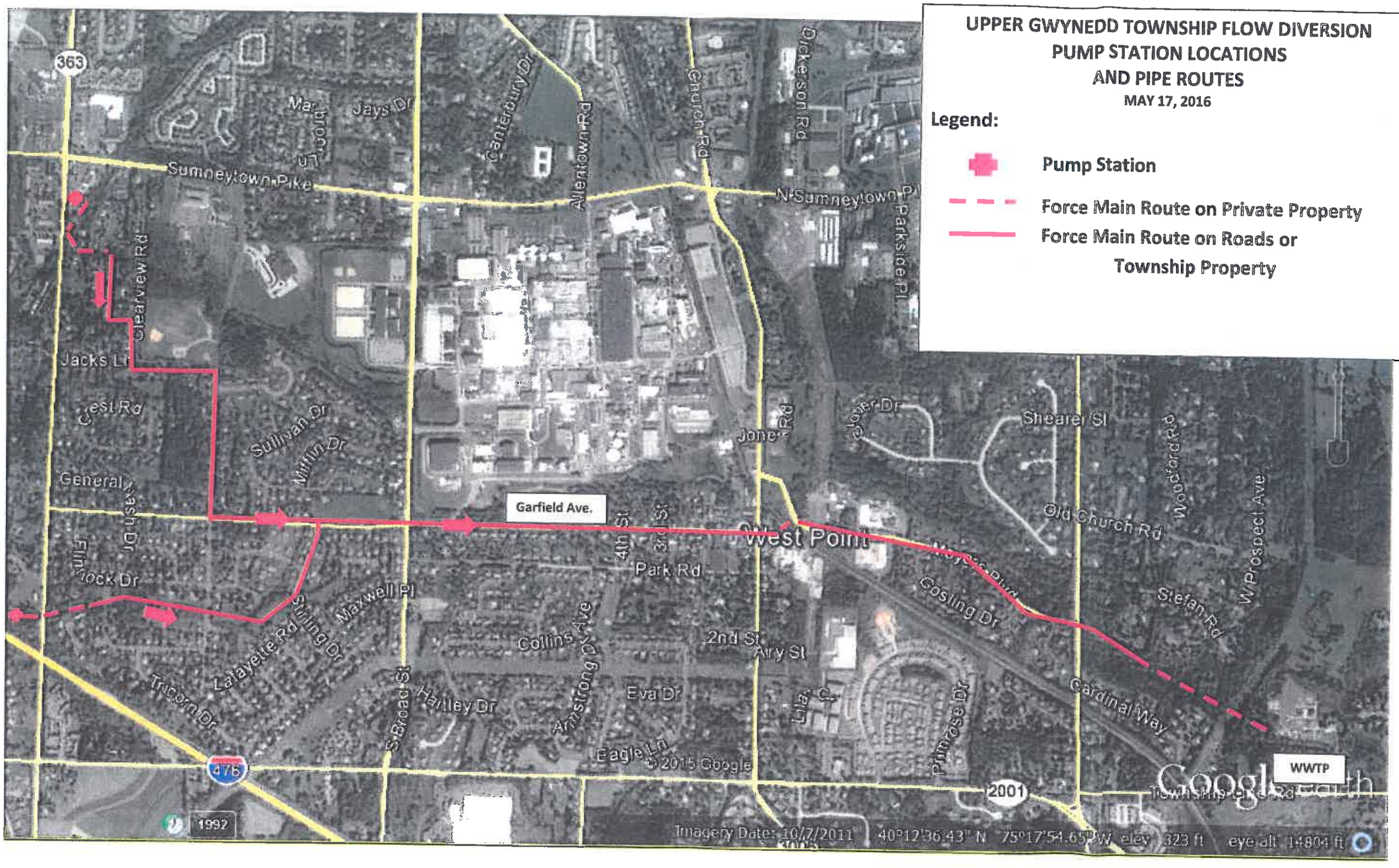
INDIVIDUAL & SYSTEM-WIDE COLLECTION TECHNOLOGIES

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

APPENDIX J

PUMP STATION AND FORCE MAIN MAP WITH EASEMENTS


UPPER GWYNEDD TOWNSHIP FLOW DIVERSION
PUMP STATION LOCATIONS
AND PIPE ROUTES
MAY 17, 2016
Legend:
Pump Station
Force Main Route on Private Property
Force Main Route on Roads or
Township Property
1
Enlarged Area View Figure Number
363
Sumneytown Pike
N Sumneytown Pk
Jays Dr
Canterbury Dr
Allentown Rd
Church Rd
Dickerson Rd
Parkside Pl
Clearview Rd
Jacks Ln
Sullivan Dr
Mifflin Dr
Jones Rd
Glover Dr
Shearer St
Garfield Ave.
West Point
4th St
3rd St
Park Rd
Old Church Rd
Woodford Rd
W Prospect Ave
Stefan Rd
Cardinal Way
Cosling Dr
Maxwell Pl
Lafayette Rd
Stirling Dr
Tricorn Dr
Collins Ave
Armstrong Dr
Eva Dr
Harley Dr
S Broad St
2nd St
Airy St
Lila Ct
Primrose Dr
Eagle Ln
476
2001
WWTP
1992
© 2015 Google
Google Earth
Imagery Date: 10/7/2011 40°12'36.43" N 75°17'54.65" W elev 323 ft eye alt 14804 ft


UPPER GWYNEDD TOWNSHIP FLOW DIVERSION
PUMP STATION LOCATIONS
AND PIPE ROUTES
MAY 17, 2016
Legend:
Pump Station
Force Main Route on Private Property
Force Main Route on Roads or
Township Property
363
Sumneytown Pike
Jays Dr
Canterbury Dr
Allentown Rd
Church Rd
Dickerson Rd
N Sumneytown Pl
Parkside Pl
Clearview Rd
Jacks Ln
Sullivan Dr
Jones Rd
Joyce Dr
Shearer St
General Nash Dr
Garfield Ave.
West Point
4th St
3rd St
Park Rd
Old Church Rd
Woodford Rd
W Prospect Ave
Flintlock Dr
Maxwell Pl
Stirling Dr
Lafayette Rd
Tricorn Dr
Collins Ave
2nd St
Arry St
Eva Dr
Armstrong Dr
S Broad St
Hartley Dr
Eagle Ln
Cosling Dr
Stefan Rd
Primrose Dr
Cardinal Way
WWTP
476
2001
1992
© 2015 Google
Google earth
Imagery Date: 10/7/2011 40°12'36.43" N 75°17'54.65" W elev 323 ft eye alt 14804 ft

Valley Forge Road near Sumneytown Pike

Figure 1

Parcel Number	Owner & Address	Impact
560009013003	DANNER RODERICK JR & PATRICIA 1611 VALLEY FORGE RD	Pump Station Location Gravity Sewer Construction In Existing Easement Force Main Construction In Existing Easement Temporary Construction Easement
560009010006	PESESKO KATE 1615 VALLEY FORGE RD	Gravity Sewer Construction In Existing Easement Force Main Construction In Existing Easement Temporary Construction Easement
560009007108 560009007009	NOWAK HARRY W III 1619 VALLEY FORGE RD	Force Main Construction In Existing Easement Temporary Construction Easement

Clearbrook Road

Figure 2

Parcel Number	Owner & Address	Impact
560001343023	SHERIDAN JOSEPH B & MARY ELLEN 1614 CLEARBROOK RD	Force Main Construction In Existing Easement Temporary Construction Easement
560001343005	DUDA DENNIS J & DIANE S 1616 CLEARBROOK RD	Force Main Construction in New Easement ***NOTE:*** *Easement required ONLY if Force Main cannot be place in street above existing culvert.*

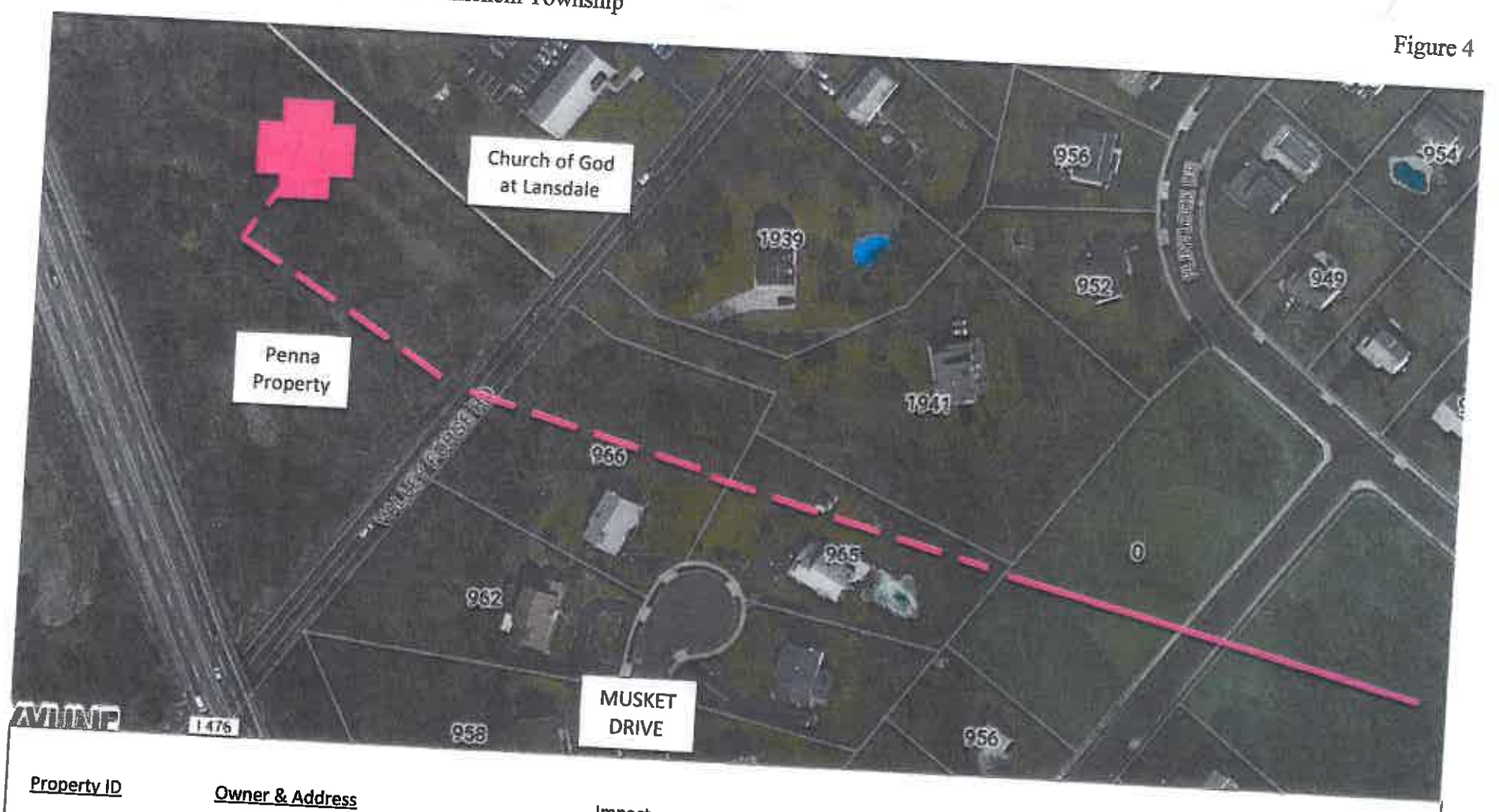
Public Streets – Clearbrook Road to Supplee Road

Figure 3

Force Main Construction in the following public streets:

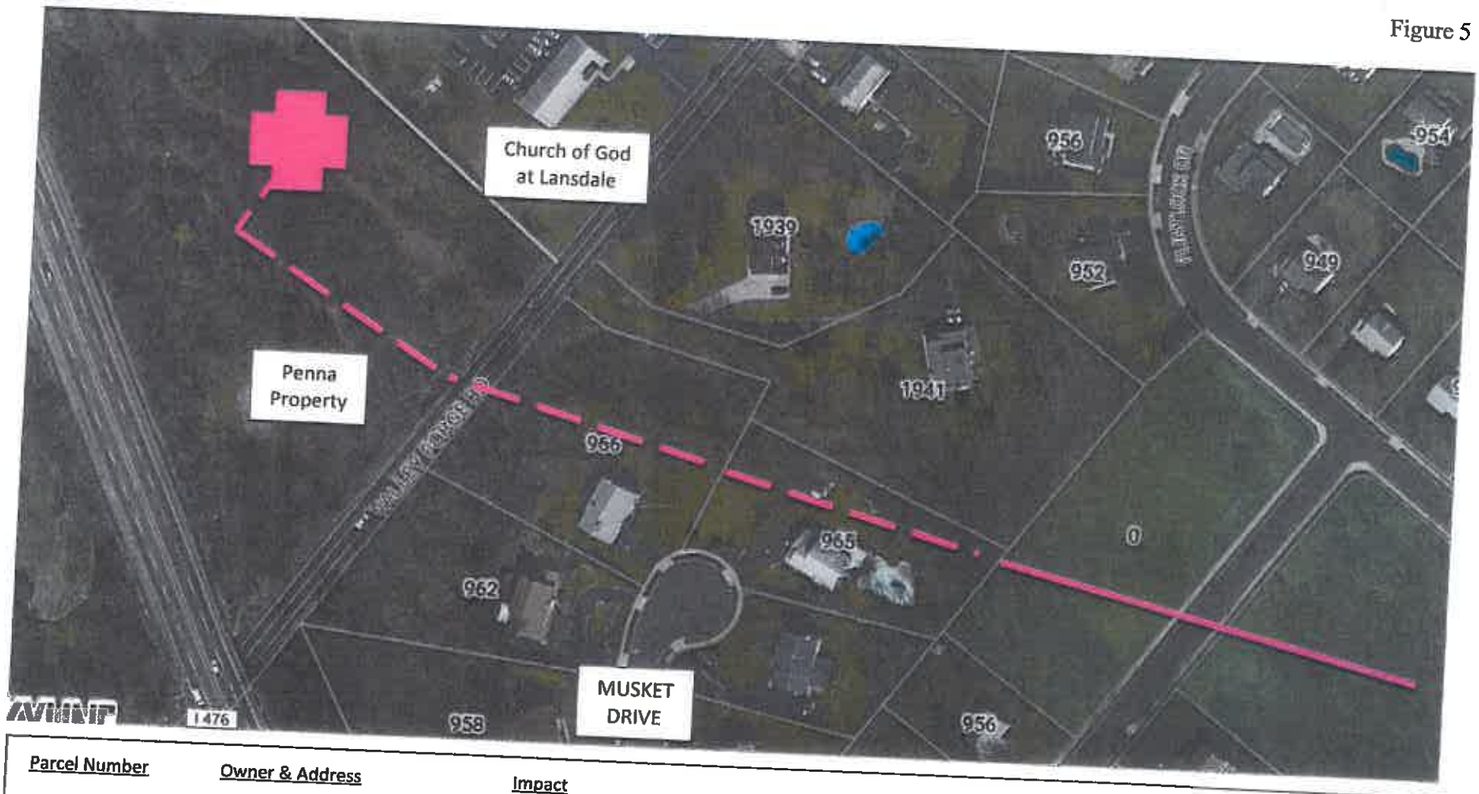
Clearbrook Road, Geyer Road, Clearview Road, Jacks Lane, Supplee Road

Figure 4



Property ID	Owner & Address	Impact
Block 13, Unit 81	PENNA DOMENIC A. & KAREN L	Permanent Easement for Pump Station and Force Main Construction Temporary Construction Easements
Block 13, Unit 80	CHURCH OF GOD AT LANSDALE	Alternate Access Easement to Pump Station

Figure 5



Parcel Number	Owner & Address	Impact
560005918281	GANNON PAUL S & ROSE M 966 MUSKET DR	Force Main Construction within Existing Sewer Easement Temporary Construction Easement
560005918308	PAGLIARO ANTHONY & KIMBERLY A 965 MUSKET DR	Force Main Construction within Existing Sewer Easement Temporary Construction Easement

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Township Open Space - Flintlock Dr. and Stirling Dr.

Figure 6

Force Main Construction within the following public streets:

Powderhorn Drive, Supplee Road, Stirling Drive

Force Main Construction within Existing Sanitary Sewer Easements, and Temporary Construction Easements, in the following parcels:

560002071015 (Flintlock Dr.) – Township Open Space

560008174176 (Stirling Dr.) – Township Open Space

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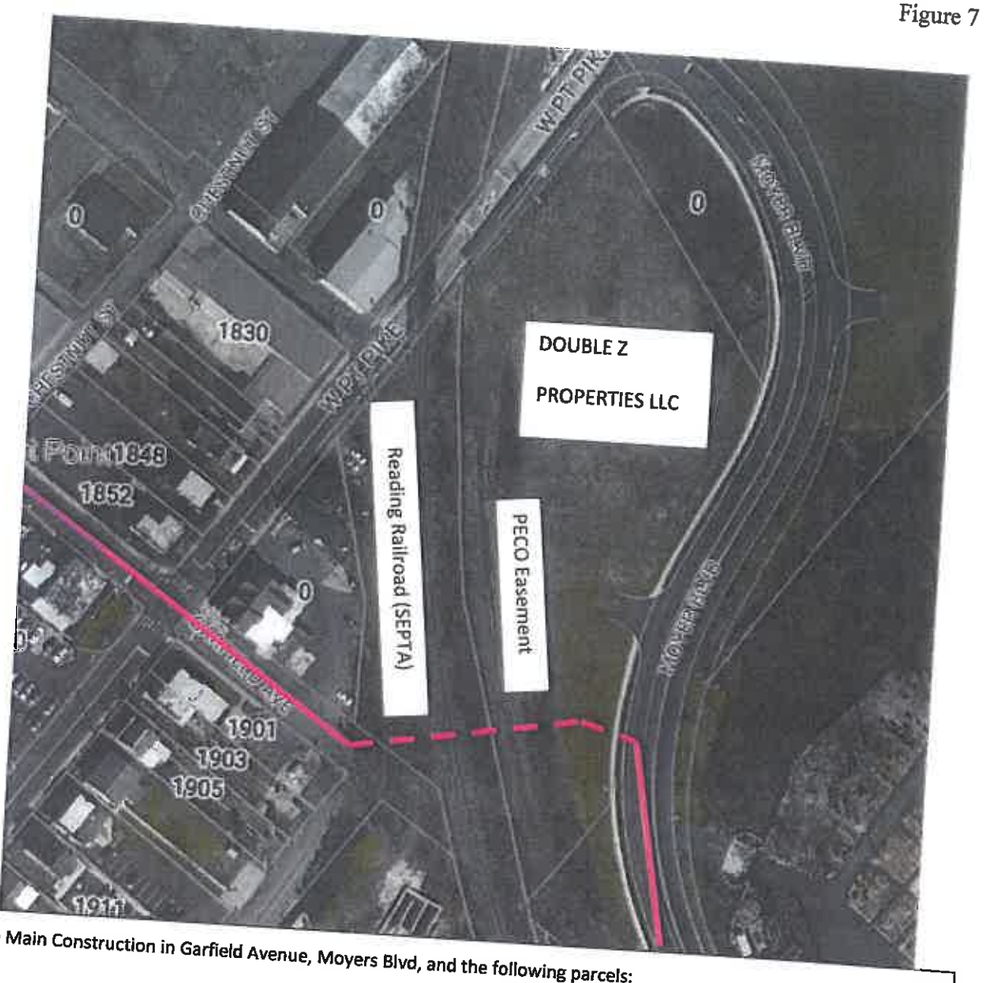
Railroad Crossing at West Point

Figure 7

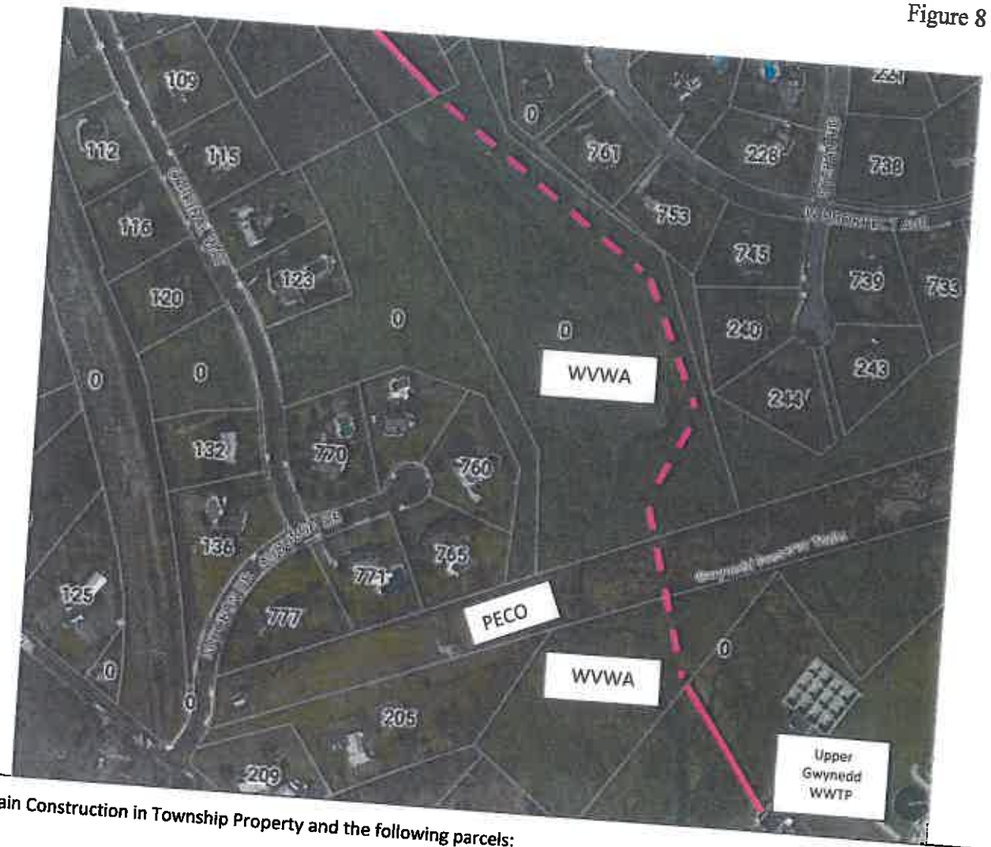


Force Main Construction in Garfield Avenue, Moyers Blvd, and the following parcels:

Parcel Number	Owner & Address	Impact
560009601009	HOFF PROPERTIES LLC 0 WEST POINT PIKE	Temporary Construction Easement
560009604006	READING RAILROAD CO (SEPTA)	Force Main Construction In New Easement Temporary Construction Easement
560009616021	DOUBLE Z PROPERTIES LLC 0 WEST POINT PIKE	Force Main Construction In New Easement Temporary Construction Easement
	PECO (Former Transit Easement)	Force Main Construction In New Easement Temporary Construction Easement

Wissahickon Valley Watershed Association

Figure 8

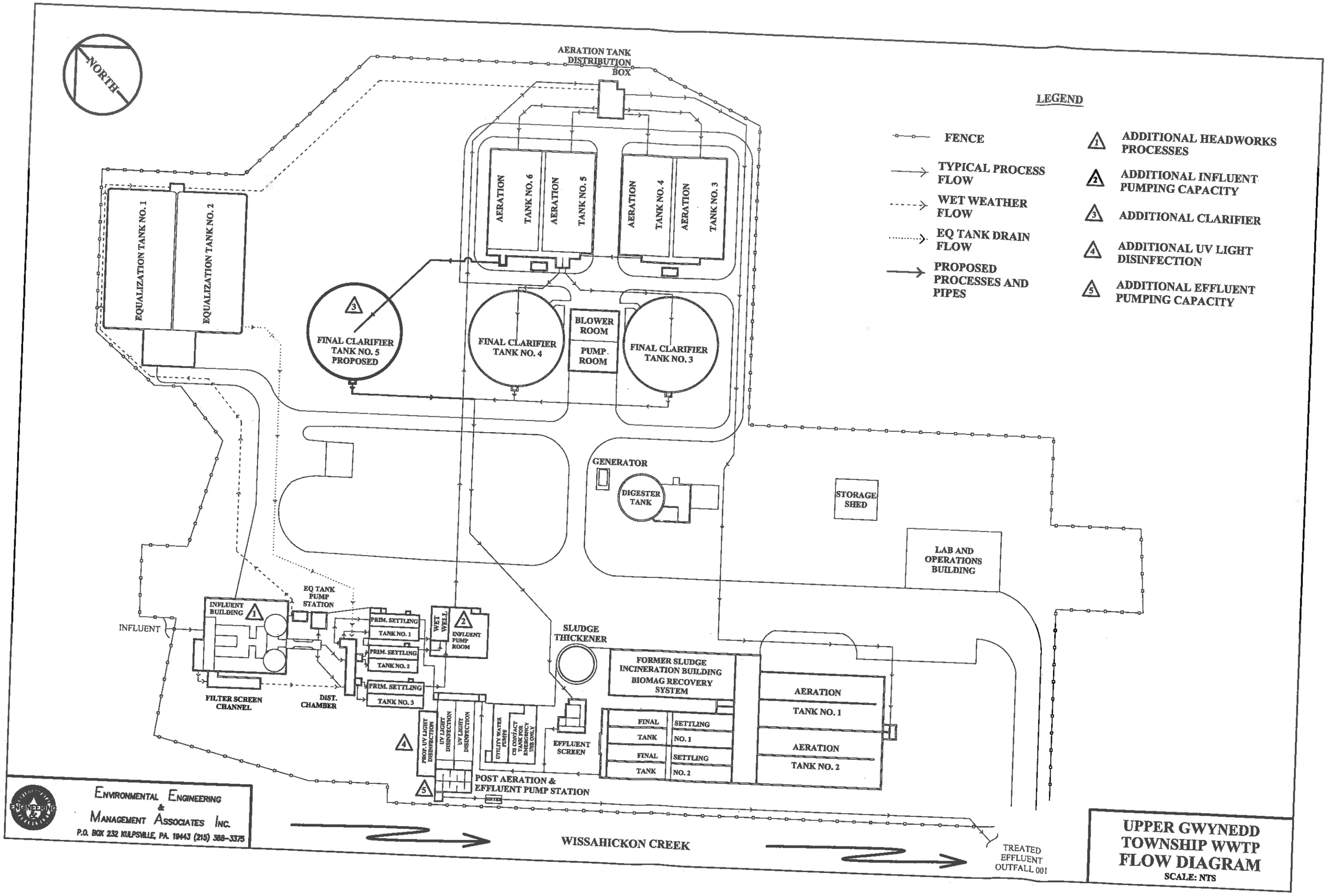


Force Main Construction in Township Property and the following parcels:

Parcel Number	Owner & Address	Impact
560000840121	WISSAHICKON VALLEY WATERSHED ASSOC 0 CARDINAL WAY	Force Main Construction In Existing Easement Temporary Construction Easement
560008398006	PECO 0 SUMNEYTOWN PIKE	Force Main Construction In Existing Easement Temporary Construction Easement

APPENDIX K

UPPER GWYNEDD TOWNSHIP WWTP
FLOW SCHEMATIC



ENVIRONMENTAL ENGINEERING & MANAGEMENT ASSOCIATES INC.
P.O. BOX 232 KULPSVILLE, PA. 19443 (215) 368-3375

UPPER GWYNEDD TOWNSHIP WWTP FLOW DIAGRAM

SCALE: NTS

APPENDIX L

UPPER GWYNEDD TOWNSHIP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

3800-PM-WSFR0012 Rev. 10/2011
Permit

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

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM DISCHARGE REQUIREMENTS FOR PUBLICLY OWNED TREATMENT WORKS (POTWs)

NPDES PERMIT NO: PA0023256

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 *et seq.* ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 *et seq.*,

Upper Gwynedd Township
PO Box 1
West Point, PA 19486

is authorized to discharge from a facility known as **Upper Gwynedd Township WWTP**, located at **261 Township Line Road, Upper Gwynedd Township, Montgomery County**, to **Wissahickon Creek** in Watershed(s) **3F-Lower Schuylkill** in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON July 1, 2012

THIS PERMIT SHALL EXPIRE AT MIDNIGHT ON June 30, 2017

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with the terms, conditions or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. (40 CFR 122.41(a))

3. A complete application for renewal of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form. (40 CFR 122.41(b), 122.21(d))

   In the event that a timely and complete application for renewal has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports (DMRs), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application. (25 Pa. Code 92a.7(b), (c))

4. This NPDES permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

DATE PERMIT ISSUED June 8, 2012

ISSUED BY

Jenifer L. Fields, P.E.
Clean Water Program Manager
Southeast Regional Office

Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 11' 24.00" , **Longitude** 75° 17' 1.00" , **River Mile Index** 18.74 , **Stream Code** 00844

Discharging to Wissahickon Creek

which receives wastewater from Upper Gwynedd Township WWTP.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	7.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.016	XXX	0.052	See Permit	Grab
CBOD5 May 1 - Oct 31	238	357	XXX	5.0	7.5	10	1/day	24-Hr Composite
CBOD5 Nov 1 - Apr 30	475	713	XXX	10	15	20	1/day	24-Hr Composite
Total Suspended Solids	1,426	2,139	XXX	30	45	60	1/day	24-Hr Composite
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/day	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite

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Outfall 001, Continued (from July 1, 2012 through June 30, 2017)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	35	XXX	XXX	0.74	XXX	1.48	1/day	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	106	XXX	XXX	2.22	XXX	4.44	1/day	24-Hr Composite
Orthophosphate May 1 - Oct 31	48	XXX	XXX	1.00	XXX	2.00	1/day	24-Hr Composite
Orthophosphate Nov 1 - Apr 30	174	XXX	XXX	3.64	XXX	7.28	1/day	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Copper	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Iron	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Chronic toxicity (Ceriodaphnia) (TUc)	XXX	XXX	XXX	XXX	1.05 Max	XXX	1/quarter	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

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Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002, Latitude 40° 11' 23.00", Longitude 75° 17' 1.00", River Mile Index _____, Stream Code 00844

Discharging to Wissahickon Creek

which receives stormwater from eastern portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002

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Permit No. PA0023256

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. C. For Outfall 003 , **Latitude** 40° 11' 27.00" , **Longitude** 75° 17' 6.00" , **River Mile Index** _____ , **Stream Code** _____

Discharging to Wissahickon Creek

which receives stormwater from western portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 003

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PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. D. For Outfall 004, Latitude 40° 11' 30.00", Longitude 75° 17' 7.00", River Mile Index _____, Stream Code _____

Discharging to Unnamed Tributary to Wissahickon Creek

which receives stormwater from northwestern portion of Upper Gwynedd Township WWTP property.

1. The permittee is authorized to discharge during the period from July 1, 2012 through June 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements, Footnotes and Supplemental Information).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Average Weekly	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 004

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PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)

Additional Requirements

1. The permittee may not discharge:

   a. Floating solids, scum, sheen or substances that result in observed deposits in the receiving water. (25 Pa Code 92a.41(c))

   b. Oil and grease in amounts that cause a film or sheen upon or discoloration of the waters of this Commonwealth or adjoining shoreline, or that exceed 15 mg/l as a daily average or 30 mg/l at any time (or lesser amounts if specified in this permit). (25 Pa. Code 92a.47(a)(7) and 95.2(2))

   c. Substances in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life. (25 Pa Code 93.6(a))

   d. Foam or substances that produce an observed change in the color, taste, odor or turbidity of the receiving water, unless those conditions are otherwise controlled through effluent limitations or other requirements in this permit. (25 Pa Code 92a.41(c))

2. The monthly average percent removal of BOD_5 or $CBOD_5$ and TSS must be at least 85% for POTW facilities on a concentration basis except where 25 Pa. Code 92a.47(g) and (h) are applicable to facilities with combined sewer overflows (CSOs) or as otherwise specified in this permit. (25 Pa. Code 92a.47(a)(3))

Footnotes

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

Supplemental Information

(1) If the permit requires reporting of average weekly limitations use the following guideline. If the "maximum average concentration" and the "maximum average mass loading" does not occur within the same week, both the highest weekly average concentration and the highest weekly average mass load should be reported, regardless of whether they both occur during the same calendar week.

(2) The hydraulic design capacity of 6.5 million gallons per day for the treatment facility is used to prepare the annual Municipal Wasteload Management Report to help determine whether a "hydraulic overload" situation exists, as defined in Title 25 Pa. Code Chapter 94.

(3) The effluent limitations for this outfall were determined using an effluent discharge rate of 5.7 million gallons per day.

II. DEFINITIONS

At Outfall (XXX) means a sampling location in outfall line XXX below the last point at which wastes are added to outfall line (XXX), or where otherwise specified.

Average refers to the use of an arithmetic mean, unless otherwise specified in this permit. (40 CFR 122.41(l)(4)(iii))

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution to surface waters of the Commonwealth. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (25 Pa. Code 92a.2)

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i))

Calendar Week is defined as the seven consecutive days from Sunday through Saturday, unless the permittee has been given permission by DEP to provide weekly data as Monday through Friday based on showing excellent performance of the facility and a history of compliance. In cases when the week falls in two separate months, the month with the most days in that week shall be the month for reporting.

Clean Water Act means the Federal Water Pollution Control Act, as amended (33 U.S.C.A. §§1251 to 1387).

Composite Sample (for all except GC/MS volatile organic analysis) means a combination of individual samples (at least eight for a 24-hour period or four for an 8-hour period) of at least 100 milliliters (mL) each obtained at spaced time intervals during the compositing period. The composite must be flow-proportional; either the volume of each individual sample is proportional to discharge flow rates, or the sampling interval is proportional to the flow rates over the time period used to produce the composite. (EPA Form 2C)

Composite Sample (for GC/MS volatile organic analysis) consists of at least four aliquots or grab samples collected during the sampling event (not necessarily flow proportioned). The samples must be combined in the laboratory immediately before analysis and then one analysis is performed. (EPA Form 2C)

Daily Average Temperature means the average of all temperature measurements made, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar day or during the operating day if flows are of a shorter duration.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (25 Pa. Code 92a.2, 40 CFR 122.2)

Daily Maximum Discharge Limitation means the highest allowable "daily discharge."

Discharge Monitoring Report (DMR) means the DEP or EPA supplied form(s) for the reporting of self-monitoring results by the permittee. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Estimated Flow means any method of liquid volume measurement based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

Geometric Mean means the average of a set of n sample results given by the n^{th} root of their product.

Grab Sample means an individual sample of at least 100 mL collected at a randomly selected time over a period not to exceed 15 minutes. (EPA Form 2C)

Hauled-In Wastes means any waste that is introduced into a treatment facility through any method other than a direct connection to the sewage collection system. The term includes wastes transported to and disposed of within the treatment facility or other entry points within the collection system.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act. (40 CFR 122.2)

Immersion Stabilization (i-s) means a calibrated device is immersed in the wastewater until the reading is stabilized.

Indirect Discharger means a non-domestic discharger introducing pollutants to a Publicly Owned Treatment Works (POTW) or other treatment works. (25 Pa. Code 92a.2 and 40 CFR 122.2)

Industrial User means a source of Indirect Discharge. (40 CFR 403.3)

Instantaneous Maximum Effluent Limitation means the highest allowable discharge of a concentration or mass of a substance at any one time as measured by a grab sample. (25 Pa. Code 92a.2)

Measured Flow means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

Monthly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. (25 Pa. Code 92a.2)

Municipality means a city, town, borough, county, township, school district, institution, authority or other public body created by or pursuant to State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes. (25 Pa. Code 92a.2)

Publicly Owned Treatment Works (POTW) means a treatment works as defined by §212 of the Clean Water Act, owned by a state or municipality. The term includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. The term also includes sewers, pipes or other conveyances if they convey wastewater to a POTW providing treatment. The term also means the municipality as defined in section 502(4) of the Clean Water Act, which has jurisdiction over the indirect discharges to and the discharges from such a treatment works. (25 Pa Code 92a.2 and 40 CFR 122.2)

Severe Property Damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR 122.41(m)(1)(ii))

Stormwater means the runoff from precipitation, snow melt runoff, and surface runoff and drainage. (25 Pa. Code 92a.2)

Stormwater Associated With Industrial Activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant, and as defined at 40 CFR §122.26(b)(14)(i) – (ix) and (xi) and 25 Pa. Code 92a.2.

Toxic Pollutant means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains may, on the basis of information available to DEP cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations in these organisms or their offspring. (25 Pa. Code 92a.2)

Weekly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

III. SELF-MONITORING, REPORTING AND RECORDKEEPING

A. Representative Sampling (40 CFR 122.41(j)(1))

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. Records Retention (40 CFR 122.41(j)(2))

Except for records of monitoring information required by this permit related to the permittee's sludge use and disposal activities which shall be retained for a period of at least 5 years, all records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for 3 years from the date of the sample measurement, report or application, unless a longer retention period is required by the permit. The 3-year period shall be extended as requested by DEP or the EPA Regional Administrator.

3. Recording of Results (40 CFR 122.41(j)(3))

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date and time of sampling or measurements.
b. The person(s) who performed the sampling or measurements.
c. The date(s) the analyses were performed.
d. The person(s) who performed the analyses.
e. The analytical techniques or methods used; and the associated detection level.
f. The results of such analyses.

4. Test Procedures (40 CFR 122.41(j)(4))

Facilities that test or analyze environmental samples used to demonstrate compliance with this permit shall be in compliance with laboratory accreditation requirements of Act 90 of 2002 (27 Pa. C.S. §§4101-4113) and 25 Pa. Code Chapter 252, relating to environmental laboratory accreditation. Unless otherwise specified in this permit, the test procedures for the analysis of pollutants shall be those approved under 40 CFR Part 136 (or in the case of sludge use or disposal, approved under 40 CFR Part 136, unless otherwise specified in 40 CFR Part 503 or Subpart J of 25 Pa. Code Chapter 271), or alternate test procedures approved pursuant to those parts, unless other test procedures have been specified in this permit.

5. Quality/Assurance/Control

In an effort to assure accurate self-monitoring analyses results:

a. The permittee, or its designated laboratory, shall participate in the periodic scheduled quality assurance inspections conducted by DEP and EPA. (40 CFR 122.41(e), 122.41(i)(3))

b. The permittee, or its designated laboratory, shall develop and implement a program to assure the quality and accurateness of the analyses performed to satisfy the requirements of this permit, in accordance with 40 CFR Part 136. (40 CFR 122.41(j)(4))

B. Reporting of Monitoring Results

1. The permittee shall effectively monitor the operation and efficiency of all wastewater treatment and control facilities, and the quantity and quality of the discharge(s) as specified in this permit. (40 CFR 122.41(e), 122.44(i)(1))

2. Unless instructed otherwise in Part C of this permit, properly completed DMR(s) must be received by the agency(ies) below within 28 days after the end of each reporting period. The permittee shall complete all Supplemental Reporting forms (Supplemental DMRs) provided by DEP in this permit (or an approved equivalent), and submit the signed, completed forms as an attachment to the DMR(s). If the permittee elects to use DEP's electronic DMR (eDMR) system, one electronic submission may be made for DMRs and Supplemental DMRs. If paper forms are used, the completed forms shall be mailed to:

   Department of Environmental Protection
   Clean Water Program
   2 East Main Street
   Norristown, PA 19401

   NPDES Enforcement Branch (3WP42)
   Office of Permits & Enforcement
   Water Protection Division
   U.S. EPA - Region III
   1650 Arch Street
   Philadelphia, PA 19103-2029

3. If the permittee elects to begin using DEP's eDMR system to submit DMRs required by the permit, the permittee shall, to assure continuity of business operations, continue using the eDMR system to submit all DMRs and Supplemental Reports required by the permit, unless the following steps are completed to discontinue use of eDMR:

   a. The permittee shall submit written notification to the regional office that issued the permit that it intends to discontinue use of eDMR. The notification shall be signed by a principal executive officer or authorized agent of the permittee.

   b. The permittee shall continue using eDMR until the permittee receives written notification from DEP's Central Office that the facility has been removed from the eDMR system, and electronic report submissions are no longer expected.

4. The completed DMR Form shall be signed and certified by either of the following applicable persons, as defined in 25 Pa. Code 92a.22:

   - For a corporation - by a principal executive officer of at least the level of vice president, or an authorized representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
   - For a partnership or sole proprietorship - by a general partner or the proprietor, respectively.
   - For a municipality, state, federal or other public agency - by a principal executive officer or ranking elected official.

   If signed by a person other than the above, written notification of delegation of DMR signatory authority must be submitted to DEP in advance of or along with the relevant DMR form. (40 CFR 122.22(b))

5. If the permittee monitors any pollutant at monitoring points as designated by this permit, using analytical methods described in Part A III.A.4. herein, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR. (40 CFR 122.41(l)(4)(ii))

C. Reporting and Notification Requirements

1. Planned Changes to Physical Facilities – The permittee shall give notice to DEP as soon as possible but no later than 30 days prior to any planned physical alterations or additions to the permitted facility. A permit under 25 Pa. Code Chapter 91 may be required for these situations prior to implementing the planned changes. A permit application, or other written submission to DEP, can be used to satisfy the notification requirements of this section.

Notice is required when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b). (40 CFR 122.41(l)(1)(i))

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in this permit. (40 CFR 122.41(l)(1)(ii))

c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR 122.41(l)(1)(iii))

d. The planned change may result in noncompliance with permit requirements. (40 CFR 122.41(l)(2))

e. The facility is proposing an expansion or modifications to its treatment processes. (25 Pa. Code 92a.24(a))

2. Planned Changes to Waste Stream – Under the authority of 25 Pa. Code 92a.24(a) and 40 CFR 122.42(b), the permittee shall provide notice to DEP and EPA as soon as possible but no later than 45 days prior to any changes in the volume or pollutant concentration of its influent waste stream as a result of indirect discharges or hauled-in wastes, as specified in paragraphs 2.a. and 2.b., below. Notice shall be provided on the "Planned Changes to Waste Stream" Supplemental Report (3800-FM-WSFR0482), available on DEP's website. The permittee shall provide information on the quality and quantity of waste introduced into the POTW, and any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW (40 CFR 122.42(b)(3)). The Report shall be sent via Certified Mail or other means to confirm DEP's receipt of the notification. DEP will determine if the submission of an application and receipt of an amended permit is required.

a. Introduction of New Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(1))

New pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were not detected in the facilities' influent waste stream as reported in the permit application, or were otherwise not analyzed in the influent and reported to DEP prior to permit issuance;

(ii) Have not been previously approved to be included in the permittee's influent waste stream by DEP and/or EPA in writing;

(iii) Are previously unapproved pollutants introduced into the POTW from an indirect discharger which would be subject to Sections 301 and 306 of the Clean Water Act if it were directly discharging those pollutants (40 CFR 122.42(b)(1)).

The permittee shall provide notification of the introduction of new pollutants in accordance with paragraph 2 above. The permittee may not authorize the introduction of new pollutants until the permittee receives DEP's and/or EPA's written approval.

b. Increased Loading of Approved Pollutants (25 Pa. Code 92a.24(a), 40 CFR 122.42(b)(2))

Approved pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were detected in the facilities' influent waste stream as reported in the permittee's permit application or were otherwise analyzed and reported to DEP prior to permit issuance;

(ii) Have an effluent limitation or monitoring requirement in this permit;

(iii) Have been previously approved for the permittee's influent waste stream by DEP in writing.

The permittee shall provide notification of the introduction of increased influent loading (lbs/day) of approved pollutants in accordance with paragraph 2 above when (1) the cumulative increase in influent loading (lbs/day) exceeds 10% of the maximum loading reported in the permit application, or a loading previously approved by DEP, or (2) may cause an exceedance in the effluent of Effluent Limitation Guidelines (ELGs) or limitations in Part A of this permit, or (3) may cause interference or pass through at the POTW, or (4) may cause exceedances of the applicable water quality standards in the receiving stream. Unless specified otherwise in this permit, if DEP and/or EPA does not respond to the notification within 30 days of its receipt, the permittee may proceed with the increase in loading. The acceptance of increased loading of approved pollutants may not result in an exceedance of ELGs or effluent limitations, may not result in a hydraulic or organic overload condition as defined in 25 Pa. Code 94.1, and may not cause exceedances of the applicable water quality standards in the receiving stream.

c. New Information on Existing Discharges

The permittee shall notify DEP and EPA where it discovers new information, not reported previously, on the quality and quantity of the effluent introduced into the POTW by an industrial user or an indirect discharger and the anticipated impact of the change in the quality and quantity of effluent to be discharged from the POTW. (40 CFR 122.42(b)(3))

3. Reporting Requirements for Hauled-In Wastes

a. Receipt of Residual Waste

(i) The permittee shall document the receipt of all hauled-in residual wastes (including but not limited to wastewater from oil and gas wells, food processing waste, and landfill leachate) received for processing at the treatment facility. The permittee shall report hauled-in residual wastes on a monthly basis to DEP on the "Hauled In Residual Wastes" Supplemental Report (3800-FM-WSFR0450) as an attachment to the DMR. If no residual wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report. The information used to develop the Report shall be retained by the permittee for five years from the date of receipt and must be made available to DEP or EPA upon request.

(1) The dates that residual wastes were received.

(2) The volume (gallons) of wastes received.

(3) The license plate number of the vehicle transporting the waste to the treatment facility.

(4) The permit number(s) of the well(s) where residual wastes were generated, if applicable.

(5) The name and address of the generator of the residual wastes.

(6) The type of wastewater.

(7) Documentation of whether or not a chemical analysis of the residual wastes were reported on a Residual Waste Form 26R, or a separate waste characterization using the parameters from Form 26R.

The transporter of residual waste must maintain these and other records as part of the daily operational record (25 Pa. Code 299.219). If the transporter is unable to provide this information, the residual wastes shall not be accepted by the permittee until such time as the transporter is able to provide the required information.

(ii) The following conditions apply to the characterization of residual wastes received by the permitted treatment facility:

(1) The permitted facility must receive and maintain on file a characterization of the residual wastes it receives from the generator, as required by 25 Pa. Code 287.54. The characterization shall conform to the Bureau of Waste Management's Form 26R except as noted in paragraph (2), below. Each load of residual waste received must be characterized accordingly.

(2) For wastewater generated from hydraulic fracturing operations ("frac wastewater") within the first 30 production days of a well site, the characterization may be a general frac wastewater characterization approved by DEP. Thereafter, the characterization must be waste-specific and reported on the Form 26R.

b. Receipt of Municipal Waste

(i) The permittee shall document the receipt of all hauled-in municipal wastes (including but not limited to septage and liquid sewage sludge) received for processing at the treatment facility. The permittee shall report hauled-in municipal wastes on a monthly basis to DEP on the "Hauled In Municipal Wastes" Supplemental Report (3800-FM-WSFR0437) as an attachment to the DMR. If no municipal wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report:

(1) The dates that municipal wastes were received.

(2) The volume (gallons) of wastes received.

(3) The BOD_5 concentration (mg/l) and load (lbs) for the wastes received.

(4) The location(s) where wastes were disposed of within the treatment facility.

(ii) Sampling and analysis of hauled-in municipal wastes must be completed to characterize the organic strength of the wastes, unless composite sampling of influent wastewater is performed at a location downstream of the point of entry for the wastes. The influent BOD_5 characterization for the treatment facility, as reported in the annual Municipal Wasteload Management Report per 25 Pa. Code Chapter 94, must be representative of the hauled-in municipal wastes received.

4. Unanticipated Noncompliance or Potential Pollution Reporting

a. Immediate Reporting - The permittee shall immediately report any incident causing or threatening pollution in accordance with the requirements of 25 Pa. Code Sections 91.33 and 92a.41(b).

(i) If, because of an accident, other activity or incident a toxic substance or another substance which would endanger users downstream from the discharge, or would otherwise result in pollution or create a danger of pollution or would damage property, the permittee shall immediately notify DEP by telephone of the location and nature of the danger. Oral notification to the Department is required as soon as possible, but no later than 4 hours after the permittee becomes aware of the incident causing or threatening pollution.

(ii) If reasonably possible to do so, the permittee shall immediately notify downstream users of the waters of the Commonwealth to which the substance was discharged. Such notice shal include the location and nature of the danger.

(iii) The permittee shall immediately take or cause to be taken steps necessary to prevent injury to property and downstream users of the waters from pollution or a danger of pollution and, in addition, within 15 days from the incident, shall remove the residual substances contained thereon or therein from the ground and from the affected waters of this Commonwealth to the extent required by applicable law.

b. The permittee shall report any noncompliance which may endanger health or the environment in accordance with the requirements of 40 CFR 122.41(l)(6). These requirements include the following obligations:

(i) 24 Hour Reporting - The permittee shall orally report any noncompliance with this permit which may endanger health or the environment within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported within 24 hours under this paragraph (40 CFR 122.41(l)(6)(ii)):

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and

(3) Violation of the maximum daily discharge limitation for any of the pollutants listed in the permit as being subject to the 24-hour reporting requirement.

(ii) Written Report - A written submission shall also be provided within 5 days of the time the permittee becomes aware of any noncompliance which may endanger health or the environment. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(iii) Waiver of Written Report - DEP may waive the written report on a case-by-case basis if the associated oral report has been received within 24 hours from the time the permittee becomes aware of the circumstances which may endanger health or the environment. Unless such a waiver is expressly granted by DEP, the permittee shall submit a written report in accordance with this paragraph. (40 CFR 122.41(l)(6)(iii))

5. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under paragraph C.4 of this section or specific requirements of compliance schedules, at the time DMRs are submitted, on the Non-Compliance Reporting Form (3800-FM-WSFR0440). The reports shall contain the information listed in paragraph C.4.b.(ii) of this section. (40 CFR 122.41(l)(7))

PART B

I. MANAGEMENT REQUIREMENTS

A. Compliance Schedules (25 Pa. Code 92a.51, 40 CFR 122.47(a))

1. The permittee shall achieve compliance with the terms and conditions of this permit within the time frames specified in this permit.

2. The permittee shall submit reports of compliance or noncompliance, or progress reports as applicable, for any interim and final requirements contained in this permit. Such reports shall be submitted no later than 14 days following the applicable schedule date or compliance deadline. (40 CFR 122.47(a)(4))

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term in accordance with 25 Pa. Code 92a.72 and 40 CFR 122.41(f).

2. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. (40 CFR 122.41(f))

3. In the absence of DEP action to modify or revoke and reissue this permit, the permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time specified in the regulations that establish those standards or prohibitions. (40 CFR 122.41(a)(1))

C. Duty to Provide Information

1. The permittee shall furnish to DEP, within a reasonable time, any information which DEP may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. (40 CFR 122.41(h))

2. The permittee shall furnish to DEP, upon request, copies of records required to be kept by this permit. (40 CFR 122.41(h))

3. Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to DEP, it shall promptly submit the correct and complete facts or information. (40 CFR 122.41(l)(8))

4. The permittee shall provide the following information in the annual Municipal Wasteload Management Report, required under the provisions of Title 25 Pa. Code Chapter 94:

   a. The requirements identified in 25 Pa. Code 94.12.

   b. The identity of any indirect discharger(s) served by the POTW which are subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act; the POTW shall also specify the total volume of discharge and estimate concentration of each pollutant discharged into the POTW by the indirect discharger.

   c. A "Solids Management Inventory" including the following information for the preceding year, at a minimum: average annual flow (MGD), average influent BOD_5 (mg/l), average effluent $CBOD_5$ (mg/l), total volume of sludge wasted (gallons), average solids concentration of return or waste sludge flow (mg/l), and total sludge or biosolids generated (wet or dry tons).

   d. The total volume of hauled-in residual and municipal wastes received during the year, by source.

e. The Annual Report requirements for permittees required to implement an industrial pretreatment program listed in Part C, as applicable.

D. General Pretreatment Requirements

1. POTWs shall require indirect dischargers to the treatment works subject to pretreatment standards adopted under Section 307(b) of the Clean Water Act to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Clean Water Act and regulations thereunder.

2. Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (MGD) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to Pretreatment Standards will be required to establish a POTW Pretreatment Program unless specifically exempted by the Approval Authority. A POTW with a design flow of 5 MGD or less may be required to develop a POTW Pretreatment Program if the Approval Authority finds that the nature or volume of the industrial influent, treatment process upsets, violations of effluent limitations, contamination of sludge, or other circumstances warrant in order to prevent interference or pass through. (40 CFR 403.8)

3. Each POTW with an approved Pretreatment Program pursuant to 40 CFR 403.8 shall develop and enforce specific limits to implement the prohibitions listed in 40 CFR 403.5(a)(1) and (b), and shall continue to develop these limits as necessary and effectively enforce such limits. This condition applies, for example, when there are planned changes to the waste stream as identified in Part A III.C.2. If the permittee is required to develop or continue implementation of a Pretreatment Program, detailed requirements will be contained in Part C of this permit.

4. For all POTWs, where pollutants contributed by indirect dischargers result in interference or pass through, and a violation is likely to recur, the permittee shall develop and enforce specific limits for indirect dischargers and other users, as appropriate, that together with appropriate facility or operational changes, are necessary to ensure renewed or continued compliance with this permit or sludge use or disposal practices. Where POTWs do not have an approved Pretreatment Program, the permittee shall submit a copy of such limits to DEP when developed. (25 Pa. Code 92a.47(d))

E. Proper Operation and Maintenance

1. The permittee shall employ operators certified in compliance with the Water and Wastewater Systems Operators Certification Act (63 P.S. §§1001-1015.1).

2. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, adequate laboratory controls including appropriate quality assurance procedures. This provision also includes the operation of backup or auxiliary facilities or similar systems that are installed by the permittee, only when necessary to achieve compliance with the terms and conditions of this permit. (40 CFR 122.41(e))

F. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR 122.41(d))

G. Bypassing

1. Bypassing Not Exceeding Permit Limitations - The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions in paragraphs two, three and four of this section. (40 CFR 122.41(m)(2))

2. Other Bypassing - In all other situations, bypassing is prohibited and DEP may take enforcement action against the permittee for bypass unless:

   a. A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage." (40 CFR 122.41(m)(4)(i)(A))

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance. (40 CFR 122.41(m)(4)(i)(B))

   c. The permittee submitted the necessary notice required in paragraph G.4 below. (40 CFR 122.41(m) (4)(i)(C))

3. DEP may approve an anticipated bypass, after considering its adverse effects, if DEP determines that it will meet the conditions listed in paragraph G.2 above. (40 CFR 122.41(m)(4)(ii))

4. Notice

   a. Anticipated Bypass – If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least 10 days before the bypass. (40 CFR 122.41(m)(3)(i))

   b. Unanticipated Bypass

      (i) The permittee shall submit immediate notice of an unanticipated bypass causing or threatening pollution. The notice shall be in accordance with Part A III.C.4.a.

      (ii) The permittee shall submit oral notice of any other unanticipated bypass within 24 hours, regardless of whether the bypass may endanger health or the environment or whether the bypass exceeds effluent limitations. The notice shall be in accordance with Part A III.C.4.b.

II. PENALTIES AND LIABILITY

A. Violations of Permit Conditions

Any person violating Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act or any permit condition or limitation implementing such sections in a permit issued under Section 402 of the Act is subject to civil, administrative and/or criminal penalties as set forth in 40 CFR §122.4l(a)(2).

Any person or municipality, who violates any provision of this permit; any rule, regulation or order of DEP; or any condition or limitation of any permit issued pursuant to the Clean Streams Law, is subject to criminal and/or civil penalties as set forth in Sections 602, 603 and 605 of the Clean Streams Law.

B. Falsifying Information

Any person who does any of the following:

- Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, or

- Knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or noncompliance)

Shall, upon conviction, be punished by a fine and/or imprisonment as set forth in *18 Pa.C.S.A § 4904* and 40 CFR §122.41(j)(5) and (k)(2).

C. Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance pursuant to Section 309 of the Clean Water Act or Sections 602, 603 or 605 of the Clean Streams Law.

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under the Clean Water Act and the Clean Streams Law.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. 40 CFR 122.41(c)

III. OTHER RESPONSIBILITIES

A. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania's Clean Streams Law, and Title 25 Pa. Code Chapter 92a and 40 CFR §122.41(i), the permittee shall allow authorized representatives of DEP and EPA, upon the presentation of credentials and other documents as may be required by law:

1. To enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; (40 CFR 122.41(i)(1))

2. To have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; (40 CFR 122.41(i)(2))

3. To inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and (40 CFR 122.41(i)(3))

4. To sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Clean Streams Law, any substances or parameters at any location. (40 CFR 122.41(i)(4))

B. Transfer of Permits

1. Transfers by modification. Except as provided in paragraph 2 of this section, a permit may be transferred by the permittee to a new owner or operator only if this permit has been modified or revoked and reissued, or a minor modification made to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (40 CFR 122.61(a))

2. Automatic transfers. As an alternative to transfers under paragraph 1 of this section, any NPDES permit may be automatically transferred to a new permittee if:

   a. The current permittee notifies DEP at least 30 days in advance of the proposed transfer date in paragraph 2.b. of this section; (40 CFR 122.61(b)(1))

   b. The notice includes the appropriate DEP transfer form signed by the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and (40 CFR 122.61(b)(2))

   c. DEP does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue this permit, the transfer is effective on the date specified in the agreement mentioned in paragraph 2.b. of this section. (40 CFR 122.61(b)(3))

d. The new permittee is in compliance with existing DEP issued permits, regulations, orders and schedules of compliance, or has demonstrated that any noncompliance with the existing permits has been resolved by an appropriate compliance action or by the terms and conditions of the permit (including compliance schedules set forth in the permit), consistent with 25 Pa. Code 92a.51 (relating to schedules of compliance) and other appropriate Department regulations. (25 Pa. Code 92a.71)

3. In the event DEP does not approve transfer of this permit, the new owner or controller must submit a new permit application.

C. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (40 CFR 122.41(g))

D. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit. (40 CFR 122.41(b))

E. Other Laws

The issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations.

IV. ANNUAL FEE

Permittees shall pay an annual fee in accordance with 25 Pa. Code § 92a.62. Annual fee amounts are specified in the following schedule and are due on each anniversary of the effective date of the most recent new or reissued permit. All flows identified in the schedule are annual average design flows. (25 Pa. Code 92a.62)

Small Flow Treatment Facility (SRSTP and SFTF)	$0
Minor Sewage Facility < 0.05 MGD (million gallons per day)	$250
Minor Sewage Facility ≥ 0.05 and < 1 MGD	$500
Minor Sewage Facility with CSO (Combined Sewer Overflow)	$750
Major Sewage Facility ≥ 1 and < 5 MGD	$1,250
Major Sewage Facility ≥ 5 MGD	$2,500
Major Sewage Facility with CSO	$5,000

As of the effective date of this permit, the facility covered by the permit is classified in the following fee category: **Major Sewage Facility >=5 MGD**.

Invoices for annual fees will be mailed to permittees approximately three months prior to the due date. In the event that an invoice is not received, the permittee is nonetheless responsible for payment. Throughout a five year permit term, permittees will pay four annual fees followed by a permit renewal application fee in the last year of permit coverage. Permittees may contact the DEP at 717-787-6744 with questions related to annual fees.

Payment for annual fees shall be remitted to DEP at the address below by the anniversary date. Checks should be made payable to the Commonwealth of Pennsylvania.

PA Department of Environmental Protection
Bureau of Point and Non-Point Source Management
Re: Chapter 92a Annual Fee
P.O. Box 8466

PART C

I. OTHER REQUIREMENTS

1. Notification of the designation of the responsible operator(s) must be submitted to the permitting agency by the permittee within 60 days after the effective date of the permit and from time to time thereafter as the operator is replaced.

2. If, at anytime, the DEP determines that the discharge permitted herein creates a public nuisance or causes environmental harm to the receiving water of the Commonwealth, the DEP may require the permittee to adopt such remedial measures as will produce a satisfactory effluent. If the permittee fails to adopt such remedial measures within the time specified by the DEP, the right to discharge herein granted shall, upon notice by the DEP, cease and become null and void.

3. No stormwater from pavements, area ways, roofs, foundation drains, or other sources shall be admitted to the sanitary sewers associated with the herein approved discharge.

4. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance, and replacement of all sewers or sewerage structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress, and regress.

5. The attention of the permittee is directed to the fact that the herein approved discharge is directed to a small stream which affords a limited dilution potential. If the effluent creates a health hazard or nuisance, the permittee shall upon notice from the DEP, provide such additional treatment as may be required by the DEP.

6. If there is a change in ownership of this facility or in permittee name, an application for transfer of permit must be submitted to the DEP.

7. During normal operations, the facility uses ultraviolet (UV) light as the primary method of disinfection of the final effluent. The facility is equipped with a chlorine disinfection system as a backup to the UV system. Use of the chlorine disinfection system is limited to during the period when the facility is experiencing extreme peak wet weather flows when the design capacity of the UV system is exceeded, or during an emergency situation where the UV system is inoperable. When the backup chlorine disinfection system is in operation, the effluent must be dechlorinated as required to meet the TRC limits listed in this permit. The facility shall collect samples for Total Residual Chlorine (TRC) every two hours when the backup chlorine disinfection system is in operation and report the results to the Department with the monthly discharge monitoring report. Sampling for TRC is not required if the backup chlorination system is not in use.

   The permittee will ensure that applied chlorine dosages, used for disinfection or other purposes, are optimized to the degree necessary such that the total residual chlorine (TRC) in the discharge effluent does not cause an adverse stream impact. In doing so, the permittee shall consider relevant factors affecting required chlorine dosage, such as wastewater characteristics, mixing and contact times, desired result of chlorination, and expected impact on the receiving water body. The TRC data shall be recorded during the use of chlorine and maintained at the facility.

   If the DEP determines or receives documented evidence that levels of TRC in the permittee's effluent are causing adverse water quality impacts in the receiving water, the permittee shall be required to institute necessary additional steps to reduce or eliminate such impact.

8. The limits of this NPDES permit are based on the installation of an ultra-violet disinfection system. If an alternate disinfection method is installed, this NPDES permit must be modified to address appropriate discharge limitations prior to operation of the treatment facility.

9. Collected screenings, slurries, sludges, and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 281, 283, and 285 (relating to general provisions and requirements for landfilling, land application, composting, processing, and storage of municipal waste), Chapters 261a, 262a, 263a, and 270a (related to identification of hazardous waste, requirements for generators and transporters, and hazardous waste permit programs) and applicable Federal Regulations, the Federal Clean Water Act, RCRA, and their amendments.

10. The DEP may identify and require certain discharge specific data to be submitted before the expiration date of this permit. Upon notification by the DEP, the permittee will have 12 months from the date of the notice to provide the required data. These data, along with any other data available to the DEP, will be used in completing the Watershed TMDL/WLA Analysis and in establishing discharge effluent limits. In the event that DEP requires the submission of data pursuant to this condition, the permittee shall have the right to appeal or otherwise contest the requirement.

11. The facility shall be operated under the charge of a responsible operator(s) certified under the Pennsylvania Water and Wastewater Systems Operations Certification Act (Act 11). The operator(s) shall comply with the continuing education requirements required under the regulations and guidelines related to Act 11.

12. Instantaneous maximum limitations for Outfall 001 are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee does not have to monitor for the instantaneous maximum limitation except for the parameters pH, total residual chlorine, and fecal coliform.

13. The permittee shall develop a treatment facility operations and maintenance plan addressing key wastewater processes. The plan shall be reviewed yearly and updated when appropriate. Said plan shall be in writing or in an electronic format. Upon request, this plan shall be submitted to DEP for review. For the purpose of this section, a key wastewater process includes any piece of equipment, or a process that if it fails may likely cause the discharge of raw wastewater or wastewater that fails to meet NPDES permit discharge requirements, or a failure that may likely threaten human or environmental health. Said plan shall include:

    - A process control strategy that includes a schedule for process control sampling, monitoring, testing, and recordkeeping.

    - A plan that identifies how key wastewater processes shall be monitored and adjusted while the facility is staffed.

    - A plan that identifies how key wastewater processes will be monitored while the treatment facility is not staffed.

    - For treatment plants that are impacted by wet weather flows, the permittee shall develop and implement a wet weather operations strategy that minimizes or eliminates the wash out of solids from the treatment system while maximizing the flow through the treatment plant.

    - An emergency plan that identifies how the facility will be operated during times of emergency. For example, the plan shall detail how key wastewater processes will be repaired or replaced in the event of a failure while minimizing loss of life and property damage to the facility. This plan shall also include emergency contact numbers for local emergency response agencies, plant personnel, critical suppliers and vendors, and DEP contacts, at a minimum.

    - A preventative maintenance plan that includes a schedule for preventative maintenance for all equipment within the treatment system. A spare parts inventory shall be included as part of this plan.

    - A solids management plan that identifies how solids produced by the facility will be wasted, treated, and ultimately disposed of.

14. Laboratory Certification

The Environmental Laboratory Accreditation Act of 2002 requires that all environmental laboratories register with the DEP. An environmental laboratory is any facility engaged in the testing or analysis of environmental samples required by a statute administered by the DEP relating to the protection of the environment or of public health, safety, and welfare.

15. The seasonal effluent limitations for fecal coliform are based on Chapter 92a (§ 92a.47(4) & (5)) of DEP's regulations and Delaware River Basin Commission's (DRBC's) Water Quality Regulations at § 4.30.4.A. DEP's regulations govern the summer limits for fecal coliform while the winter limits are based on DRBC's regulations. The DRBC regulations state that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. For reporting purposes, a copy of the guidelines on the 10 percent rule is enclosed with the permit.

16. Chronic Whole Effluent Toxicity (WET) Monitoring Required for Permit Renewal

The permittee shall conduct Chronic Whole Effluent Toxicity (WET) Testing within the final 18 months of this permit cycle, according to Federal Regulation 40 CFR § 122.21(j)(5). The permittee shall conduct a minimum of four quarterly tests during the year preceding the submission of the permit application, and shall submit the results with the permittee's next NPDES Permit renewal application. The tests shall include chronic survival and reproduction data for the cladoceran, *Ceriodaphnia dubia* and survival and growth data for the fathead minnow, *Pimephales promelas.* The dilution series for the testing shall be **100%, 95%, 90%, 86%, 81%**, unless modified in writing by the DEP. The appropriate biomonitoring protocol for the testing can be obtained from the DEP regional office.

17. **Chronic Whole Effluent Toxicity (WET) Permit Limit**

A. General Requirements

The permittee shall conduct chronic whole effluent toxicity (WET) tests in accordance with the appropriate test protocols or guidance described in Section E, Test Conditions and Methods, below. The permittee shall collect discharge samples and perform WET tests to generate chronic survival and reproduction data for the cladoceran, *Ceriodaphnia dubia*. These results will be expressed as No Observed Effect Concentration (NOEC) and a dose-response curve shall be plotted, if possible. NOEC results will be reported on DMRs as Chronic Toxicity Units (TUc).

B. Test Frequency

Chronic WET testing shall be conducted quarterly starting within three months of the permit's effective date. If the results of four consecutive chronic WET tests indicates toxicity equal to or less than 1.05 TUc, the permittee may request that the DEP reevaluate the performance of the facility and the effects of the facility effluent upon the aquatic community and reduce or remove the WET testing frequency for the remainder of the permit cycle.

C. Toxicity Identification/Reduction Evaluation

If any of the quarterly WET tests results exceed 1.05 TUc, the permittee shall within 30 days of test completion collect additional discharge samples and perform an additional WET test. If the result of the additional WET test also exceeds 1.05 TUc, the permittee shall commence a Toxicity Identification Evaluation (TIE) and Toxicity Reduction Evaluation (TRE). The TIE/TRE evaluates the possible causes of the effluent toxicity, the possible sources of the causative agents, possible control options to reduce or eliminate the effluent toxicity, and implementation of controls. Quarterly WET testing will continue during the period the permittee is conducting the TIE/TRE.

Within 30 days of submitting the chronic test report that triggers a TIE/TRE requirement, the permittee must submit either a written report on the results of the TIE/TRE, or if the TIE/TRE is not completed, a schedule for completing the TIE/TRE. The schedule must contain specific time frames for completing major elements of the TIE/TRE.

The TIE/TRE must be conducted in accordance with EPA's guidance in "Methods for Aquatic Identification Evaluations," Phase I (600/3-88/034, September 1988), Phase II (600/3-88/035, February 1989), Phase III (600/3-88/036, February 1989), or current approved TIE/TRE protocols.

Once the toxicant(s) or other cause(s) of the WETT failure(s) is (are) identified, confirmed, and controlled to acceptable levels through establishment of chemical specific limits or institutional methods, the permittee may submit a request to the DEP for modification of the permit condition, documenting the changes instituted to achieve the toxicity reduction. Documentation may include, but is not limited to: the results of TIE/TRE, pretreatment program changes, plant operation and maintenance, design changes, or establishment of and compliance with chemical limits that address the effluent toxicity.

The DEP will decide if the toxicity has been properly addressed based upon the permittee's report and completion of four consecutive WET tests which indicates toxicity equal to or less than 1.05 TUc, subsequent to institution of the controls specified in the report.

D. Sample Collection

For each chronic testing event, three 24-hour flow-proportioned, composite samples shall be collected over a seven-day exposure period. The samples shall be collected at a frequency of not greater than every two hours and flow proportioned. The samples must be collected at the NPDES permit sampling point. The permittee shall collect chemical and physical data on the effluent samples specified in this permit.

E. Test Conditions and Methods

The permittee shall follow the EPA manual "Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh Water Organisms, 4th Edition, October 2002 (EPA-821-R-02-013)," or the most current version. The tests shall be performed in accordance with the enclosed QA/QC procedures and shall include the enclosed summary coversheets for *Ceriodaphnia dubia*. The laboratory must prepare a series of effluent dilutions which are specific to your discharge. **The dilution series shall be 100%, 100%, 95%, 90%, 86%, 81%.** If proper chronic test acceptability criteria are not met or the proper QA/QC conditions were not followed, you must perform a retest within 30 days.

F. Chemical Analysis

The chemistry tests shall include pH, conductivity, total alkalinity, total hardness, total residual chlorine, total ammonia (unionized ammonia), dissolved oxygen, and temperature. Chemical analyses as described in the EPA Methods (above) shall be performed for each sampling event, including each new batch of dilution water and each testing event.

In addition to the chemical analyses required above, those parameters listed in PART A and PART C of the NPDES permit for the outfall(s) tested shall be analyzed concurrently with the WET test by using the method specified in the NPDES permit or, if not specified, by using EPA Methods at 40 C.F.R. Part 136; Standard Methods for the Examination of Water and Wastewater, American Public Health Association; and approved methods cited in 25 Pa. Code Chapter 16, Water Quality Toxics Management Strategy, Statement of Policy.

G. Chronic Toxicity Test Report Elements

At a minimum, the following must be reported with each chronic WET test:

1. General test description: origin and age of test organisms, dates and results of reference toxicant tests, light and temperature regimes, and other information on test conditions.

2. Completion of Ceriodaphnia dubia coversheets (Forms 3620-FM-WQ0145).

3. Description of sample collection procedures and of the sample location.

4. Names of individuals collecting and transporting samples, times and dates of sample collection and analysis, and temperature of sample upon receipt.

5. Description, time, and date of sample renewals.

6. All chemical and physical data, including method detection levels and observations made on the species. The chronic WET test hardness shall be reported with each test.

7. Copies of raw data sheets and/or bench sheets with data entries and signatures.

8. Dechlorination procedures with test statistical comparisons.

9. All observations or test conditions affecting the test outcome. All Type 1 or Type II errors must be explained.

10. The reference toxicant shall be identified and be a commonly used toxicant approved by EPA. Reports of reference toxicant tests shall include all information needed for the proper evaluation of the test. This includes the following: water chemistry parameters of controls and test concentrations, chronic endpoint with appropriate statistical analyses, and control charts (for point estimates, cumulative mean ± two standards deviations; for NOEC's central tendency ± one for concentration interval).

H. Submission of Test Reports

The permittee shall submit copies of all chronic WET test reports to DEP at the address listed below within 30 days of the test completion:

Department of Environmental Protection
Southeast Regional Office
Water Quality Management
2 East Main Street
Norristown, PA 19401

18. The Operation and Implementation of a Pretreatment Program

A. General Requirements - The permittee shall operate and implement an industrial pretreatment program in accordance with the Federal Clean Water Act, the Pennsylvania Clean Stream Law, and the federal General Pretreatment Regulations at 40 C.F.R. 403. The program shall also be implemented in accordance with the pretreatment program and any modifications thereto submitted by the permittee and approved by the Approval Authority.

B. Annual Report and Other Requirements - The permittee shall submit an Annual Report by March 31 of each year to the DEP and Environmental Protection Agency (EPA) that describes the permittee's pretreatment activities for the previous calendar year. The Annual Report shall include a description of pretreatment activities in all municipalities from which wastewater is received at the permittee's Publicly Owned Treatment Works (POTW). The submission to the DEP shall be incorporated into the permittee's Annual Municipal Wasteload Management Report required by 25 Pa. Code Chapter 94. In addition, the permittee shall meet all of the conditions specified below whether or not they relate to the Annual Report:

1. Control Mechanism Issuance - The Annual Report shall contain a summary of Significant Industrial User (SIU) control mechanism issuance, including a list of issuance and expiration dates for each SIU.

2. Sampling and Inspection - The Annual Report shall contain a summary of the number and type of inspections and samplings of SIUs by the permittee, including a list of all SIUs either not sampled or not inspected, and the reason that the sampling and/or inspection was not conducted.

3. Industrial User (IU) Compliance and POTW Enforcement - The Annual Report shall contain a summary of the number and type of violations of pretreatment standards and requirements, including local limits, and the actions taken by the permittee to obtain compliance, including civil penalty assessments and actions for injunctive relief. The report shall state whether each SIU was in significant noncompliance, as that term is defined in 40 C.F.R. Section 403.8(f)(2)(vii).

4. Industrial Listing - The Annual Report shall contain an updated industrial listing showing all current SIUs and the categorical standard, if any, applicable to each. In addition, the report shall contain a summary of any trucked or hauled wastewater accepted at the plant including the source of the wastewater (domestic, commercial, or industrial), and the discharge point designated by the POTW for acceptance of such wastewater. For each industrial source, the report shall indicate the name and address of the industrial source, the average (per discharge day) amount of wastewater received on a monthly basis, a brief description of the type of process operations conducted at the industrial facility, whether the source facility is a categorical industry, significant industry or non-significant user, and any controls imposed on the user.

5. Summary of POTW Operations - The Annual Report shall contain a summary of any interference, pass-through, or permit violations by the POTW which may be attributed to industrial users, and actions taken to address these events. The summary shall also include sampling and analysis of treatment plant influent, effluent, and sludge for toxic and any other pollutants for which a local limit exists, and an analysis of any trends in such data for the last three years.

6. Pretreatment Program Changes - The Annual Report shall contain a summary of any changes to the approved program and the date of submission to the Approval Authority.

7. Monitoring - The permittee shall conduct monitoring at its treatment plant that, at a minimum, includes quarterly influent, effluent, and sludge analysis for all local limit parameters, and an annual priority pollutant scan for influent and sludge.

C. Notification of Pass-Through or Interference - The permittee shall notify EPA and the DEP, in writing, of any instance of pass-through or interference related to an industrial discharge from an IU into the POTW. The notification shall be attached to the DMR submitted to the DEP and EPA and shall describe the incident, including the date, time, length, cause (including responsible user if known), and the steps taken by the permittee and IU (if identified) to address the incident. A copy of the notification shall also be sent to the EPA at the address provided below.

D. Headwork Analysis - The permittee shall submit to the DEP and EPA a reevaluation of its local limits based on a headworks analysis of its treatment plant within one (1) year of permit issuance. The list of pollutants to be evaluated, as well as a sampling plan for collection of necessary data, shall be submitted to the DEP and EPA within three (3) months of permit issuance. Within four (4) months of acceptance of the headwork analysis by the Approval Authority, the permittee shall adopt the revised local limits and notify all contributing municipalities of the need to adopt the revised local limits.

F. Changes to Pretreatment Program - The DEP and EPA may require the permittee to submit for approval changes to its pretreatment program if any one or more of the following conditions is present:

1. The program is not implemented in accordance with 40 C.F.R. Part 403.

2. Problems such as interference, pass-through or sludge contamination, develop or continue.

3. Federal, state, or local requirements change.

4. Changes are needed to assure protection of waters of the Commonwealth.

G. Procedure For Pretreatment Program Changes - Upon submittal by the permittee, and written notice of approval by the Approval Authority to the permittee of any changes to the permittee's approved pretreatment program, such changes are effective and binding upon the permittee unless the permittee objects within 30 days of receipt of the written notice of approval. Any such objections must be submitted in writing to both the DEP and EPA at the addresses shown below.

H. Correspondence - The Approval Authority shall be EPA at the following address:

Pretreatment Coordinator (3WP41)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029

Copies of all correspondence and reports dealing with this program shall be sent to:

Department of Environmental Protection
Southeast Regional Office
Water Management Program
2 East Main Street
Norristown, PA 19401

19. REQUIREMENTS APPLICABLE TO STORMWATER OUTFALLS

A. Prohibition of Nonstormwater Discharges

1. Except as provided in A.2, all discharges to stormwater Outfalls 002 thru 004 shall be composed entirely of stormwater and allowable nonstormwater as specified in A.2 below.

2. The following nonstormwater discharges may be authorized, provided the discharge is in compliance with D.2.b: discharges from fire fighting activities; fire hydrant flushings, potable water sources, including waterline flushings, irrigation drainage, lawn watering, routine external building washdown which does not use detergents or other compounds, pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used, air conditioning condensate, springs, uncontaminated groundwater, and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Spills

This permit does not authorize the discharge of any polluting substances resulting from an on-site spill. Such spills shall be controlled through proper implementation of a Preparedness, Prevention, and Contingency (PPC) Plan as stated in Section D below.

C. This permit does not authorize any discharge (stormwater or nonstormwater) containing any pollutant that may cause or contribute to an impact on aquatic life or pose a substantial hazard to human health or the environment due to its quantity or concentration.

D. PPC Plans

1. Development of Plan

Operators of facilities shall have developed a PPC Plan in accordance with 25 Pa. Code Section 91.34 and the "Guidelines for the Development and Implementation of Environmental Emergency Response Plans." The PPC Plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the facility. In addition, the PPC Plan shall describe the BMPs that are to be used to reduce the pollutants in stormwater discharges at the facility ensuring compliance with the terms and conditions of this permit. The PPC Plan shall be completed within 90 days from the permit effective date.

2. Nonstormwater Discharges

a. The PPC Plan shall contain a certification that the discharge has been tested or evaluated for the presence of nonstormwater discharges. The certification shall include the identification of potential significant sources of nonstormwater at the site, a description of the results of any test and/or evaluation for the presence of nonstormwater discharges, the evaluation criteria or testing methods used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the stormwater discharge does not have access to an outfall, manhole, or other point of access to the ultimate conduit that receives the discharge. In such cases, the source identification section of the PPC Plan shall indicate why the certification was not feasible. A discharger that is unable to provide the certification must notify the DEP within 90 days of the effective date of this permit.

b. Except for flows from fire fighting activities, sources of nonstormwater listed in A.2. (authorized nonstormwater discharges) that are combined with stormwater discharges must be identified in the Plan. The Plan shall identify and ensure the implementation of appropriate pollution prevention measures for the nonstormwater component(s) of the discharge.

3. Comprehensive Site Compliance Evaluations and Recordkeeping

Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall include:

a. Visual inspection and evaluation of areas contributing to a stormwater discharge for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural stormwater management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the Plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the Plan, such as spill response equipment, shall be made.

b. Based on the results of the inspection, the description of potential pollutant sources identified in the PPC Plan, and pollution prevention measures and controls identified in the Plan shall be revised as appropriate within 15 days of such inspection and shall provide for implementation of any changes to the Plan in a timely manner, but in no case more than 90 days after the inspection.

c. A report summarizing the scope of the inspection, using the DEP's Annual Inspection form shall be completed and made available upon request and retained as part of the PPC Plan for at least one year after coverage under this permit terminates.

E. Stormwater Management Best Management Practices (BMPs)

The permittee shall implement at least the following BMPs:

1. Manage sludge in accordance with all applicable permit requirements; temporarily collect and store sludge in enclosed containers or tanks.

2. Store chemicals in secure and covered areas on impervious surfaces away from storm drains.

3. For new facilities and improvements: Design wastewater treatment facilities to avoid, to the maximum extent practicable, stormwater commingling with sanitary wastewater.

4. Efficiently use herbicides for weed control; where practicable, investigate use of the least toxic herbicides; do not apply during windy conditions.

5. Do not wash parts or equipment over impervious surfaces that wash into storm drains.

6. Conduct Good Housekeeping Practices.

7. Implement infiltration techniques, including infiltration basins, trenches, dry wells, porous pavements, etc., wherever practicable.

F. Stormwater Sampling and Reporting

1. If stormwater samples are required by this permit, they shall be collected as grab samples during the first 30 minutes, but no later than one-hour of the discharge resulting from a storm event that occurs at least 72 hours from the previously measurable storm event.

2. When the discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit, in lieu of sampling data, a description of why samples could not be collected, including available documentation of the event. This sampling waiver may not be used more than once during a two-year period.

3. Stormwater monitoring results shall be summarized on a DMR form and the DEP's "Additional Information for the Reporting of Stormwater Monitoring" form.

4. When a facility has two or more outfalls that may reasonably be believed to discharge substantially identical effluents, based on a consideration of features and activities within the area drained by the outfall, the permittee may sample one such outfall and report that the quantitative data also applies to the substantially identical outfalls.

20. There is an existing site-specific criteria modification for total recoverable copper for this facility (*Pennsylvania Bulletin*, Volume 26, No. 15, April 13, 1996). Based on the results of a recalculation and water effects ratio (WER) study and a hardness of 200 mg/l as $CaCO_3$, DEP approved the site-specific chronic and acute life criteria for total recoverable copper of 0.17 mg/l and 0.27 mg/l, respectively. Without the WER, the site-specific criteria are 0.0348 mg/l (CCC) and 0.0554 mg/l (CMC), respectively. The basis for the site-specific criteria is as follows:

$$CCC = 4.89 \times Exp (0.8545 \times \ln[H] - 0.9773)$$
$$CMC = 4.89 \times Exp (0.9422 \times \ln[H] - 0.9772)$$

Due to significant changes in wastewater characteristics expected from recent and/or proposed treatment plant modifications, the Department requests that the facility submit an updated WER to the Department, or otherwise develop updated site-specific water quality criteria for copper [25 PA Code 93.8d]. Approved methods to develop site-specific criteria are listed in 25 Pa Code 93.8d(c). The Department will also accept proposed site-specific criteria based on the Biotic Ligand Model (BLM), as described in EPA's updated aquatic life criteria for copper.

The permittee shall submit to the Department a proposed plan of study for an updated WER or site-specific water quality criteria at least 24 months prior to the expiration date of this permit [25 Pa Code 93.8d(d)]. The completed WER or scientific study shall be submitted with the next NPDES Permit renewal application.

APPENDIX M

UPPER GWYNEDD TOWNSHIP
CORRECTIVE ACTION PLAN

CORRECTIVE ACTION PLAN

AND

CONNECTION MANAGEMENT PLAN

UPPER GWYNEDD TOWNSHIP

SEPTEMBER 2009

REVISED SEPTEMBER 2010

REVISED SEPTEMBER 2011

REVISED MARCH 2013

REVISED FEBRUARY 2016

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APPENDICES

A UPPER GWYNEDD TOWNSHIP COLLECTION SYSTEM

SECTION 1.0 PURPOSE

The Pennsylvania Department of Environmental Protection (PADEP) sent a letter to Upper Gwynedd Township (UGT), dated May 20, 2009, requesting that UGT develop a Corrective Action Plan (CAP) to ultimately terminate Sanitary Sewer Overflows (SSO) in the UGT collection system. UGT submitted a CAP to the PADEP on September 17, 2009. PADEP provided comments in a January 11, 2010 letter to UGT. UGT and PADEP had several meetings in 2010 to discuss the CAP and related issues. A revised CAP was submitted in September 2010 to address PADEP's January 11, 2010 letter and update the progress of our I/I program. PADEP provided additional comments in a March 22, 2011 letter to UGT. UGT and the PADEP had phone conversations and meetings since the September 2010 CAP revision was submitted to discuss the March 22 comments and related issues. UGT submitted a revised CAP in September 2011 to address PADEP's January 11, 2010 and March 22, 2011 letters and further update the progress of UGT's I/I program. The CAP was approved by PADEP in a letter dated February 2, 2012. UGT subsequently submitted another CAP revision in March 2013.

This CAP is intended to document the I/I Abatement Program work UGT has performed since the March 2013 CAP and to request EDU credits and a lifting of the connection prohibition based on the success in reducing both Infiltration & Inflow (I/I) and Sanitary Sewer Overflows (SSO). Also included with this CAP is a Connection Management Plan (CMP) which will state the Estimated Dwelling Units (EDU) that UGT will need to accommodate future growth.

SECTION 2.0 UGT COLLECTION SYSTEM DESCRIPTION

The Upper Gwynedd Township collection system serves the entire Township. There are two major service areas in the Township that are delineated by a ridge line running through the Merck facility that are serviced by the Towamencin Municipal Authority (TMA formerly UGTMA) Wastewater Treatment Plant (WWTP) and UGT WWTP. The TMA WWTP serves the portion of the collection system west of the drainage divide, while the UGT WWTP serves the portion east of the drainage divide. A map of the UGT collection system is included in Appendix A.

There are nine SSO that UGT has reported in the UGT service area.

There are nine SSO that UGT has reported in the TMA service area.

2.1 UGT WWTP SERVICE AREA

The UGT WWTP is served by two main interceptors, the East Interceptor and the Southwest Interceptor. The majority of flow is from the Southwest Interceptor. Of the eight manholes that have experienced SSO in the UGT service area, four are located on the East Interceptor and five are located on the Southwest Interceptor.

EAST INTERCEPTOR

The manholes that have overflowed on the East Interceptor are:

- Manhole E1700
- Manhole E2800
- Manhole E3000
- Manhole E3100

Manhole E1700 is located just south of the railroad tracks at Node J.
Manhole E2800 is located just south of Sumneytown Pike, right next to Node F on the map.
Manholes E3000 and E3100 are located just north of Sumneytown Pike, right next to Node F also.

SOUTHWEST INTERCEPTOR

The manholes that have overflowed on the Southwest Interceptor are:

- Manhole PS 200
- Manhole PS 323
- Manhole NW 600
- Manhole NW 2600
- Manhole NW 4000A

Manhole PS 200 is located right near (upstream of) the Briar Glen Pump Station, located just off the intersection of Morris Road and Broad Street.

Manhole PS323 is located on Morris Road Upstream of Conrad Avenue and downstream of Briar Glen), just west of the intersection of Morris Road and Berks Road.

Manhole NW 600 is located just north of Sumneytown Pike, between Nodes G and H.

Manhole NW 2600 is located on Hancock Road, just west of Dickerson Road.

Manhole NW 4000A is located on Sumneytown Pike near Ivy Lane.

SECTION 2.2 KRIEBEL ROAD INTERCEPTOR

The TMA drainage area located within UGT is served by the Kriebel Road Interceptor (KRI). This service area is situated west of Broad Street south of Sumneytown Pike, and west of the railroad tracks north of Sumneytown Pike. There are four points where the flow from the UGT collection system crosses the Township line into Towamencin Township. The crossing manhole locations are:

- Manhole 201/24A
- Manhole 473/21.1
- Manhole 475
- Manhole 236/35

These manholes are all located south of Sumneytown Pike. Manhole 201 is located just north of the bridge that crosses Towamencin Creek. MH 24A is just south of the bridge and west of Route 363.

Manhole 473 is located just south of Jacks Lane on Valley Forge Road. MH 21.1 is located just north of Hillside Ave. and just west of Route 363 in Towamencin Township. Manhole 475 is located on Route 363 south of Anders Road, just into Towamencin Township. Manhole 236 is located just on the Towamencin Township side of Route 363, just north of the PA Turnpike overpass. MH 35 is located one manhole downstream (west) of MH 236.

Please note that where two manhole designations are used, it is either because TMA has a different numbering system than UGT or because flow meter locations were moved from one manhole to an adjacent manhole (e.g. MH 236/MH35) due to field logistical reasons. All of these manholes represent the crossing points where the UGT system crosses Route 363 into Towamencin Township.

All of these manholes, which collect the entire flow from UGT going to the TMA WWTP, ultimately flow into the KRI. The KRI also drains a significant portion of Towamencin Township.

Nine SSO are located in the TMA service area. These are:

- Manhole 237A
- Manhole 239
- Manhole 244
- Manhole 249
- Manhole 250
- Manhole 833
- Manhole 834
- Manhole 204A
- Manhole 456

Manhole 237A is located at the end of Musket Drive, just east of Route 363, north of Morris Road, and just upstream from Manhole 236.

Manhole 239 is located just east of Powderhorn Drive and upstream from Manhole 237

Manhole 244 is located on Supplee Road, upstream from Manhole 237A. Manholes 249 and 250 are located just upstream of Manhole 244.

Manholes 833 and 834 are located just north of Allentown Road on Sturbridge Avenue.

Manhole 204A is located just north of Sumneytown Pike and just east of Route 363.

Manhole 456 is located on Sumneytown Pike, just east of Manhole 204A.

SECTION 3.0 UGT COLLECTION SYSTEM STUDY

3.1 INTRODUCTION

UGT has been submitting bi-annual Infiltration/Inflow Abatement Program reports to the PADEP since 2004. These reports have discussed the actions that UGT has taken to investigate and reduce I/I from the collection system. The most recent report, was submitted to the PADEP on March 31, 2015. Based on discussions with PADEP UGT is no longer required to submit these bi-annual reports.

These bi-annual reports have described, in detail, the studies and investigations that UGT has performed, the Township-wide program that has been undertaken, corrective actions that have been implemented, and future actions needed to further reduce I/I. As these reports have clearly indicated, UGT has developed, maintained, and implemented an aggressive I/I program for many years. UGT has spent a considerable amount of money as one means of demonstrating its commitment to removing I/I.

The studies, investigations, and corrective actions that have been performed include a variety of actions. This work is ongoing and continues to progress since our last CAP submittal in March 2013. The work described in the following sections of this CAP includes only those actions taken since the last CAP revision in March 2013.

The I/I work performed to date includes a variety of activities. Section 3.2 describes the work that has been performed on identifying sources of I/I since March 2013. The format used and the title of the section headings is the same as in the previous CAP.

3.2 DESCRIPTION OF I/I SOURCES

MARCH 2013 TO SEPTEMBER 2015

During the period March 2013 to December 2015, UGT continued to perform a variety of activities to identify potential sources of I/I. Several sources of note were discovered during two major construction projects to improve the UGT collection system, reduce I/I, and eliminate SSO.

EAST INTERCEPTOR PROJECT

Two significant sources of I/I were discovered during the East Interceptor improvement project completed in December 2013. During construction an underground spring was found to be leaking into MH E2300. Also clear water was found leaking into MH E3000. The project was amended to include repairs to eliminate these sources of I/I. They were successfully completed with an estimated I/I reduction of 45 GPM.

SOUTHWEST INTERCEPTOR PROJECT

During the Southwest Interceptor construction project done as part of the inter-connection with the North Wales Water Authority, a significant source of I/I was found. During the excavation work, a break in a 27 inch pipe was found. An underground spring was found to be entering the break in the pipe. Based on the size of the pipe and visual estimates of the rate of flow, it is estimated that approximately 500,000 gallons per day (gpd) of infiltration was eliminated when the pipe was replaced with a new pipe.

Please note that the information in the sections below is presented in segments for each of the three interceptors that we are focusing on, as this is the way UGT collects and tracks information. All of the segments in this section represent work done by UGT during the period March 2013 to September 2015.

2013 - EAST INTERCEPTOR

- Televised 2,970 feet of sewer main
    1. Lower Valley Road
    2. Sumneytown Pike
    3. Upper Valley Road
    4. Barberry Road

UGT staff performed visual inspection of manholes during several rain events to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. This information is used to identify potential, future repairs. Section 5 discusses future I/I reduction work in the East Interceptor drainage area.

2013 - SOUTHWEST INTERCEPTOR

- Televised 1,580 feet of sewer main on the following streets
    1. Wissahickon Avenue
    2. Park Road
    3. Collins Avenue

- Inspected ten manholes as follows:
    1. Hancock Road; Manholes NW 2602 to NW 2608; NW 2615 to NW 2617
- Televised fourteen laterals on the following streets
    1. Whitaker Place
    2. Hazelwood Drive
    3. North Lane
    4. West Point Pike
    5. Collins Avenue
    6. Tranquility Lane
    7. Eva Drive
    8. Borman Lane
    9. Aldrin Avenue

We also note that UGT performed a collection system wide inspection of manholes during the rain events of June 7 and June 10, 2013. The inspections were done at selected manholes which have shown the highest levels of I/I in the past.

2013 - KRIEBEL ROAD INTERCEPTOR

- Televised 5,140 feet of sewer main
    1. Stirling Drive
    2. Green Street
    3. Sullivan Drive
    4. Smallwood Drive

- Inspected 24 manholes
    1. Towamencin Ave (MH 300-308
    2. MH 209 to MH 213
    3. MH 226 to MH 235

- Televised fourteen laterals
    1. Allentown Road
    2. State Street
    3. Green Street
    4. Crest Road
    5. Hartley Place

UGT staff performed visual inspections of manholes during rain events. For the MH 255 drainage area, the inspection was performed on March 12, 2013. For the MH 251 drainage area the inspection was performed on July 1, 2013. As described in the sections below, UGT uses these inspections to identify leaks in manholes and identify drainage areas which have the highest I/I rates. The repairs are, in part, based on these valuable field inspections.

We also note that UGT performed a collection system wide inspection of manholes during the rain events of June 7 and June 10. The inspections were done at selected manholes which have shown the highest levels of I/I in the past.

2013-2014 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 10,475 feet of sewer main on the following streets
    1. Lower Valley Road
    2. Sumneytown Pike
    3. Upper Valley Road
    4. Jenkins Ave.
    5. Croft Road
    6. Hibbert Road
    7. Britt Road

All of these streets except for Jenkins Ave. are tributary to MH E3000. Most of this work was done in preparation for the large C.I.P.P lining project UGT performed in 2014.

UGT staff also performed visual inspection of 30 manholes on Lower Valley Road, Upper Valley Road, Gwynedd Manor Road, Letitia Lane, and Sumneytown Pike during rain events on December 23 and 29, 2013 and February 5 and 21, 2014 to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. All of these manholes are tributary to MH E3000. This information is used to identify potential, future repairs.

2013 -2014 SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 500 feet of sewer main
    1. Hancock Road

UGT also televised seven laterals on North Lane. No significant sources of I/I were found.

2013 – 2014 KRIEBEL ROAD INTERCEPTOR

- Televised 1,840 feet of sewer main
    1. Supplee Road
    2. Barry Lane

Barry Lane is tributary to MH 205 and MH 24A and Supplee is tributary to MH 245.

- UGT inspected twenty five manholes during rain and non-rain event periods as follows:
    1. Gwynnedale Townhouse development
    2. Charter Oaks development
    3. Stonegate development
    4.

These developments are tributary to MH 205

Three manholes in the Ryans Run development at the intersection of Morris Road and Valley Forge Road were also inspected during the above listed rain events in December and February. No significant sources of 1/1 were located during these observation periods. Ryans Run is tributary to MH 35 in the UGTMA service area and ultimately flows to the Kriebel Road Interceptor.

- Televised two laterals
    1. Barry Lane

UGT's home inspection program continued with the inspection of 226 homes in the Sugar Valley area identified in previous reports. No significant sources of I/I were found during these inspections.

2014 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 5,065 feet of sewer main on the following streets
    1. Sumneytown Pike
    2. Swedesford Road
    3. Meadowbrook Road
    4. West Prospect Avenue

In addition to this televising work, 11,500 feet of sewer main was televised for the East Interceptor CIPP and manhole lining projects.

UGT staff also performed visual inspection of forty manholes on Lower Valley Road, Upper Valley Road, Gwynedd Manor Road, Letitia Lane, Britt Road, Hibbert Road and Sumneytown Pike during 2014 rain events on March 30, April 15, and May 16 to monitor manhole levels during the events. They also looked for indications of leakage in the manholes. All of these manholes, except those on Gywnedd Manor Road, are tributary to MH E3000. This information is used to identify the effectiveness of repairs already completed or potential, future repairs.

In addition, UGT inspected ninety five homes as part of our home inspection program. These homes were on:

- Croft Road
- Lower Valley Road
- Upper Valley Road

These homes are all tributary to MH E3000.

No significant sources of I/I were found during these inspections.

2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 900 feet of sewer main on the following streets
    1. Hancock Road
    2. Armstrong Drive
    3. Eagle Lane

Armstrong and Eagle Lane are tributary to the Conrad Avenue pump station.

UGT also televised four laterals on Hancock Road, Sumneytown Pike, Haines Drive, and Dickerson Road. No significant sources of I/I were found.

UGT also inspected twenty five manholes during the 2014 rain events of March 30, April 15, and May 16.

2014 - KRIEBEL ROAD INTERCEPTOR

- Televised 5,108 feet of sewer main
    1. Whitney Place
    2. S. Broad St.
    3. State St.
    4. Jarvis Lane
    5. Sumneytown Pike
    6. Muhlenburg Drive
    7. Supplee Road
    8. Hartley Place
    9. Tricorn Drive

The first five listed above are tributary to MH 24A. The last four are tributary to MH 237A.

UGT also inspected twenty manholes during the rain events of March 30, April 15, and May 16, 2014.

These manholes are tributary to MH 237A, MH 245, and MH 24A.

MH 801 was repaired. This is tributary to MH 24A.

- Televised one lateral
    1. Sumneytown Pike

Ninety manholes were inspected as part of UGT's ongoing field inspection efforts. These manholes are all tributary to MH 237A.

UGT also started work on inspection of commercial properties. Six commercial properties were inspected during the last six month period. These are all tributary to MH 24A.

2015 - EAST INTERCEPTOR DRAINAGE AREA

- Televised 1,510 feet of sewer main on the following streets
    1. Jenkins Lane
    2. Swedesford Road
    3. West Prospect Avenue

- Televised 900 feet of sewer main in anticipation of the CIPP lining project
    1. Jenkins Lane

- Televised eight laterals on the following streets
    1. West Prospect Avenue
    2. Lower Valley Road
    3. Township Line Road
    4. Swedesford Road

5. Brian Way
6. Sumneytown Pike

UGT staff also performed visual inspection of eighteen manholes in the Haines Run development (this pumps to a small pump station at the UGT WWTP which feeds directly to the WWTP influent) The manholes inspected were PS110 thru PS123, PS100, PS101, PS106, PS107, and PS108. The UGT collection system staff looked for indications of leakage in these manholes. This information is used to identify potential future repairs. Section 3 discusses I/I work performed and Section 5 discusses future I/I work in the East Interceptor drainage area.

2015 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

- Televised 6,180 feet of sewer main on the following streets
  1. Sumneytown Pike
  2. Dickerson Road
  3. Clover Drive

These areas are directly tributary to the Southwest Interceptor and do not go through any pump station.

UGT also televised ninety four laterals on the following streets:

- Clover Drive
- Shearer Street
- Comly Circle
- Gage Lane
- Old Church Road

UGT inspected fifteen manholes (PS204 thru PS217) that flow to the Briar Glen Pump Station as follows:

- Dunleavy Place
- Collins Avenue
- Hartley Drive

2015 – KRIEBEL ROAD INTERCEPTOR

- Televised 4,795 feet of sewer main in anticipation of the CIPP lining project
  1. State Street
  2. S. Broad St.
  3. Stirling Drive
  4. Lafayette Drive
  5. Easement between Manholes 675 and 681A
  6. Easement between MH250 & MH251

The first two listed above are tributary to MH 24A. The last four are tributary to MH 237A.

- Televised one lateral

Valley Forge Road

One hundred three manholes were inspected as part of UGT's ongoing field inspection efforts. Ninety eight of these manholes are tributary to MH 237A, four are tributary to MH 21.1 (one of the other crossing points), and one is tributary to MH 24A. The manholes tributary to MH 237A are included in the manhole repair work described in Table 3.14. These manholes are located as follows:

- Conway Place
- Flintlock Drive
- Garfield Avenue
- General Nash Drive
- Lafayette Drive
- Maxwell Place
- McIntosh Way
- Muhlenberg Drive
- Musket Drive
- Patriot Drive
- Powderhorn Drive
- Pulaski Drive
- Scott's way
- Shepard Drive
- S. Broad Street
- Stirling Drive
- Supplee Road
- Tricorn Drive

3.3 CORRECTIVE ACTION

The corrective actions UGT implemented prior to March 2013 have been documented in previous semi-annual I/I reports and in our EDU credit requests to PADEP so they are not repeated herein.

During the period March 2013 through the end of 2015, UGT performed a significant amount of I/I repair & rehabilitation work. The tables referenced in Sections 3.3.1, 3.3.2, and 3.3.3, for the East Interceptor, the Southwest Interceptor, and the Kriebel Road Interceptor, respectively represent the work UGT has performed from March 2013 through the end of 2015.

3.3.1 EAST INTERCEPTOR

For the East Interceptor, Table 3.1 includes manhole repair work; Table 3.2 includes CIPP lining work; Table 3.3 includes spot repairs using CIPP; Table 3.4 includes the I/I reduction work done during the East Interceptor improvement project and several miscellaneous repairs.

In additional to the work described in these tables, UGT successfully completed the East Interceptor improvement project. This project increased the capacity of several section of the

East Interceptor and made improvements to MH E3000 which has been the location of past SSO. Since completion of this project MH E3000 hasn't even surcharged let alone experience an SSO.

3.3.2 SOUTHWEST INTERCEPTOR

For the Southwest Interceptor, Table 3.5 includes manhole I/I reduction work done upstream of the Briar Glen pump station; Table 3.6 includes manhole I/I reduction work done upstream of the Conrad Avenue pump station; Table 3.7 includes repairs and improvements to sanitary sewer mains; Table 3.8 includes repairs and improvements to homeowner sewer laterals; Table 3.9 includes repairs and improvements to Township sanitary sewer laterals.

In addition to the work described in these tables, UGT successfully completed the Southwest Interceptor improvement project. This project was done as part of the North Wales Interconnection project. As stated earlier, a significant source of I/I was located and corrected as part of this project.

3.3.3 KRIEBEL ROAD INTERCEPTOR

For the Kriebel Road Interceptor, Table 3.10 includes manhole repair work for the MH 24A drainage area. Table 3.11 includes CIPP lining work for the MH 24A drainage area.

Table 3.12 includes 2014 manhole repair work in the MH 35 drainage area. Table 3.13 includes CIPP lining work in the MH 35 drainage area. Table 3.14 includes 2015 manhole repair work in the MH35 drainage area

3.3.4 OTHER I/I CORRECTIVE ACTIONS

During the period March 2013 to September 2015, UGT continued to perform a variety of Corrective Action besides the repair and rehabilitation work described in Sections 3.3.1, 3.3.2, and 3.3.3 to eliminate I/I. As noted above in Section 3.2, UGT identified and eliminated significant sources of I/I during the East Interceptor and Southwest Interceptor improvement projects.

Two major sources of I/I were discovered during the East Interceptor project in 2013. During construction, clear water was observed flowing into existing MH E2000 and new MH E2100C from upstream sources. Upper Gwynedd televised these upstream sections contributing to these manholes and repair work to eliminate these sources was performed in 2014. The work for these repairs are included in Table 3.4. Also, the pipe from MH E3001 that went to MH E3000 was found to be leaking. This was repaired during the East Interceptor project.

As stated in Section 3.2, during the Southwest Interceptor project done for the North Wales Interconnection, a break in a 27 inch pipe was found which a significant source of I/I was. An underground spring was found to be entering the break in the pipe. Based on the size of the pipe and visual estimates of the rate of flow, it is estimated that this pipe beak contributed approximately 500,000 gallons per day (gpd) of infiltration. This source was eliminated when the pipe was replaced with a new pipe.

Listed below are other Corrective Actions UGT performed from March 2013 through the end of 2015. Please note that in this section, the information is presented in segments for each of the two interceptors that we are focusing on, as this is the way UGT collects and tracks the information. All of the segments in this section represent additional I/I Corrective Actions done by UGT during the period March 2013 through the end of 2015.

2013 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 9,235 feet of sewer main

- Swedesford Road
- Sumneytown Pike
- Lower Valley Road
- Meadowbrook Road
- Barberry Road

2013 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 1,920 feet of sewer main

- Sumneytown Pike
- Dickerson Road
- North Lane

2013 – KRIEBEL ROAD INTERCEPTOR DRAIANAGE AREA

Performed preventative maintenance cleaning of 9,275 feet of sewer main

- Jackson Street
- State Street
- Allentown Road
- S. Broad Street
- Sullivan Drive
- Smallwood Drive

2013 – 2014 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 4,190 feet of sewer main

- Swedesford Road
- Meadowbrook Road

One last important note on the East Interceptor is that the East Interceptor project was completed in December 2013. This included replacement of approximately 2,400 of the Interceptor along with a reconfiguration of MH E3000. We note that since the project there have not been any SSO events at MH E3000. In addition, based on our field work, MH E3000 has not even surcharged. This is indicative of the efficacy of this project.

2013 - 2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 3,425 feet of sewer main

- Sumneytown Pike
- Lafayette Ave.
- Allentown Road
- Dickerson Road
- Farm Lane

2013 -2014 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 2,925 feet of sewer main

- Sumneytown Pike
- Lafayette Ave.
- Allentown Road
- Dickerson Road

2014 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 6,200 feet of sewer main

- W. Prospect Ave.
- Sumneytown Pike
- Swedesford Road
- Meadowbrook Road

UGT rehabilitated two manholes:

- MH E2300
- MH E2301

We would make note of the one big project in these tables. Table 3.2 includes the lining (C.I.P.P.) of 11,500 feet of sewer main in the East Interceptor drainage area that is tributary to MH E3000. Table 3.1 includes the lining of forty three (43) manholes, also tributary to MH E3000. Work on this project, which included both the CIPP and manhole lining, started in March 2014 and was successfully completed in July 2014.

2014 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 1,520 ft. of sewer main

- Sumneytown Pike
- DickersonRoad

- Armstrong Drive
- Eagle Lane

We also note the successful completion of another significant project in September 2014. This is the Conrad Ave. and Briar Glen pump station upgrade project. The larger pumps included as part of this project at each pump station are responsible for eliminating the SSO at MH PS200 and MH PS323, except for an equipment malfunction noted in previous reports.

2014 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 11,808 feet of sewer main

- S. Broad St.
- Allentown Road
- Jackson St.
- Supplee Road
- Hartley Place
- Lafayette Road

The first three are tributary to MH 24A. The last three are tributary to MH 237A.

2015 - EAST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning on 2,800 feet of sewer main

- Swedesford Road (Manholes E2030, E2301, E2032, E3019, E3020, E3021)
- Meadowbrook Road (Manholes E2018, E2023, MH E2029
- Sumneytown Pike (Manholes E3010, E3011, E3019,

UGT made four lateral repairs as follows:

- Lower Valley Road
- Airy Street
- Township Line Road

2015 - SOUTHWEST INTERCEPTOR DRAINAGE AREA

Performed preventative maintenance cleaning of 2,160 ft. of sewer main

- Sumneytown Pike (Manholes NW102, NW103, NW500, SW3800, SW3801, SW3807, SW2308
- Dickerson Road (Manholes NW701, NW702, NW714, NW715)

UGT rehabilitated MH PS 323 which flows to the Conrad Avenue Pump Station.

UGT reset the frame on MH NW101

2015 – KRIEBEL ROAD INTERCEPTOR

Performed preventative maintenance cleaning of 1,650 feet of sewer main

- Allentown Road (Manholes 488, 489, & 490, 401A to 402)

These manholes are tributary to MH 24A.

UGT repaired/rehabilitated ten manholes as follows:

- Shepard Drive MH 1109
- Maxwell Place MH 669
- Hartley Place MH 682 & 683
- Patterson Drive 1018
- S. Broad St MH 1102
- Muhlenburg Drive MH 676
- Quinn Drive MH 651A2
- Supplee Road MH 651B &651C

The first six streets listed above are tributary to MH 237A. The last two are tributary to one of the other crossing points, MH 473.

UGT installed plugs in the vents that are below ground in the Sumney Forge Shopping Center which flows to MH201 to prevent I/I.

4.0 EFFECTIVENESS OF CORRECTIVE MEASURES

The effectiveness of our corrective action program through March 2013 has been documented in previous semi-annual I/I reports and EDU credit requests to PADEP and is not included herein.

The following summarizes the UGT flow monitoring program from March 2013 through November 2015 by drainage area within UGT.

4.1 EAST INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through 2015 for the East Interceptor. Specifically, flow monitoring was performed at the following manholes:

- E100
- E2005
- E2701
- E3010
- E3400
- E3402
- E3411
- E3418

Reference is made to Table 4.1 in the attachments. This table shows the carrying capacity of individual sections of the East Interceptor as well as identification of manholes where flow has been monitored. Also included is the peak flow for rain events greater than one inch during times when flow was being monitored. The table has been updated to include rain events through November 2015. Please note that not all manholes were being flow monitored at the same time.

MH E100 includes the total flow for the East Interceptor. All of the other manholes monitored are tributary to MH E3000. Although we have eliminated the SSO at MH E3000, UGT continued to perform I/I reduction work in 2014 and 2015 after completion of the East Interceptor improvement project. In addition, more work is planned for 2016 as described in Section 5.

Please note the following qualifier for 2014 flow data during the March 29, April 15, April 29, and May 16, rain events. During these rain events some manholes were open as part of implementation of the sewer main and manhole lining project included in Tables 3.1 and 3.2. In addition, the NWWA was doing some water line flushing for maintenance purposes, specifically during the April 29 event. These actions could have influenced the flow data during these periods.

As noted in Section 3, the East Interceptor CIPP lining project was completed in June 2014. Along with the East Interceptor capacity project completed in December 2013 these projects have been and will continue to be very successful in reducing I/I and eliminating SSO at MH 3000. UGT collection system personnel performed field reconnaissance during rain events. Based on this field reconnaissance, MH E3000 has not had a SSO nor has it even surcharged since completion of the East Interceptor improvement project. We note that there have been significant rain events that occurred in 2014 and 2015. We will, of course, continue to monitor this manhole.

4.2 SOUTHWEST INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through November 2015 for the Southwest Interceptor. Flow metering was performed at the following manholes:

- MH PS 202
- MH PS 323
- MH PS 324
- MH PS325
- MH PS 326
- MH 2346A
- MH NW4013

The flow meter at MH 2346A (on West Point Pike) was installed at the request of PADEP to confirm that adequate capacity exists in this main trunk line tributary to the Southwest Interceptor. Flow data and field observations during heavy rain events has confirmed that this line does not surcharge.

The flow meter at MH 324 was installed in July 2014 to help meter flow from the Briar Glen pump station.

Other than MH 2346A, these locations were chosen specifically to address the SSO that have occurred at Manholes PS200 and PS323. We note that with minor exception we have eliminated the SSO at manholes PS200 and PS323. This exception occurred at MH PS200 because of a pump equipment malfunction. The reason for the pump not going on was corrected.

Reference is made to Table 4.2 in the attachment. This table shows the carrying capacity of individual sections as well as identification of manholes where flow has been monitored. This table has been updated to include the flow for rain events greater than one inch through November 2015 when the flow was being monitored.

We would emphasize that UGT has continued with significant I/I reduction efforts on the Southwest Interceptor drainage area despite the fact that we have eliminated the SSO at MH PS200 and MH PS323. We recognize that we still have I/I and will continue to work on this. Section 5 includes additional I/I reduction work that UGT has planned for 2016.

4.3 KRIEBEL ROAD INTERCEPTOR

UGT's flow monitoring program continued from March 2013 through the end of 2015 for the Kriebel Road Interceptor

Since March 2013, UGT worked with TMA on continuing to implement a comprehensive flow monitoring program for the KRI drainage area. UGT has monitored flow at the following manholes:

- MH 35
- MH 21.1
- MH 24A
- MH 473
- MH 205
- MH 459A
- MH 245
- MH 251
- MH 255
- MH 237A
- MH 694
- MH 1103

The first four manholes represent the crossing points from UGT into TT. MH 205 and MH 459A are tributary to MH 24A. MH 245 is tributary to MH 21.1. MH 251, MH 255, and MH 237A are tributary to MH 35.

The last two manholes are contributory to the MH 255 drainage area.

Reference is made to Table 4.3 in the attachment for flow data during heavy precipitation events. This figure has been updated to include rain events greater than 1' through December 2015. Please note that not all manholes were being flow monitored at the same time.

The drainage area tributary to MH 237 A is the only area where UGT continues to have SSO.

Section 6.3 includes documentation on I/I flow reduction as part of our request for additional EDUs in the KRI service area.

5.0 FUTURE I/I PROGRAM ACTIVITIES

UGT has been implementing an aggressive I/I Abatement Program since our last CAP in March 2013. The Corrective Actions UGT has taken since March 2013 are included in Section 3. Included below is a summary of the I/I reduction work UGT has planned for 2016.

5.1 EAST INTERCEPTOR

FUTURE REPAIR WORK

Tables 5.1 and 5.2 include the I/I repair work UGT has planned for 2016. Table 5.1 includes pipe bursting to replace 2,300 feet of sewer main. Table 5.2 includes manhole repairs to 14 manholes. This work is tributary to MH E3000. This demonstrates our commitment that even though UGT has eliminated the SSO at MH E3000, it will continue to reduce I/I even further.

5.2 SOUTHWEST INTERCEPTOR

FUTURE REPAIR WORK

UGT has additional repairs that are planned for 2016. Table 5.3 includes manhole repair/rehabilitation work scheduled in 2016. This work is being done in a new area of the UGT collection system. This area is the Northwest Interceptor which represents the upper part of the Southwest Interceptor.

5.3 KRIEBEL ROAD INTERCEPTOR
FUTURE REPAIR WORK

UGT has additional repairs that are planned for 2016. Table 5.4 includes manhole repair/rehabilitation work in the MH 24A drainage area. Table 5.5 includes lateral lining work in the MH 24A drainage area. Table 5.6 includes wye repair work also in the MH 24A drainage area.

5.4 SUMMARY OF FUTURE ACTIONS

We are providing you with our summary of actions UGT plans on doing based on what we know now. The sections below includes these recommended actions. Each drainage basin is discussed separately.

5.4.1 EAST INTERCEPTOR

UGT plans on implementing the following actions for the East Interceptor

- Continue with flow monitoring at manholes E100, E2005, E3010, E3400, and E3701
- Implement work described in Tables 5.1 and 5.2
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

5.4.2 SOUTHWEST INTERCEPTOR

UGT plans on implementing the following actions for the Southwest Interceptor

- Continue with flow monitoring at Manholes PS202, PS323, PS325, 2346A, and NW4013
- Implement repairs in attached Table 5.3
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

5.4.3 KRIEBEL ROAD INTERCEPTOR

UGT plans on implementing the following actions for the Kriebel Road Interceptor

- Continue with flow monitoring at Manholes 24A, 35, 21.1, 473, 205, 237A, 245, 251, 255, and 459A
- Implement repairs in attached Tables 5.4, 5.5, and 5.6
- Continue to identify and implement repair/rehabilitation projects on sewer lines or manholes, as needed
- Continued flow monitoring to confirm effectiveness of repair/rehabilitation work

6.0 CONNECTION MANAGEMENT PLAN

Due to anticipated development in the Township, we anticipate the need to be able to make additional connections into the system over the next five to seven years. The most recent Connection Management Plan (CMP) is attached as Table 6.1. The CMP shows the proposed development for UGT. UGT has proposed an ambitious program to eliminate SSO in the years ahead.

To help implement CMP, UGT will need additional approvals and actions by the PADEP as discussed below.

6.1 EAST INTERCEPTOR

As had been stated in the many I/I reports UGT has provided to the PADEP, MH E3000 was the location of repeated SSO. Over the last few years UGT has undertaken significant actions to reduce I/I in the area tributary of MH E3000 and the entire East Interceptor drainage basin. The success of this program was last documented to the PADEP in our November 20, 2012 request for EDU credits. Based on this work PADEP released 15 EDUs to UGT for future connections. It is noted that the documented amount of I/I reduction was equivalent to forty five EDUs.

As we have noted herein, the East Interceptor improvement project was successfully completed in 2013. Since then MH E3000 has not experienced an SSO or even surcharged. UGT collection staff regularly does field reconnaissance during rain events so this statement can be made with certainty.

Based on our successful elimination of the SSO at MH E3000, UGT is requesting that the connection prohibition be removed for the East Interceptor. We, once again, note that we will continue to perform I/I reduction work in the east Interceptor drainage basin. This is commitment is demonstrated by the fact that we have done significant I/I reduction work after the E3000 SSO was eliminated and plan on doing more work in 2016.

6.2 SOUTHWEST INTERCEPTOR

The Southwest Interceptor SSO at MH PS200 and MH PS323 have also been eliminated based on the significant amount of I/I reduction work UGT has successfully performed. Based on our past work and to accommodate future growth included in the CMP, UGT is requesting additional EDU credits be approved by the PADEP. Included below is the documentation of I/I reduction based on flow monitoring before and after I/I reduction work. This documentation is structured the same as our previous EDU requests to the PADEP.

6.2.1 SOUTHWEST INTERCEPTOR EDU REQUEST

I/I REDUCTION WORK OVERVIEW

In order to document the success of the I/I reduction work in the Southwest Interceptor drainage basin work and the resulting reduction in I/I, UGT did pre and post flow metering at MH PS202 and MH PS323. MH PS202 is upstream of the Briar Glen pump station and MH PS323 is upstream of the Conrad Avenue pump station. The rain events being used are when the rainfall total was greater than 1" as requested by PADEP. The pre repair flow metering being used for both manholes for this analysis was performed on March 29-31, 2014 following a significant rain event (2.68"). For the post repair monitoring, it is our understanding that PADEP wants multiple post repair rain events to document the magnitude and sustainability of the I/I reduction. Therefore, this request for additional EDUs includes two rain events for MH PS202 (September 28, 2015 and October 2, 2015) and three rain events (August 20, 2015, September 28, 2015, and October 2, 2015. The rain associated with these events in chronological order are 2.43", 2.2", and 2.19", respectively.

I/I REDUCTION METHODOLOGY

To provide documentation for our I/I reduction, we are using two different methods. The first method compares the peak hourly flow for the pre and post rain events. As the data below will clearly show, the peak flow for all three post repair events is significantly lower than the pre repair rain event. The second method being used incorporates calculations for net I/I reduction to account for variations in rainfall, groundwater conditions, and climate conditions. We will use the average flow for the 10 day period prior to each rain event and compare it to the peak flows to generate a net I/I rate. This net I/I rate will be compared for the pre and post repair events to show net I/I reduction.

Having both methods for the rain events shows the effectiveness of our I/I reduction program in achieving significant, documented I/I reduction.

As has been reported to PADEP, flow metering is ongoing at these manhole locations, so flow data exists before, during, and after the actual rain events and is documented herein.

For Manholes PS202 and PS323, we are providing extensive flow data in both graphic and tabular form. Attached to this CAP is the following flow and rainfall information:

- Flow graphs for Manholes PS202 and PS323 showing a comparison of the flows and rainfall during all four referenced rain events on the same graph
- A tabular summary of the flows at Manholes PS202 and PS323 for each rain event with hourly flow interval data
- A graphic and tabular summary of the flows for Manholes PS202 and PS323 and each rain event for the entire month of the rain events

PEAK FLOW I/I REDUCTION ANALYSIS

MANHOLE PS 202

For MH PS202, the peak hourly flow for the pre repair March 2014 rain event is 0.322 mgd. For the two post repair rain events the average peak hourly flow is 0.025 mgd (September 28 = 0.001 mgd; October 2 = 0.049 mgd).

The total documented I/I reduction using the average post repair reduction for the two rain events for Manhole PS 202 is 0.322 mgd minus 0.025 mgd which equals 0.297 mgd (206 gpm).

Based on the reduction of 0.297 mgd, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 125 EDUs.

MANHOLE PS323

For MH PS323, the peak hourly flow for the pre repair March 2014 rain event is 0.934 mgd. For the three post repair rain events the average peak hourly flow is 0.308 mgd (August 20 = 0.424; September 28 = 0.154; October 2 = 0.347 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole PS 323 is 0.934 mgd minus 0.308 mgd which equals 0.626 mgd (435 gpm).

Based on the reduction of 0.626 mgd, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 264 EDUs.

The average for these two manholes is 195 EDUs

NET I/I REDUCTION ANALYSIS

The second method being used is to calculate net I/I reduction using net I/I rates. To do this, we took the 10 day period prior to each rain event and calculated the average daily flow. We then took the peak daily flow for each rain event and compared the average and peak daily flow rates. The average daily flow was subtracted from the peak daily flow to obtain a net I/I rate. The net I/I for the pre and post events was compared. Reference is made to the attached Tables 6.2 and 6.3.

MANHOLE PS 202

For MH PS202, the net I/I for the March 2014 rain event is 0.147 mgd (102 gpm). The average net I/I for the two post repair rain events is 0.0064 mgd (4 gpm). Therefore, the net I/I reduction is 0.147 minus 0.0064 which equals 0.141 mgd (98 gpm).

Using a net I/I reduction of 141,000 GPD and the same method as above for the peak flow comparison, this equates to 59 EDUs.

MANHOLE PS 323

For MH PS323, the net I/I for the March 2014 rain event is 0.503 mgd (350 gpm). The average net I/I for the three post repair rain events is 0.04 mgd (23 gpm). Therefore, the net I/I reduction is 0.503 minus 0.04 which equals 0.47 mgd (327 gpm).

Using a net I/I reduction of 470,000 GPD and the same method as above for the peak flow comparison, this equates to 198 EDUs.

The average using the Net I/I reduction method is 129 EDUs

PEAKING FACTOR ANALYSIS

We would add one last piece of documentation to show significant I/I reduction. As part of the second method using net I/I reduction, the average daily flow for the 10 day period prior the rain event was calculated for each rain event. We compared the peak daily flow to the 10 day average daily flow for each rain event.

MANHOLE PS 202

For MH PS202, the peaking factor for the pre repair rain event in March 2014 is 10.8. The average of the peaking factors for the two post repair rain events is 6.2. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

MANHOLE PS 323

For MH PS323, the peaking factor for the pre repair rain event in March 2014 is 7.5. The average of the peaking factors for the three post repair rain events is 1.5. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

EDU REQUEST SUMMARY

UGT has documented significant I/I reduction using two different methods. The first method using peak hourly flow I/I reduction justifies 195 EDU credits. The second method using net I/I reduction justifies 129 EDUs credits.

Therefore, UGT is requesting EDUs credits for the Southwest Interceptor which represent the average of the two methods, 162 EDUs.

6.3 KRIEBEL ROAD INTERCEPTOR

The number and frequency of SSO in the UGT service area that flows to the Kriebel Road Interceptor have been greatly reduced based on the significant amount of I/I reduction work UGT has successfully performed. Based on our past work and to accommodate future growth included in the CMP, UGT is requesting additional EDU credits be approved by the PADEP. Included below is the documentation of I/I reduction based on flow monitoring before and after I/I reduction work. This documentation is structured the same as our previous EDU requests to the PADEP.

6.3.1 KRIEBEL ROAD INTERCEPTOR EDU REQUEST

I/I REDUCTION WORK OVERVIEW

In order to document the success of the I/I reduction work in the Kriebel Road Interceptor drainage basin work and the resulting reduction in I/I, UGT did pre and post flow metering at MH 24A and MH 35. These manholes represent two of the four crossing points from UGT into TMA. MH 24A has the largest amount of flow of the four crossing points while MH 35 has the second most amount of flow. Combined, these two crossing points convey over 90% of the flow from UGT to TMA.

The rain events being used are when the rainfall total was greater than 1" as requested by PADEP. The pre repair flow metering being used for both manholes for this analysis was

performed on March 29-31, 2014 following a significant rain event (2.68"). For the post repair monitoring, it is our understanding that PADEP wants multiple post repair rain events to document the magnitude and sustainability of the I/I reduction. Therefore, this request for additional EDUs includes three rain events for each of the manholes. August 20, 2015, September 28, 2015, and October 2, 2015. The rain associated with these events in chronological order are 2.43", 2.2", and 2.19", respectively.

I/I REDUCTION METHODOLOGY

To provide documentation for our I/I reduction, we are using two different methods. The first method compares the peak hourly flow for the pre and post rain events. As the data below will clearly show, the peak flow for all three post repair events is significantly lower than the pre repair rain event of March 29, 2014. The second method being used incorporates calculations for net I/I reduction to account for variations in rainfall, groundwater conditions, and climate conditions. We will use the average flow for the 10 day period prior to each rain event and compare it to the peak flows to generate a net I/I rate. This net I/I rate will be compared for the pre and post repair events to show net I/I reduction.

Having both methods for the rain events shows the effectiveness of our I/I reduction program in achieving significant, documented I/I reduction.

As has been reported to PADEP, flow metering is ongoing at these manhole locations, so flow data exists before, during, and after the actual rain events and is documented herein.

For Manholes 24A and 35, we are providing extensive flow data in both graphic and tabular form. Attached to this CAP is the following flow and rainfall information:

- Flow graphs for Manholes 24A and 35 showing a comparison of the flows and rainfall during all four referenced rain events on the same graph
- A tabular summary of the flows at Manholes 24A and 35 for each rain event with hourly flow interval data
- A graphic and tabular summary of the flows for Manholes 24A and 35 and each rain event for the entire month of the four rain events

PEAK FLOW I/I REDUCTION ANALYSIS

MANHOLE 24A

For MH 24A, the peak hourly flow for the pre repair March 2014 rain event is 4.373 mgd. For the three post repair rain events the average peak hourly flow is 2.328 mgd (August 20 = 2.818, September 28 = 1.728 mgd; October 2 = 2.437 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole 24A is 4.373 mgd minus 2.328 mgd which equals 2.045 mgd (1,421 gpm).

Based on the reduction of 2,045,000 GPD, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 863 EDUs.

MANHOLE 35

For MH 35, the peak hourly flow for the pre repair March 2014 rain event is 1.414 mgd. For the three post repair rain events the average peak hourly flow is 0.423 mgd (August 20 = 0.368; September 28 = 0.309; October 2 = 0.593 mgd).

The total documented I/I reduction using the average post repair reduction for the three rain events for Manhole 35 is 1.414 mgd minus 0.423 mgd which equals 0.991 mgd (689 gpm).

Based on the reduction of 991,000 GPD, using the 10 to 1 ratio for EDU credits, and our Act 57 number of 237 gallons per EDU, this I/I reduction is equivalent to 418 EDUs.

The average for these two manholes is 641 EDUs

NET I/I REDUCTION ANALYSIS

The second method being used is to calculate net I/I reduction using net I/I rates. To do this, we took the 10 day period prior to each rain event and calculated the average daily flow. We then took the peak daily flow for each rain event and compared the average and peak daily flow rates. The average daily flow was subtracted from the peak daily flow to obtain a net I/I rate. The net I/I for the pre and post events was compared. Reference is made to the attached Tables 6.4 and 6.5.

MANHOLE 24A

For MH 24A, the net I/I for the March 2014 rain event is 1.988 mgd (1,382 gpm). The average net I/I for the three post repair rain events is 0.389 mgd (270 gpm). Therefore, the net I/I reduction is 1.988 mgd minus 0.389 mgd which equals 1.589 mgd (1,104 gpm).

Using a net I/I reduction of 1,589,000 GPD and the same method as above for the peak flow comparison, this equates to 670 EDUs.

MANHOLE 35

For MH 35, the net I/I for the March 2014 rain event is 0.781 mgd (543 gpm). The average net I/I for the three post repair rain events is 0.098 mgd (68 gpm). Therefore, the net I/I reduction is 0.781 minus 0.098 which equals 0.683 mgd (475 gpm).

Using a net I/I reduction of 683,000 GPD and the same method as above for the peak flow comparison, this equates to 288 EDUs.

The average using the Net I/I reduction method is 479 EDUs

PEAKING FACTOR ANALYSIS

We would add one last piece of documentation to show significant I/I reduction. As part of the second method using net I/I reduction, the average daily flow for the 10 day period prior the rain event was calculated for each rain event. We compared the peak daily flow to the 10 day average daily flow for each rain event.

MANHOLE 24A

For MH 24A, the peaking factor for the pre repair rain event in March 2014 is 3.05. The average of the peaking factors for the three post repair rain events is 1.53. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

MANHOLE 35

For MH 35, the peaking factor for the pre repair rain event in March 2014 is 5.1. The average of the peaking factors for the three post repair rain events is 2.2. The significant reduction in peaking factor provides further documentation of the I/I reduction calculated using the two different methods.

EDU REQUEST SUMMARY

UGT has documented significant I/I reduction using two different methods. The first method using peak hourly flow I/I reduction justifies 641 EDU credits. The second method using net I/I reduction justifies 479 EDUs credits.

Therefore, UGT is requesting EDUs credits for the Kriebel Road Interceptor which represent the average of the two methods, 560 EDUs.

CAP SUMMARY

As you can see, UGT continues to be serious about reducing I/I and is making a commitment of significant resources to address the issue aggressively. We will keep PADEP informed of our progress as needed in the future. We are confident we will continue to address PADEP's concerns and further reduce I/I in UGT.

TABLES

Table 3.1

Upper Gwynedd Township Collection System

East Interceptor

Manhole Repairs 2014

1 The following manholes were spray lined.
New lids and frames were installed on the manholes listed below prior to being spray
2 lined.

	Street:	Lower Valley Rd.		
	Manhole #	Depth	Construction	Date
1	E3402	5' 8"	Brick	May-14
2	E3403	6' 4"	Brick	May-14
3	E3404	6' 0"	Brick	May-14
4	E3418	5' 10"	Brick	May-14
5	E3419	6' 0"	Brick	May-14
6	E3420	6' 10"	Brick	May-14
7	E3421	6' 7"	Brick	May-14
8	E3422	6' 6"	Brick	May-14
9	E3423	10' 2"	Brick	May-14
10	E3429	7' 0"	Brick	May-14
11	E3432	6' 6"	Brick	May-14

	Street:	Croft Rd.		
	Manhole #	Depth	Construction	Date
1	E3401	6' 9"	Brick	May-14
2	E3411	5' 8"	Brick	Apr-14
3	E3412	6' 3"	Brick	Apr-14
4	E3413	6' 1"	Brick	Apr-14
5	E3414	5' 9"	Brick	Apr-14
6	E3415	6' 2"	Brick	Apr-14
7	E3416	6' 1"	Brick	Apr-14
8	E3417	5' 8"	Brick	Apr-14

	Street:	Upper Valley Rd.		
	Manhole #	Depth	Construction	Date
1	E3203	13' 5"	Brick	May-14
2	E3404	6' 0"	Brick	May-14
3	E3405	5' 10"	Brick	May-14
4	E3406	5' 10"	Brick	May-14
5	E3407	6' 0'	Brick	May-14
6	E3408	6' 0"	Brick	May-14
7	E3409	6' 0"	Brick	May-14
8	E3410	5' 10"	Brick	May-14

Table 3.1

Upper Gwynedd Township Collection System

East Interceptor

Manhole Repairs 2014

	Street:	Britt Rd.		
	Manhole #	Depth	Construction	Date
1	E3424	6' 2"	Brick	May-14
2	E3425	6' 4"	Brick	May-14
3	E3426	5' 7"	Brick	May-14
4	E3427	5' 10"	Brick	May-14
5	E3428	6' 8"	Brick	May-14

	Street:	Hibbert Rd.		
	Manhole #	Depth	Construction	Date
1	E3430	6' 0"	Brick	Apr-14
2	E3431	5' 10"	Brick	Apr-14

	Street:	Barberry Rd.		
	Manhole #	Depth	Construction	Date
1	E3702	7' 2"	Brick	May-14
2	E3703	6' 8"	Brick	May-14
3	E3704	7' 10"	Brick	May-14
4	E3705	5' 0"	Brick	May-14
5	E3706	4' 1"	Brick	May-14

	Street:	Swedesford Rd.		
	Manhole #	Depth	Construction	Date
1	E2034	9' 10"	Block	May-14
2	E2036	9' 6"	Block	May-14
3	E3019	7' 8"	Block	May-14
4	E3020	7' 9"	Block	May-14
5	E2031	9 ft. 10"	Block	Sep-14

	Street:	Gwynedd Manor Rd.	Construction	
	Manhole #	Depth		Date
1	Gwynedd Manor Rd.	11'5"	Block	Sep-14

Total: 45 Manholes

Table 3.2

Upper Gwynedd Township Collection System
East Interceptor
CIPP Lining 2014

CIPP Liner was installed in the following 47 sections of 8 inch VCP sanitary sewers

	Street:	Lower Valley Rd.		
	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3402	E3401	221	Apr-14
2	E3403	E3402	141	Apr-14
3	E3404	E3403	327	Apr-14
4	E3418	E3401	274.6	Apr-14
5	E3419	E3418	258.7	Apr-14
6	E3420	E3419	376.8	Apr-14
7	E3421	E3420	316	Apr-14
8	E3422	E3421	320	Apr-14
9	E3423	E3422	341	Apr-14
10	E3429	E3423	204	May-14
11	E3432	E3429	186	May-14
		Total	**2966.1**	

	Street:	Croft Rd.		
	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3417	E3416	319	Apr-14
2	E3416	E3415	284	Apr-14
3	E3415	E3414	307	Apr-14
4	E3414	E3413	298	Apr-14
5	E3413	E3412	297	Apr-14
6	E3412	E3411	220	Apr-14
7	E3411	E3401	237	Apr-14
		Total	**1962**	

	Street:	Jenkins Lane		
	Downstream Manhole	Upstream Manhole	Footage	Date of
1	E2000	E2001.1	162	Oct-14
2	E2001.1	E2001	19	Oct-14
3	E2001	E2005	293	Oct-14
4	E2005	E2006	216	Oct-14
5	E2006	E2007	323	Oct-14
		Total	**1013**	

Table 3.2

Upper Gwynedd Township Collection System

East Interceptor

CIPP Lining 2014

Street: **Upper Valley Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3410	E3409	386	Apr-14
2	E3409	E3408	391	Apr-14
3	E3408	E3407	390	Apr-14
4	E3407	E3406	377	Apr-14
5	E3406	E3405	379	Apr-14
6	E3405	E3404	375	Apr-14
7	E3205	E3204	109	Apr-14
8	E3204	E3203	300	Apr-14
9	E3203	E3202	317	May-14
10	E3202	E3201	129	May-14
11	E3201	E3200	36	May-14
		Total	**3189**	

Street: **Britt Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3428	E3427	253	Apr-14
2	E3427	E3426	396	Apr-14
3	E3426	E3425	368	Apr-14
4	E3425	E3424	361	Apr-14
5	E3424	E3423	129	Apr-14
		Total	**1507**	

Street: **Hibbert Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3431	E3430	318	Apr-14
2	E3430	E3429	354	Apr-14
		Total	**672**	

Street: **Barberry Rd.**

	Upstream Manhole	Downstream Manhole	Footage	Date
1	E3706	E3705	399	May-14
2	E3705	E3704	283	May-14
3	E3704	E3703	125	May-14
4	E3703	E3702	141	May-14
5	E3702	E3701	208	May-14
6	E3701	E3700 A	40	May-14
		Total	**1196**	

Total CIPP Linear Feet: **12505.1**

Table 3.3

Upper Gwynedd Township Collection System

East Interceptor

CIPP Spot Repairs 2014

	Downstream Manhole	Upstream Manhole	Location - Footage	Street	Defect Description	Repair Type	GPM Estimate	Date of Repair
1	E5001A	E5001	133 ft.	Hancock Rd	Fractured 8" x6" Wye	3 ft. CIPP	3	Sep-14
2	E5006	E5007	255 ft.	Hancock Rd	Heavy Roots	4 ft. CIPP	2	Sep-14
3	E2900	E2901	2 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
4	E2900	E2901	41.3 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
5	E2900	E2901	162.4 ft.	Sumneytown Pike	Hole in Pipe	4 ft. CIPP	2	Sep-14
6	E2901	E2902	57 ft.	Sumneytown Pike	Fractured 8" x6" Wye	3 ft. CIPP	2	Sep-14
7	E1906	E1907	157 ft.	W. Prospect Ave	Fractured 8" x6" Wye	4 ft. CIPP	3	Sep-14
8	E2026	E2027	382 ft. to 385 ft.	Oakland Place	Holes in Pipe	6 ft. CIPP	5	Sep-14
9	E3401	E3418	270 ft.	Lower Valley Rd.	Hole in Wye	2 ft. CIPP	3	Sep-14
10	E3429	E3432	120 ft.	Lower Valley Rd.	Hole in Wye	2 ft. CIPP	3	Sep-14

* ***Above repairs describe CIPP point repairs within 8" A/C and VCP mains***

Total Estimated Reduction 27

Amended Attachment 21-B.2
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Table 3.4

Upper Gwynedd Township

East Interceptor

Repairs & Improvements to the Sanitary Sewer Collection System to Reduce I/I

Date	Address or Location	Repair Description	Estimated I/I Reduction
Oct-13	601 Sumneytown Pike	Replaced 10 ft. of 6" A/C sewer lateral with SDR-26 and a PVC 8'x6" wye connection	10
Nov-13	Manhole E3705 - Barberry Rd.	Grouted upstream pipe connection to manhole	5
Sept - 13 to Dec. 2013	East Interceptor Capacity Improvement Project	M.H. E3000 - Replacement of 10 l.f. of 8" A/C main	25
pt - 13 to ec. 2013	East Interceptor Capacity Improvement Project	M.H. E2300 - Sealed the leaking pipe connections in manhole	20
Sept - 13 to Dec. 2013	East Interceptor Capacity Improvement Project	Replacement of 2,030 l.f. of 8" A/C sanitary main with 16" C905 PVC pipe	70
Sept - 13 to Dec. 2014	East Interceptor Capacity Improvement Project	Replacement of 8 existing manholes, modification of 2 manholes and installation of 3 new additional manholes	40
		Total Estimated Reduction	**170**

Table 3.5
Upper Gwynedd Township
South West Drainage Area Manhole Improvements 2015

Manhole Improvements Upstream of the Briar Glen Pump Station

The brick and mortar risers were replaced with precast concrete riser rings and riser adjustment rings. The leaking manhole frames and lids were replaced with gasketed manhole frames and secure lids on the manholes listed below.

Dunleavy Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS209	Precast	Brick & Mortar	13.5"	3

Hartley Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS204	Precast	Brick & Mortar	3.5"	10
2	PS205	Precast	Brick & Mortar	8.5"	5
3	PS206	Precast	Brick & Mortar	6.5"	10
4	PS207	Precast	Brick & Mortar	11.5"	7
5	PS208	Precast	Brick & Mortar	2"	3

Collins Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS210	Precast	Brick & Mortar	8"	10
2	PS211	Precast	Brick & Mortar	7.5"	5
3	PS212	Precast	Brick & Mortar	3"	10
4	PS213	Precast	Brick & Mortar	5"	10
5	PS214	Precast	Brick & Mortar	5.5"	5
6	PS215	Precast	Brick & Mortar	8"	5
7	PS216	Precast	Brick & Mortar	10"	3
				Total GPM Reduction	**86**

Table 3.6

Upper Gwynedd Township

South West Drainage Area Manhole Improvements 2015

Manhole Improvements Upstream of the Conrad Pump Station

The brick and mortar risers were replaced with precast concrete riser rings and riser adjustment rings. The leaking manhole frames and lids were replaced with gasketed manhole frames and secure lids on the manholes listed below.

	Aldrin Ave.				
	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	PS332	Precast	Brick and Mortar	6"	6
2	PS335	Precast	Brick and Mortar	8.5"	5
				Total GPM Reduction	**11**

Table 3.7

Upper Gwynedd Township

South West Interceptor

Repairs & Improvements to the Sanitary Sewer Mains 2013

Date	Address or Location	Repair Description	GPM Reduction
Jan-13	PS338 to PS339	Grout 5 - 6" VCP laterals	15
Jan-13	PS328 to PS329	Grout 3 - 6" VCP laterals	8
Jan-13	PS341 ,PS342 PS343	Grout all joints in 8" VCP mains	15
Jan-13	PS300.1	Mortar repair and grout leaking manhole	10
May-13	PS211 to PS212	4ft. length CIPP spot repairs at 8ft. and 55 ft. covering holes in 8"A/C mains	12
May-13	PS219 to PS220	7 ft. CIPP spot repair in 8" PVC mains covering leaking offset joints	5
May-13	PS200, PS201, PS203, PS204, PS205, PS207,PS320.1	Grouting & mortar repair to leaking manholes upstream of the Briar Glen pump station	10
May-13	1615 West Point Pike	Replaced 7ft of 6" VCP lateral with SDR-18 PVC pipe	5
Sep-13	2908 ft. of 8" A/C & PVC sanitary sewer that flows to Briar Glen Pump Station	Grouting & Pressure Testing	8
Sep-13	1807 ft. of 8" VCP & PVC sanitary sewer that flows to the Conrad Ave. Pump Station	Grouting & Pressure Testing	10
Sep-13	Manhole NW3209A	Grouted leaking wall joint	4
		Total Estimated Reduction	**102**

Upper Gwynedd Township Collection System

South West Interceptor

Repairs & Improvements to the Sanitary Sewer Mains 2014

The sewer laterals listed below were repaired by contractors. The repairs were a combination of CIPP spot repairs, grouting and excavation, removal of the defective pipe and installation of PVC pipe.

	Manholes	Pipe	Street	Observations	Type of Repair Performed	Date of Repair	GPM
1	PS328 to PS329	8" VCP and 6" VCP Pipe	Armstrong Drive	Groundwater infiltration at CIPP & wye connections	Grouting of pipe connections and 6" VCP for 4 laterals	Apr-14	20
2	PS338 to PS339	8" VCP and 6" VCP Pipe	Armstrong Drive	Groundwater infiltration at CIPP & wye connections	Grouting of pipe connections and 6" VCP for 5 laterals	Apr-14	10
3	PS328, PS337, PS338, PS339, PS340, PS341, PS342, PS343.	8" VCP	Armstrong Drive	Groundwater infiltration at VCP Pipe Joints	Pressure Testing and grouting of 1245 ft. of 8" VCP pipe joints	Apr-14	15
4	PS325, PS326, PS327	8" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Pressure Testing and grouting of 482 ft. of 8" VCP pipe joints	Apr-14	10
5	PS328 to PS327	8" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Installation of 173 ft. of CIPP liner	May-14	10
6	PS328 to PS327	8" CIPP & 6" VCP	Eagle Lane	Groundwater infiltration at VCP Pipe Joints	Grouting of 8" & 6" pipe connections	May-14	10
7	PS216 to PS217	6"VCP & 4" cast iron	728 Collins Ave.	Roots & groundwater infiltration at transition coupling	Excavation & repair	Jul-14	2
8	NW4021 to NW4022	8" ACP	Cathy's Lane	Infiltration at joint	CIPP	Sep-14	3
9	NW4001 to NW4022	8" ACP	Welsh Road	Hole in pipe	CIPP	Sep-14	2
10	NW2111 to NW2112	8" ACP	Dickerson Road	Hole in pipe	CIPP	Sep-14	5

This table reflects pipe repairs between the manholes listed.

Total Estimated Reduction: **87**

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Upper Gwynedd Township Collection System
South West Interceptor
Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
1	707 Aldrin Ave.	VCP	Heavy Roots at 20' at transition to 4" cast iron	May-13	2
2	708 Aldrin Ave.	VCP	Medium roots at joint 21.4'	May-13	2
3	720 Aldrin Ave.	VCP	Light Roots at transition to 4" cast iron at 25' 6"	May-13	1
4	743 Aldrin Ave.	VCP	Medium Roots at joint 32.7'; Disconnected sump pump from lateral connection	May-13	7
5	1901 Armstrong Drive	VCP	Light roots at 16.4' Medium roots at 20.4' and 26.4' Heavy roots at 24.4'	Apr-13	1
6	1926 Armstrong Drive	VCP	Medium Roots at joint at 17'	Jun-13	2
7	1932 Armstrong Drive	VCP	Light Roots at joint at 16'	Jul-13	1
8	1933 Armstrong Drive	VCP	Medium roots at joint at 22.4'	Jul-13	2
9	1958 Armstrong Drive	VCP	Heavy roots at 26 .2', at transition to 4" cast iron	Sep-13	2
10	1979 Armstrong Drive	VCP	Medium roots at 16', Heavy Roots at 25'	Jul-13	2
11	1985 Armstrong Drive	VCP	Medium Roots at 16' 6"	Oct-13	2

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Upper Gwynedd Township Collection System
South West Interceptor
Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
12	1972 Blue Fox Drive	PVC	Medium Roots at 4" cast iron to 6" PVC transition coupling	Oct-13	1
13	615 Collins Ave	VCP	Medium roots at 13', 21' and 25' at transition to 4" cast iron	Oct-13	2
14	623 Collins Ave	VCP	Heavy roots at 13' 5", 17' 5", 21', and 24'.	May-13	2
15	754 Hartley Drive	VCP	Heavy Roots at 63' 6"	Apr-13	2
16	617 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 24.6'	Jun-13	2
17	636 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 36.6'	Mar-13	2
18	637 Eagle Lane	VCP	roots heavy at transition to 4" cast iron 12.5'	Mar-13	2
19	671 Eagle Lane	VCP	roots heavy at transition to 4"cast iron 25'	Jun-13	2
20	694 Eagle Lane	VCP	roots at 21.8' and 25'	Jun-13	1
21	1919 Eva Drive	PVC	I & I running at trans to 4" cast iron 25'	Aug-13	2
22	1930 Eva Drive	PVC	I & I gushing at trans to 4" cast iron 24.4'	Sep-13	3

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Upper Gwynedd Township Collection System

South West Interceptor

Repairs and Improvements to Homeowner Sewer Laterals 2013

The sewer laterals listed below were repaired by plumbing contractors. The repairs included excavation, removal of the defective pipe and installion of PVC pipe to replace the defective sections of sewer lateral.

	Address	Pipe Type	Observations	Repair Date	GPM
23	1964 Eva Drive	PVC	roots light at transition to 4" cast iron 25'	Jul-13	1
24	1968 Eva Drive	PVC	roots medium at transition to 4" cast iron 25.2'	Aug-13	2
25	1971 Eva Drive	PVC	I & I running at trans to 4" cast iron 24.2'	Aug-13	2
26	720 Tranquility Lane	VCP	Root mass at 16'	Jun-13	2
27	736 Tranquility Lane	VCP	roots at 35', 39.3', 43.6' and 46'	Mar-13	1
28	611 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	May-13	1
29	612 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	May-13	3
30	620 Whittaker Place	PVC	I & I running at trans to 4" cast iron 26.2'	Sep-13	2
31	624 Whittaker Place	PVC	roots heavy at transition to 4" cast iron 26.2'	Aug-13	2
32	631 Whittaker Place	PVC	root mass at transition to 4" cast iron 26'	Sep-13	2

Total GPM Reduction **57**

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Table 3.9

Upper Gwynedd Township Collection System

South West Interceptor

Repairs & Improvements to Township Sanitary Sewer Laterals 2013

The sewer laterals listed below were repaired by contractors. The repairs were a combination of CIPP spot repairs; and excavation, removal of the defective pipe and installation of PVC pipe.

	Address	Pipe	Observations	Type of Repair Performed	Date of Repair	GPM
1	708 Aldrin Ave.	VCP	Heavy roots at wye connection	New 8" by 6" wye & 15'6" PVC pipe	May-13	5
2	750 Aldrin Ave.	VCP	Heavy roots at 1st joint from wye connection. 3', heavy roots at 1.5' and 6'	New 8" by 6" wye & 14' of PVC pipe	May-13	5
3	1991 Armstrong Dr.	VCP	Light roots at joint at 10.8'	3' PVC spot repair	May-13	1
4	754 Hartley Dr.	VCP	Roots at 6' And 10'	Installation of 14.6' of 6" PVC pipe	May-13	3
5	1943 Armstrong Dr.	VCP	Roots at 1st joint of wye connection	New 8" by 6" wye & 6' of PVC pip	May-13	5
6	627 Whittaker Pl.	PVC	I & I at wye connection	CIPP Repair at wye connection	May-13	3
7	1901 Armstrong Dr.	VCP	Light roots at 13.4', I & I at wye connection	New 8" by 6" wye & 14' of PVC pipe	May-13	6
8	1907 Armstrong Dr.	VCP	Medium roots at 9.6'	3' PVC spot repair	May-13	2
9	720 Tranquility Ln.	VCP	Roots at 4'	New 8" by 6" wye & 10' of 6" PVC pipe	May-13	3
10	1979 Armstrong Dr.	VCP	Roots	New 8" by 6" wye & 14' of PVC pipe	Jul-13	2
				Total Estimated GPM Reduction		**35**

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Table 3.10

Upper Gwynedd Township Collection System

Manhole 24A Drainage Basin

Improvements contributory to the Kriebel Road Interceptor

Manhole Repairs

	Manhole #	Street	Manhole Depth	Observations	Repair Type	GPM Estimate	Date of Repair
1	812	Jackson St.	8 ft. 4"	Infiltration at pipe connections	Grouting and mortar repair	8	Nov-14
2	814	State St.	9 ft. 8"	Infiltration at pipe connections	Grouting and mortar repair	4	Nov-14

Lateral Repairs

	Downstream Manhole	Upstream Manhole	Location	Observations	Repair Description	GPM Estimate	Date of Repair
1	477	814	234 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 10 ft. of 6" VCP lateral and 8" x 6" VCP wye.	5	Sep-14
2	814	812	233 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 14 ft. of 6" VCP lateral and 8" x 6" VCP wye.	3	Sep-14
3	814	812	238 State St.	Root intrusions in 6" sewer lateral	Excavate, remove and replace 12 ft. of 6" VCP lateral and 8" x 6" VCP wye.	3	Sep-14
4	814	812	239 State St.	Broken 8" main at connection to 4" cast iron	Excavate, remove and replace 4ft. of 8" VCP sanitary main. Install cast iron wye and	10	Sep-14
					Total Estimated Reduction	**33**	

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Table 3.11
Upper Gwynedd Township Collection System
Manhole 24A Drainage Basin
CIPP Lining of 8" Sanitary Mains & Lateral Grouting - 2014
Improvements contributory to the Kriebel Road Interceptor

The following sections of 8" A/C sanitary sewers were damaged by H2S. Groundwater infiltration was identifed at the pipe connections.

MH 205 Drainage Area — **30 Laterals were grouted.**

	Upstream Manhole	Downstream Manhole	Location	Footage	GPM Reduction Estimate
1	219	220	S. Broad St.	290	2
2	220	816	S. Broad St.	98	1
3	816	413	S. Broad St.	380	1
4	413	414	S. Broad St.	348	2
5	414	414A	S. Broad St.	370	3
6	414A	801	S. Broad St.	30	1
7	801	415	S. Broad St.	200	1
8	415	416	S. Broad St.	220	2
9	416	417	S. Broad St.	262	1
10	417	418	S. Broad St.	200	2

The following sections of 8" VCP sanitary sewers were damaged by root intrusions, and circumferential cracks. Infiltration was also identifed at the pipe connections and laterals .

205 Drainage Area — **47 Laterals were grouted.**

	Upstream Manhole	Downstream Manhole	Location	Footage	GPM Reduction Estimate
1	477	814	State St.	440	3
2	814	812	State St.	295	5
3	812	813	Jackson St.	157	10
4	812	811	Jackson St.	305	12
5	811	815	Jackson St.	154	5
		Totals:		**3,749**	**51**

Table 3.12
Upper Gwynedd Township
Manhole 35 Drainage Area

Manhole Spray Lining and Grouting

Improvements contributory to the Kriebel Road Interceptor

	Manhole #	Construction	Street	Observations	Type of Repair Performed	Date of Repair	GPM Estimate
1	682	Precast	Hartley Place	Groundwater Infiltration in Manhole Riser	Interior Manhole Lining at Riser	Sep-14	5
2	683	Precast	Hartley Place	Groundwater Infiltration in Manhole Wall Joints	Interior Manhole Lining	Sep-14	5
3	676	Precast	Muhlenburg Drive	Groundwater Infiltration in Manhole Wall Joints	Interior Manhole Lining	Sep-14	8
4	699	Precast	Maxwell Place	Groundwater Infiltration at 3 Pipe Connections in Manhole	Interior Manhole Lining	Sep-14	5
5	1109	Precast	Shepard Drive	Groundwater Infiltration at Manhole Wall Joints	Interior Manhole Lining	Sep-14	8
6	696	Precast	S. Broad St.	manhole wall joints, at incoming pipe connection & frame/riser connection.	Interior Manhole Lining	Sep-14	8
7	1102	Precast	S. Broad St.	pipe connections, at frame/riser connection and within riser.	Interior Manhole Lining	Sep-14	5
8	681	Precast	Hartley Place (R.O.W.)	Groundwater Infiltration at pipe connections	Grouting and mortar repair	Nov-14	3

Total Estimated Reduction 47

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Table 3.13

Upper Gwynedd Township

Manhole 35 Drainage Area

CIPP Lining of 8" Sanitary Mains & Lateral Grouting - 2014

Improvements contributory to the Kriebel Road Interceptor

The following sections of 8" A/C sanitary sewers were damaged by H2S. Groundwater infiltration was identifed at the pipe connections.

237A -Drainage Area **19 Laterals were grouted.**

	Upstream MH	Downstream MH	Location	Footage	GPM Reduction Estimate
1	252	664	Lafayette Rd.	160	2
2	664	666	Lafayette Rd.	398	6
3	252	251	Easement	203	2
4	251	250	Easement	198	3
5	666	674	Stirling Drive	347	3
6	674	675	Stirling Drive	348	2
7	675	680	Easement	190	5
8	680	681	Easement	252	5
9	681	682	Easement	178	2
10	681	681A	Easement	139	1
			Totals:	**2,413**	**31**

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Conway Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	693	Precast	Brick & Mortar	8.5"	6
2	694	Precast	Brick & Mortar	2"	2

Flintlock Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	254	Precast	Brick & Mortar	17.25"	1
2	698	Precast	Brick & Mortar	10.5"	1
3	638B	Precast	Brick & Mortar	11.25"	3
4	634	Precast	Brick & Mortar	8.5"	3
5	633	Precast	Brick & Mortar	3"	2
6	635	Precast	Brick & Mortar	0.5"	5
7	636A	Precast	Brick & Mortar	1.5"	2
8	636B	Precast	Brick & Mortar	1.5"	2
9	636C	Precast	Brick & Mortar	12.75"	2
10	637	Precast	Brick & Mortar	4"	2

Garfield Ave.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1004	Precast	Precast	3"	3
2	1006	Precast	Precast	2.25"	3
3	1005A	Precast	Precast	8"	2
4	1005	Precast	Brick & Mortar	14"	4
5	1008	Precast	Brick & Mortar	7.25"	2
6	1009	Precast	Brick & Mortar	14"	3
7	1010	Precast	Brick & Mortar	14.5"	1
8	697D	Precast		8"	3

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

General Nash Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	630	precast	Brick & Mortar	1.25"	1

Lafayette Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	660		Brick & Mortar	17.25"	2
2	661		Brick & Mortar	5.5"	3
3	252		Brick & Mortar	21"	2
4	664		Brick & Mortar	15.5"	1

Maxwell Place

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	669	Precast	brick & mortar	4.5"	2
2	670	Precast	brick & mortar	6"	2
3	671	Precast	brick & mortar	6"	2

McIntosh Way

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	665	Precast	Brick & Mortar	20.5"	3

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Muhlenburg Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	688A	Precast	Brick & Mortar	7.5"	1
2	688B	Precast	Brick & Mortar	5"	3
3	688	Precast	Brick & Mortar	1/2"	1
4	685	Precast	Brick & Mortar	2"	3
5	684	Precast	Brick & Mortar	8"	4
6	675	Precast	Brick & Mortar	21"	2
7	676	Precast	Brick & Mortar	3.5"	2
8	677	Precast	Brick & Mortar	10.5"	10
9	645F	Precast	Brick & Mortar	17.5"	2
10	645G	Precast	Brick & Mortar	4.5"	2

Musket Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	643A	Precast	None	1.5"	1
2	700	Precast	Precast	4.5"	3
3	701	Precast	Precast	12"	3

Park Rd.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1105	Precast	Brick & Mortar	10"	2
2	1104	Precast	Brick & Mortar	4"	1
3	1103	Precast	Brick & Mortar	6.5"	2

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Patriot Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	627	Precast	Brick & Mortar	12.5"	2
2	628	Precast	Brick & Mortar	19"	4
3	629	Precast	Brick & Mortar	14.5"	2
4	631	Precast	Brick & Mortar	1/2"	1
5	632	Precast	Brick & Mortar	1/2"	1
6	641	Precast	Brick & Mortar	10"	3
7	640	Precast	Brick & Mortar	12"	2
8	639	Precast	Brick & Mortar	1/2"	1

Powderhorn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	238	Precast	Brick & Mortar	30"	2
2	642	Precast	Brick & Mortar	12"	1
3	643	Precast	Brick & Mortar	2"	1
4	644	Precast	Brick & Mortar	6.5"	2
5	645	Precast	Brick & Mortar	22"	3
6	646	Precast	Brick & Mortar	1/2"	1
7	647	Precast	Brick & Mortar	10.5"	2
8	648	Precast	Brick & Mortar	3.5"	2

Pulaski Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	687	Precast	Brick & Mortar	11.5"	2

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Scott's Way

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	662	Precast	Brick & Mortar	7"	2
2	663	Precast	Brick & Mortar	10"	2

Shepard Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1108	Precast	Brick & Mortar	14"	2
2	1107	Precast	Brick & Mortar	13.5"	2
3	1106	Precast	Brick & Mortar	8.5"	3

South Broad St.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	1102	Precast	Brick & Mortar	8"	1
2	1102A	Precast	Brick & Mortar	3.5"	1
3	1100	Precast	Brick & Mortar	1.5"	1
4	1101	Precast	Precast	10"	1
5	697	Precast	Precast	7"	2
6	697A	Precast	Precast	2.5"	1
7	697B	Precast	Precast	10"	2
8	697C	Precast	Precast	9.5"	1
9	696	Precast	Precast	3"	3

Stirling Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	256	Precast	Brick & Mortar	9"	4
2	690	Precast	Brick & Mortar	10.5"	2
3	690A	Precast	Brick & Mortar	16.5"	2
4	691	Precast	Brick & Mortar	3"	3
5	692	Precast	Brick & Mortar	1"	1
6	666	Precast	Brick & Mortar	9.5"	1
7	674	Precast	Brick & Mortar	11"	1

Table 3.14

Upper Gwynedd Township

Manhole 35 Drainage Area Manhole Improvements 2015

Manhole Improvements contributory to the Kriebel Road Interceptor

The brick and mortar risers; and the leaking manhole frames and lids were replaced with precast concrete riser rings, adjustment rings and gasketed manhole frames and lids. Inflow was observed from the street during rain events. This was eliminated by the replacement of the risers, lids and frames.

Supplee Rd.

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	655	Precast	Precast	10"	2
2	499	Precast	Precast	3"	1
3	498	Precast	Precast	3"	2
4	498A	Precast	Precast	5"	2
5	243A	Precast	Precast	6"	3
6	656	Precast	Precast	5"	2
7	657	Precast	Precast	5"	2
8	658	Precast	Brick & Mortar	21"	2
9	659	Precast	Brick & Mortar	18"	3
10	244	Precast	Brick & Mortar	14.5"	4
11	243	Precast	Brick & Mortar	17.5"	3

Tricorn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	645A	Precast	Brick & Mortar	21"	4
2	645B	Precast	Brick & Mortar	9.25"	2
3	645C	Precast	Brick & Mortar	6.5"	2
4	645D	Precast	Brick & Mortar	11"	3
5	645E	Precast	Brick & Mortar	6"	3

Twinlyn Drive

	Manhole #	Construction	Riser	Approx Depth Bottom of frame to Cone	GPM Reduction Estimate
1	699	Precast	Brick & Mortar	6.5"	1
2	699A	Precast	Brick & Mortar	5.5"	1

Total GPM Reduction Estimate **224**

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS >THAN 1"

EAST INTERCEPTOR CAPACITY

MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
SW300	281.56	275.51	277.4				
				405	0.0044	3.57	2.31
E100	288.09	279.19	279.40				
				577	0.0036	3.52	2.27
E200	288.86	283.08	283.22				
				150	0.0152	4.40	2.84
E300	290.62	285.20	285.23				
				316	0.0154	4.42	2.86
E400	295.96	290.10	290.10				
				270	0.0119	3.89	2.51
E500	299.61	293.32	293.34				
				296	0.0106	3.67	2.37
E600	302.20	296.48	296.51				
				354	0.0099	3.55	2.29
E700	306.18	300.03	300.70				
				238	0.0074	3.06	1.98
E800	309.17	302.46	302.51				
				251	0.0071	2.99	1.93
E900	310.33	304.28	304.28				
				191	0.0074	3.07	1.98
E1000	311.46	305.70	305.72				
				398	0.0097	3.51	2.27
E1100	315.60	309.56	309.61				
				396	0.0141	4.23	2.73
E1200	321.13	315.20	315.30				
				270	0.0123	3.96	2.56
E1300	326.08	318.63	318.67				
				365	0.0117	3.85	2.49
E1400	328.36	322.94	322.96				
				220	0.0061	2.78	1.80
E1500	331.00	324.30	324.38				
				100	0.0194	4.96	3.20
E1600	333.33	326.32	326.46				
				326	0.0038	2.19	1.41
E1700	334.39	327.69	327.75				
				314	0.0293	6.10	3.94
E1800	344.43	336.95	338.01				
RAILROAD				182	0.0207	5.13	3.31
Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.							
E1900	353.87	341.78	341.90				
				388	0.0024	1.74	1.13
E2000	349.96	342.83	342.99				
				17	0.0024	3.72	2.40
E1900	353.87	341.78	341.99				
				370	0.0024	3.76	2.43
E1900A	353.00	342.03	342.05				
E2000A	350.00	342.94	342.96				
E2005				287	0.0076	6.67	4.31
E2100	352.00	345.13	345.15				
				74	0.0073	6.55	4.23
E2100A	353.00	345.69	345.71				
				84	0.0073	6.54	4.22
E2100B	351.40	346.32	346.34				
				114	0.0073	6.54	4.23
E2100C	356.00	347.17	347.19				
				62	0.0085	7.09	4.58
E2400	354.50	347.72	347.74				
				154	0.0085	7.07	4.57
E2500	358.00	349.05	349.07				
				48	0.0085	7.09	4.58
E2600	359.00	349.48	349.50				
				474	0.0120	8.41	5.43
E2700	364.00	355.20	355.22				
				276	0.0085	7.08	4.57
E2800	366.79	357.56	357.58				
				63	0.0167	9.90	6.40
E2900	369.87	358.63	358.63				
Summerytown Pk.				62	0.0192	2.21	1.43
E3000	368.26	359.26	359.42				
				204	0.0241	3.40	2.20
E3100	375.00	364.34	364.45				
				17	0.0382	4.28	2.77
E3200	371.98	365.10	365.29				
				99	0.0043	1.44	0.93
E3300		365.72	365.72				
				390	0.0060	1.70	1.10
E3400		368.06	368.06				
E3402							
E3411							
E3418							
E3701							

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

EAST INTERCEPTOR CAPACITY

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)
SW300		
	2.31	1,602
E100		
	2.27	1,579
E200		
	2.84	1,972
E300		
	2.86	1,983
E400		
	2.51	1,745
E500		
	2.37	1,646
E600		
	2.29	1,593
E700		
	1.98	1,374
E800		
	1.93	1,342
E900		
	1.98	1,378
E1000		
	2.27	1,573
E1100		
	2.73	1,898
E1200		
	2.56	1,774
E1300		
	2.49	1,728
E1400		
	1.80	1,247
E1500		
	3.20	2,225
E1600		
	1.41	981
E1700		
	3.94	2,735
E1800		
	3.31	2,300
E1900		
	1.13	782
E2000		
E1900		
	2.40	1,669
E1900A		
	2.43	1,688
E2000A		
E2005		
	4.31	2,992
E2100		
	4.23	2,939
E2100A		
	4.22	2,932
E2100B		
	4.23	2,936
E2100C		
	4.58	3,181
E2400		
	4.57	3,174
E2500		
	4.58	3,180
E2600		
	5.43	3,773
E2700		
	4.57	3,174
E2800		
	6.40	4,442
E2900		
Summerytown Pk.	1.43	990
E3000		
	2.20	1,529
E3010		
	2.77	1,921
E3200		
	0.93	645
E3300		
	1.10	761
E3400		
Merrybrook Neighborhood		
E3402		
E3411		
E3418		
E3701		

Feb-16

Observed Peak Flows in gpm[1]

Date	04/10/13	05/10/13	05/23/13	06/06/13	06/10/13	06/26/13	07/01/13	07/12/13	07/22/13	08/01/13	08/12/13	10/09/13	11/26/13	12/06/13	12/14/13	12/29/13
Total Rain	1.61"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
	460	611	778	2673	2639	230	1093	594	944	623	1099	508	884	61		1018

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS >THAN 1"

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
EAST INTERCEPTOR CAPACITY

Feb-15

EAST INTERCEPTOR CAPACITY									Calculated Capacity		03/29/14	04/15/14	04/29/14	05/16/14	05/28/14	06/09/14	07/14/14	07/27/14	10/15/14	11/26/14	12/08/14
											2.68"	1.99"	5.12"	2.57	1.30"	1.71"	1.37"	1.08"	1.20"	1.05"	1.37"
MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	(MGD)	(gpm)											
SW300	281.56	275.51	277.4					SW300													
				405	0.0044	3.57	2.31		2.31	1,602											
E100	288.09	279.19	279.40					E100			2813	1091	1536	1317	398	409	393	224	No Data	No Data	703
				377	0.0068	3.52	2.27		2.27	1,579											
E200	288.86	283.06	283.22					E200													
				130	0.0152	4.40	2.84		2.84	1,972											
E300	290.62	285.20	285.23					E300													
				316	0.0154	4.42	2.86		2.86	1,983											
E400	295.95	290.10	290.10					E400													
				270	0.0119	3.89	2.51		2.51	1,745											
E500	299.61	293.32	293.34					E500													
				296	0.0106	3.67	2.37		2.37	1,646											
E600	302.20	296.48	296.51					E600													
				354	0.0099	3.55	2.29		2.29	1,593											
E700	306.18	300.03	300.70					E700													
				238	0.0074	3.06	1.98		1.98	1,374											
E800	309.17	302.46	302.51					E800													
				261	0.0071	2.99	1.93		1.93	1,342											
E900	310.33	304.28	304.28					E900													
				191	0.0074	3.07	1.98		1.98	1,378											
E1000	311.46	305.70	305.72					E1000													
				395	0.0097	3.51	2.27		2.27	1,573											
E1100	315.60	309.56	309.61					E1100													
				396	0.0141	4.23	2.73		2.73	1,898											
E1200	321.13	315.20	315.30					E1200													
				270	0.0123	3.96	2.56		2.56	1,774											
E1300	326.08	318.63	318.67					E1300													
				365	0.0117	3.85	2.49		2.49	1,728											
E1400	328.36	322.94	322.96					E1400													
				220	0.0061	2.78	1.80		1.80	1,247											
E1500	331.00	324.30	324.38					E1500													
				100	0.0194	4.96	3.20		3.20	2,225											
E1600	333.33	326.32	326.46					E1600													
				326	0.0038	2.19	1.41		1.41	981											
E1700	334.39	327.69	327.75					E1700													
				314	0.0293	6.10	3.94		3.94	2,735											
E1800	344.43	336.95	338.01					E1800													
RAILROAD				182	0.0207	5.13	3.31		3.31	2,300											
Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.																					
E1900	353.87	341.78	341.90					E1900													
				388	0.0024	1.74	1.13		1.13	782											
E2000	349.96	342.83	342.99					E2000													
								E1900													
E1900	353.87	341.78	341.99	17	0.0024	3.72	2.40		2.40	1,669											
E1900A	353.00	342.03	342.05					E1900A													
				370	0.0024	3.76	2.43		2.43	1,688											
E2000A	350.00	342.94	342.96					E2000A													
E2005								E2005													
				287	0.0076	6.87	4.31		4.31	2,992											
E2100	352.00	345.13	345.15					E2100													
				74	0.0073	6.55	4.23		4.23	2,939											
E2100A	353.00	345.69	345.71					E2100A													
				84	0.0073	6.54	4.22		4.22	2,932											
E2100B	351.40	346.32	346.34					E2100B													
				114	0.0073	6.54	4.23		4.23	2,936											
E2100C	356.00	347.17	347.19					E2100C													
				62	0.0085	7.09	4.58		4.58	3,181											
E2400	354.50	347.72	347.74					E2400													
				154	0.0085	7.07	4.57		4.57	3,174											
E2500	356.00	349.05	349.07					E2500													
				48	0.0085	7.09	4.58		4.58	3,180											
E2600	359.00	349.48	349.50					E2600													
				474	0.0120	8.41	5.43		5.43	3,773											
E2700	364.00	355.20	355.22					E2700													
				275	0.0085	7.08	4.57		4.57	3,174											
E2800	366.79	357.56	357.58					E2800													
				63	0.0157	9.90	6.40		6.40	4,442											
E2900	369.87	358.63	358.63					E2900													
Sumneytown Pk.				62	0.0102	2.21	1.43	Sumneytown Pk.	1.43	990											
E3000	368.26	359.26	359.42					E3000													
				204	0.0241	3.40	2.20		2.20	1,526											
E3100	375.00	364.34	364.45					E3010													
				17	0.0362	4.28	2.77		2.77	1,921											
E3200	371.98	365.10	365.29					E3200													
				59	0.0043	1.44	0.93		0.93	648											
E3300		365.72	366.72					E3300													
				390	0.0060	1.70	1.10		1.10	761											
E3400		368.06	368.06					E3400			1227	577	1325	909					130	174	190
								Merrybrook Neighborhood													
E3402								E3402			111										
E3411								E3411			111										
E3418								E3418			104										
E3701								E3701			43			11		8	10	8	15	14	14
								Note: Flows are for rain event													

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS <THAN 1"
EAST INTERCEPTOR CAPACITY

MH #	RIM ELEV	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
SW300	281.56	275.51	277.4				
				405	0.0044	3.57	2.31
E100	288.09	279.19	279.40				
				377	0.0056	3.52	2.27
E200	285.86	283.08	283.22				
				130	0.0152	4.40	2.84
E300	290.62	285.20	285.23				
				316	0.0154	4.42	2.86
E400	295.96	290.10	290.10				
				270	0.0119	3.89	2.51
E500	299.61	293.32	293.34				
				296	0.0106	3.67	2.37
E600	302.20	296.48	296.51				
				354	0.0099	3.55	2.29
E700	306.18	300.03	300.79				
				238	0.0074	3.06	1.98
E800	309.17	302.46	302.51				
				251	0.0071	2.99	1.93
E900	310.33	304.28	304.28				
				151	0.0074	3.07	1.98
E1000	311.46	305.70	305.72				
				396	0.0097	3.51	2.27
E1100	315.60	309.56	309.61				
				396	0.0141	4.23	2.73
E1200	321.13	315.20	315.30				
				270	0.0122	3.96	2.56
E1300	326.08	318.63	318.67				
				365	0.0117	3.85	2.49
E1400	328.36	322.94	322.96				
				220	0.0061	2.78	1.80
E1500	331.00	324.30	324.38				
				100	0.0194	4.96	3.20
E1600	333.33	326.32	326.46				
				326	0.0038	2.19	1.41
E1700	334.39	327.69	327.75				
				314	0.0293	6.10	3.94
E1800	344.43	336.95	338.01				
RAILROAD				182	0.0207	5.13	3.31

Note: E1900 to E2000 is parallel to E1900 to E1900A to E2000A. Both pipes are active. An 8" pipe connects E2000 and E2000A.

E1900	353.87	341.78	341.90				
				368	0.0024	1.74	1.13
E2000	349.96	342.83	342.99				
E1900	353.87	341.78	341.99				
				17	0.0024	3.72	2.40
E1900A	353.00	342.03	342.05				
				370	0.0024	3.76	2.43
E2000A	350.00	342.94	342.96				
E2005				287	0.0076	6.67	4.31
E2100	352.00	345.13	345.15	74	0.0073	6.55	4.23
E2100A	353.00	345.69	345.71	84	0.0073	6.54	4.22
E2100B	351.40	346.32	346.34	114	0.0073	6.54	4.23
E2100C	356.00	347.17	347.19	62	0.0085	7.09	4.58
E2400	354.50	347.72	347.74	154	0.0085	7.07	4.57
E2500	356.00	349.05	349.07	48	0.0085	7.09	4.58
E2600	359.00	349.48	349.50	474	0.0120	8.41	5.43
E2700	364.00	355.20	355.22	275	0.0085	7.08	4.57
E2800	366.79	357.56	357.58	63	0.0167	9.90	6.40
E2900	369.87	358.63	358.63	62	0.0102	2.21	1.43
Sunnyidown Pk.							
E3000	368.26	359.26	359.42	204	0.0241	3.40	2.20
E3100	375.00	364.34	364.45	17	0.0382	4.28	2.77
E3200	371.98	360.10	365.29	99	0.0043	1.44	0.93
E3300		365.72	365.72	390	0.0060	1.70	1.10
E3400		368.06	368.06				
E3402							
E3411							
E3418							
E3701							

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
EAST INTERCEPTOR CAPACITY

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	01/03/15 1.00"	1/18/2015 1.44"	04/20/15 1.71"	05/31/15 2.32"	06/08/15 1.4"	6/26/2015 2.30"	07/05/15 1.16"	07/14/15 1.15"	Feb-16 08/10/15 1.26"	08/20/15 2.43"	09/09/15 1.29"	09/29/15 2.2"	10/01/15 2.19"	10/28/15 1.49"	11/19/15 1.1"
SW300																	
	2.31	1,602															
E100						320	510	772	450	564	393	1391	332	434	787	478	
	2.27	1,576															
E200																	
	2.84	1,972															
E300																	
	2.86	1,983															
E400																	
	2.51	1,745															
E500																	
	2.37	1,646															
E600																	
	2.29	1,593															
E700																	
	1.98	1,374															
E800																	
	1.93	1,342															
E900																	
	1.98	1,378															
E1000																	
	2.27	1,573															
E1100																	
	2.73	1,898															
E1200																	
	2.56	1,774															
E1300																	
	2.49	1,728															
E1400																	
	1.80	1,247															
E1500																	
	3.20	2,225															
E1600																	
	1.41	981															
E1700																	
	3.94	2,735															
E1800																	
	3.31	2,300															
E1900																	
	1.13	782															
E2000																	
E1900																	
	2.40	1,669															
E1900A																	
	2.43	1,688															
E2000A																	
E2005						208	34	46	148	63	60	29	170	25	35	97	42
	4.31	2,992															
E2100																	
	4.23	2,939															
E2100A																	
	4.22	2,932															
E2100B																	
	4.23	2,936															
E2100C																	
	4.58	3,181															
E2400																	
	4.57	3,174															
E2500																	
	4.58	3,180															
E2600																	
	5.43	3,773															
E2700																	
	4.57	3,174															
E2800																	
	6.40	4,442															
E2900																	
Sunnyidown Pk.	1.43	990															
E3000																	
	2.20	1,526															
E3010			302	413	427	146	162	278	216	194	149	311	127	141	186	136	
	2.77	1,921															
E3200																	
	0.93	648															
E3300																	
	1.10	761															
E3400			47	112	142	125	159	169	70	93	96	222	78	82	123	85	
Merrybrook Neighborhood																	
E3402																	
E3411																	
E3418																	
E3701			15	18	16	8	10	12	9	11	7	13	7	11	13	8	

Note: Flows are for rain even

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS > THAN 1"

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
Conrad Ave. Pump Station Wet Well		293.16	316	0.0052	0.87	0.56
PS322	294.79	295.95	270	0.0061	0.94	0.61
PS323	297.60	297.59	296	0.0202	1.72	1.11
PS324	303.56	303.56				

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)
NW 4013 Weber Conrad Ave. Pump Station Wet Well	0.56	389
PS322	0.61	424
PS323	1.11	770
PS324		
MH PS325		
MH PS 326		
MH PS202		
MH 2346A		

Observed Peak Flows in gpm [1]

Date	4/10/2013	5/10/2013	5/23/2015	6/6/2013	6/10/2013	6/26/2013	7/1/2013	7/12/2013	7/22/2013	8/1/2013	8/12/2013	10/9/2013	11/26/2013	12/6/2013	12/14/2013	12/29/2013
Total Rain	1.61"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
					FEBRUARY 2016											
PS324									57	50	352	79	172	119	114	182
MH PS 326	22		17	457	588	26	111	47								
MH PS202	49	35			207				16	11	11	34	85	64	42	85
MH 2346A	385	372	203	1869	2227	298	828	498	57	394	1275	327	610	495	423	983
PS323	161	138	64	819	1380					100	631	152	288	220	225	289

Note:

1. Flows listed are for rain events greater than 1 inch.

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENTS > THAN 1"

February 2016

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Observed Peak Flows in gpm [1]
										Date
										Total Rai
							NW 4013			
Conrad Ave.							Conrad Ave.			
Pump Station							Pump Station			
Wet Well		293.16					Wet Well			
			316	0.0052	0.87	0.56		0.56	389	
PS322	294.79	295.95					PS322			
			270	0.0061	0.94	0.61		0.61	424	
PS323	297.60	297.59					PS323			
			296	0.0202	1.72	1.11		1.11	770	
PS324	303.56	303.56					PS324			
							MH PS325			
							MH PS 326			
							MH PS202			
							MH 2346A			

MH #	3/29/2014	4/15/2014	4/29/2014	5/16/2014	5/28/2014	6/9/2014	7/14/2014	7/27/2014	10/15/2014	11/26/2014	12/8/2014
Total Rai	2.66"	1.99"	5.12"	2.97"	1.30"	1.71"	1.37"	1.08"	1.20"	1.05"	1.37"
PS323	649	497	751	672	173	56	85	72	76	258	341
PS324	476	254	620	486	78	25	37	39			
MH PS325									90	88	79
MH PS202	224	180	344	1398	53	13	11	9	12	29	67
MH 2346A	1570	1305	2056	1762	629	276	307	140	339	342	525

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN

FLOWS FOR RAIN EVENT >THAN 1"

SOUTH WEST INTERCEPTOR CAPACITY

MORRIS ROAD SEWERS

MH #		INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
MH #	Conrad Ave. Pump Station Wet Well		293.16				
Conrad Ave.				316	0.0052	0.87	0.56
Pump Station	PS322	294.79	295.95				
Wet Well				270	0.0061	0.94	0.61
	PS323	297.60	297.59				
PS322				298	0.0202	1.72	1.11
	PS324	303.56	303.56				
PS323							
PS324							
							Note:

Calculated Capacity			Observed Peak Flows in gpm [1]																			
			Date	1/3/2015	1/16/2015	4/20/2015	5/31/2015	6/8/2015	6/26/2015	7/9/2015	7/14/2015	8/10/2015	8/20/2015	9/9/2015	9/29/2015	10/1/2015	10/28/2015	11/19/2015					
MH #	(MGD)	(gpm)	Total Rain	1.0"	1.44"	1.73"	2.32"	1.4"	2.30"	1.16"	1.16"	1.28"	2.43"	1.29"	2.2"	2.19"	1.49"	1.1"				
NW 4013 WEBER ROAD							34	57	103	24	38	22	110	15	104	79	59					
Conrad Ave. Pump Station Wet Well																						
	0.56	389																				
PS322																						
	0.61	424																				
PS323				343	631					85		183	295	90	107	241	154					
	1.11	770																				
PS324										37												
MH PS325				158	322					67	188	137	204		89	209	118					
MH PS 326																						
MH PS202				76	104	51		18	34	7	6	6	15	4	8	34	11					
MH 2346A				610	903	552	318	320	456	171	274	298	795	294	260	463	368					
Note:																						

1. Flows listed are for rain events greater than 1 inch.

February 2016

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UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS > THAN 1"

KRIEBEL ROAD TRIBUTARY CAPACITY[1]

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Observed Peak Flows in gpm [2] Date	1/15/2013	1/30/2013	4/11/2013	4/20/2013	5/19/2013	5/23/2013	6/6/2013	February 2013 6/18/2013	6/26/2013	7/1/2013	7/12/2013	7/22/2013	8/1/2013	8/12/2013	10/18/2013	11/6/2013	12/5/2013	12/14/2013	12/29/2013
										Total Rain	1.28"	1.59"	1.61"	1.00"	1.28"	1.60"	3.94"	2.97"	1.36"	2.00"	1.18"	2.94"	1.33"	3.72"	1.70"	2.45"	1.10"	1.17"	1.10"
							24A				2097	2836	1014	1405	1614	812	3162	3400	1047	2895	1526	2476	1309	3150	1649	2284	1697	1420	2113
							21.1				449	735	235	302	80	120	899	1066	116	482	445	475	177	754	218	371	323	217	426
							35				733	926	291	509	291	182	887	926	156	560	693	601	245	851	275	589	327	599	715
205							205				1322	2129	713	573	992	553	2407	2356	596	571	1134	1570	673	2366	945	1647	1060	864	1236
236	252.68	252.68					236																						
			34.59	0.0246	1.69	1.22		1.22	849																				
236A	253.53	253.50					236A																						
			289.71	0.0126	1.35	0.87		0.87	607																				
237A	257.14	257.19					237A				487	766	292	342	324	94	774	797	130	405	361	374	151	654	215	373	263	274	447
			80.54	0.0226	1.82	1.17		1.17	815																				
237	259.01	259.12					237																						
			401.66	0.0142	1.44	0.93		0.93	646																				
238	264.83	265.05					238																						
			295.73	0.0106	1.24	0.80		0.80	557																				
239	268.17	268.27					239																						
			359.36	0.0348	2.25	1.46		1.46	1,011																				
240	280.79	280.85					240																						
			250.16	0.0126	1.35	0.87		0.87	606																				
241	283.98	283.97					241																						
			264.81	0.0106	1.25	0.80		0.80	559																				
242	287.00	287.26					242																						
			125.65	0.0249	1.91	1.23		1.23	855																				
243	290.39	291.00					243																						
			20.91	-0.0053	0.00	0.00		0.00	=																				
243A	290.89	291.09					243A																						
			96.5	0.0058	0.92	0.59		0.59	413																				
244	291.65	291.53					244																						
			252.47	0.0041	0.76	0.50		0.50	348																				
245							245				200	360	94	187	143	41	457	828	46	241	203	222	87	344	137	236	197	151	182
249	292.57	292.67					249																						
			223.88	0.0113	1.28	0.83		0.83	576																				
250	295.40	295.53					250																						
			344.45	0.0188	1.65	1.07		1.07	742																				
251							251				267	344	91	123	91	48	438	666	34	159	176	169	67	372	109	186	114	140	209
253	301.99	302.41					253																						
			325.56	0.0173	1.59	1.03		1.03	713																				
255	308.04	307.95					255				152	218	86	27	24	31	98	403	38	48	100	60	72	49	94	78	70	72	155
			90.43	0.0412	2.45	1.58		1.58	1,101																				
256	311.68	311.72					256																						
459A							459A				607	631	384	381	392														
477							477																						
694							694																						

Notes:

1 The Manhole in this table are located in Upper Gwynedd Township with the exceptions of Manholes #24A, 21.1, 35 and #236, which is located just west of the Township dividing line

2 Flows listed are for rain events greater than 1 inch.

3 This section of pipe slopes slightly up.

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Table 4.3

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN
FLOWS FOR RAIN EVENTS > THAN 1"

KRIEBEL ROAD TRIBUTARY CAPACITY[1]

MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)
205						
			34.59	0.0246	1.89	1.22
236	252.68	252.68				
			289.71	0.0126	1.35	0.87
236A	253.53	253.50				
			80.54	0.0226	1.82	1.17
237A	257.14	257.19				
			401.66	0.0142	1.44	0.93
237	259.01	259.12				
			295.73	0.0108	1.24	0.80
238	264.82	265.05				
			359.36	0.0348	2.25	1.46
239	268.17	268.27				
			250.16	0.0125	1.35	0.87
240	280.79	280.85				
			284.81	0.0106	1.25	0.80
241	283.98	283.97				
			125.65	0.0249	1.91	1.23
242	287.00	287.26				
			20.91	-0.0053	0.00	0.00
243	290.39	291.00				
			96.5	0.0058	0.92	0.59
243A	290.88	291.09				
			252.47	0.0041	0.78	0.50
244	291.65	291.53				
			223.88	0.0113	1.28	0.83
245						
			344.45	0.0188	1.65	1.07
249	292.57	292.87				
			325.56	0.0173	1.59	1.03
250	295.40	295.53				
			90.43	0.0412	2.45	1.58
251						
253	301.99	302.41				
255	308.04	307.95				
256	311.68	311.72				
459A						
477						
694						

MH #	Calculated Capacity (MGD)	Calculated Capacity (gpm)	Date	3/29/2014	4/15/2014	4/30/2014	5/16/2014	5/26/2014	6/9/2014	7/14/2014	February 2016 7/27/2014	10/15/2014	11/26/2014	12/8/2014
			Total Rain	2.66"	1.99"	5.12"	2.97"	1.30"	1.71"	1.37"	1.08"	1.20"	1.05"	1.37"
24A				3037	3203	3418	3316	1249	1117	1425	836	1527	1307	1414
21.1				900	883	1065	1023	295	137	104	86	134	182	3047
35				882	996	971	936	447	306	221	148	213	273	711
205				1877	2352	2394	2283	716	757	851	597	983	833	1028
236														
	1.22	849												
236A														
	0.87	607												
237A				796	721	776	772	305	161	137	102	143	177	364
	1.17	815												
237														
	0.93	646												
238														
	0.80	557												
239														
	1.46	1,011												
240														
	0.87	606												
241														
	0.80	559												
242														
	1.23	855												
243														
	0.00	3												
243A														
	0.59	413												
244														
	0.50	348												
245				425	503	837	958	127	62	38	26	81	103	218
249														
	0.83	576												
250														
	1.07	742												
251				400	350	596	526	128	52	28	51	48		
253														
	1.03	713												
255				162	138	418	191	71	31	16	13	9	19	75
	1.58	1,101												
256														
459A				874	669	761	755	365	303	335	280	335	371	419
477				202	210	260	241	81	74	108	33		19	22
694														

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Table 4.6

UPPER GWYNEDD TOWNSHIP CORRECTIVE ACTION PLAN FLOWS FOR RAIN EVENTS > THAN 1"								Calculated Capacity		Observed Peak Flows in gpm [2]							February 2016										
KRIEBEL ROAD TRIBUTARY CAPACITY[1]										Date	1/18/2015	4/20/2015	5/31/2015	6/8/2015	6/26/2015	7/9/2015	7/14/2015	8/10/2015	8/20/2015	9/9/2015	9/29/2015	10/1/2015	10/26/2015	11/19/2015	12/17/2015	12/23/2015	12/27/2015
										Total Rain	1.44"	1.73"	2.32"	1.4"	2.30"	1.16"	1.16"	1.26"	2.43"	1.29"	2.2"	2.19"	1.49"	1.1"	1.02"	1.03"	1.5"
MH #	INV OUT	INV IN	DISTANCE	SLOPE	Q (cfs)	Q(MGD)	MH #	(MGD)	(gpm)																		
							24A				1281	1511	818	1326	1682	795	1041	790	1957	898	1351	1692	1242	1621	1399	583	1735
							21.1				299	263	90	277	332	78	111	72	273	85	119	207	164	214	290	384	529
							35				715	326	184	222	400	143	154	108	255	141	215	412	333	356	393	574	191
205							205				1284	1221	656	994	1093	556	708	535	1671	540	967	1263	876	1043	1084	1218	681
236	252.68	252.68					236																				
			34.59	0.0246	1.89	1.22		1.22	849																		
236A	253.53	253.50					236A																				
			289.71	0.0126	1.35	0.87		0.87	607																		
237A	257.14	257.19					237A				382	320	142	243	386	121	130	109	302	101	138	297	876	210	277	309	72
			80.54	0.0226	1.82	1.17		1.17	815																		
237	259.01	259.12					237																				
			401.66	0.0142	1.44	0.93		0.93	646																		
238	264.82	265.05					238																				
			295.73	0.0106	1.24	0.80		0.80	557																		
239	268.17	268.27					239																				
			359.36	0.0348	2.25	1.46		1.46	1,011																		
240	280.79	280.85					240																				
			250.16	0.0125	1.35	0.87		0.87	606																		
241	283.98	283.97					241																				
			284.81	0.0106	1.25	0.80		0.80	559																		
242	287.00	287.26					242																				
			125.65	0.0249	1.91	1.23		1.23	855																		
243	290.39	291.00					243																				
			20.91	-0.0053	0.00	0.00		0.00	[3]																		
243A	290.89	291.09					243A																				
			96.5	0.0058	0.92	0.59		0.59	413																		
244	291.65	291.53					244																				
			252.47	0.0041	0.78	0.50		0.50	348																		
245							245				166	160	56	106	155	46	52	46	163	50	86	166	112	116	208	220	97
249	292.57	292.87					249																				
			223.88	0.0113	1.28	0.83		0.83	576																		
250	295.40	295.53					250																				
			344.45	0.0188	1.65	1.07		1.07	742																		
251							251					68	23	52	120	27	24	42	164	61	49	106	57	56	140	190	47
253	301.99	302.41					253																				
			325.56	0.0173	1.59	1.03		1.03	713																		
255	308.04	307.95					255				132	94	43	45	95	74	58	47	102	17	28	76	29	24	47	63	45
			90.43	0.0412	2.45	1.58		1.58	1,101																		
256	311.68	311.72					256																				
459A							459A				440	421	299	403	431	236	197	265	324	231	281	353	326	317	363	388	363
477							477				38		7	46	73	7	43	9	84	28	37	93	78	110			
694							694																				

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Table 5.1

Upper Gwynedd Township Collection System

Scheduled Repairs & Improvements 2016

East Interceptor

The eight (8) sections of sanitary sewer listed below will be replaced utilizing pipe bursting and excavations. All necessary repairs to laterals that flow to these sections of sanitary mains will also be included within this project.

	Downstream Manhole	Upstream Manhole	Street	Footage	# of Lateral Connections
1	E2030	E2031	Swedesford Rd.	422	2
2	E2031	E2032	Swedesford Rd.	400	5
3	E2032	E2033	Swedesford Rd.	357	5
4	E2033	E2034	Swedesford Rd.	224	5
5	E2034	E2035	Swedesford Rd.	230	2
6	E2035	E2036	Swedesford Rd.	210	1
7	E2036	E2037	Swedesford Rd.	226	1
8	E2037	E2038	Swedesford Rd.	200	1
			Total	**2269**	**22**

Table 5.2
Upper Gwynedd Township Collection System
Scheduled Repairs & Improvements for 2016
East Inteceptor Drainage Area

Improvements are scheduled for 14 manholes within East Interceptor of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames.

The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	E5000	Hancock St.
2	E5001	Hancock St.
3	E5001A	Hancock St.
4	E5002	Hancock St.
5	E5003	Hancock St.
6	E5004	Hancock St.
7	E5005	Hancock St.
8	E5006	Hancock St.
9	E5007	Hancock St.
10	E3013	Gwynedd Ave.
11	E3014	Gwynedd Ave.
12	E3015	Gwynedd Ave.
13	E3016	Gwynedd Ave.
14	E3017	Sixth St.

Table 5.3
Upper Gwynedd Township Collection System
Scheduled Repairs & Improvements for 2016
South West Interceptor

Groundwater infiltration has been identified at the pipe connections and wall joints in the 9 manholes listed below. All 9 manholes are scheduled to be spray-lined in 2016.

	Manhole #	Street
1	NW4014	Weber's Lane
2	NW4017	Weber's Lane
3	NW4020	Weber's Lane
4	NW4023	Sandy's Lane
5	NW4030	Sandy's Lane
6	NW4031	Sandy's Lane
7	NW4032	Sandy's Lane
8	NW4033	Sandy's Lane
9	NW4034	Sandy's Lane

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Table 5.3

Upper Gwynedd Township Collection System

Scheduled Repairs & Improvements for 2016

South West Interceptor

Improvements are scheduled for 30 manholes within the South West Interceptor of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames. The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	NW2628	Hancock St.
2	NW2629	Marlyn's Lane
3	NW2630	Marlyn's Lane
4	NW2631	Marlyn's Lane
5	NW2632	Cathy's Lane
6	NW2633	Cathy's Lane
7	NW2634	Cathy's Lane
8	NW2635	Cathy's Lane
9	NW2643	Hancock St.
10	NW2644	Hancock St.
11	NW2645	Hancock St.
12	NW4013	Weber's Lane
13	NW4014	Weber's Lane
14	NW4015	Marlyn's Lane
15	NW4016	Marlyn's Lane
16	NW4017	Weber's Lane
17	NW4018	Weber's Lane
18	NW4019	Weber's Lane
19	NW4020	Weber's Lane
20	NW4021	Cathy's Lane
21	NW4022	Cathy's Lane
22	NW4023	Sandy's Lane
23	NW4024	Sandy's Lane
24	NW4030	Sandy's Lane
25	NW4031	Sandy's Lane
26	NW4032	Sandy's Lane
27	NW4033	Sandy's Lane
28	NW4034	Sandy's Lane
29	NW4035	Sandy's Lane
30	NW4036	Sandy's Lane

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Table 5.4
Upper Gwynedd Township Collection System
Manholes
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

Improvements are scheduled for 15 manholes within the Manhole 24A Drainage Area of the Towamencin Municipal Authority portion of Upper Gwynedd Township's collection system. These improvements are scheduled to be performed in 2016. The existing manholes are precast concrete manholes with brick and mortar risers. Groundwater infiltration has been identified entering the manholes through the brick and mortar risers, and inflowing at the street level between the lids and frames.

The manhole improvement project will include the removal and replacement of the brick risers with precast concrete risers and/or composite risers. The lids and frames will be replaced with East Jordan Ergo manhole frames with gasket sealing manhole access lids.

	Manhole #	Street
1	402	Green St.
2	403	Green St.
3	404	Green St.
4	405	Green St.
5	406	Green St.
6	407	Green St.
7	408	Green St.
8	409	Green St.
9	419	Park Ave.
10	420	Rosemont Ave.
11	421	Rosemont Ave.
12	422	Rosemont Ave.
13	423	Rosemont Ave.
14	424	Rosemont Ave.
15	NW4016	Rosemont Ave.

Table 5.5
Upper Gwynedd Township Collection System
Laterals
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

The sections of sanitary sewer mains listed below were lined from manhole to manhole with Cured-In-Place Pipe in 2014. In 2016 the 43 VCP (clay) laterals, that were not previously replaced with PVC pipe, on State St. and Jackson St. that are listed below are scheduled to be lined from the main to the 4" cast- iron pipe with CIPP liner.
This will eliminate the possibility of ground water infiltration at the joints within the VCP laterals and between the previously installed liner and the lateral connections at the main.

	Downstream Manhole	Upstream Manhole	Street	# of lateral connections
1	477	814	State St.	11
2	814	812	State St.	1
3	812	813	Jackson St.	9
4	812	811	Jackson St.	13
5	811	815	Jackson St.	9
			Total:	43

Table 5.6
Upper Gwynedd Township Collection System
Wyes
2016 Scheduled Repairs & Improvements
TMA Manhole 24A Drainage Area

The sections of sanitary sewers listed below were lined from manhole to manhole with Cured-In-Place Pipe in 2014. In 2016 the 30 lateral connections on S. Broad St. that are listed below will be sealed at the wye connections with CIPP to eliminate the possibility of groundwater infiltration entering the sanitary sewers between the lateral and the previously installed CIPP liner.

	Downstream Manhole	Upstream Manhole	Street	Lateral Connections
1	219	220	S. Broad St.	3
2	220	816	S. Broad St.	2
3	816	413	S. Broad St.	6
4	413	414	S. Broad St.	5
5	414	414A	S. Broad St.	7
6	414A	801	S. Broad St.	0
7	801	415	S. Broad St.	5
8	415	416	S. Broad St.	2
9	416	417	S. Broad St.	0
10	417	418	S. Broad St.	0
			Total :	30

CONNECTION MANAGEMENT PLAN

UPDATED: 02/04/16

TABLE 6.1

UGT WWTP

	DEP Code No.	Flow Approved	Date Approved by DEP	Connection Status								
				EDUs	EDUs	EDUs	Remaining	2015	2016	2017	2018	Tributary to SSO
Upper Gwynedd Township		gpd		Approved	Connected	Remaining	gpd					
EAST INTERCEPTOR												
[illegible]												
Gwynedd Manor On-Lot Systems						30	7,110					MH E1000
Misc. On-Lot Systems						3	711		3			
						10	2,370		5	5		MH E1700
SOUTHWEST INTERCEPTOR												
[illegible]												
116 Old Church Road						1	237					None
Hancock Road						50	11,850				30	None
Worcester Township						490	116,130				385	None
Montgomery Township						10	2,370				5	None
Misc. On Lot Systems						9	2,133	3	4	5	8	
Merck-Phase 5						652	154,524				352	
TMA SERVICE AREA												None
[illegible]												
Misc. On Lot Systems						10	2,370		2			
Martin I Green Street							9,480		2	2		
Martin II Allentown Rd.							4,740		20	20		None
Martin III S. Broad St.							2,844		10	10		None
									6	6		None

1. 237 Gal/EDU is used in accordance with Act 57 calculations
2. There is one connection for Clemrock that is part of the Providence Reserve development.
3. Where "None" is shown in the last column, "Tributary to SSO", this means that the project is not tributary to any SSO within UGT. We recognize that there are SSO on the KRI & that all UGT flow goes to the KRI.
4. Note that EDUs included for the Preserve at Worcester are included in the total allocation for Worcester Township.

[illegible] Ready to go. Subject to filing Building Permit and buying EDU's.

[illegible] Need Planning Module approval

[illegible] On lot Septic System with problems

[illegible] No approval pending or applied for and working on lot systems

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TABLE 6.2

UGT NET 1/1 REDUCTION[1]

BRIAR GLEN SERVICE

AREA

MANHOLE PS 202

	Peak Daily Flow	Average Daily Flow[2]	Net I/I[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.162	0.015	0.147		10.8
September 28, 2015	0.002	0.001	0.001	0.146	2.0
October 2, 2015	0.013	0.001	0.012	0.135	10.5

AVG. Net I/I Reduction 0.141

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the two post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

Amended Attachment 21-B.2
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TABLE 6.3

UGT NET 1/1 REDUCTION[1]

CONRAD AVENUE PUMP

STATION SERVICE AREA

MANHOLE PS 323

	Peak Daily Flow	Average Daily Flow[2]	Net I/1[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.581	0.078	0.503		7.5
August 20, 2015	0.218	0.184	0.034	0.469	1.2
September 28, 2015	0.082	0.061	0.021	0.482	2.0
October 2, 2015	0.141	0.077	0.064	0.439	1.8

AVG. Net I/I Reduction 0.47

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the two post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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TABLE 6.4

UGT NET 1/1 REDUCTION[1]

KRI SERVICE AREA

MANHOLE 24A

	Peak Daily Flow	Average Daily Flow[2]	Net I/1[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	2.957	0.969	1.988		3.05
August 20, 2015	1.184	0.676	0.508	1.48	1.75
September 28, 2015	0.942	0.815	0.127	1.86	1.16
October 2, 2015	1.327	0.794	0.533	1.46	1.67

AVG. Net I/I Reduction = 1.6 mgd

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the three post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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TABLE 6.5

UGT NET 1/1 REDUCTION[1]

KRI SERVICE AREA

MANHOLE 35

	Peak Daily Flow	Average Daily Flow[2]	Net I/I[3]	Net 1/1 Reduction[4]	Peaking Factor[5]
March 30, 2014	0.97	0.189	0.781		5.13
August 20, 2015	0.155	0.053	0.102	0.679	2.92
September 28, 2015	0.124	0.086	0.038	0.743	1.44
October 2, 2015	0.276	0.121	0.155	0.626	2.28

AVG. Net I/I Reduction = 0.683 mgd

1. Flows are in MGD
2. Average flow is the average daily flow of the 10 days preceding the day of the peak daily flow
3. Net I/I is peak daily flow minus the 10 day average daily flow
4. Net I/I Reduction is the Net I/I for each of the three post repair events subtracted from the Net I/I for the pre-repair event
5. Peaking factor is the peak daily flow divided by the 10 day average daily flow

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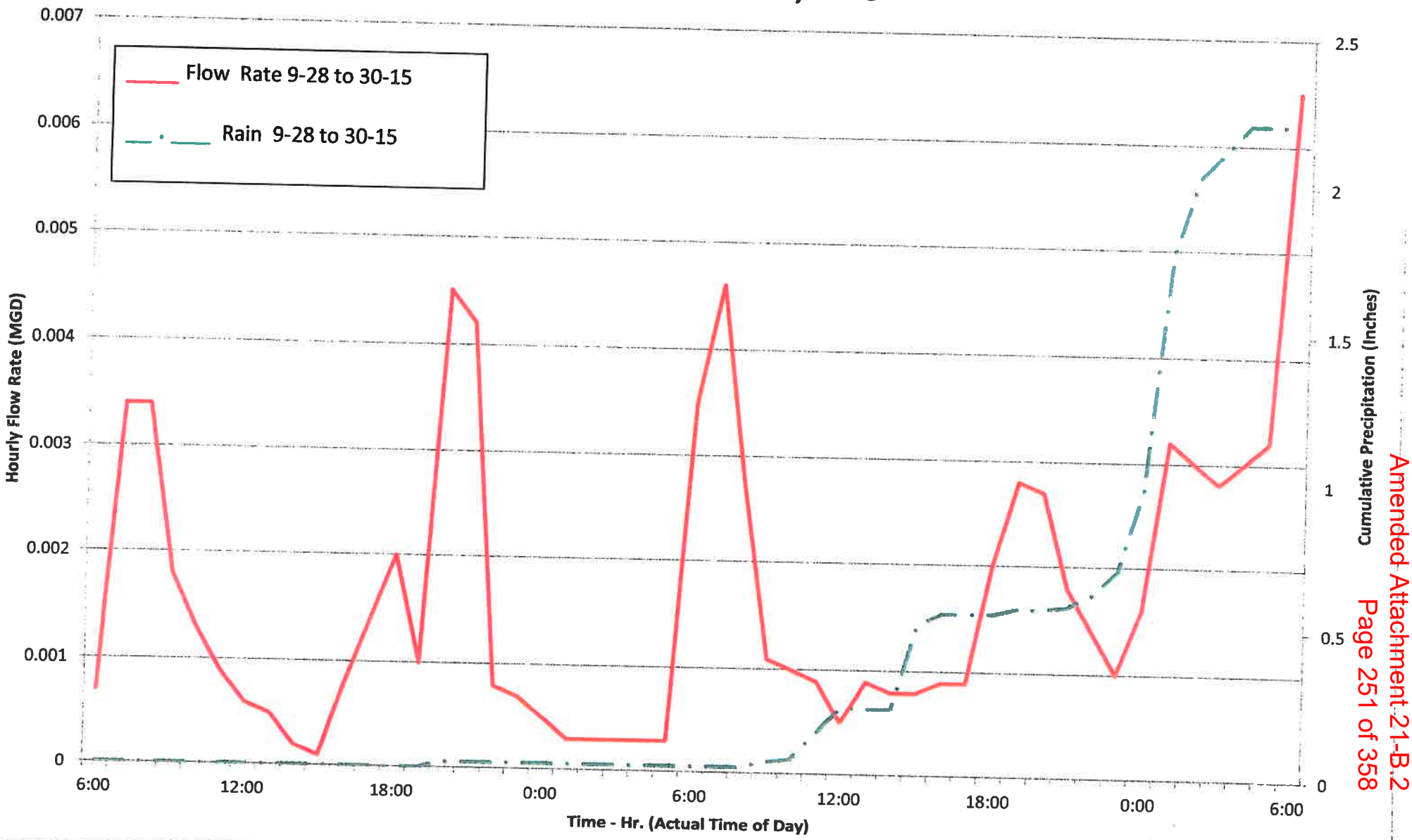
SOUTHWEST INTERCEPTOR

EDU REQUEST

FLOW DATA AND INFORMATION

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS202 - Upstream of the Briar Glen Pump Station - September 28 to 30, 2015



Amended Attachment 21-B.2
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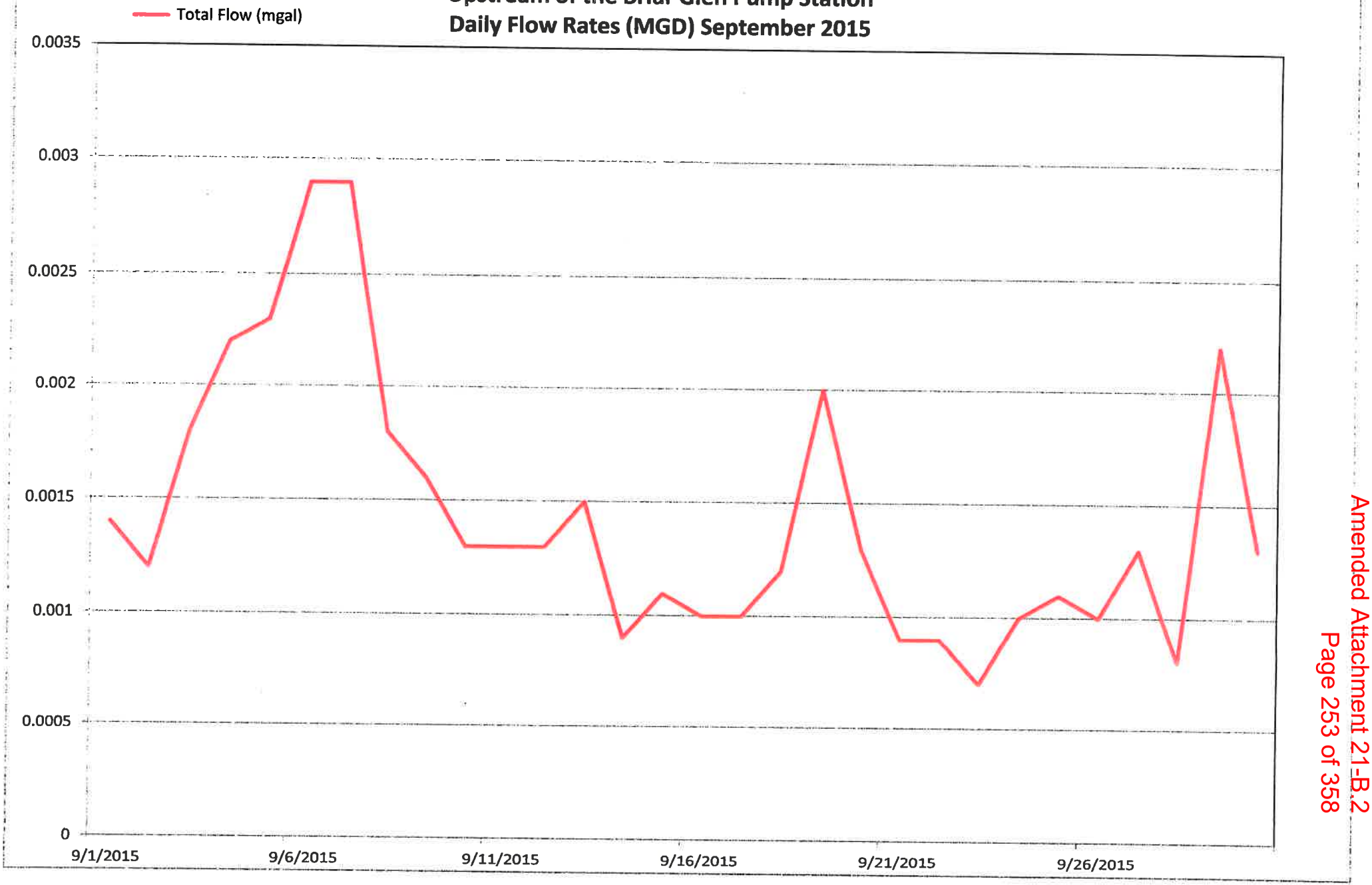
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS202 for Rain Event: September 28 to 30, 2015

Date	Time	Flow Rate (MGD)	Hourly Rain Totals
9/28/2015	6:00	0.0007	0
9/28/2015	7:00	0.0034	0
9/28/2015	8:00	0.0034	0
9/28/2015	9:00	0.0018	0
9/28/2015	10:00	0.0013	0
9/28/2015	11:00	0.0009	0
9/28/2015	12:00	0.0006	0
9/28/2015	13:00	0.0005	0
9/28/2015	14:00	0.0002	0
9/28/2015	15:00	0.0001	0
9/28/2015	16:00	0.0008	0
9/28/2015	17:00	0.0014	0
9/28/2015	18:00	0.002	0
9/28/2015	19:00	0.001	0
9/28/2015	20:00	0.0045	0.02
9/28/2015	21:00	0.0042	0.02
9/28/2015	22:00	0.0008	0.02
9/28/2015	23:00	0.0007	0.02
9/29/2015	0:00	0.0005	0.02
9/29/2015	1:00	0.0003	0.02
9/29/2015	2:00	0.0003	0.02
9/29/2015	3:00	0.0003	0.02
9/29/2015	4:00	0.0003	0.02
9/29/2015	5:00	0.0003	0.02
9/29/2015	6:00	0.0035	0.02
9/29/2015	7:00	0.0046	0.02
9/29/2015	8:00	0.0027	0.02
9/29/2015	9:00	0.0011	0.04
9/29/2015	10:00	0.001	0.05
9/29/2015	11:00	0.0009	0.14
9/29/2015	12:00	0.0005	0.23
9/29/2015	13:00	0.0009	0.23
9/29/2015	14:00	0.0008	0.23
9/29/2015	15:00	0.0008	0.51
9/29/2015	16:00	0.0009	0.55
9/29/2015	17:00	0.0009	0.55
9/29/2015	18:00	0.002	0.55
9/29/2015	19:00	0.0028	0.57
9/29/2015	20:00	0.0027	0.57
9/29/2015	21:00	0.0018	0.58
9/29/2015	22:00	0.0014	0.62
9/29/2015	23:00	0.001	0.7
9/30/2015	0:00	0.0016	0.98
9/30/2015	1:00	0.0032	1.77
9/30/2015	2:00	0.003	2.03
9/30/2015	3:00	0.0028	2.12
9/30/2015	4:00	0.003	2.21
9/30/2015	5:00	0.0032	2.21
9/30/2015	6:00	0.0065	2.21

Upper Gwynedd Township - Manhole PS202

Upstream of the Briar Glen Pump Station

Daily Flow Rates (MGD) September 2015



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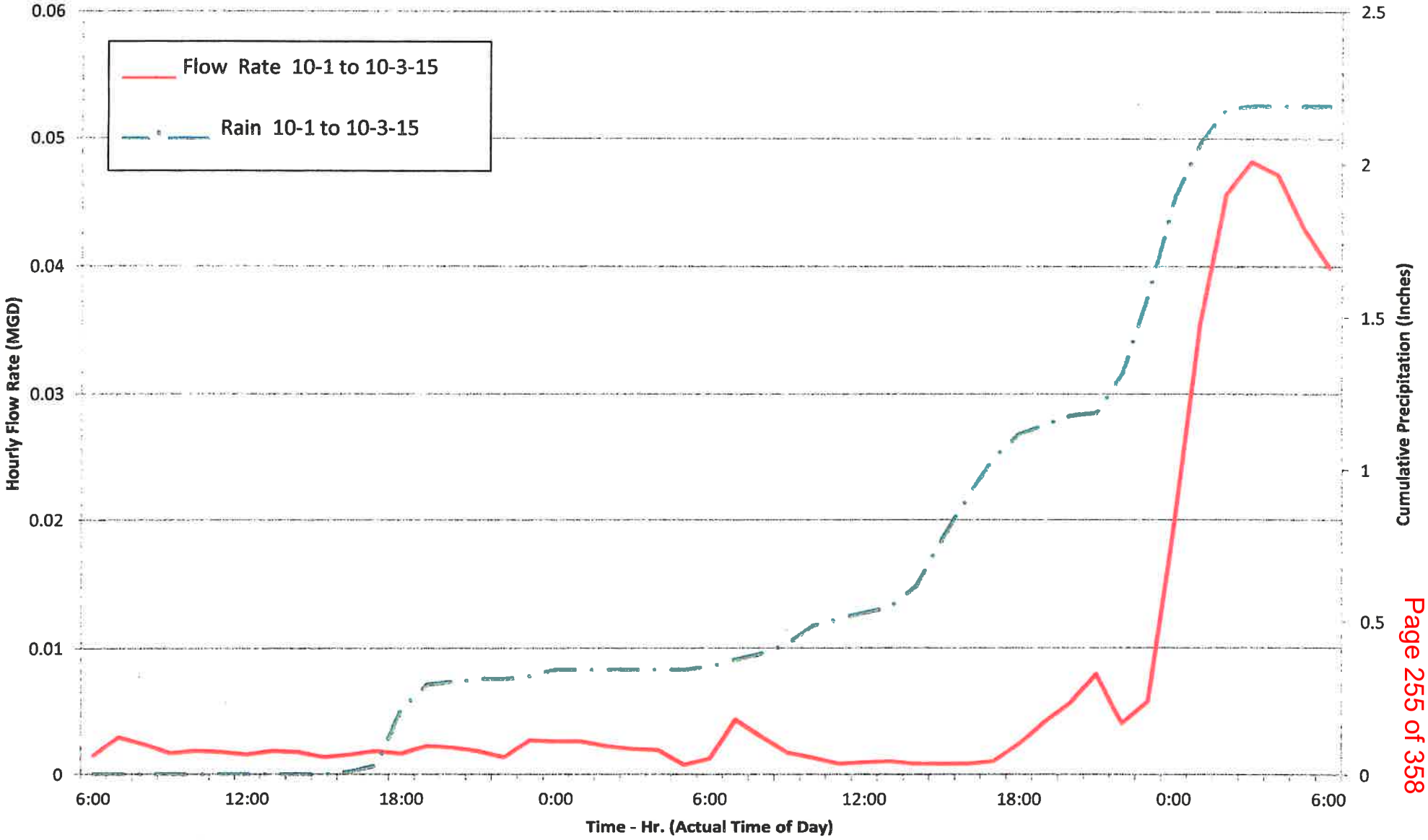
Upper Gwynedd Township - Manhole PS202

September 2015

Date / Time	Total Flow (mgal)
9/1/2015	0.0014
9/2/2015	0.0012
9/3/2015	0.0018
9/4/2015	0.0022
9/5/2015	0.0023
9/6/2015	0.0029
9/7/2015	0.0029
9/8/2015	0.0018
9/9/2015	0.0016
9/10/2015	0.0013
9/11/2015	0.0013
9/12/2015	0.0013
9/13/2015	0.0015
9/14/2015	0.0009
9/15/2015	0.0011
9/16/2015	0.001
9/17/2015	0.001
9/18/2015	0.0012
9/19/2015	0.002
9/20/2015	0.0013
9/21/2015	0.0009
9/22/2015	0.0009
9/23/2015	0.0007
9/24/2015	0.001
9/25/2015	0.0011
9/26/2015	0.001
9/27/2015	0.0013
9/28/2015	0.0008
9/29/2015	0.0022
9/30/2015	0.0013

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS202 - Upstream of the Briar Glen Pump Station - October 1 to 3, 2015



Amended Attachment 21-B.2
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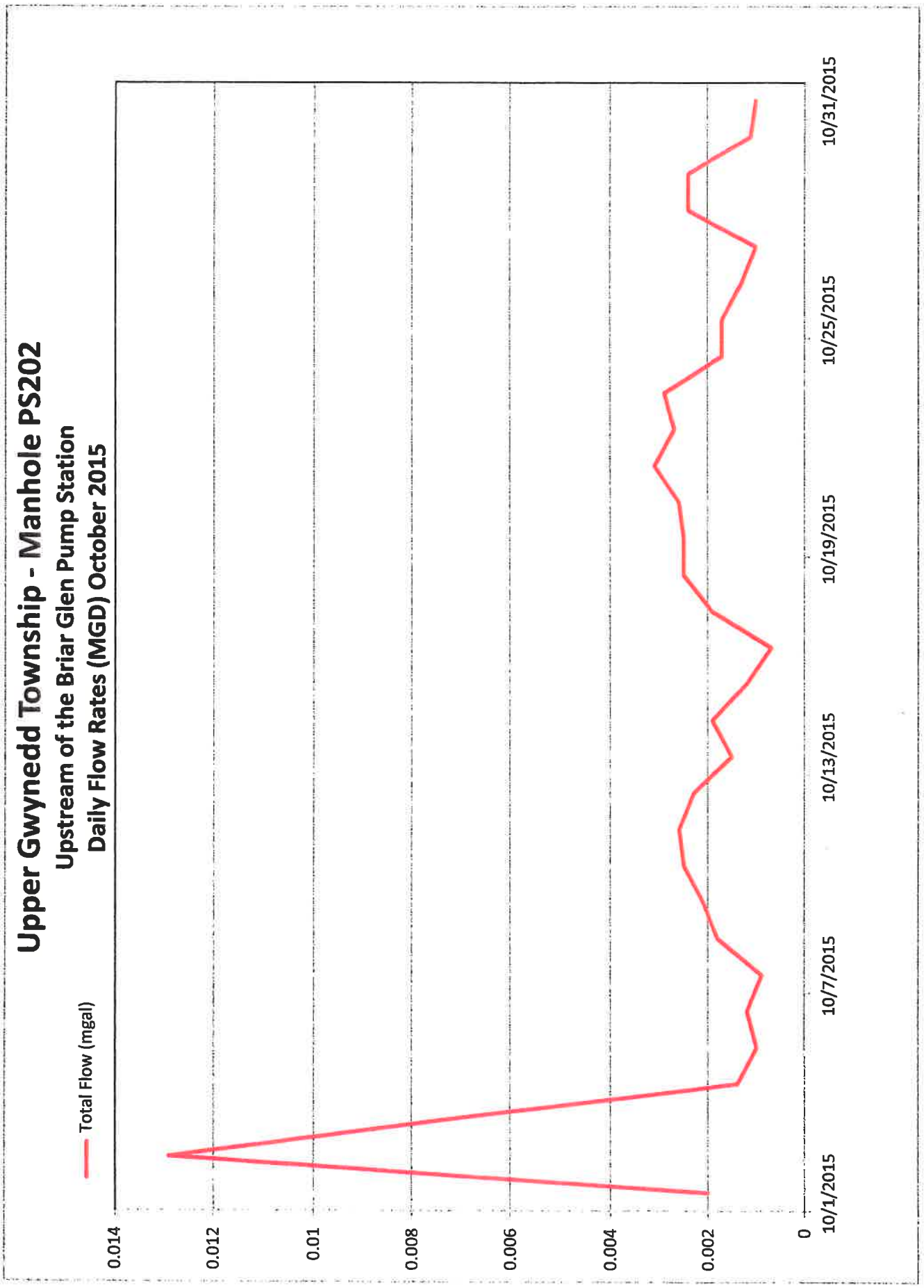
Upper Gwynedd Township Flow Data & Cumulative Precipitation at PH PS 206 for Rain Event: October 1 to 3, 2015

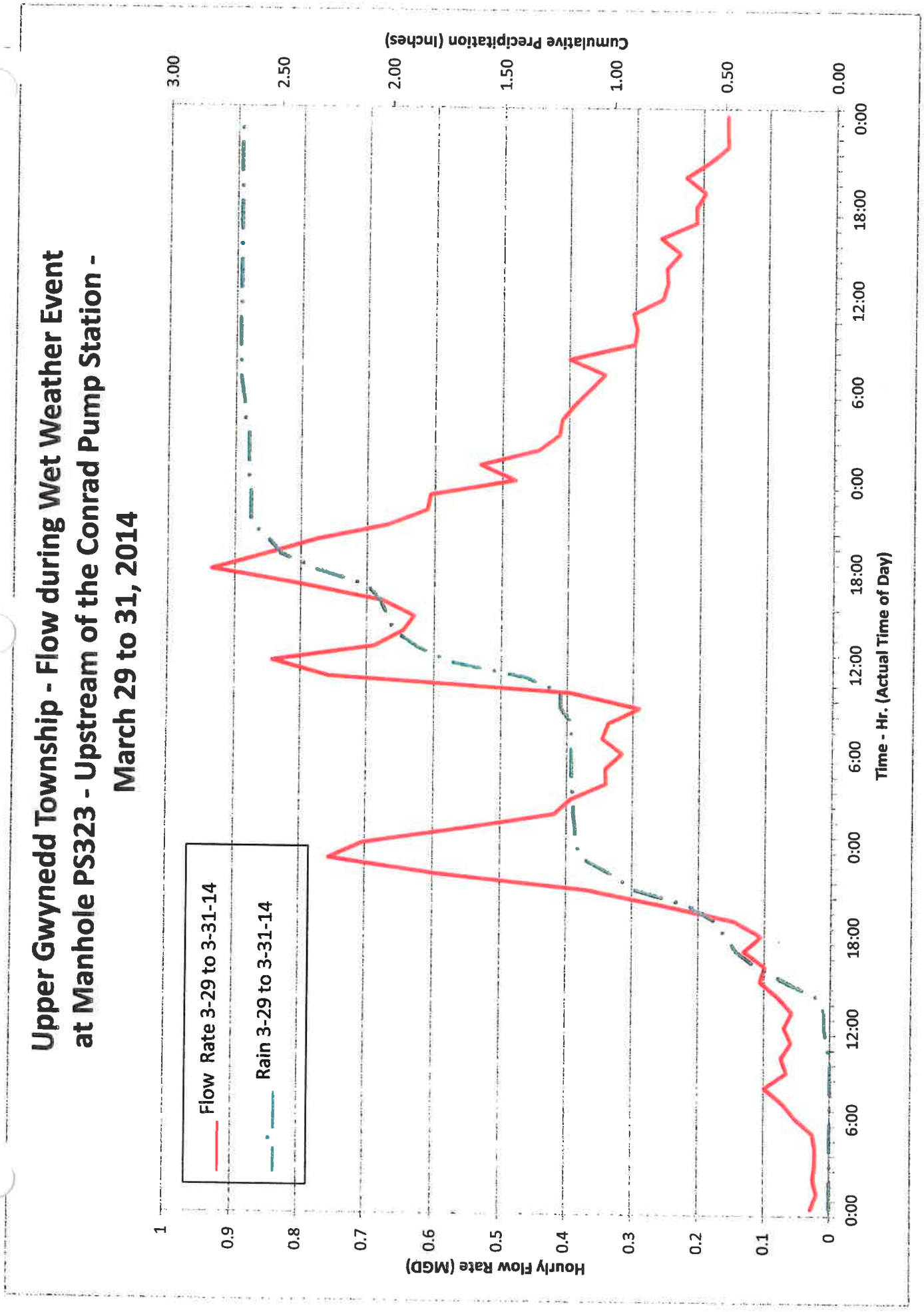
Date	Time	Flow Rate mgd	Hourly Rain Totals
10/1/2015	6:00	0.0015	0
10/1/2015	7:00	0.003	0
10/1/2015	8:00	0.0024	0
10/1/2015	9:00	0.0017	0
10/1/2015	10:00	0.0019	0
10/1/2015	11:00	0.0018	0
10/1/2015	12:00	0.0016	0
10/1/2015	13:00	0.0019	0
10/1/2015	14:00	0.0018	0
10/1/2015	15:00	0.0014	0
10/1/2015	16:00	0.0016	0.01
10/1/2015	17:00	0.0019	0.03
10/1/2015	18:00	0.0017	0.22
10/1/2015	19:00	0.0023	0.3
10/1/2015	20:00	0.0022	0.31
10/1/2015	21:00	0.0019	0.32
10/1/2015	22:00	0.0014	0.32
10/1/2015	23:00	0.0028	0.33
10/2/2015	0:00	0.0027	0.35
10/2/2015	1:00	0.0027	0.35
10/2/2015	2:00	0.0023	0.35
10/2/2015	3:00	0.0021	0.35
10/2/2015	4:00	0.002	0.35
10/2/2015	5:00	0.0008	0.35
10/2/2015	6:00	0.0013	0.36
10/2/2015	7:00	0.0044	0.38
10/2/2015	8:00	0.0031	0.4
10/2/2015	9:00	0.0018	0.43
10/2/2015	10:00	0.0014	0.49
10/2/2015	11:00	0.0009	0.51
10/2/2015	12:00	0.001	0.53
10/2/2015	13:00	0.0011	0.55
10/2/2015	14:00	0.0009	0.62
10/2/2015	15:00	0.0009	0.77
10/2/2015	16:00	0.0009	0.91
10/2/2015	17:00	0.0011	1.04
10/2/2015	18:00	0.0025	1.12
10/2/2015	19:00	0.0042	1.15
10/2/2015	20:00	0.0058	1.18
10/2/2015	21:00	0.008	1.19
10/2/2015	22:00	0.0041	1.32
10/2/2015	23:00	0.0059	1.58
10/3/2015	0:00	0.0196	1.89
10/3/2015	1:00	0.0355	2.07
10/3/2015	2:00	0.0456	2.18
10/3/2015	3:00	0.0482	2.19
10/3/2015	4:00	0.0472	2.19
10/3/2015	5:00	0.043	2.19
10/3/2015	6:00	0.0399	2.19


Upper Gwynedd Township - Manhole PS202
Upstream of the Briar Glen Pump Station
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

Upper Gwynedd Township - Manhole PS202

October 2015

Date / Time	Total Flow (mgal)
10/1/2015	0.002
10/2/2015	0.0129
10/3/2015	0.0074
10/4/2015	0.0014
10/5/2015	0.001
10/6/2015	0.0012
10/7/2015	0.0009
10/8/2015	0.0018
10/9/2015	0.0021
10/10/2015	0.0025
10/11/2015	0.0026
10/12/2015	0.0023
10/13/2015	0.0015
10/14/2015	0.0019
10/15/2015	0.0012
10/16/2015	0.0007
10/17/2015	0.0019
10/18/2015	0.0025
10/19/2015	0.0025
10/20/2015	0.0026
10/21/2015	0.0031
10/22/2015	0.0027
10/23/2015	0.0029
10/24/2015	0.0017
10/25/2015	0.0017
10/26/2015	0.0013
10/27/2015	0.001
10/28/2015	0.0024
10/29/2015	0.0024
10/30/2015	0.0011
10/31/2015	0.001

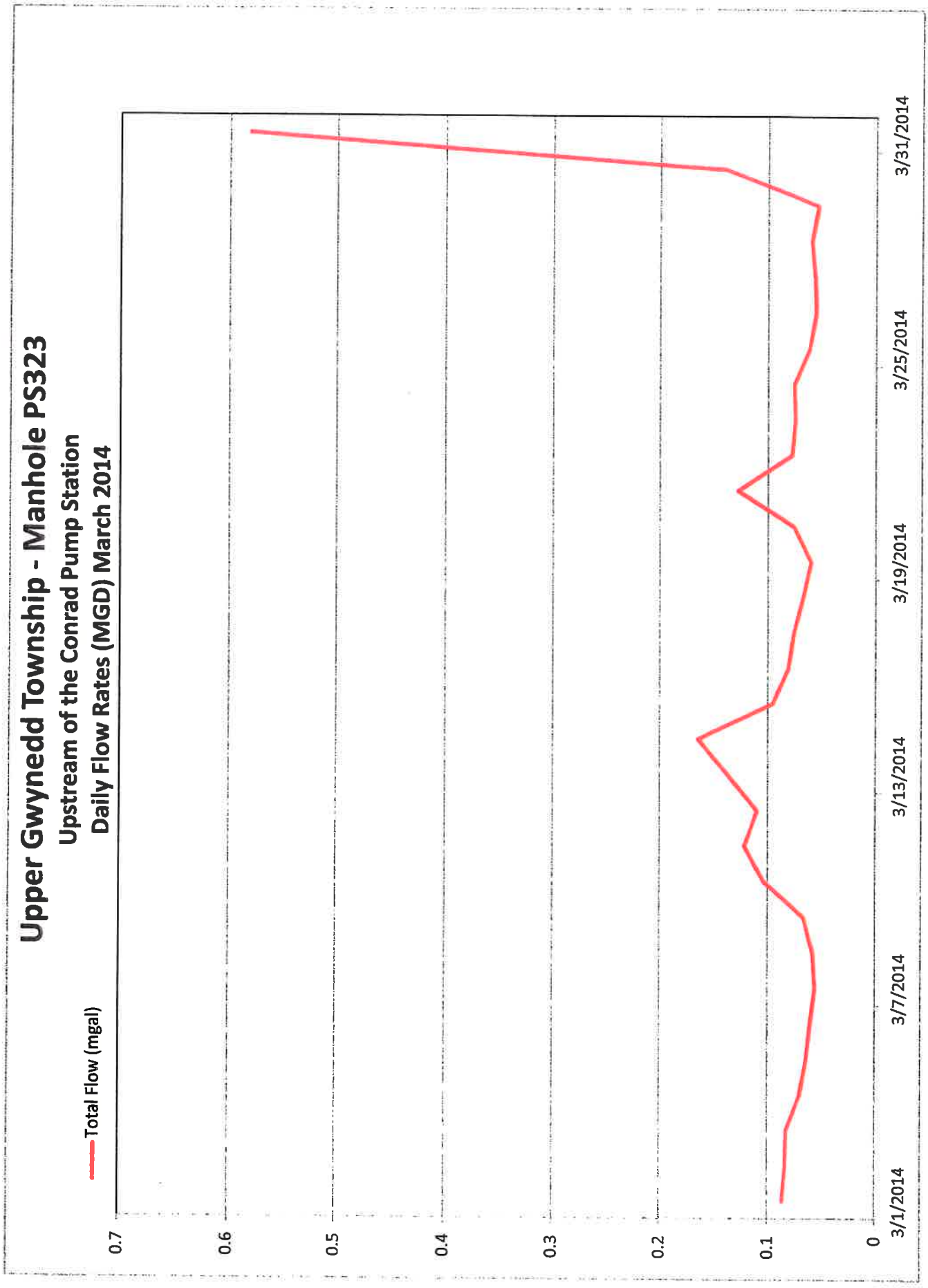

Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole PS323 - Upstream of the Conrad Pump Station -
March 29 to 31, 2014
Flow Rate 3-29 to 3-31-14
Rain 3-29 to 3-31-14
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0.00
0.50
1.00
1.50
2.00
2.50
3.00
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS323 for Rain Event: March 29 to 30, 2014

Date / Time		Flow (gpm)	Hourly Rain Totals
3/29/2014	0:00	0.028	0.00
3/29/2014	1:00	0.02	0.00
3/29/2014	2:00	0.025	0.00
3/29/2014	3:00	0.022	0.00
3/29/2014	4:00	0.022	0.00
3/29/2014	5:00	0.026	0.00
3/29/2014	6:00	0.053	0.00
3/29/2014	7:00	0.073	0.00
3/29/2014	8:00	0.1	0.00
3/29/2014	9:00	0.067	0.00
3/29/2014	10:00	0.075	0.00
3/29/2014	11:00	0.06	0.02
3/29/2014	12:00	0.071	0.03
3/29/2014	13:00	0.059	0.03
3/29/2014	14:00	0.08	0.06
3/29/2014	15:00	0.107	0.21
3/29/2014	16:00	0.1	0.34
3/29/2014	17:00	0.132	0.43
3/29/2014	18:00	0.106	0.48
3/29/2014	19:00	0.147	0.53
3/29/2014	20:00	0.253	0.65
3/29/2014	21:00	0.37	0.89
3/29/2014	22:00	0.595	0.99
3/29/2014	23:00	0.755	1.12
3/30/2014	0:00	0.705	1.16
3/30/2014	1:00	0.558	1.16
3/30/2014	2:00	0.419	1.17
3/30/2014	3:00	0.394	1.17
3/30/2014	4:00	0.341	1.18
3/30/2014	5:00	0.342	1.18
3/30/2014	6:00	0.317	1.18
3/30/2014	7:00	0.347	1.18
3/30/2014	8:00	0.338	1.18
3/30/2014	9:00	0.291	1.23
3/30/2014	10:00	0.396	1.23
3/30/2014	11:00	0.757	1.39
3/30/2014	12:00	0.843	1.74
3/30/2014	13:00	0.689	1.88
3/30/2014	14:00	0.647	1.98
3/30/2014	15:00	0.63	2.01
3/30/2014	16:00	0.677	2.04
3/30/2014	17:00	0.795	2.10
3/30/2014	18:00	0.935	2.33
3/30/2014	19:00	0.854	2.49
3/30/2014	20:00	0.776	2.55
3/30/2014	21:00	0.67	2.63
3/30/2014	22:00	0.612	2.63
3/30/2014	23:00	0.607	2.63

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS323 for Rain Event: March 29 to 30, 2014

Date / Time		Flow (gpm)	Hourly Rain Totals
3/31/2014	0:00	0.481	2.64
3/31/2014	1:00	0.533	2.64
3/31/2014	2:00	0.446	2.64
3/31/2014	3:00	0.415	2.64
3/31/2014	4:00	0.411	2.66
3/31/2014	5:00	0.392	2.66
3/31/2014	6:00	0.369	2.67
3/31/2014	7:00	0.346	2.68
3/31/2014	8:00	0.4	2.68
3/31/2014	9:00	0.302	2.68
3/31/2014	10:00	0.298	2.68
3/31/2014	11:00	0.304	2.68
3/31/2014	12:00	0.26	2.68
3/31/2014	13:00	0.253	2.68
3/31/2014	14:00	0.254	2.68
3/31/2014	15:00	0.234	2.68
3/31/2014	16:00	0.263	2.68
3/31/2014	17:00	0.21	2.68
3/31/2014	18:00	0.211	2.68
3/31/2014	19:00	0.197	2.68
3/31/2014	20:00	0.226	2.68
3/31/2014	21:00	0.191	2.68
3/31/2014	22:00	0.163	2.68
3/31/2014	23:00	0.164	2.68
4/1/2014	0:00	0.164	2.68

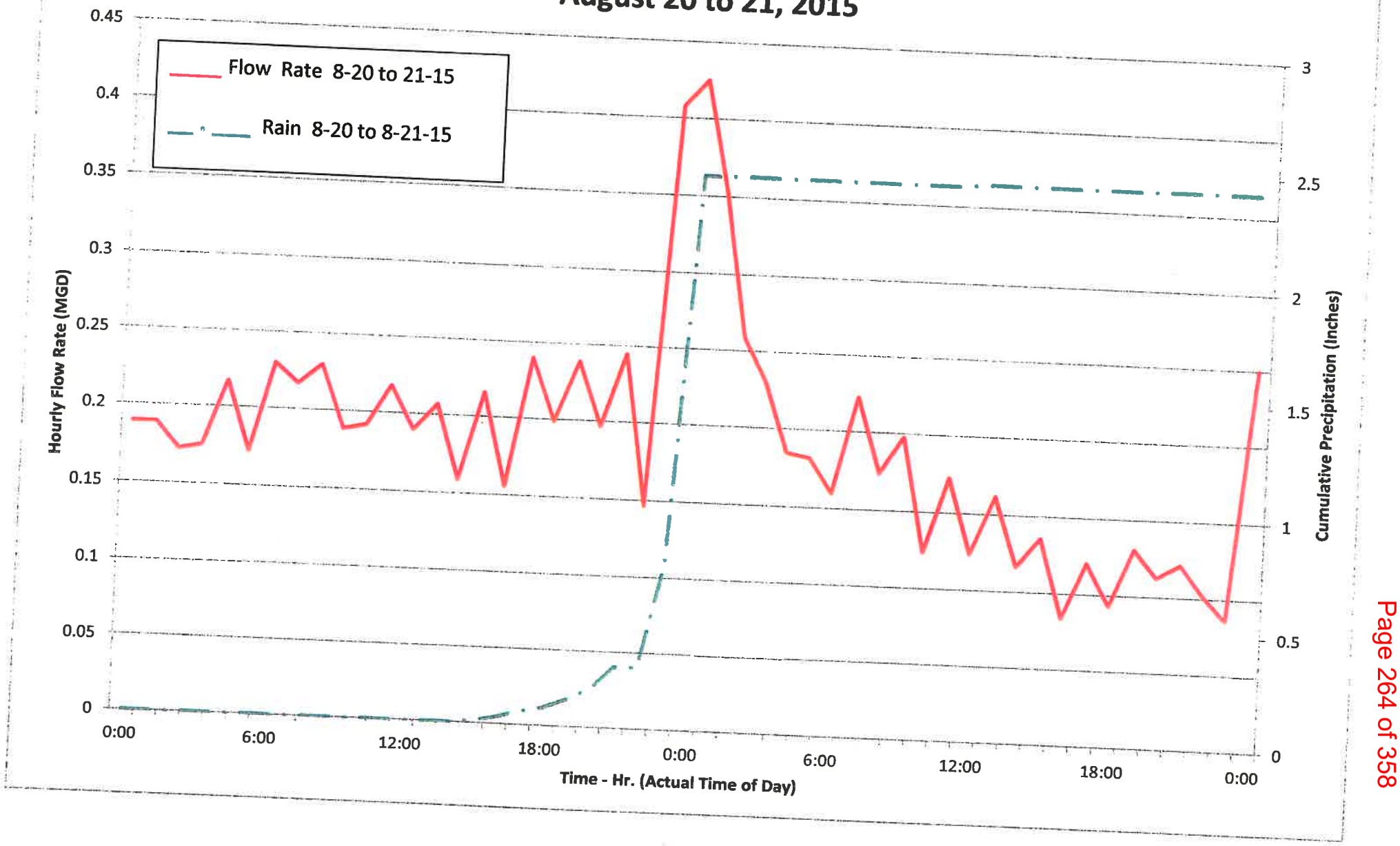

Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

Upper Gwynedd Township-Manhole PS323

March 1 to March 31, 2014

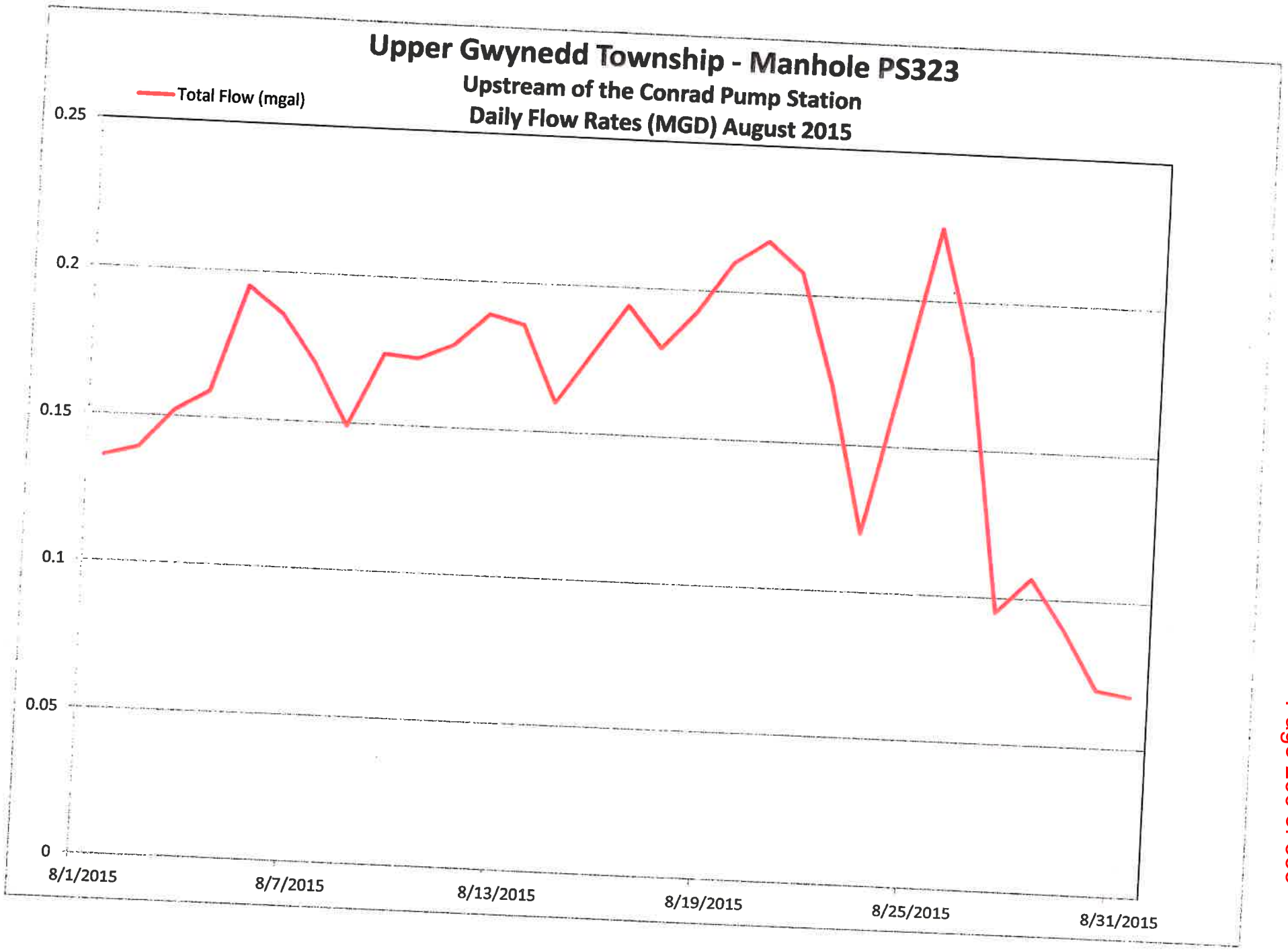
Date	Total Flow (mgal)
3/1/2014	0.086
3/2/2014	0.083
3/3/2014	0.082
3/4/2014	0.069
3/5/2014	0.063
3/6/2014	0.059
3/7/2014	0.055
3/8/2014	0.057
3/9/2014	0.066
3/10/2014	0.104
3/11/2014	0.122
3/12/2014	0.11
3/13/2014	0.137
3/14/2014	0.165
3/15/2014	0.096
3/16/2014	0.081
3/17/2014	0.076
3/18/2014	0.067
3/19/2014	0.059
3/20/2014	0.076
3/21/2014	0.128
3/22/2014	0.078
3/23/2014	0.075
3/24/2014	0.076
3/25/2014	0.061
3/26/2014	0.055
3/27/2014	0.056
3/28/2014	0.059
3/29/2014	0.053
3/30/2014	0.139
3/31/2014	0.581

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS323 - Upstream of the Conrad Pump Station - August 20 to 21, 2015



Upper Gwynedd Township Flow Data & Cumulative Precipitation 5MH-1
for Rain Event : August 20 to 21, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
8/20/2015	0:00	0.189	0
8/20/2015	1:00	0.189	0
8/20/2015	2:00	0.172	0
8/20/2015	3:00	0.175	0
8/20/2015	4:00	0.217	0
8/20/2015	5:00	0.172	0
8/20/2015	6:00	0.23	0
8/20/2015	7:00	0.217	0
8/20/2015	8:00	0.23	0
8/20/2015	9:00	0.189	0
8/20/2015	10:00	0.192	0
8/20/2015	11:00	0.218	0
8/20/2015	12:00	0.19	0
8/20/2015	13:00	0.207	0
8/20/2015	14:00	0.159	0
8/20/2015	15:00	0.216	0.01
8/20/2015	16:00	0.156	0.03
8/20/2015	17:00	0.24	0.06
8/20/2015	18:00	0.199	0.08
8/20/2015	19:00	0.239	0.12
8/20/2015	20:00	0.197	0.17
8/20/2015	21:00	0.245	0.27
8/20/2015	22:00	0.147	0.27
8/20/2015	23:00	0.408	0.73
8/21/2015	0:00	0.425	2.42
8/21/2015	1:00	0.353	2.42
8/21/2015	2:00	0.259	2.42
8/21/2015	3:00	0.23	2.42
8/21/2015	4:00	0.185	2.42
8/21/2015	5:00	0.182	2.42
8/21/2015	6:00	0.16	2.42
8/21/2015	7:00	0.223	2.42
8/21/2015	8:00	0.174	2.42
8/21/2015	9:00	0.198	2.42
8/21/2015	10:00	0.124	2.42
8/21/2015	11:00	0.173	2.42
8/21/2015	12:00	0.124	2.43
8/21/2015	13:00	0.162	2.43
8/21/2015	14:00	0.117	2.43
8/21/2015	15:00	0.136	2.43
8/21/2015	16:00	0.084	2.43
8/21/2015	17:00	0.121	2.43
8/21/2015	18:00	0.093	2.43
8/21/2015	19:00	0.131	2.43
8/21/2015	20:00	0.113	2.43
8/21/2015	21:00	0.122	2.43
8/21/2015	22:00	0.102	2.43
8/21/2015	23:00	0.086	2.43
8/22/2015	0:00	0.25	2.43

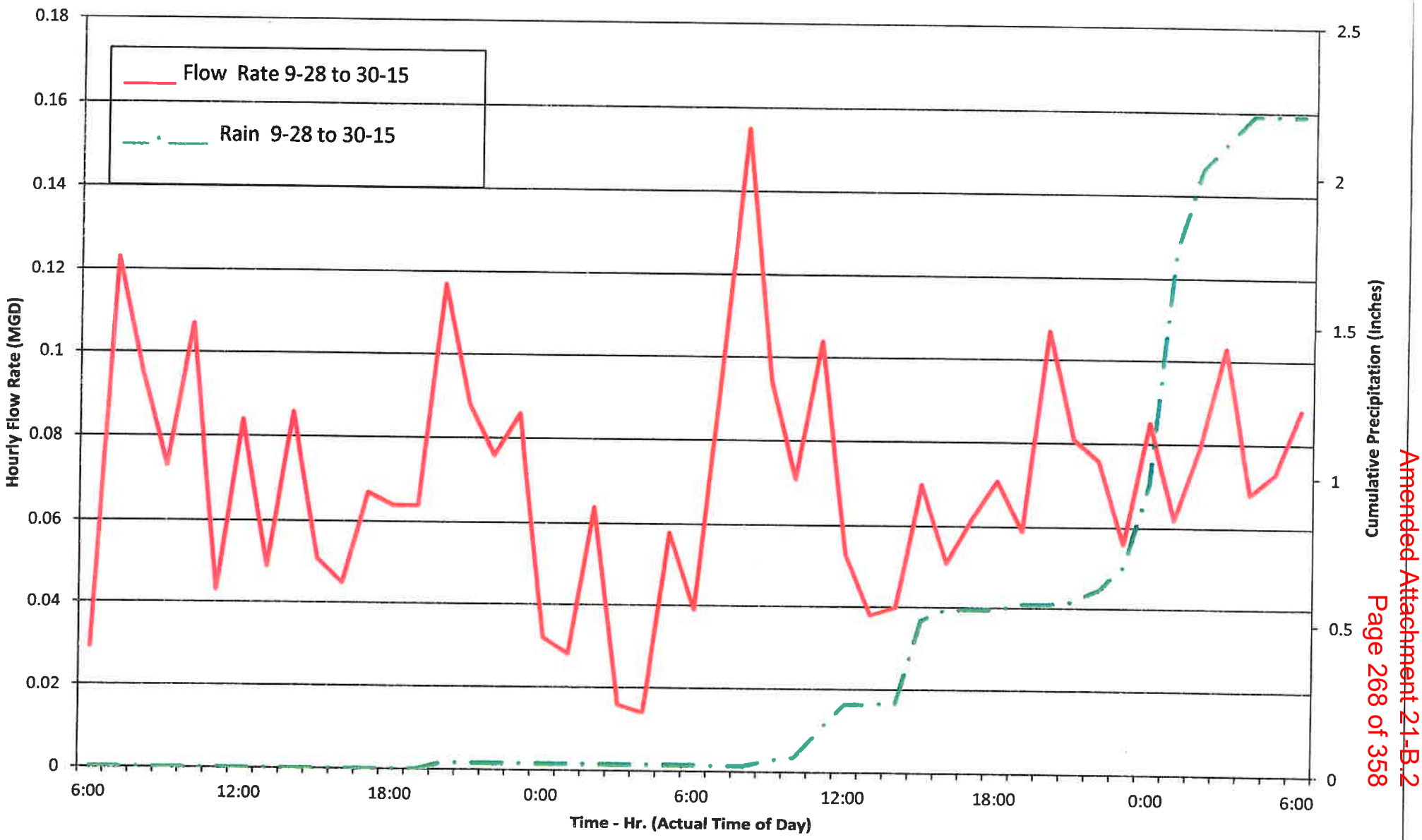

Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) August 2015
Total Flow (mgal)
0.25
0.2
0.15
0.1
0.05
0
8/1/2015
8/7/2015
8/13/2015
8/19/2015
8/25/2015
8/31/2015

Upper Gwynedd Township-Manhole PS323

August 1 to 31, 2015

Date	Total Flow (mgal)
8/1/2015	0.136
8/2/2015	0.139
8/3/2015	0.152
8/4/2015	0.159
8/5/2015	0.195
8/6/2015	0.186
8/7/2015	0.17
8/8/2015	0.149
8/9/2015	0.174
8/10/2015	0.173
8/11/2015	0.178
8/12/2015	0.189
8/13/2015	0.186
8/14/2015	0.16
8/15/2015	0.177
8/16/2015	0.194
8/17/2015	0.18
8/18/2015	0.193
8/19/2015	0.21
8/20/2015	0.218
8/21/2015	0.208
8/22/2015	0.17
8/23/2015	0.12
8/24/2015	0.172
8/25/2015	0.225
8/26/2015	0.181
8/27/2015	0.095
8/28/2015	0.107
8/29/2015	0.09
8/30/2015	0.07
8/31/2015	0.068

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS323 - Upstream of the Conrad Pump Station - September 28 to 30, 2015



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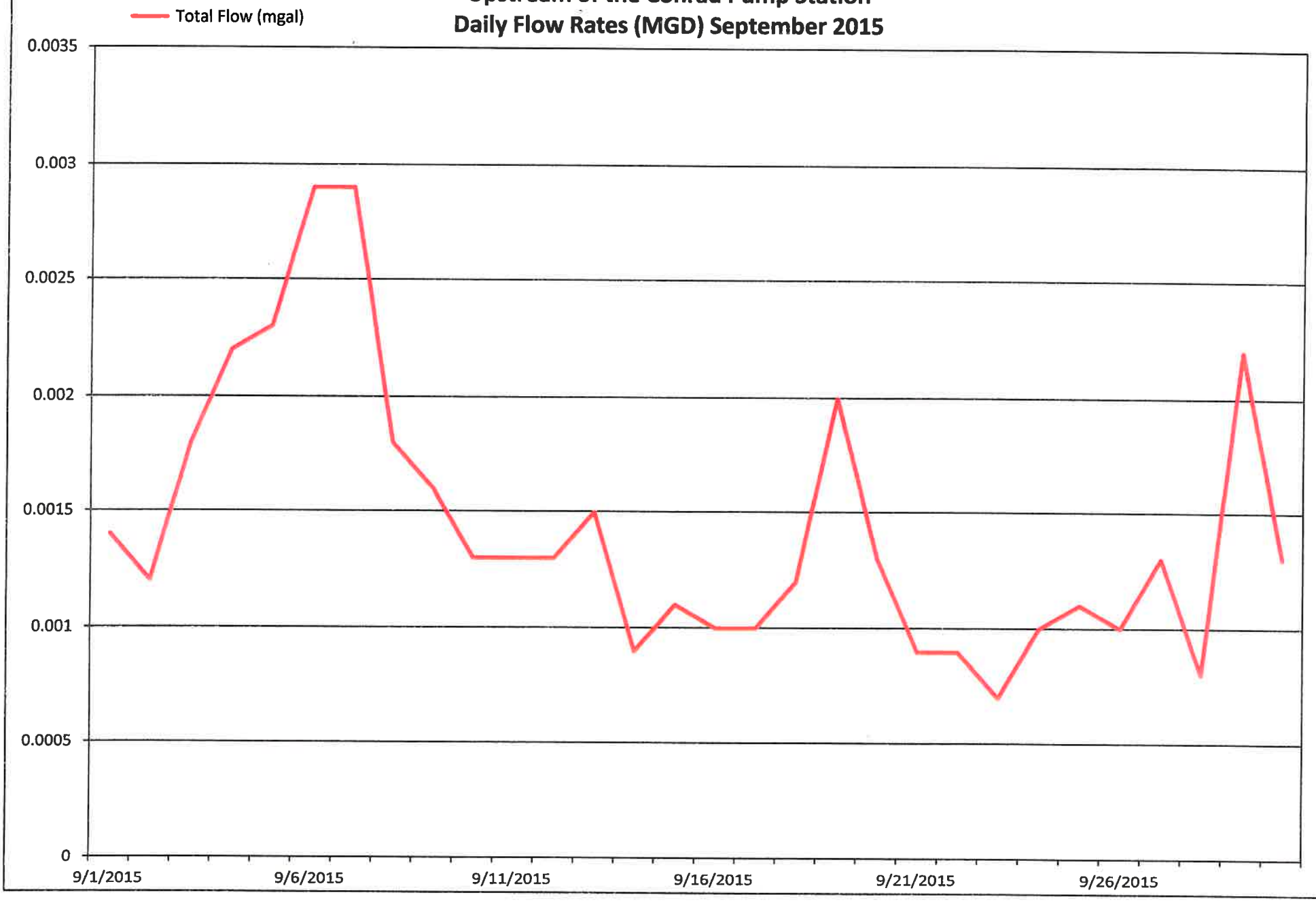
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS328 for Rain Event: September 28 to 30, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.029	0
9/28/2015 7:00	7:00	0.123	0
9/28/2015 8:00	8:00	0.095	0
9/28/2015 9:00	9:00	0.073	0
9/28/2015 10:00	10:00	0.107	0
9/28/2015 11:00	11:00	0.043	0
9/28/2015 12:00	12:00	0.084	0
9/28/2015 13:00	13:00	0.049	0
9/28/2015 14:00	14:00	0.086	0
9/28/2015 15:00	15:00	0.051	0
9/28/2015 16:00	16:00	0.045	0
9/28/2015 17:00	17:00	0.067	0
9/28/2015 18:00	18:00	0.064	0
9/28/2015 19:00	19:00	0.064	0
9/28/2015 20:00	20:00	0.117	0.02
9/28/2015 21:00	21:00	0.088	0.02
9/28/2015 22:00	22:00	0.076	0.02
9/28/2015 23:00	23:00	0.086	0.02
9/29/2015 0:00	0:00	0.032	0.02
9/29/2015 1:00	1:00	0.028	0.02
9/29/2015 2:00	2:00	0.064	0.02
9/29/2015 3:00	3:00	0.016	0.02
9/29/2015 4:00	4:00	0.014	0.02
9/29/2015 5:00	5:00	0.058	0.02
9/29/2015 6:00	6:00	0.039	0.02
9/29/2015 7:00	7:00	0.095	0.02
9/29/2015 8:00	8:00	0.155	0.02
9/29/2015 9:00	9:00	0.094	0.04
9/29/2015 10:00	10:00	0.071	0.05
9/29/2015 11:00	11:00	0.104	0.14
9/29/2015 12:00	12:00	0.053	0.23
9/29/2015 13:00	13:00	0.038	0.23
9/29/2015 14:00	14:00	0.04	0.23
9/29/2015 15:00	15:00	0.07	0.51
9/29/2015 16:00	16:00	0.051	0.55
9/29/2015 17:00	17:00	0.062	0.55
9/29/2015 18:00	18:00	0.071	0.55
9/29/2015 19:00	19:00	0.059	0.57
9/29/2015 20:00	20:00	0.107	0.57
9/29/2015 21:00	21:00	0.081	0.58
9/29/2015 22:00	22:00	0.076	0.62
9/29/2015 23:00	23:00	0.056	0.7
9/30/2015 0:00	0:00	0.085	0.98
9/30/2015 1:00	1:00	0.062	1.77
9/30/2015 2:00	2:00	0.079	2.03
9/30/2015 3:00	3:00	0.103	2.12
9/30/2015 4:00	4:00	0.068	2.21
9/30/2015 5:00	5:00	0.073	2.21
9/30/2015 6:00	6:00	0.088	2.21

Upper Gwynedd Township - Manhole PS323

Upstream of the Conrad Pump Station

Daily Flow Rates (MGD) September 2015

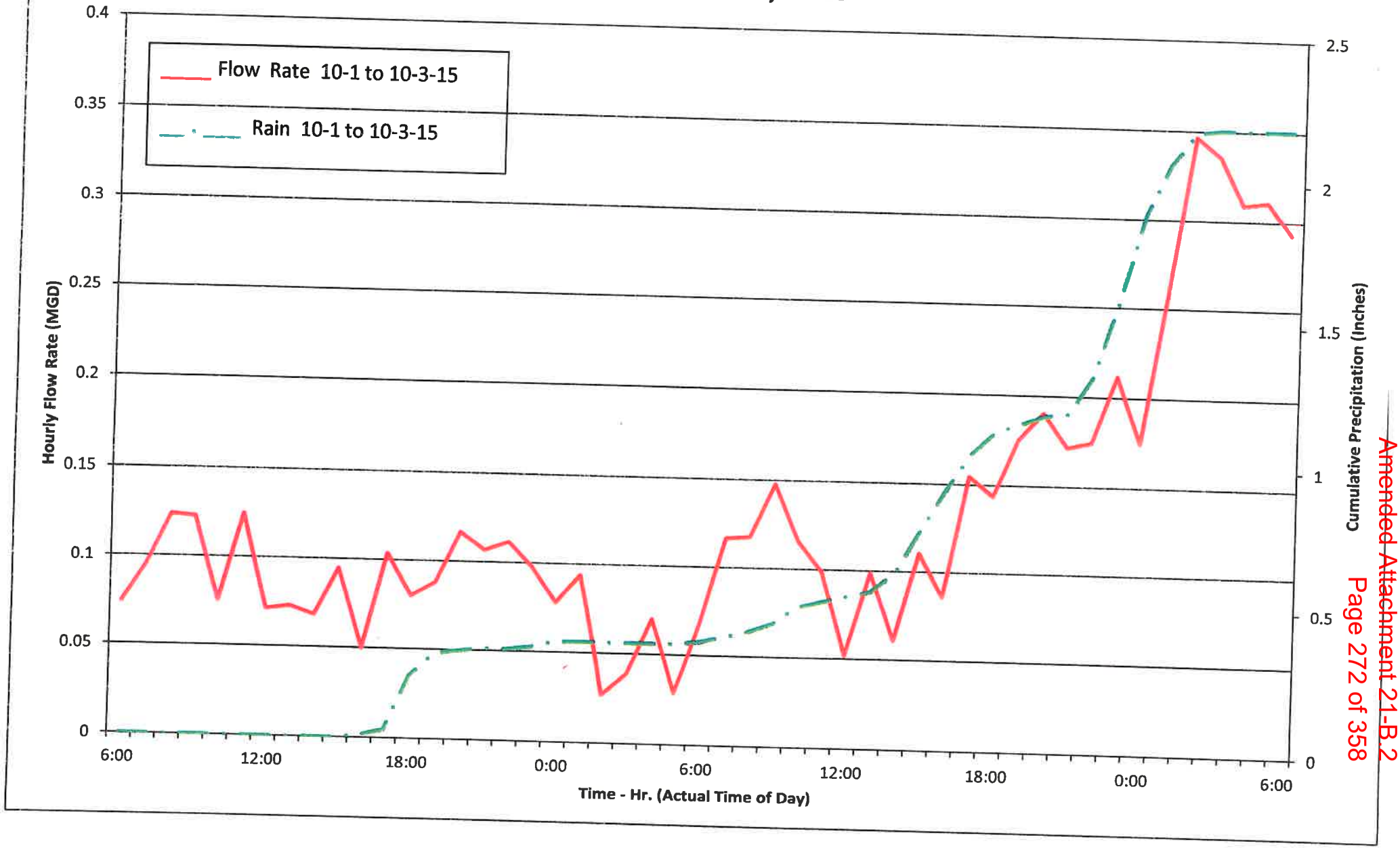


Upper Gwynedd Township-Manhole PS323

September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.055
9/2/2015	0.065
9/3/2015	0.067
9/4/2015	0.064
9/5/2015	0.064
9/6/2015	0.066
9/7/2015	0.08
9/8/2015	0.073
9/9/2015	0.074
9/10/2015	0.07
9/11/2015	0.067
9/12/2015	0.039
9/13/2015	0.031
9/14/2015	0.055
9/15/2015	0.068
9/16/2015	0.071
9/17/2015	0.073
9/18/2015	0.067
9/19/2015	0.064
9/20/2015	0.072
9/21/2015	0.082
9/22/2015	0.076
9/23/2015	0.082
9/24/2015	0.079
9/25/2015	0.073
9/26/2015	0.076
9/27/2015	0.067
9/28/2015	0.074
9/29/2015	0.064
9/30/2015	0.062

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole PS323 - Upstream of the Conrad Pump Station - October 1 to 3, 2015



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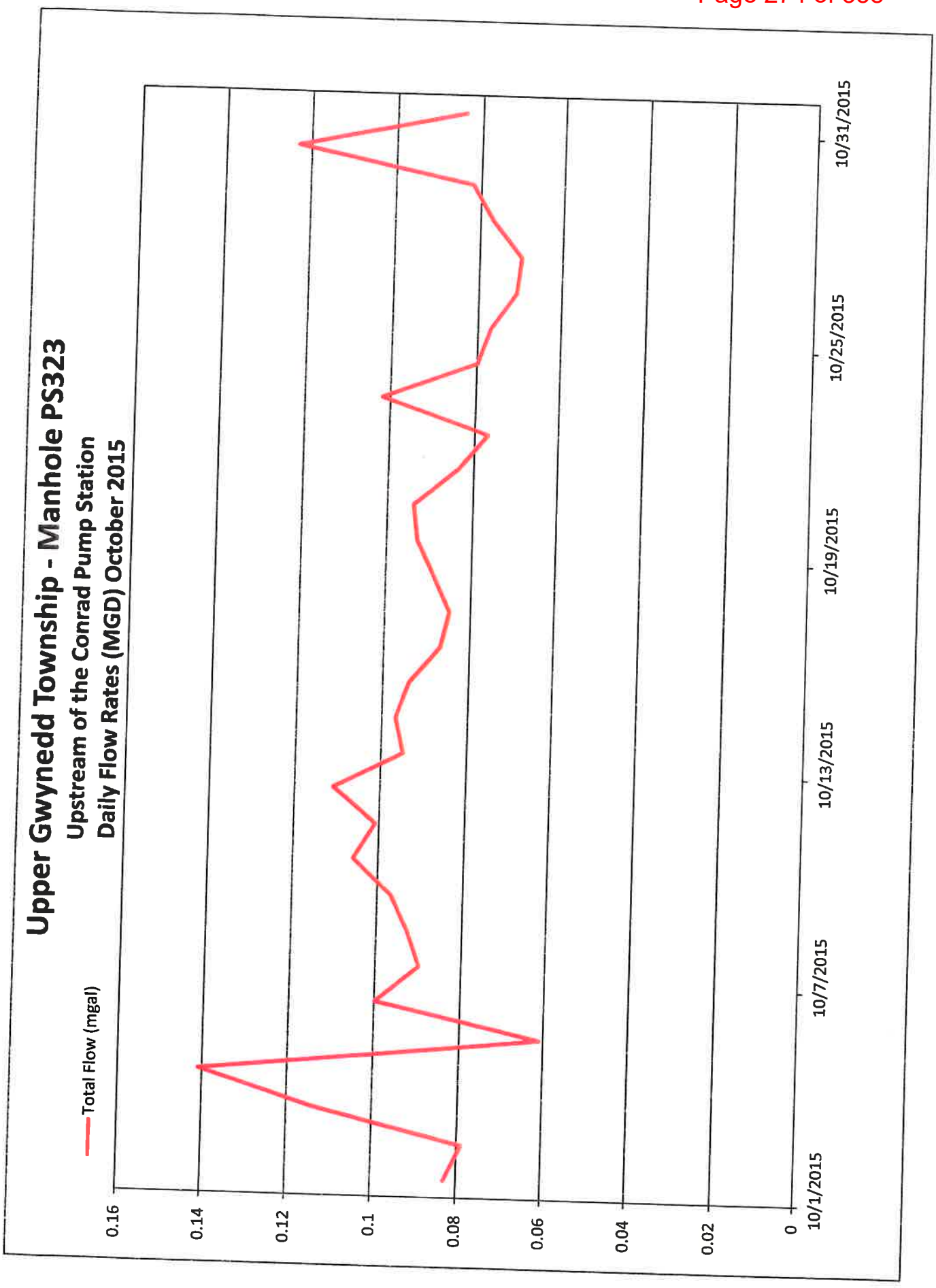
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH PS23 for Rain Event: October 1 to 3, 2015

Date / Time		Flow (gpm)	Hourly Rain Totals
10/1/2015	6:00	0.074	0
10/1/2015	7:00	0.095	0
10/1/2015	8:00	0.124	0
10/1/2015	9:00	0.123	0
10/1/2015	10:00	0.075	0
10/1/2015	11:00	0.125	0
10/1/2015	12:00	0.071	0
10/1/2015	13:00	0.073	0
10/1/2015	14:00	0.068	0
10/1/2015	15:00	0.095	0
10/1/2015	16:00	0.05	0.01
10/1/2015	17:00	0.104	0.03
10/1/2015	18:00	0.08	0.22
10/1/2015	19:00	0.088	0.3
10/1/2015	20:00	0.117	0.31
10/1/2015	21:00	0.107	0.32
10/1/2015	22:00	0.112	0.32
10/1/2015	23:00	0.098	0.33
10/2/2015	0:00	0.078	0.35
10/2/2015	1:00	0.094	0.35
10/2/2015	2:00	0.027	0.35
10/2/2015	3:00	0.039	0.35
10/2/2015	4:00	0.07	0.35
10/2/2015	5:00	0.029	0.35
10/2/2015	6:00	0.069	0.36
10/2/2015	7:00	0.117	0.38
10/2/2015	8:00	0.118	0.4
10/2/2015	9:00	0.148	0.43
10/2/2015	10:00	0.116	0.49
10/2/2015	11:00	0.099	0.51
10/2/2015	12:00	0.052	0.53
10/2/2015	13:00	0.099	0.55
10/2/2015	14:00	0.061	0.62
10/2/2015	15:00	0.111	0.77
10/2/2015	16:00	0.086	0.91
10/2/2015	17:00	0.155	1.04
10/2/2015	18:00	0.144	1.12
10/2/2015	19:00	0.176	1.15
10/2/2015	20:00	0.191	1.18
10/2/2015	21:00	0.172	1.19
10/2/2015	22:00	0.175	1.32
10/2/2015	23:00	0.212	1.58
10/3/2015	0:00	0.175	1.89
10/3/2015	1:00	0.257	2.07
10/3/2015	2:00	0.347	2.18
10/3/2015	3:00	0.336	2.19
10/3/2015	4:00	0.309	2.19
10/3/2015	5:00	0.311	2.19
10/3/2015	6:00	0.293	2.19


Upper Gwynedd Township - Manhole PS323
Upstream of the Conrad Pump Station
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

Upper Gwynedd Township-Manhole PS323

October 1 to 31, 2015

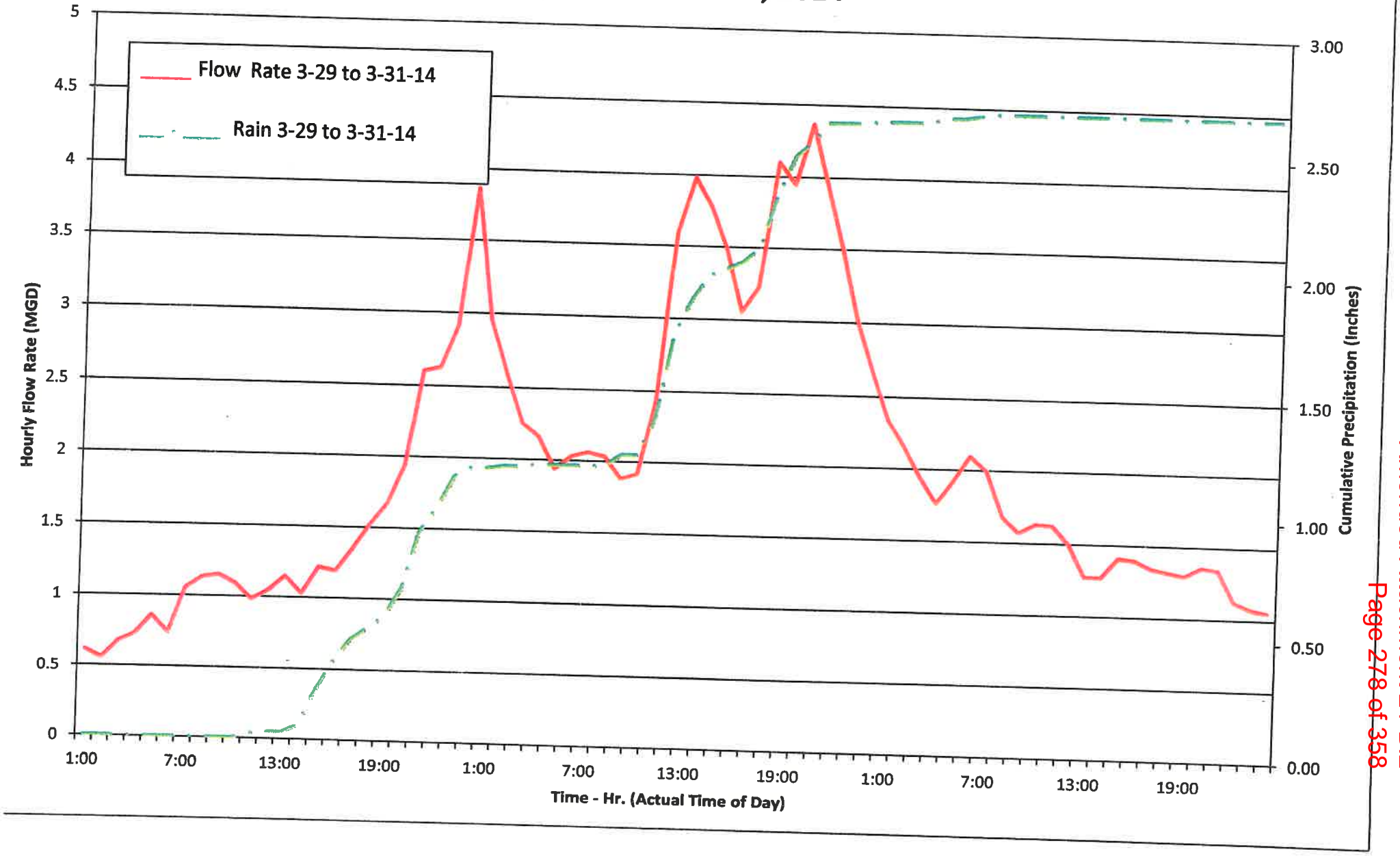
Date	Total Flow (mgal)
10/1/2015	0.083
10/2/2015	0.079
10/3/2015	0.114
10/4/2015	0.141
10/5/2015	0.061
10/6/2015	0.1
10/7/2015	0.09
10/8/2015	0.093
10/9/2015	0.097
10/10/2015	0.106
10/11/2015	0.101
10/12/2015	0.111
10/13/2015	0.095
10/14/2015	0.097
10/15/2015	0.094
10/16/2015	0.087
10/17/2015	0.085
10/18/2015	0.089
10/19/2015	0.093
10/20/2015	0.094
10/21/2015	0.084
10/22/2015	0.077
10/23/2015	0.102
10/24/2015	0.08
10/25/2015	0.077
10/26/2015	0.071
10/27/2015	0.07
10/28/2015	0.077
10/29/2015	0.082
10/30/2015	0.123
10/31/2015	0.084

KRIEBEL ROAD INTERCEPTOR

EDU REQUEST

FLOW DATA AND INFORMATION

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A- Located in TMA on the KRI - March 29 to 31, 2014



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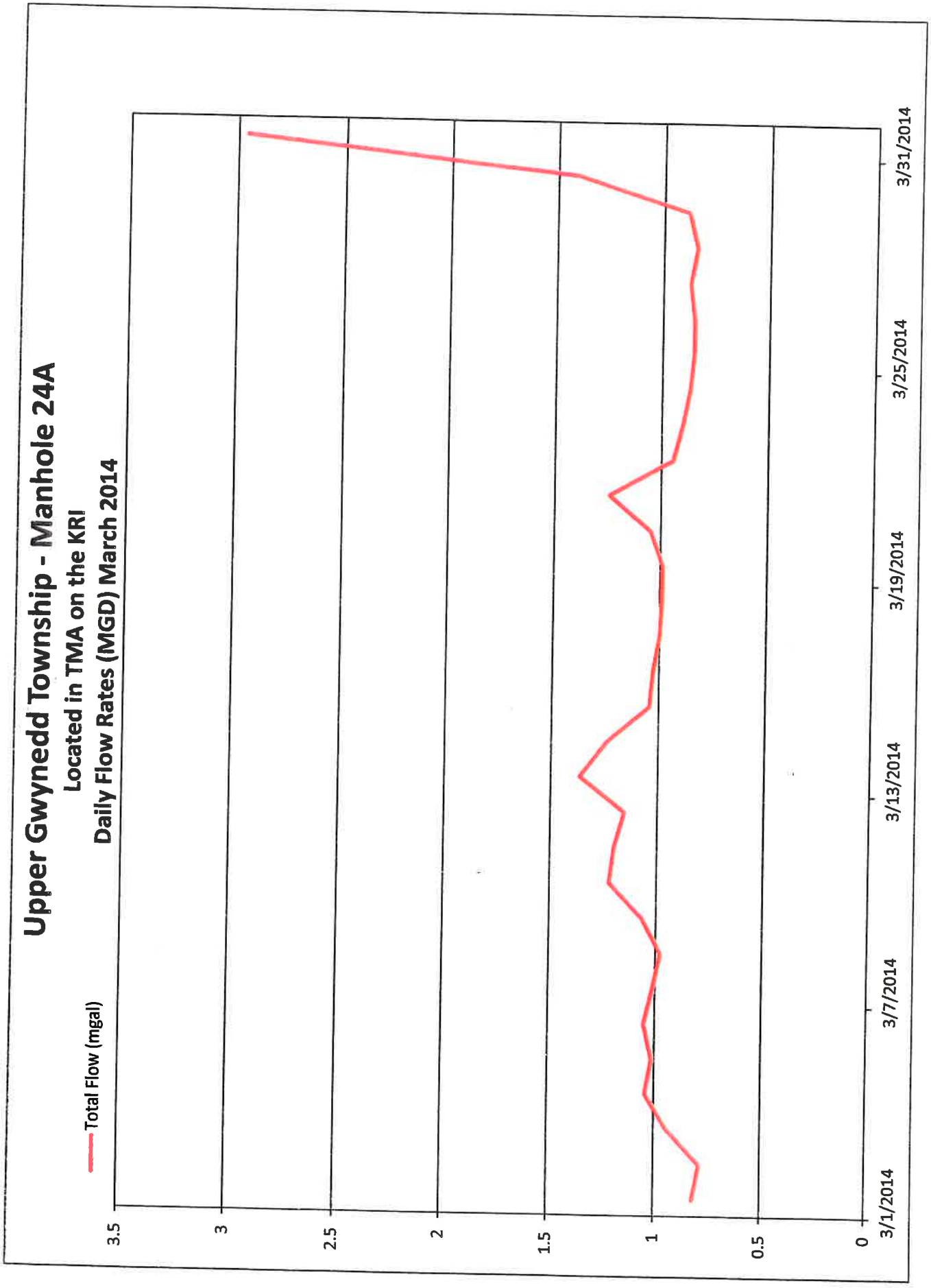
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/29/2014	1:00	0.615	0.00
3/29/2014	2:00	0.558	0.00
3/29/2014	3:00	0.678	0.00
3/29/2014	4:00	0.729	0.00
3/29/2014	5:00	0.86	0.00
3/29/2014	6:00	0.741	0.00
3/29/2014	7:00	1.057	0.00
3/29/2014	8:00	1.135	0.00
3/29/2014	9:00	1.153	0.00
3/29/2014	10:00	1.095	0.00
3/29/2014	11:00	0.984	0.02
3/29/2014	12:00	1.051	0.03
3/29/2014	13:00	1.152	0.03
3/29/2014	14:00	1.032	0.06
3/29/2014	15:00	1.223	0.21
3/29/2014	16:00	1.195	0.34
3/29/2014	17:00	1.35	0.43
3/29/2014	18:00	1.525	0.48
3/29/2014	19:00	1.67	0.53
3/29/2014	20:00	1.937	0.65
3/29/2014	21:00	2.603	0.89
3/29/2014	22:00	2.631	0.99
3/29/2014	23:00	2.916	1.12
3/30/2014	0:00	3.87	1.16
3/30/2014	1:00	2.959	1.16
3/30/2014	2:00	2.594	1.17
3/30/2014	3:00	2.259	1.17
3/30/2014	4:00	2.169	1.18
3/30/2014	5:00	1.942	1.18
3/30/2014	6:00	2.034	1.18
3/30/2014	7:00	2.065	1.18
3/30/2014	8:00	2.04	1.18
3/30/2014	9:00	1.883	1.23
3/30/2014	10:00	1.918	1.23
3/30/2014	11:00	2.434	1.39
3/30/2014	12:00	3.594	1.74
3/30/2014	13:00	3.983	1.88
3/30/2014	14:00	3.785	1.98
3/30/2014	15:00	3.481	2.01
3/30/2014	16:00	3.059	2.04
3/30/2014	17:00	3.234	2.10
3/30/2014	18:00	4.106	2.33
3/30/2014	19:00	3.949	2.49
3/30/2014	20:00	4.373	2.55
3/30/2014	21:00	3.936	2.63
3/30/2014	22:00	3.491	2.63
3/30/2014	23:00	3.017	2.63
3/31/2014	0:00	2.668	2.64

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/31/2014	1:00	2.339	2.64
3/31/2014	2:00	2.158	2.64
3/31/2014	3:00	1.943	2.64
3/31/2014	4:00	1.766	2.66
3/31/2014	5:00	1.921	2.66
3/31/2014	6:00	2.103	2.67
3/31/2014	7:00	1.998	2.68
3/31/2014	8:00	1.683	2.68
3/31/2014	9:00	1.575	2.68
3/31/2014	10:00	1.636	2.68
3/31/2014	11:00	1.629	2.68
3/31/2014	12:00	1.499	2.68
3/31/2014	13:00	1.28	2.68
3/31/2014	14:00	1.279	2.68
3/31/2014	15:00	1.413	2.68
3/31/2014	16:00	1.4	2.68
3/31/2014	17:00	1.346	2.68
3/31/2014	18:00	1.322	2.68
3/31/2014	19:00	1.299	2.68
3/31/2014	20:00	1.36	2.68
3/31/2014	21:00	1.345	2.68
3/31/2014	22:00	1.12	2.68
3/31/2014	23:00	1.073	2.68
4/1/2014	0:00	1.054	2.68


Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
3.5
3
2.5
2
1.5
1
0.5
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

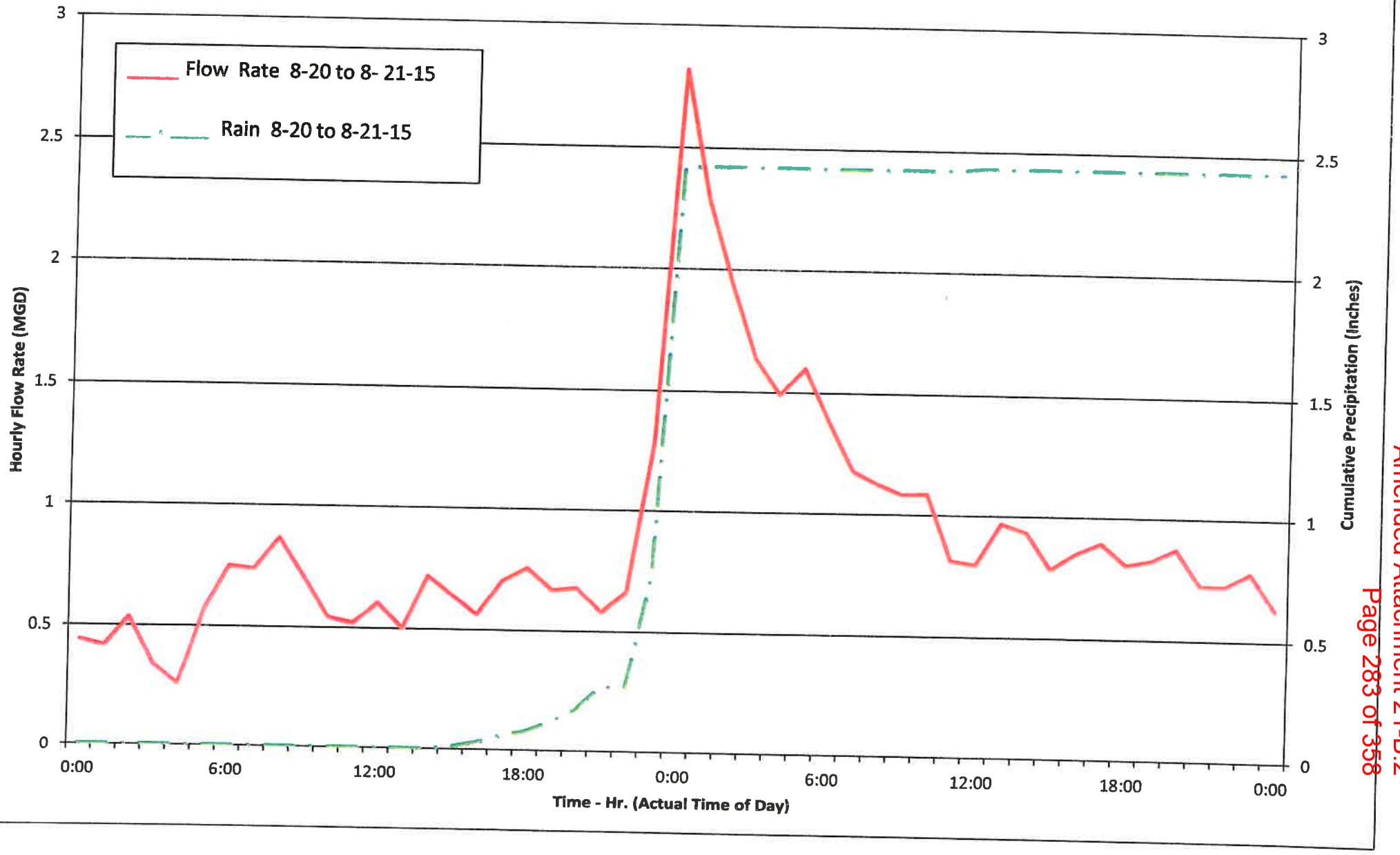
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

March 1 to March 31, 2014

Date	Total Flow (mgal)
3/1/2014	0.817
3/2/2014	0.785
3/3/2014	0.937
3/4/2014	1.042
3/5/2014	1.013
3/6/2014	1.052
3/7/2014	1.012
3/8/2014	0.977
3/9/2014	1.068
3/10/2014	1.225
3/11/2014	1.202
3/12/2014	1.156
3/13/2014	1.368
3/14/2014	1.242
3/15/2014	1.045
3/16/2014	1.03
3/17/2014	1
3/18/2014	0.991
3/19/2014	0.989
3/20/2014	1.049
3/21/2014	1.245
3/22/2014	0.948
3/23/2014	0.906
3/24/2014	0.872
3/25/2014	0.854
3/26/2014	0.855
3/27/2014	0.874
3/28/2014	0.843
3/29/2014	0.883
3/30/2014	1.407
3/31/2014	2.957

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A- Located in TMA on the KRI - August 20 to 21, 2015



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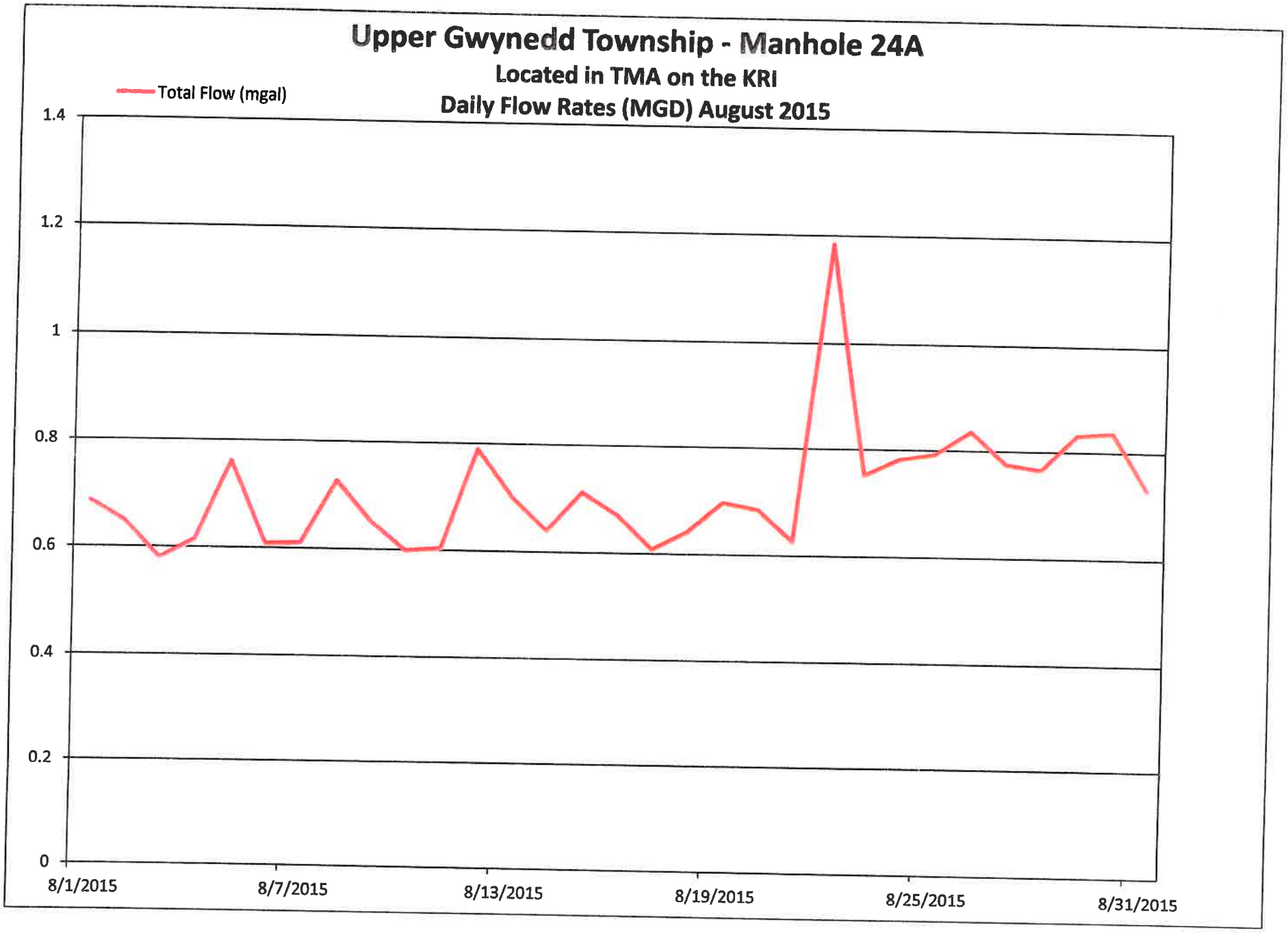
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: August 20 to 21, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
8/20/2015	0:00	0.438	0
8/20/2015	1:00	0.414	0
8/20/2015	2:00	0.532	0
8/20/2015	3:00	0.337	0
8/20/2015	4:00	0.256	0
8/20/2015	5:00	0.565	0
8/20/2015	6:00	0.747	0
8/20/2015	7:00	0.736	0
8/20/2015	8:00	0.864	0
8/20/2015	9:00	0.707	0
8/20/2015	10:00	0.542	0
8/20/2015	11:00	0.519	0
8/20/2015	12:00	0.603	0
8/20/2015	13:00	0.501	0
8/20/2015	14:00	0.718	0
8/20/2015	15:00	0.639	0.01
8/20/2015	16:00	0.562	0.03
8/20/2015	17:00	0.702	0.06
8/20/2015	18:00	0.757	0.08
8/20/2015	19:00	0.668	0.12
8/20/2015	20:00	0.678	0.17
8/20/2015	21:00	0.578	0.27
8/20/2015	22:00	0.664	0.27
8/20/2015	23:00	1.283	0.73
8/21/2015	0:00	2.818	2.42
8/21/2015	1:00	2.286	2.42
8/21/2015	2:00	1.943	2.42
8/21/2015	3:00	1.637	2.42
8/21/2015	4:00	1.492	2.42
8/21/2015	5:00	1.601	2.42
8/21/2015	6:00	1.384	2.42
8/21/2015	7:00	1.181	2.42
8/21/2015	8:00	1.128	2.42
8/21/2015	9:00	1.086	2.42
8/21/2015	10:00	1.089	2.42
8/21/2015	11:00	0.814	2.42
8/21/2015	12:00	0.798	2.43
8/21/2015	13:00	0.971	2.43
8/21/2015	14:00	0.936	2.43
8/21/2015	15:00	0.784	2.43
8/21/2015	16:00	0.851	2.43
8/21/2015	17:00	0.894	2.43
8/21/2015	18:00	0.806	2.43
8/21/2015	19:00	0.824	2.43
8/21/2015	20:00	0.873	2.43
8/21/2015	21:00	0.724	2.43
8/21/2015	22:00	0.722	2.43
8/21/2015	23:00	0.778	2.43
8/22/2015	0:00	0.624	2.43



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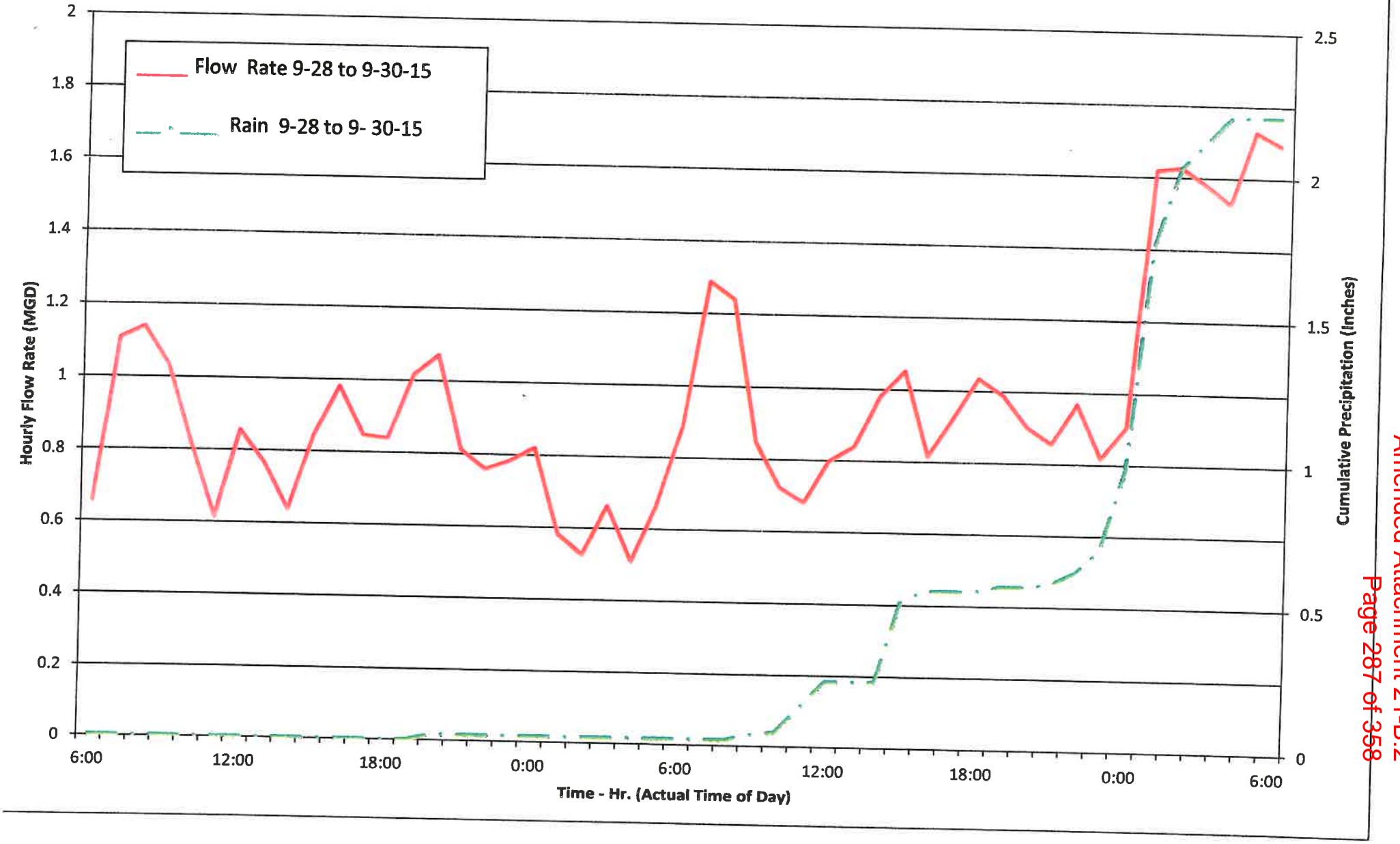
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

August 1 to 31, 2015

Date	Total Flow (mgal)
8/1/2015	0.683
8/2/2015	0.646
8/3/2015	0.579
8/4/2015	0.614
8/5/2015	0.759
8/6/2015	0.608
8/7/2015	0.61
8/8/2015	0.725
8/9/2015	0.651
8/10/2015	0.599
8/11/2015	0.604
8/12/2015	0.789
8/13/2015	0.7
8/14/2015	0.639
8/15/2015	0.711
8/16/2015	0.67
8/17/2015	0.608
8/18/2015	0.641
8/19/2015	0.696
8/20/2015	0.684
8/21/2015	0.626
8/22/2015	1.184
8/23/2015	0.751
8/24/2015	0.782
8/25/2015	0.792
8/26/2015	0.837
8/27/2015	0.775
8/28/2015	0.765
8/29/2015	0.832
8/30/2015	0.837
8/31/2015	0.728

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A in TMA on the KRI - September 28 to 30, 2015



Amended Attachment 21-B.2
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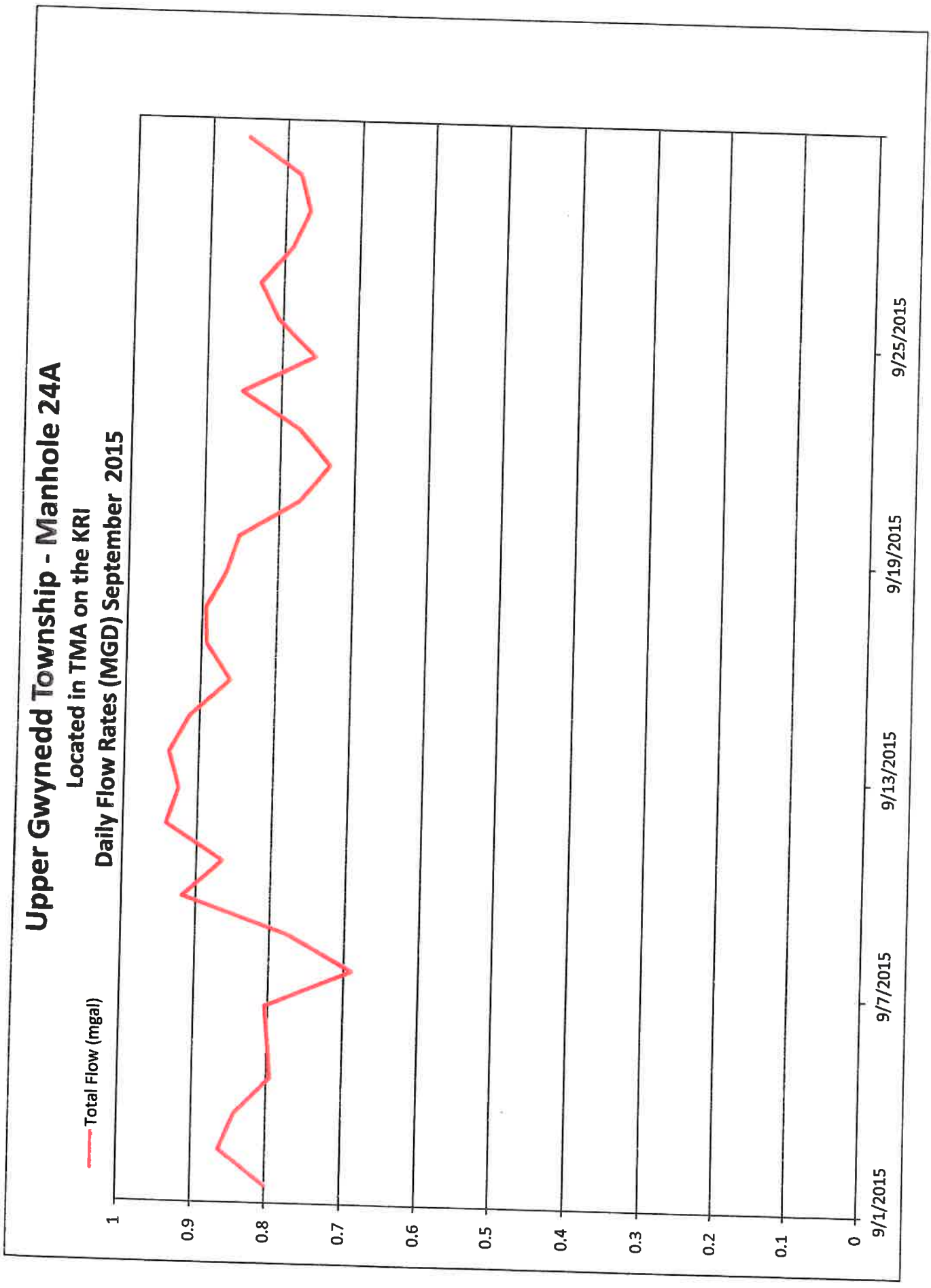
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: September 28 to 30, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.655	0
9/28/2015 7:00	7:00	1.106	0
9/28/2015 8:00	8:00	1.137	0
9/28/2015 9:00	9:00	1.033	0
9/28/2015 10:00	10:00	0.819	0
9/28/2015 11:00	11:00	0.614	0
9/28/2015 12:00	12:00	0.856	0
9/28/2015 13:00	13:00	0.766	0
9/28/2015 14:00	14:00	0.638	0
9/28/2015 15:00	15:00	0.846	0
9/28/2015 16:00	16:00	0.982	0
9/28/2015 17:00	17:00	0.848	0
9/28/2015 18:00	18:00	0.84	0
9/28/2015 19:00	19:00	1.016	0
9/28/2015 20:00	20:00	1.071	0.02
9/28/2015 21:00	21:00	0.813	0.02
9/28/2015 22:00	22:00	0.759	0.02
9/28/2015 23:00	23:00	0.784	0.02
9/29/2015 0:00	0:00	0.821	0.02
9/29/2015 1:00	1:00	0.583	0.02
9/29/2015 2:00	2:00	0.526	0.02
9/29/2015 3:00	3:00	0.664	0.02
9/29/2015 4:00	4:00	0.509	0.02
9/29/2015 5:00	5:00	0.666	0.02
9/29/2015 6:00	6:00	0.886	0.02
9/29/2015 7:00	7:00	1.288	0.02
9/29/2015 8:00	8:00	1.24	0.02
9/29/2015 9:00	9:00	0.849	0.04
9/29/2015 10:00	10:00	0.723	0.05
9/29/2015 11:00	11:00	0.682	0.14
9/29/2015 12:00	12:00	0.8	0.23
9/29/2015 13:00	13:00	0.84	0.23
9/29/2015 14:00	14:00	0.98	0.23
9/29/2015 15:00	15:00	1.053	0.51
9/29/2015 16:00	16:00	0.817	0.55
9/29/2015 17:00	17:00	0.926	0.55
9/29/2015 18:00	18:00	1.035	0.55
9/29/2015 19:00	19:00	0.989	0.57
9/29/2015 20:00	20:00	0.903	0.57
9/29/2015 21:00	21:00	0.858	0.58
9/29/2015 22:00	22:00	0.969	0.62
9/29/2015 23:00	23:00	0.818	0.7
9/30/2015 0:00	0:00	0.907	0.98
9/30/2015 1:00	1:00	1.619	1.77
9/30/2015 2:00	2:00	1.627	2.03
9/30/2015 3:00	3:00	1.581	2.12
9/30/2015 4:00	4:00	1.527	2.21
9/30/2015 5:00	5:00	1.728	2.21
9/30/2015 6:00	6:00	1.691	2.21

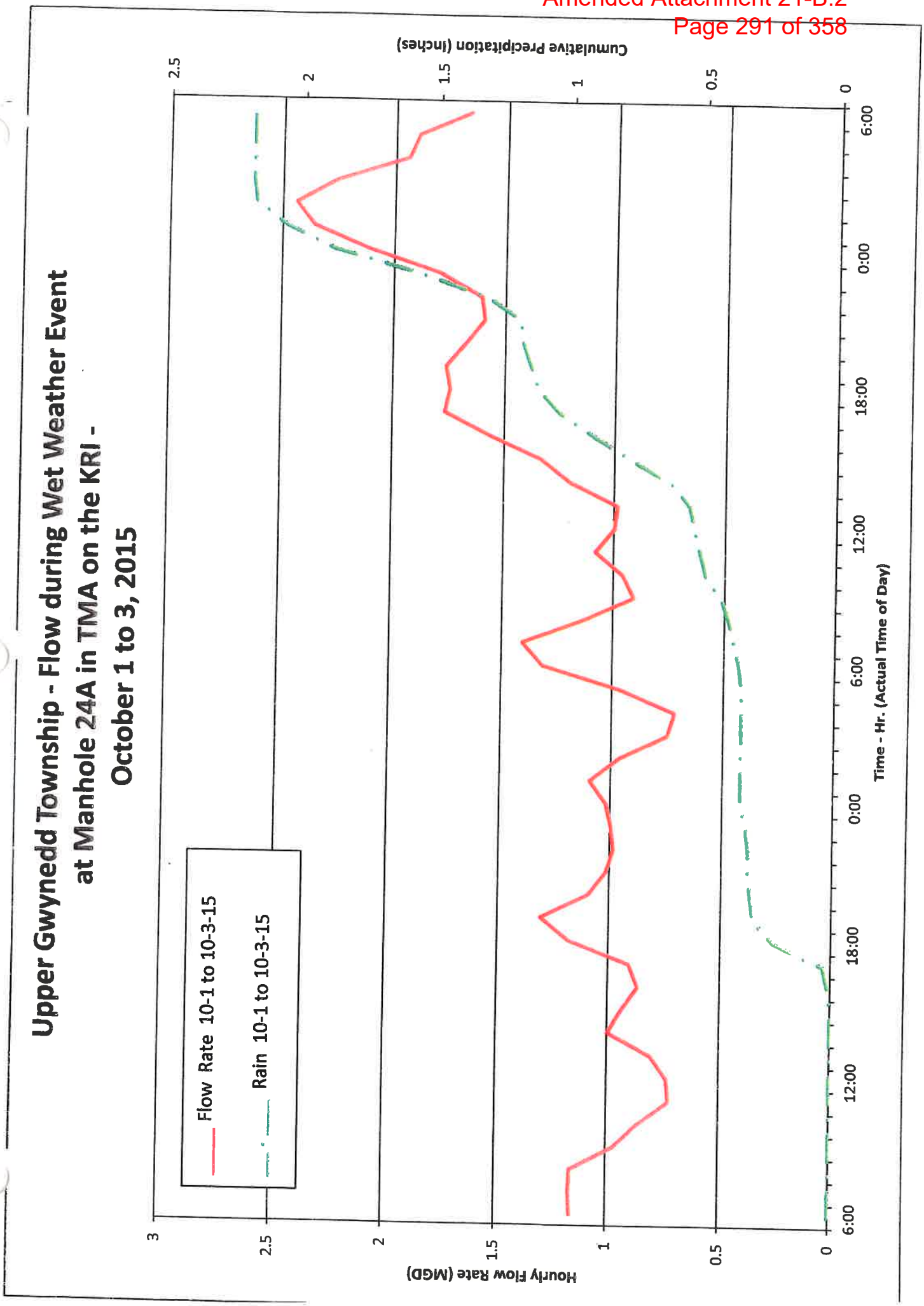

Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) September 2015
Total Flow (mgal)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
9/1/2015
9/7/2015
9/13/2015
9/19/2015
9/25/2015

Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

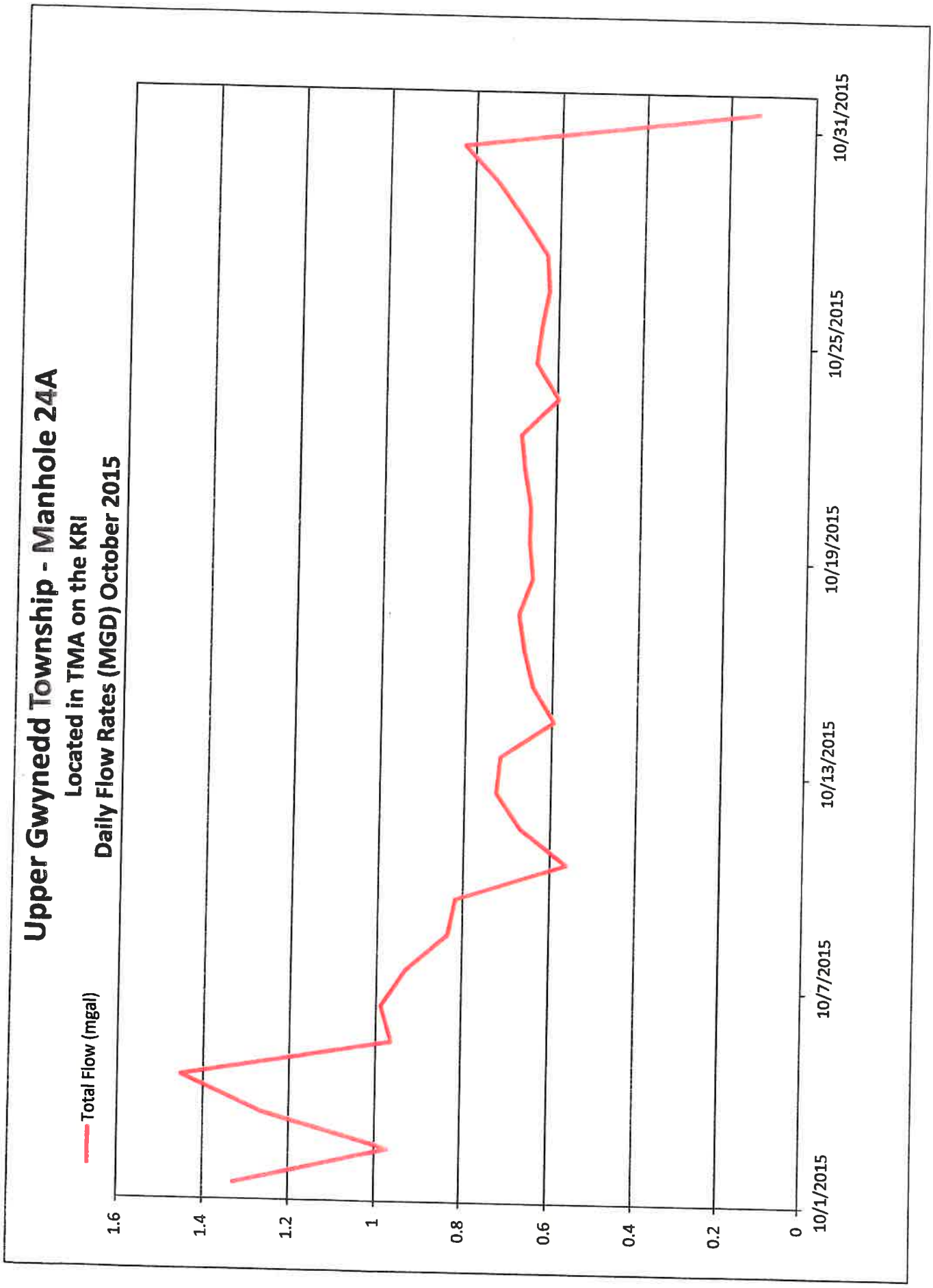
September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.799
9/2/2015	0.862
9/3/2015	0.842
9/4/2015	0.795
9/5/2015	0.799
9/6/2015	0.804
9/7/2015	0.689
9/8/2015	0.776
9/9/2015	0.918
9/10/2015	0.865
9/11/2015	0.942
9/12/2015	0.926
9/13/2015	0.94
9/14/2015	0.913
9/15/2015	0.86
9/16/2015	0.893
9/17/2015	0.895
9/18/2015	0.868
9/19/2015	0.853
9/20/2015	0.773
9/21/2015	0.733
9/22/2015	0.775
9/23/2015	0.853
9/24/2015	0.756
9/25/2015	0.806
9/26/2015	0.831
9/27/2015	0.789
9/28/2015	0.767
9/29/2015	0.78
9/30/2015	0.851


Upper Gwynedd Township - Flow during Wet Weather Event
at Manhole 24A in TMA on the KRI -
October 1 to 3, 2015
Flow Rate 10-1 to 10-3-15
Rain 10-1 to 10-3-15
Hourly Flow Rate (MGD)
Cumulative Precipitation (Inches)
Time - Hr. (Actual Time of Day)
0
0.5
1
1.5
2
2.5
3
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
6:00

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH24A for Rain Event: October 1 to 3, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
10/1/2015	6:00	1.157	0
10/1/2015	7:00	1.163	0
10/1/2015	8:00	1.159	0
10/1/2015	9:00	0.966	0
10/1/2015	10:00	0.862	0
10/1/2015	11:00	0.724	0
10/1/2015	12:00	0.733	0
10/1/2015	13:00	0.806	0
10/1/2015	14:00	0.998	0
10/1/2015	15:00	0.938	0
10/1/2015	16:00	0.867	0.01
10/1/2015	17:00	0.908	0.03
10/1/2015	18:00	1.177	0.22
10/1/2015	19:00	1.307	0.3
10/1/2015	20:00	1.096	0.31
10/1/2015	21:00	1.016	0.32
10/1/2015	22:00	0.983	0.32
10/1/2015	23:00	0.996	0.33
10/2/2015	0:00	1.019	0.35
10/2/2015	1:00	1.095	0.35
10/2/2015	2:00	0.962	0.35
10/2/2015	3:00	0.752	0.35
10/2/2015	4:00	0.72	0.35
10/2/2015	5:00	0.967	0.35
10/2/2015	6:00	1.315	0.36
10/2/2015	7:00	1.406	0.38
10/2/2015	8:00	1.133	0.4
10/2/2015	9:00	0.908	0.43
10/2/2015	10:00	0.96	0.49
10/2/2015	11:00	1.083	0.51
10/2/2015	12:00	0.998	0.53
10/2/2015	13:00	0.984	0.55
10/2/2015	14:00	1.199	0.62
10/2/2015	15:00	1.333	0.77
10/2/2015	16:00	1.566	0.91
10/2/2015	17:00	1.769	1.04
10/2/2015	18:00	1.746	1.12
10/2/2015	19:00	1.765	1.15
10/2/2015	20:00	1.677	1.18
10/2/2015	21:00	1.595	1.19
10/2/2015	22:00	1.608	1.32
10/2/2015	23:00	1.794	1.58
10/3/2015	0:00	2.109	1.89
10/3/2015	1:00	2.355	2.07
10/3/2015	2:00	2.437	2.18
10/3/2015	3:00	2.253	2.19
10/3/2015	4:00	1.941	2.19
10/3/2015	5:00	1.896	2.19
10/3/2015	6:00	1.663	2.19


Upper Gwynedd Township - Manhole 24A
Located in TMA on the KRI
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

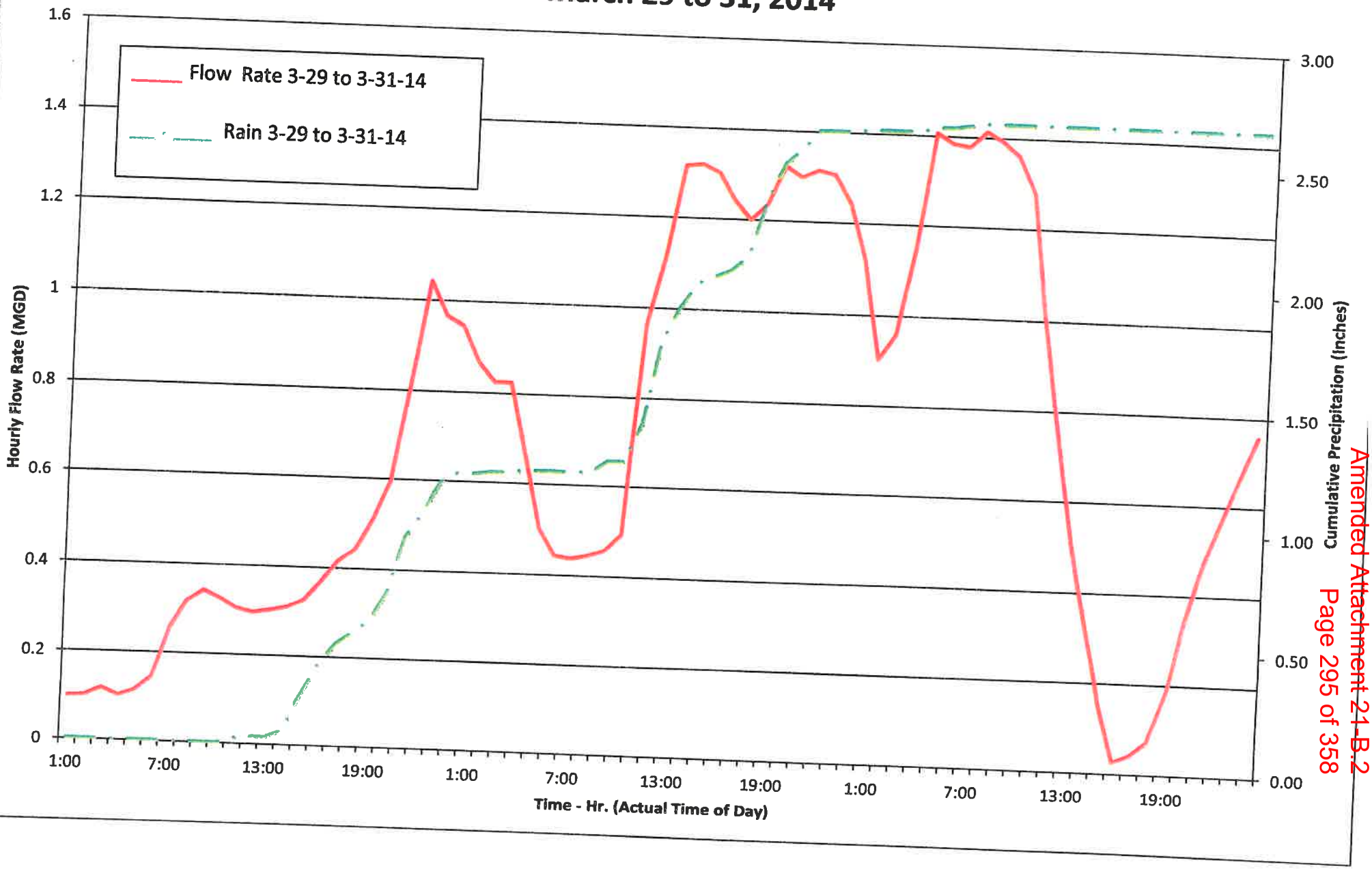
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 24A

October 1 to 31, 2015

Date	Total Flow (mgal)
10/1/2015	1.327
10/2/2015	0.967
10/3/2015	1.265
10/4/2015	1.452
10/5/2015	0.963
10/6/2015	0.989
10/7/2015	0.933
10/8/2015	0.835
10/9/2015	0.818
10/10/2015	0.561
10/11/2015	0.67
10/12/2015	0.727
10/13/2015	0.718
10/14/2015	0.595
10/15/2015	0.646
10/16/2015	0.667
10/17/2015	0.681
10/18/2015	0.65
10/19/2015	0.659
10/20/2015	0.658
10/21/2015	0.672
10/22/2015	0.682
10/23/2015	0.597
10/24/2015	0.649
10/25/2015	0.639
10/26/2015	0.623
10/27/2015	0.628
10/28/2015	0.685
10/29/2015	0.746
10/30/2015	0.825
10/31/2015	0.132

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35- Located in TMA on the KRI - March 29 to 31, 2014



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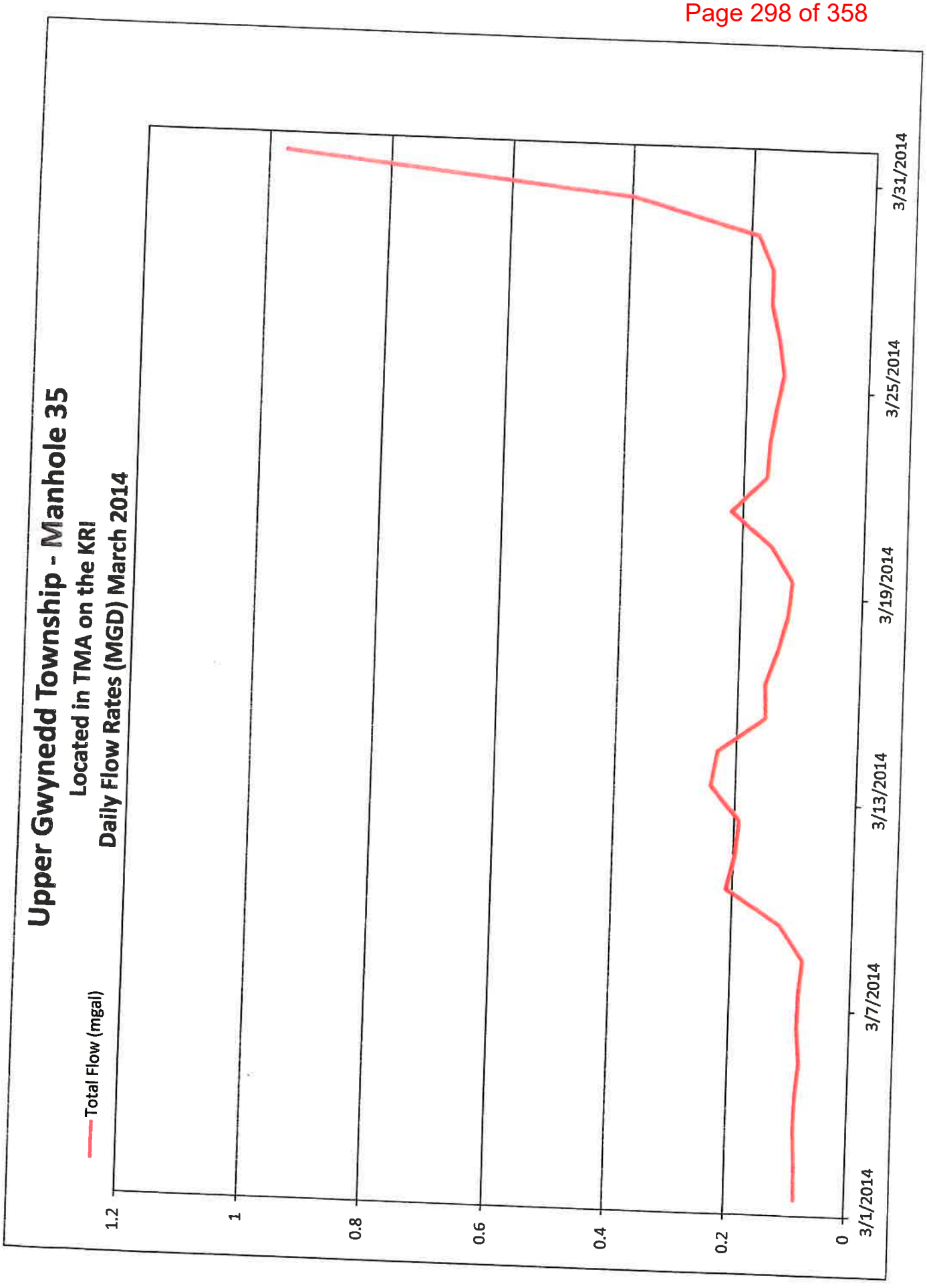
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/29/2014	1:00	0.097	0.00
3/29/2014	2:00	0.099	0.00
3/29/2014	3:00	0.117	0.00
3/29/2014	4:00	0.1	0.00
3/29/2014	5:00	0.113	0.00
3/29/2014	6:00	0.145	0.00
3/29/2014	7:00	0.255	0.00
3/29/2014	8:00	0.318	0.00
3/29/2014	9:00	0.343	0.00
3/29/2014	10:00	0.326	0.00
3/29/2014	11:00	0.304	0.02
3/29/2014	12:00	0.296	0.03
3/29/2014	13:00	0.302	0.03
3/29/2014	14:00	0.31	0.06
3/29/2014	15:00	0.326	0.21
3/29/2014	16:00	0.368	0.34
3/29/2014	17:00	0.417	0.43
3/29/2014	18:00	0.442	0.48
3/29/2014	19:00	0.509	0.53
3/29/2014	20:00	0.596	0.65
3/29/2014	21:00	0.818	0.89
3/29/2014	22:00	1.042	0.99
3/29/2014	23:00	0.967	1.12
3/30/2014	0:00	0.947	1.16
3/30/2014	1:00	0.867	1.16
3/30/2014	2:00	0.825	1.17
3/30/2014	3:00	0.825	1.17
3/30/2014	4:00	0.669	1.18
3/30/2014	5:00	0.504	1.18
3/30/2014	6:00	0.445	1.18
3/30/2014	7:00	0.439	1.18
3/30/2014	8:00	0.447	1.18
3/30/2014	9:00	0.459	1.23
3/30/2014	10:00	0.495	1.23
3/30/2014	11:00	0.962	1.39
3/30/2014	12:00	1.113	1.74
3/30/2014	13:00	1.317	1.88
3/30/2014	14:00	1.321	1.98
3/30/2014	15:00	1.304	2.01
3/30/2014	16:00	1.243	2.04
3/30/2014	17:00	1.201	2.10
3/30/2014	18:00	1.236	2.33
3/30/2014	19:00	1.324	2.49
3/30/2014	20:00	1.299	2.55
3/30/2014	21:00	1.316	2.63
3/30/2014	22:00	1.307	2.63
3/30/2014	23:00	1.244	2.63
3/31/2014	0:00	1.12	2.64

Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: March 29 to 31, 2014

Date / Time		Flow (mgd)	Hourly Rain Totals
3/31/2014	1:00	0.903	2.64
3/31/2014	2:00	0.96	2.64
3/31/2014	3:00	1.148	2.64
3/31/2014	4:00	1.408	2.66
3/31/2014	5:00	1.385	2.66
3/31/2014	6:00	1.379	2.67
3/31/2014	7:00	1.414	2.68
3/31/2014	8:00	1.392	2.68
3/31/2014	9:00	1.361	2.68
3/31/2014	10:00	1.28	2.68
3/31/2014	11:00	0.988	2.68
3/31/2014	12:00	0.743	2.68
3/31/2014	13:00	0.505	2.68
3/31/2014	14:00	0.325	2.68
3/31/2014	15:00	0.152	2.68
3/31/2014	16:00	0.026	2.68
3/31/2014	17:00	0.041	2.68
3/31/2014	18:00	0.072	2.68
3/31/2014	19:00	0.179	2.68
3/31/2014	20:00	0.342	2.68
3/31/2014	21:00	0.474	2.68
3/31/2014	22:00	0.57	2.68
3/31/2014	23:00	0.664	2.68
4/1/2014	0:00	0.757	2.68


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) March 2014
Total Flow (mgal)
1.2
1
0.8
0.6
0.4
0.2
0
3/1/2014
3/7/2014
3/13/2014
3/19/2014
3/25/2014
3/31/2014

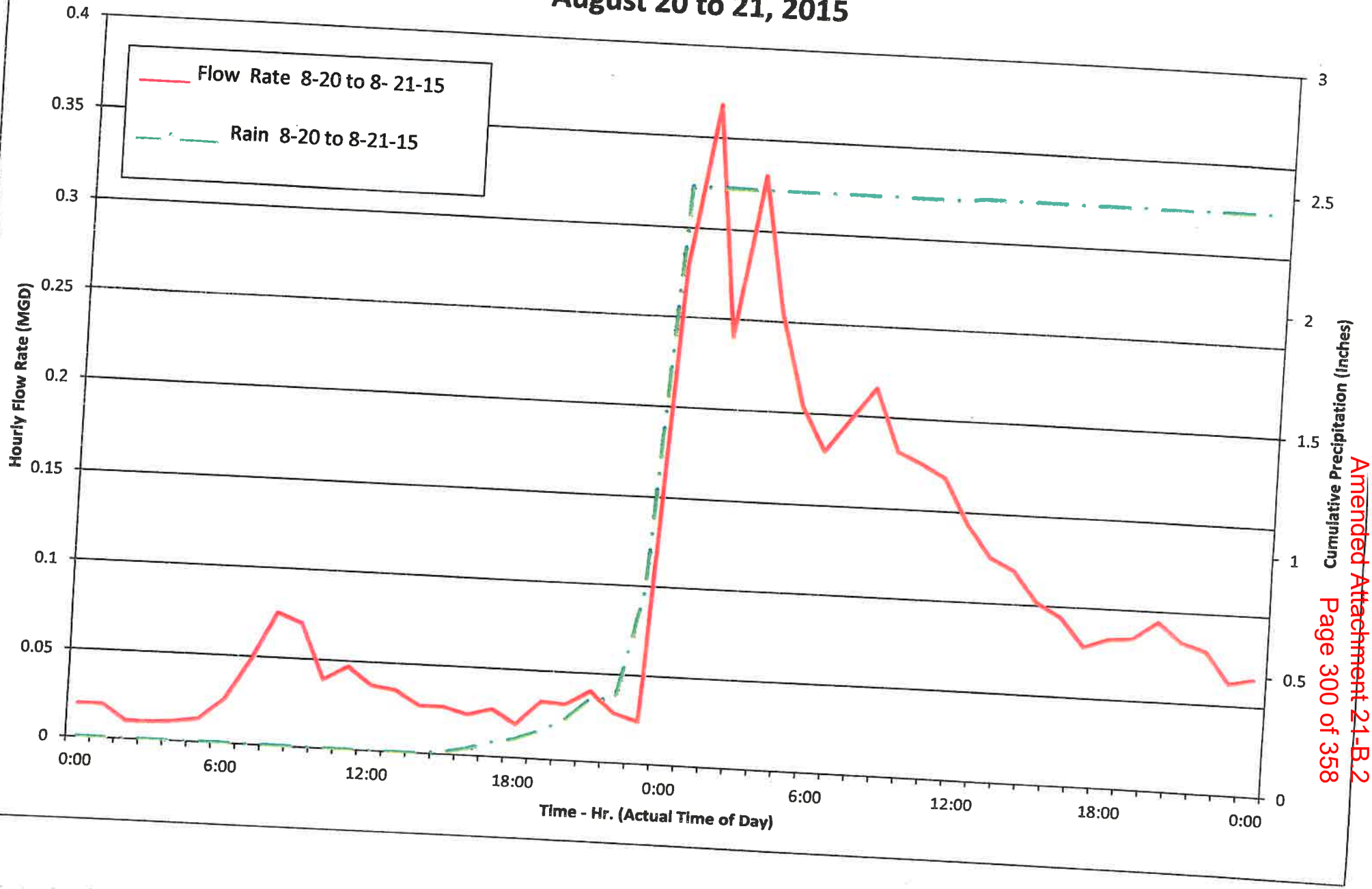
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

March 1 to March 31, 2014

Date	Total Flow (mgal)
3/1/2014	0.081
3/2/2014	0.082
3/3/2014	0.085
3/4/2014	0.084
3/5/2014	0.079
3/6/2014	0.084
3/7/2014	0.083
3/8/2014	0.078
3/9/2014	0.119
3/10/2014	0.21
3/11/2014	0.197
3/12/2014	0.192
3/13/2014	0.241
3/14/2014	0.231
3/15/2014	0.153
3/16/2014	0.155
3/17/2014	0.135
3/18/2014	0.12
3/19/2014	0.114
3/20/2014	0.151
3/21/2014	0.22
3/22/2014	0.162
3/23/2014	0.159
3/24/2014	0.15
3/25/2014	0.139
3/26/2014	0.148
3/27/2014	0.162
3/28/2014	0.162
3/29/2014	0.188
3/30/2014	0.398
3/31/2014	0.97

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35- Located in TMA on the KRI - August 20 to 21, 2015



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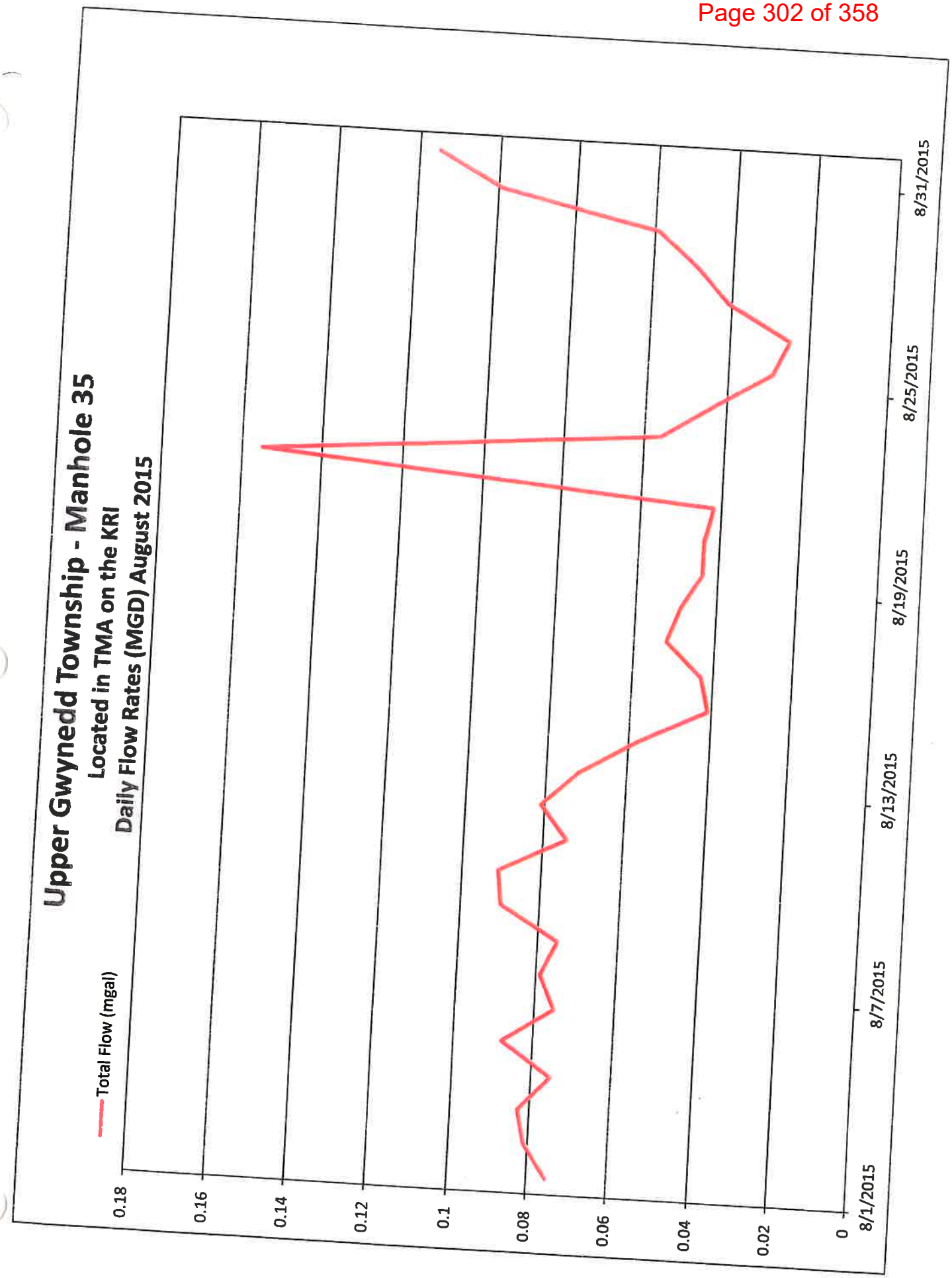
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for
Rain Event: August 20 to 21, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
8/20/2015	0:00	0.019	0
8/20/2015	1:00	0.019	0
8/20/2015	2:00	0.01	0
8/20/2015	3:00	0.01	0
8/20/2015	4:00	0.011	0
8/20/2015	5:00	0.013	0
8/20/2015	6:00	0.025	0
8/20/2015	7:00	0.048	0
8/20/2015	8:00	0.075	0
8/20/2015	9:00	0.07	0
8/20/2015	10:00	0.039	0
8/20/2015	11:00	0.047	0
8/20/2015	12:00	0.037	0
8/20/2015	13:00	0.035	0
8/20/2015	14:00	0.027	0
8/20/2015	15:00	0.027	0.01
8/20/2015	16:00	0.023	0.03
8/20/2015	17:00	0.027	0.06
8/20/2015	18:00	0.019	0.08
8/20/2015	19:00	0.033	0.12
8/20/2015	20:00	0.032	0.17
8/20/2015	21:00	0.04	0.27
8/20/2015	22:00	0.028	0.27
8/20/2015	23:00	0.024	0.73
8/21/2015	0:00	0.28	2.42
8/21/2015	1:00	0.368	2.42
8/21/2015	2:00	0.24	2.42
8/21/2015	3:00	0.331	2.42
8/21/2015	4:00	0.254	2.42
8/21/2015	5:00	0.204	2.42
8/21/2015	6:00	0.18	2.42
8/21/2015	7:00	0.198	2.42
8/21/2015	8:00	0.216	2.42
8/21/2015	9:00	0.182	2.42
8/21/2015	10:00	0.176	2.42
8/21/2015	11:00	0.169	2.42
8/21/2015	12:00	0.144	2.43
8/21/2015	13:00	0.126	2.43
8/21/2015	14:00	0.119	2.43
8/21/2015	15:00	0.102	2.43
8/21/2015	16:00	0.094	2.43
8/21/2015	17:00	0.078	2.43
8/21/2015	18:00	0.083	2.43
8/21/2015	19:00	0.084	2.43
8/21/2015	20:00	0.094	2.43
8/21/2015	21:00	0.083	2.43
8/21/2015	22:00	0.079	2.43
8/21/2015	23:00	0.062	2.43
8/22/2015	0:00	0.065	2.43


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) August 2015
Total Flow (mgal)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
8/1/2015
8/7/2015
8/13/2015
8/19/2015
8/25/2015
8/31/2015

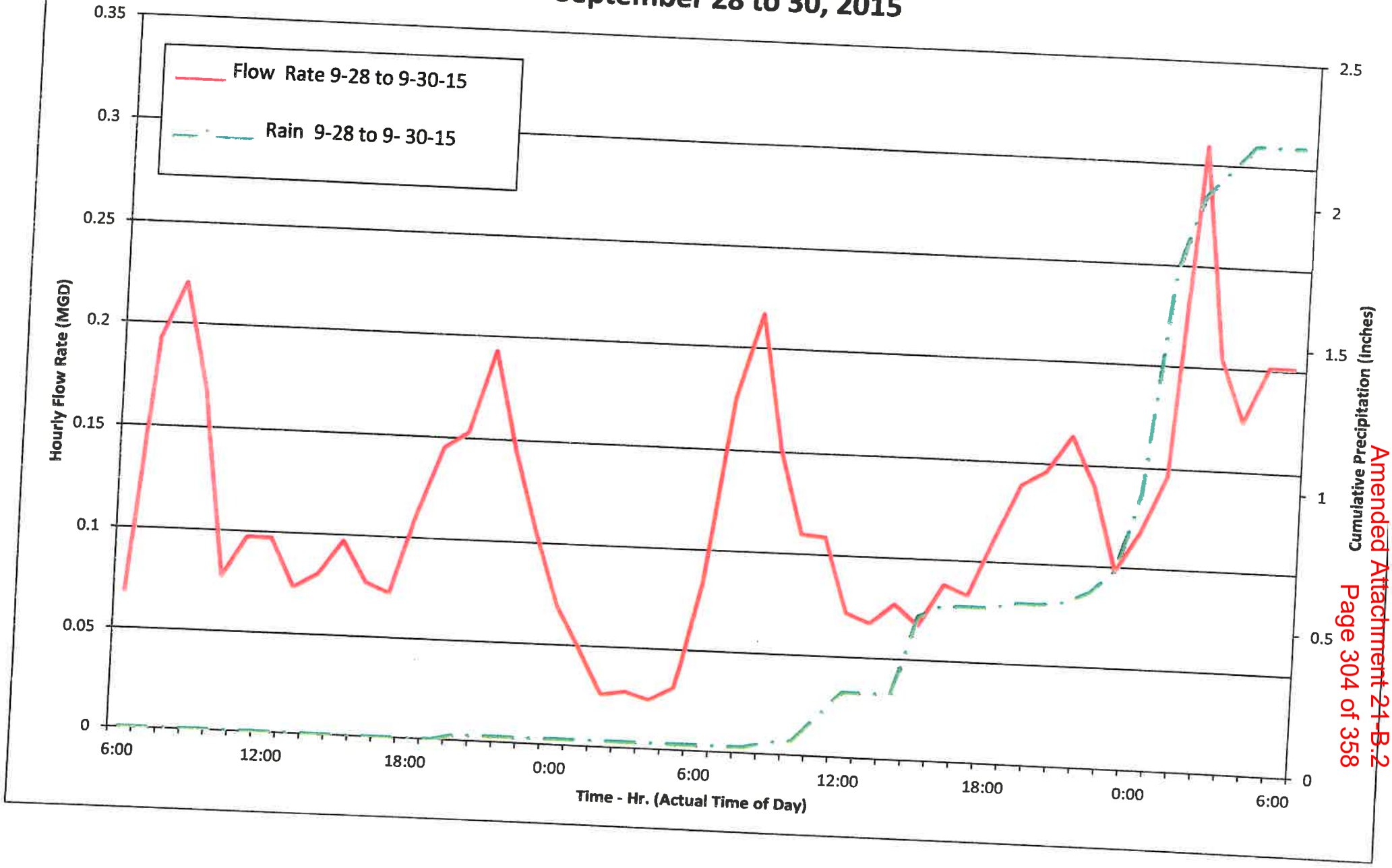
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

August 1 to 31, 2015

Date	Total Flow (mgal)
8/1/2015	0.075
8/2/2015	0.081
8/3/2015	0.083
8/4/2015	0.075
8/5/2015	0.088
8/6/2015	0.075
8/7/2015	0.079
8/8/2015	0.075
8/9/2015	0.09
8/10/2015	0.091
8/11/2015	0.074
8/12/2015	0.081
8/13/2015	0.072
8/14/2015	0.058
8/15/2015	0.041
8/16/2015	0.043
8/17/2015	0.052
8/18/2015	0.049
8/19/2015	0.044
8/20/2015	0.044
8/21/2015	0.042
8/22/2015	0.155
8/23/2015	0.056
8/24/2015	0.043
8/25/2015	0.029
8/26/2015	0.025
8/27/2015	0.041
8/28/2015	0.049
8/29/2015	0.059
8/30/2015	0.099
8/31/2015	0.115

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35 in TMA on the KRI - September 28 to 30, 2015



Amended Attachment 21-B.2
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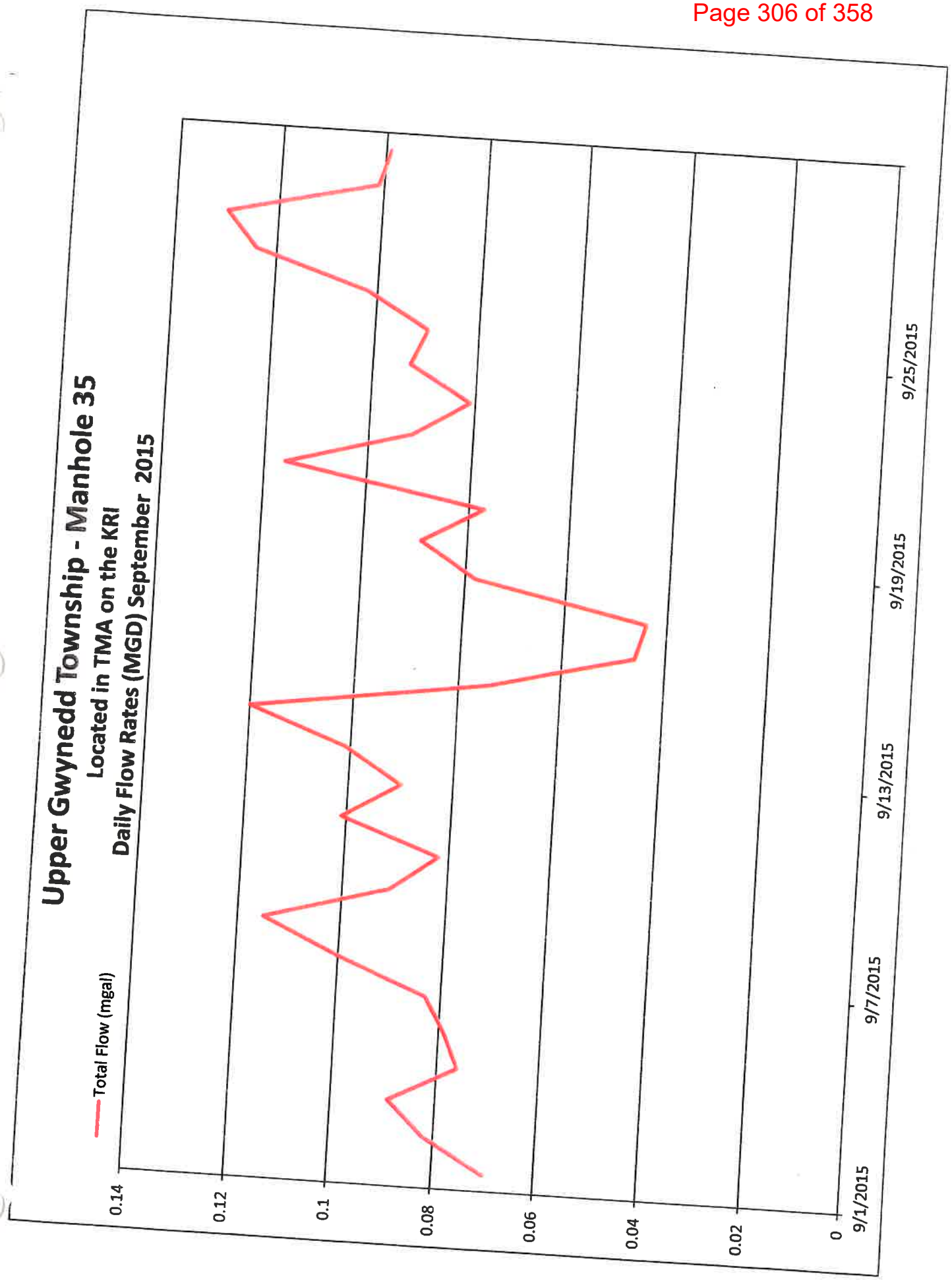
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: September 28 to 30, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
9/28/2015 6:00	6:00	0.068	0
9/28/2015 7:00	7:00	0.192	0
9/28/2015 8:00	8:00	0.22	0
9/28/2015 9:00	9:00	0.168	0
9/28/2015 10:00	10:00	0.077	0
9/28/2015 11:00	11:00	0.097	0
9/28/2015 12:00	12:00	0.097	0
9/28/2015 13:00	13:00	0.073	0
9/28/2015 14:00	14:00	0.08	0
9/28/2015 15:00	15:00	0.097	0
9/28/2015 16:00	16:00	0.077	0
9/28/2015 17:00	17:00	0.072	0
9/28/2015 18:00	18:00	0.112	0
9/28/2015 19:00	19:00	0.145	0
9/28/2015 20:00	20:00	0.153	0.02
9/28/2015 21:00	21:00	0.193	0.02
9/28/2015 22:00	22:00	0.145	0.02
9/28/2015 23:00	23:00	0.105	0.02
9/29/2015 0:00	0:00	0.069	0.02
9/29/2015 1:00	1:00	0.048	0.02
9/29/2015 2:00	2:00	0.026	0.02
9/29/2015 3:00	3:00	0.028	0.02
9/29/2015 4:00	4:00	0.024	0.02
9/29/2015 5:00	5:00	0.031	0.02
9/29/2015 6:00	6:00	0.084	0.02
9/29/2015 7:00	7:00	0.175	0.02
9/29/2015 8:00	8:00	0.217	0.02
9/29/2015 9:00	9:00	0.152	0.04
9/29/2015 10:00	10:00	0.11	0.05
9/29/2015 11:00	11:00	0.109	0.14
9/29/2015 12:00	12:00	0.072	0.23
9/29/2015 13:00	13:00	0.067	0.23
9/29/2015 14:00	14:00	0.077	0.23
9/29/2015 15:00	15:00	0.067	0.51
9/29/2015 16:00	16:00	0.088	0.55
9/29/2015 17:00	17:00	0.083	0.55
9/29/2015 18:00	18:00	0.112	0.55
9/29/2015 19:00	19:00	0.139	0.57
9/29/2015 20:00	20:00	0.146	0.57
9/29/2015 21:00	21:00	0.164	0.58
9/29/2015 22:00	22:00	0.14	0.62
9/29/2015 23:00	23:00	0.098	0.7
9/30/2015 0:00	0:00	0.118	0.98
9/30/2015 1:00	1:00	0.146	1.77
9/30/2015 2:00	2:00	0.309	2.03
9/30/2015 3:00	3:00	0.205	2.12
9/30/2015 4:00	4:00	0.174	2.21
9/30/2015 5:00	5:00	0.201	2.21
9/30/2015 6:00	6:00	0.201	2.21


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) September 2015
Total Flow (mgal)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
9/1/2015
9/7/2015
9/13/2015
9/19/2015
9/25/2015

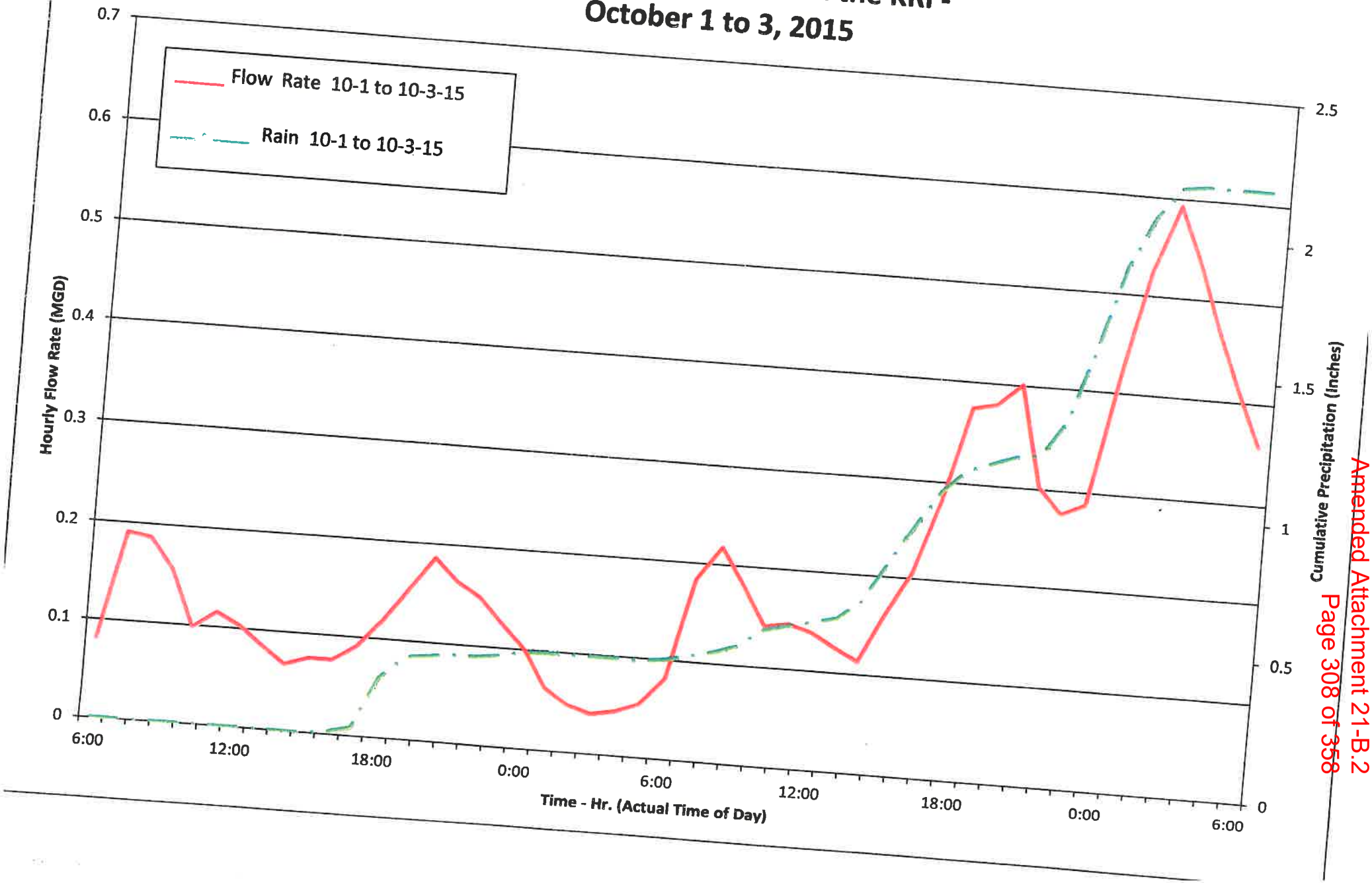
Upper Gwynedd Township

Towamencin Municipal Authority - Manhole 35

September 1 to 30, 2015

Date	Total Flow (mgal)
9/1/2015	0.07
9/2/2015	0.082
9/3/2015	0.089
9/4/2015	0.076
9/5/2015	0.079
9/6/2015	0.083
9/7/2015	0.1
9/8/2015	0.115
9/9/2015	0.091
9/10/2015	0.082
9/11/2015	0.101
9/12/2015	0.09
9/13/2015	0.101
9/14/2015	0.12
9/15/2015	0.074
9/16/2015	0.046
9/17/2015	0.044
9/18/2015	0.078
9/19/2015	0.089
9/20/2015	0.077
9/21/2015	0.116
9/22/2015	0.092
9/23/2015	0.081
9/24/2015	0.093
9/25/2015	0.09
9/26/2015	0.102
9/27/2015	0.124
9/28/2015	0.13
9/29/2015	0.101
9/30/2015	0.099

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 35 in TMA on the KRI - October 1 to 3, 2015



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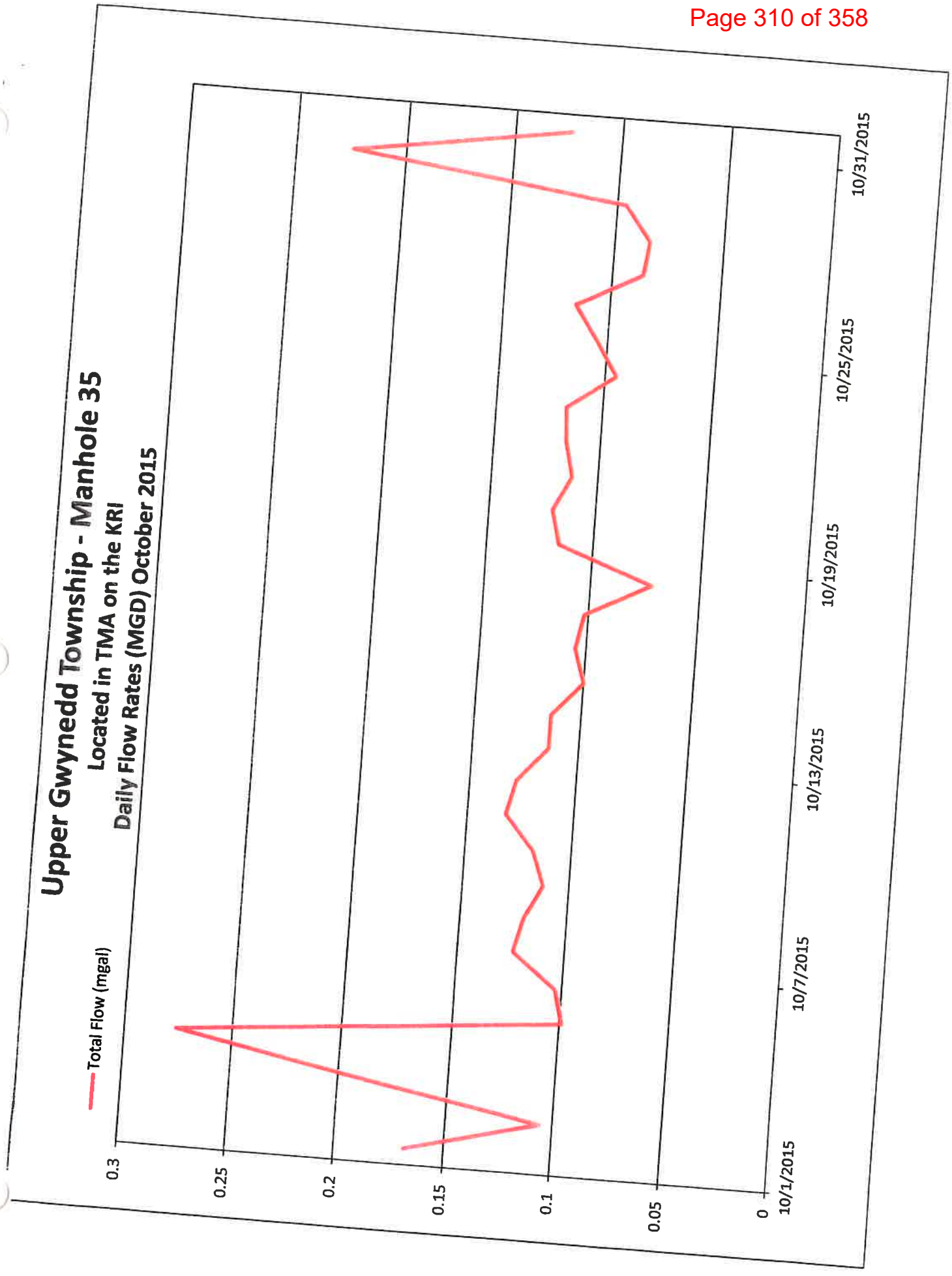
Upper Gwynedd Township Flow Data & Cumulative Precipitation at MH35 for Rain Event: October 1 to 3, 2015

Date / Time		Flow (mgd)	Hourly Rain Totals
10/1/2015	6:00	0.081	0
10/1/2015	7:00	0.19	0
10/1/2015	8:00	0.186	0
10/1/2015	9:00	0.155	0
10/1/2015	10:00	0.098	0
10/1/2015	11:00	0.115	0
10/1/2015	12:00	0.103	0
10/1/2015	13:00	0.085	0
10/1/2015	14:00	0.068	0
10/1/2015	15:00	0.076	0
10/1/2015	16:00	0.076	0
10/1/2015	17:00	0.092	0.01
10/1/2015	18:00	0.119	0.03
10/1/2015	19:00	0.152	0.22
10/1/2015	20:00	0.186	0.3
10/1/2015	21:00	0.163	0.31
10/1/2015	22:00	0.149	0.32
10/1/2015	23:00	0.124	0.32
10/2/2015	0:00	0.101	0.33
10/2/2015	1:00	0.064	0.35
10/2/2015	2:00	0.048	0.35
10/2/2015	3:00	0.041	0.35
10/2/2015	4:00	0.045	0.35
10/2/2015	5:00	0.054	0.35
10/2/2015	6:00	0.082	0.35
10/2/2015	7:00	0.184	0.36
10/2/2015	8:00	0.218	0.38
10/2/2015	9:00	0.181	0.4
10/2/2015	10:00	0.141	0.43
10/2/2015	11:00	0.145	0.49
10/2/2015	12:00	0.138	0.51
10/2/2015	13:00	0.125	0.53
10/2/2015	14:00	0.113	0.55
10/2/2015	15:00	0.162	0.62
10/2/2015	16:00	0.206	0.77
10/2/2015	17:00	0.282	0.91
10/2/2015	18:00	0.375	1.04
10/2/2015	19:00	0.38	1.12
10/2/2015	20:00	0.401	1.15
10/2/2015	21:00	0.303	1.18
10/2/2015	22:00	0.277	1.19
10/2/2015	23:00	0.288	1.32
10/3/2015	0:00	0.412	1.58
10/3/2015	1:00	0.525	1.89
10/3/2015	2:00	0.593	2.07
10/3/2015	3:00	0.536	2.18
10/3/2015	4:00	0.469	2.19
10/3/2015	5:00	0.41	2.19
10/3/2015	6:00	0.358	2.19


Upper Gwynedd Township - Manhole 35
Located in TMA on the KRI
Daily Flow Rates (MGD) October 2015
Total Flow (mgal)
0.3
0.25
0.2
0.15
0.1
0.05
0
10/1/2015
10/7/2015
10/13/2015
10/19/2015
10/25/2015
10/31/2015

Upper Gwynedd Township
Towamencin Municipal Authority - Manhole 35
October 1 to 31, 2015

Date	Total Flow (mgal)
10/1/2015	0.168
10/2/2015	0.106
10/3/2015	0.194
10/4/2015	0.276
10/5/2015	0.099
10/6/2015	0.103
10/7/2015	0.124
10/8/2015	0.12
10/9/2015	0.112
10/10/2015	0.118
10/11/2015	0.132
10/12/2015	0.128
10/13/2015	0.114
10/14/2015	0.114
10/15/2015	0.1
10/16/2015	0.105
10/17/2015	0.102
10/18/2015	0.072
10/19/2015	0.116
10/20/2015	0.12
10/21/2015	0.112
10/22/2015	0.116
10/23/2015	0.117
10/24/2015	0.095
10/25/2015	0.105
10/26/2015	0.116
10/27/2015	0.086
10/28/2015	0.084
10/29/2015	0.096
10/30/2015	0.224
10/31/2015	0.123

Upper Gwynedd Township - Flow during Wet Weather Event at Manhole 24A- Located in TMA on the KRI - March 29 to 31, 2014

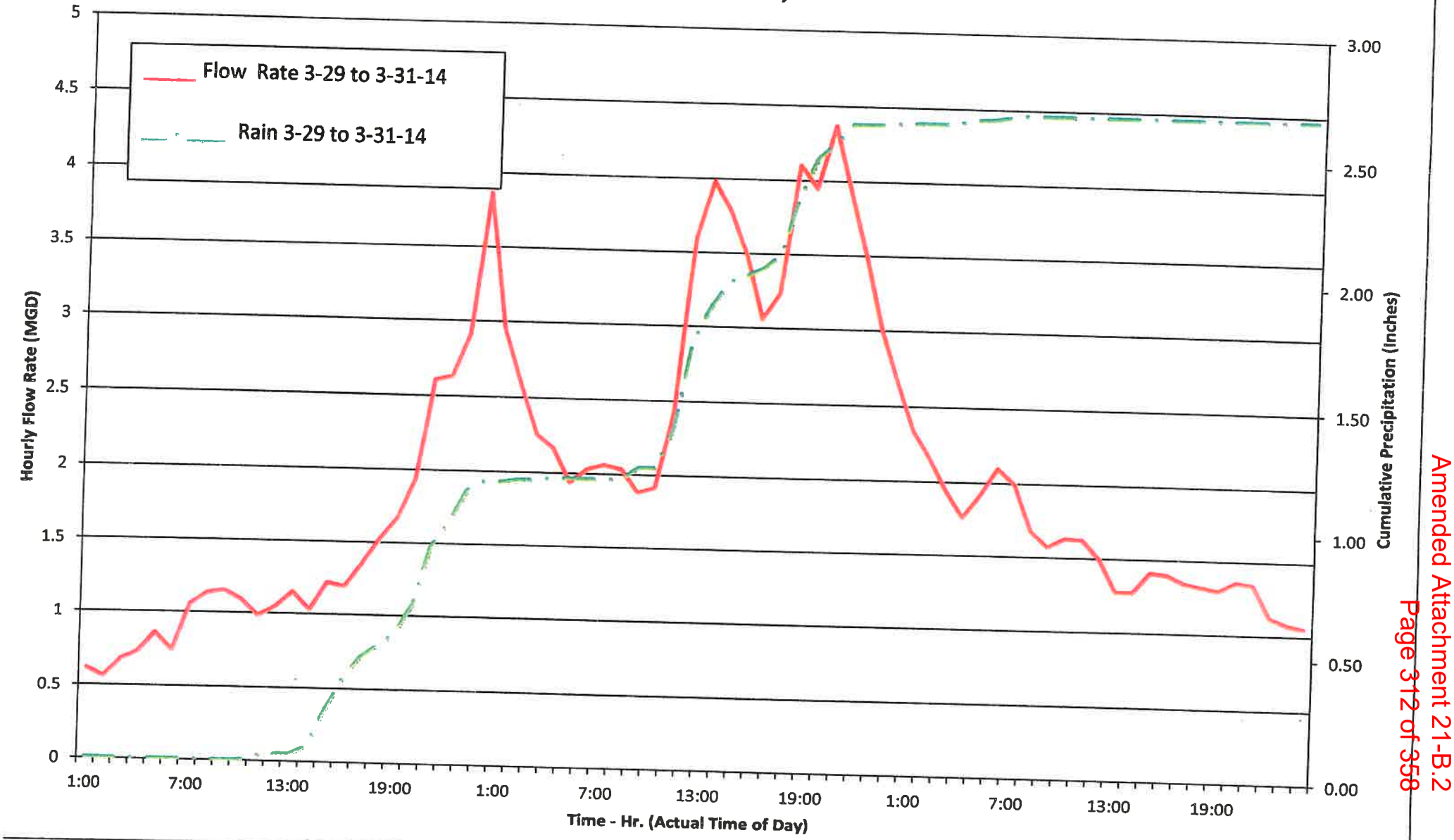


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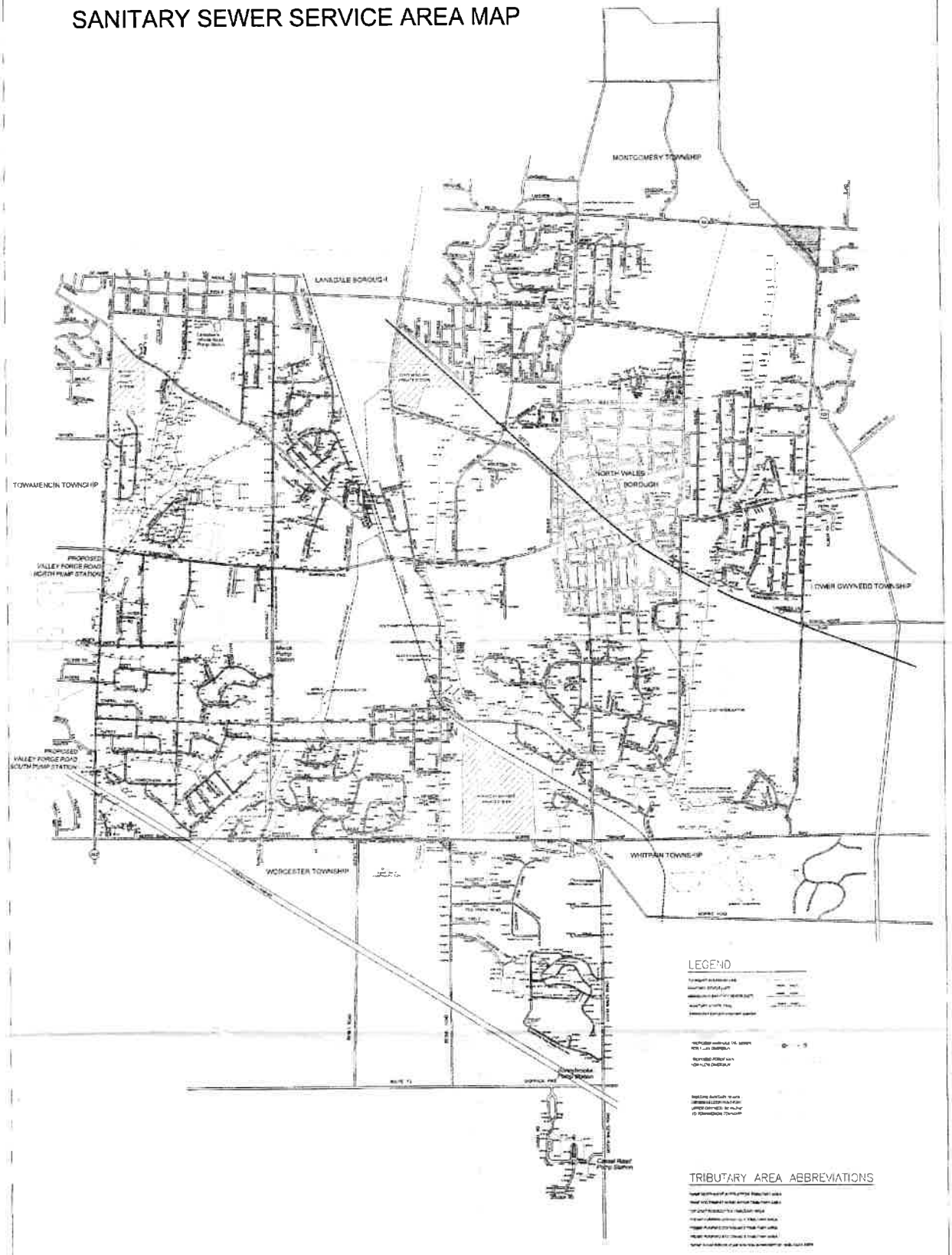
FIGURE 1

UPPER GWYNEDD TOWNSHIP
SANITARY SEWER SERVICE AREA MAP

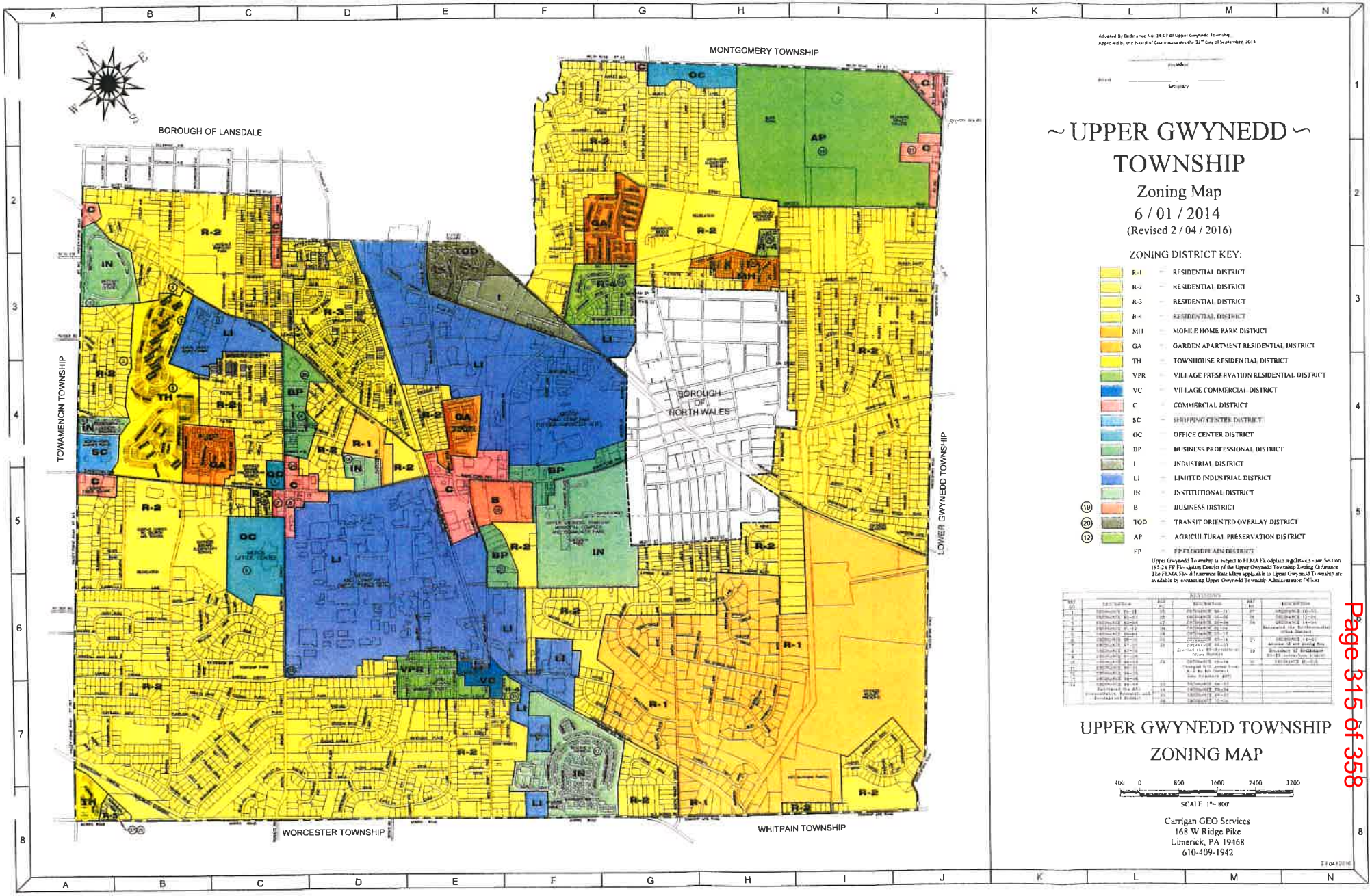


SCALE 1"=1000'

JULY 2016

APPENDIX N

UPPER GWYNEDD TOWNSHIP
ZONING MAP



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APPENDIX O

UPPER GWYNEDD TOWNSHIP
CONNECTION MANAGEMENT PLAN

CONNECTION MANAGEMENT PLAN

UPDATED: 08/2[illegible]

UGT WWTP

Connection Status

	DEP Code No	Flow Approved gpd	Date Approved by DEP	EDUs Approved	EDUs Connected	EDUs Remaining	Remaining gpd	2015	2016	2017	2018	Tributary to SSO
Upper Gwynedd Township												
EAST INTERCEPTOR												
Angatiay	1-469-53139-E	3,510	4/29/2008	13	13	0	711					
Foulkeways	1-46934-162-X	3,640	7/17/2008	13	10	3	1,680		3			MH E 3000
445 Prospect Ave. (Ciriacausa)	1-46953-146-E	237	11/8/2013	1	0	1	237		1			MH E 3000
501 Prospect Ave. (Ciriacausa)	1-46953-147-E	474	11/8/2013	2	0	2	474		2			None
0 Royal Avenue	1-46953-148-X	237	11/8/2013	1	1	0	0	1				None
417 W. Prospect Avenue	1-46953-153-X	237	8/15/2004	1	0	0	0					MH E3000
407 W. Prospect Avenue	1-46953-154-X	237	10/2/2014	1	0	0	237	1				None
2nd Summerhill Drive	1-46953-156-XJ	237	4/15/2016	1	0	1			1			
Foulkeways Expansion	1-46934-205-3J					30	7,110		30			MH E3000
Gwynedd Friends		237							1			
Gwynedd Manor On-Lot Systems						3	711		3			MH E1700
Misc. On-Lot Systems						10	2,370		5	5		
SOUTHWEST INTERCEPTOR												
JA JOPE	1-46962-168-E	948	3/31/2010	4	3	1	237	1	1			None
Preserve at Worcester	1-46962-159-3J	10,238	5/16/2012	39	26	13	10,238	26	13			None
Subway (Montgomery Township)			12/7/2012									
1034 Dickerson Road (Jay)	1-46953-145-E	711	7/11/2013	3	0	3	711		3			None
The Little Pod (Montgomery	1-46940-327-3J		11/26/2013	2		2	474					None
Enclave at Maple Green	1-46953-155-3J	1185	3/22/2016	5	0	5	1,185		5			
514 Washington Avenue	1-46953-157-X	237	5/28/2015	1	0	1	237		1			
Cottage Avenue Realty L.P.	1-46953-162-E	5214	2/2/2016	22	0	22	5,214			22		
715 East Walnut Street		474								2		
116 Old Church Road						1	237					None
Hancock Road						50	11,850				30	None
Worcester Township						490	116,130				385	None
Montgomery Township						10	2,370				6	None
Misc. On Lot Systems						9	2,133		3	3	3	
Merck-Phase 5						652	154,524				352	
70 1711 Dickerson Road						3	711					None
												None
TMA SERVICE AREA												
871 Flintlock Drive			pre-1980									
Newtech Dental Lab	1-46953-101-E	1,660		1	0	0	0					
Bella Casa	1-46953-115-E	4,480		8	8	0	0					MH 237A
Providence Reserve (Clemens)	1-46953-138-E	11,856	8/15/2007	16	14	2	560		2			None
810 Rosemont Ave	1-46953-146-X	237	11/15/2013	52	57	0	0	1				None
Dev Dion	1-46953-151-3J	5,214	3/11/2014	1	0	0	0	1				None
Samantha Court	1-46953-150-3J	5451	4/29/2014	22	21	1	237	27	1			None
1830 Sumneytown Road (Schaal)	1-46953-152-3J	237	4/8/2014	23	0	23	5,451		20	3		None
925 Lexington Avenue	1-46953-158-X	237	8/25/2015	1	0	1	237		1			None
720 S. Broad St. (NP Ave)	1-46953-159-3J	474	8/31/2015	1	0	1	237		1			
1678 Sumneytown Road	1-46953-163-X	260	9/15/2015	2	0	2						
Lehigh Valley Dairy	1-46953-160-3J	13642		1	1	0	0			2		
719 S. Broad St. (Carney)	1-46953-161-3J	237							65			
Misc. On Lot Systems						10	2,370		2	2		
Martin I Green Street							9,480		20	20		None
Martin II Allentown Rd							4,740		10	10		None
Martin III S. Broad St							2,844		6	6		None

1. 237 Gal/EDU is used in accordance with Act 57 calculations
2. There is one connection for Clemrock that is part of the Providence Reserve development.
3. Where "None" is shown in the last column, "Tributary to SSO", this means that the project is not tributary to any SSO within UGT. We recognize that there are SSO on the KRI & that all UGT flow goes to the KRI.
4. Note that EDUs included for the Preserve at Worcester are included in the total allocation for Worcester Township.

Ready to go. Subject to filing Building Permit and buying EDU's.

Need Planning Module approval

On lot Septic System with problems

No approval pending or applied for and working on lot systems

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APPENDIX P

PENNSYLVANIA NATURAL DIVERSITY INVENTORY

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
County(s): **Montgomery**
Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
ZIP Code: **19422; 19446; 19454**
Quadrangle Name(s): **LANSDALE**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **Skippack Creek; Upper Wissahickon Creek**
Decimal Degrees: **40.207926, -75.304236**
Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" 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

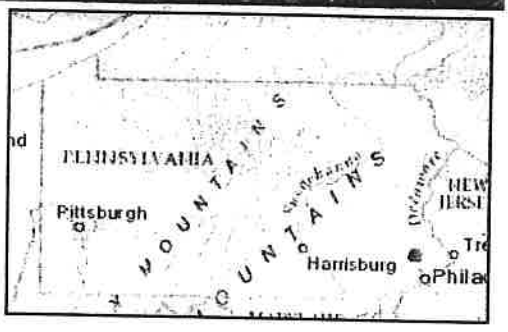
As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with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

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

Upper Gwynedd Sewer Diversion

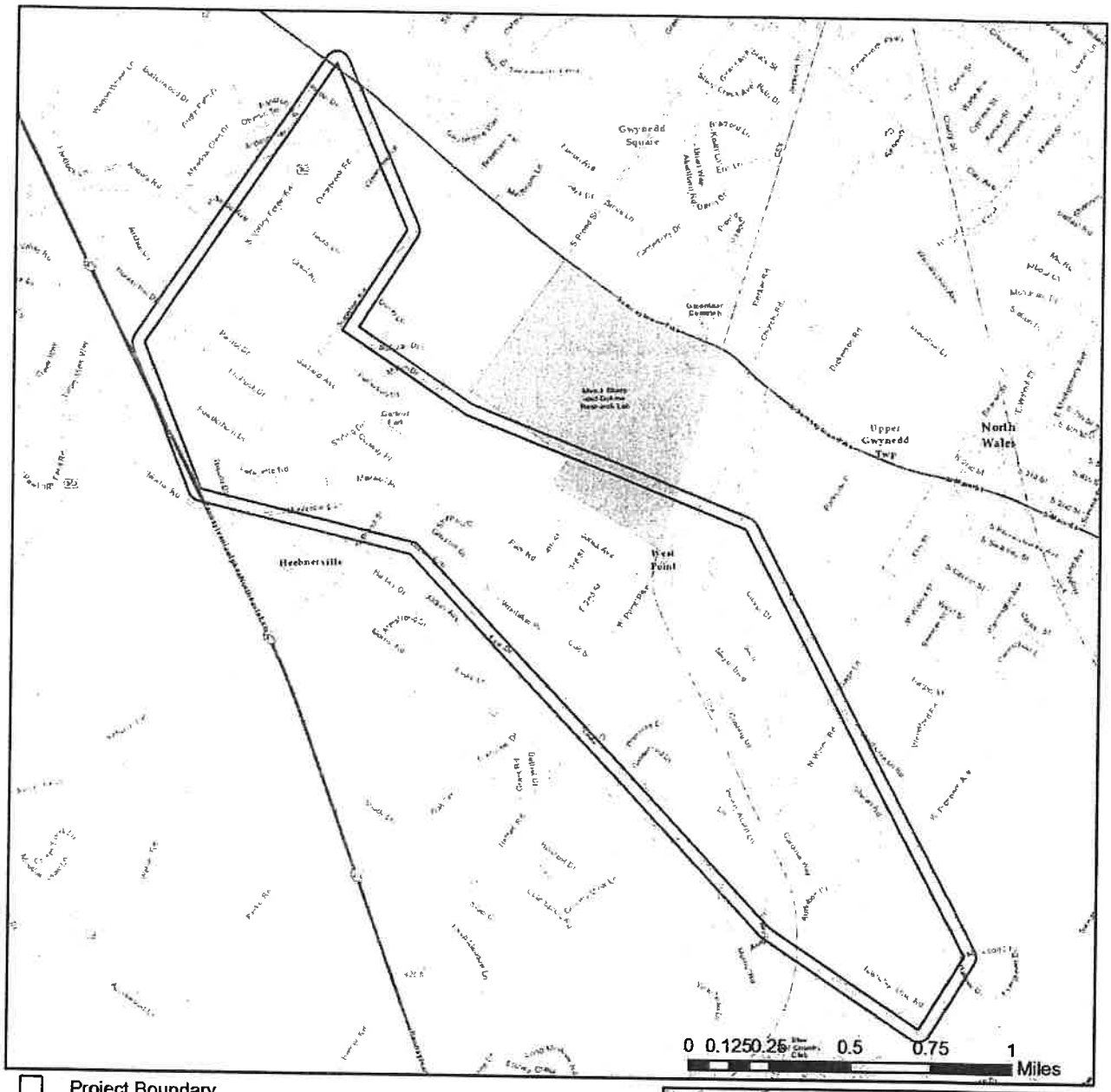
☐ Project Boundary

☐ Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

Upper Gwynedd Sewer Diversion



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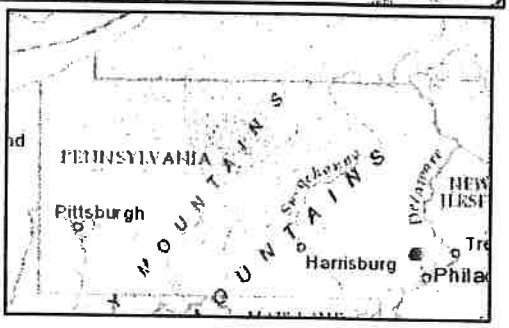

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Address: P.O. Box 232
City, State, Zip: Kulpsville, PA 19443
Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.com

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William A Brown II
applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
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ZIP Code: **19422; 19446; 19454**
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Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" W**

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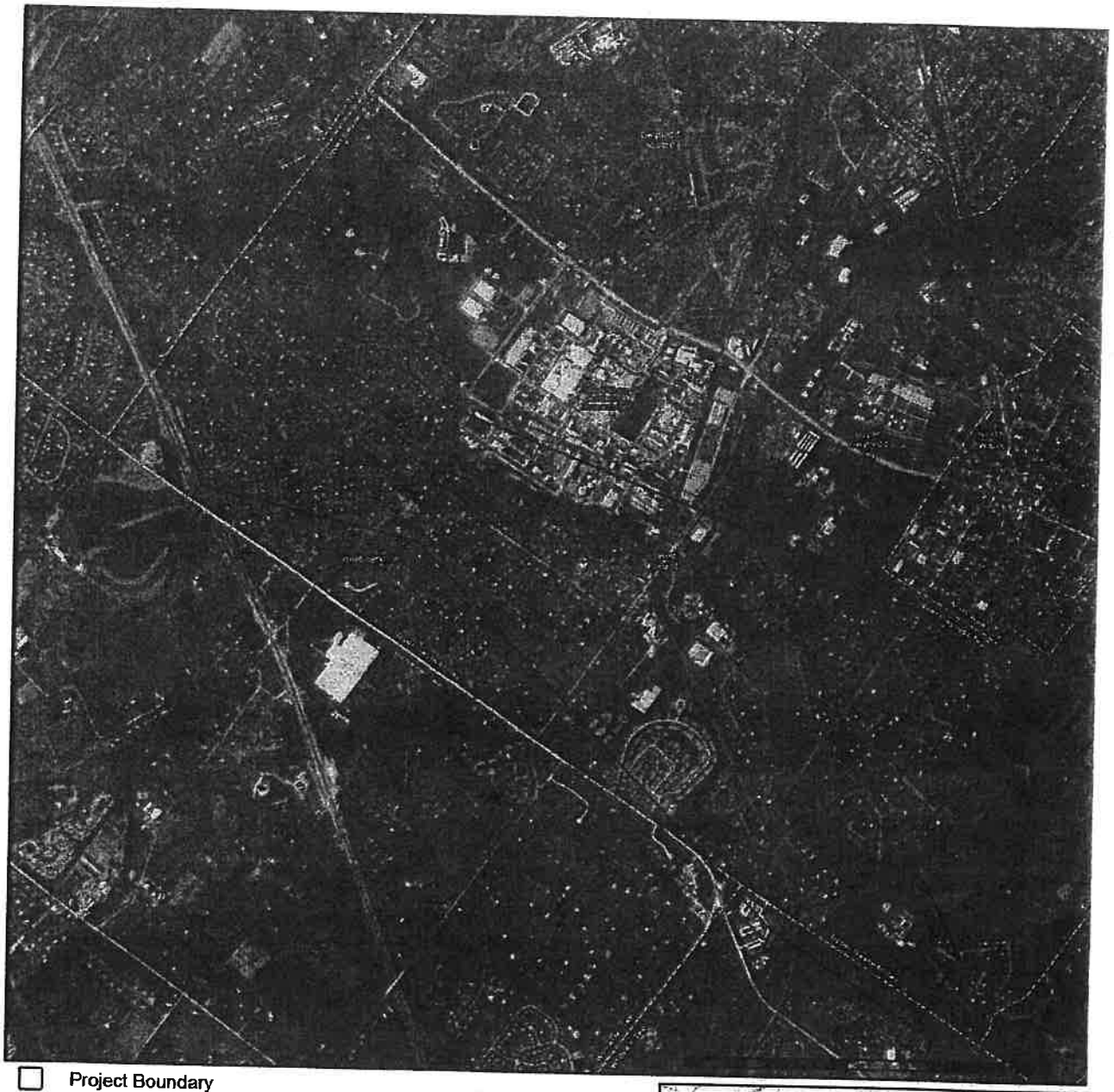

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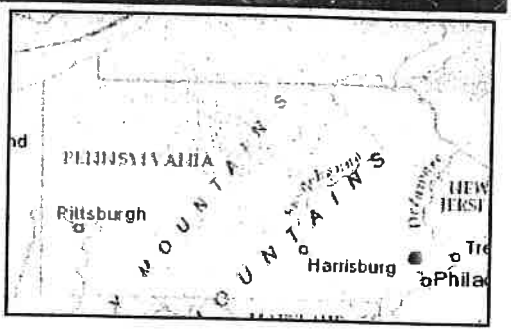

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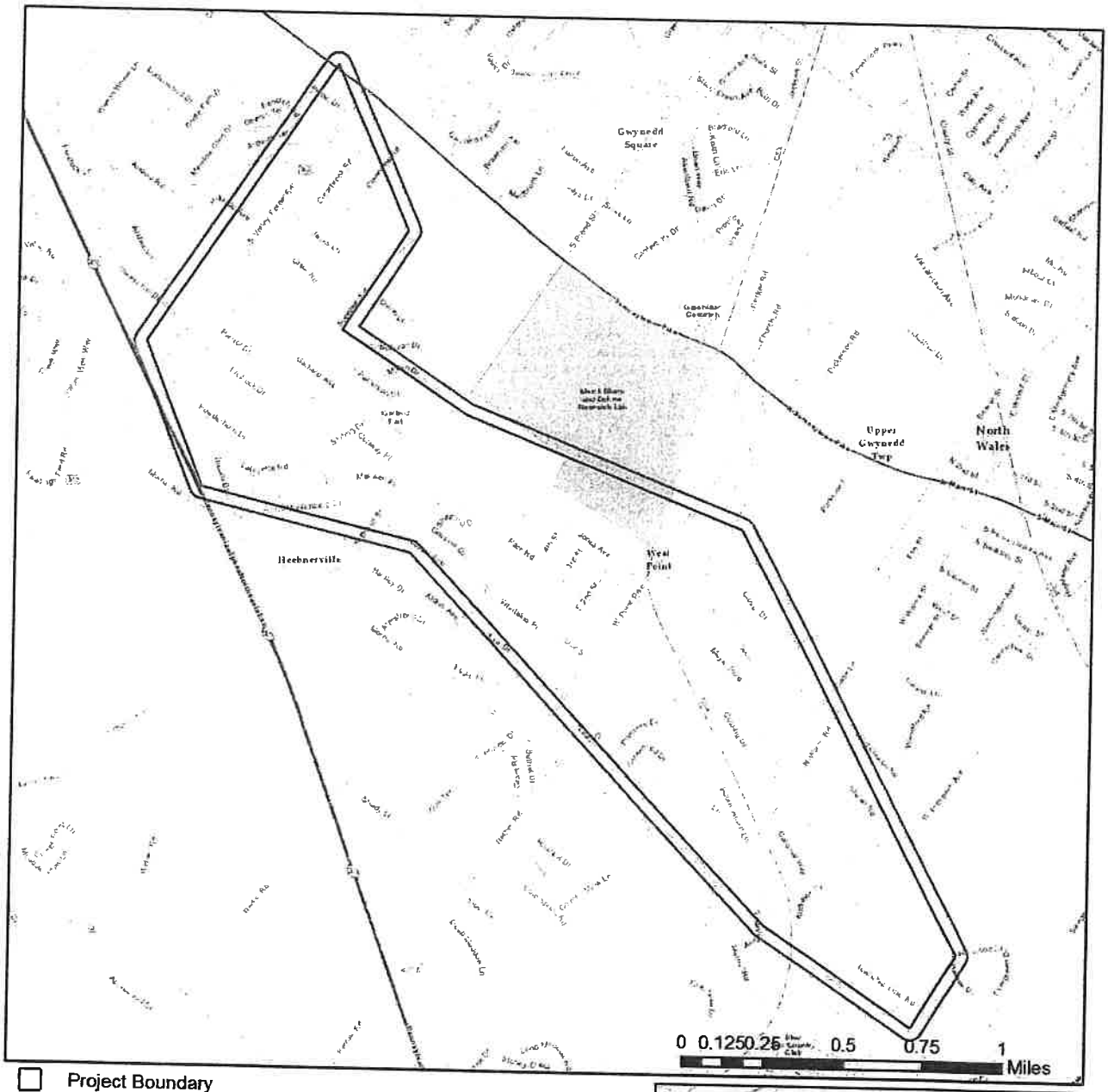

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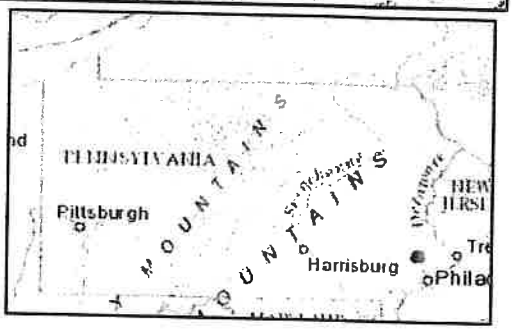

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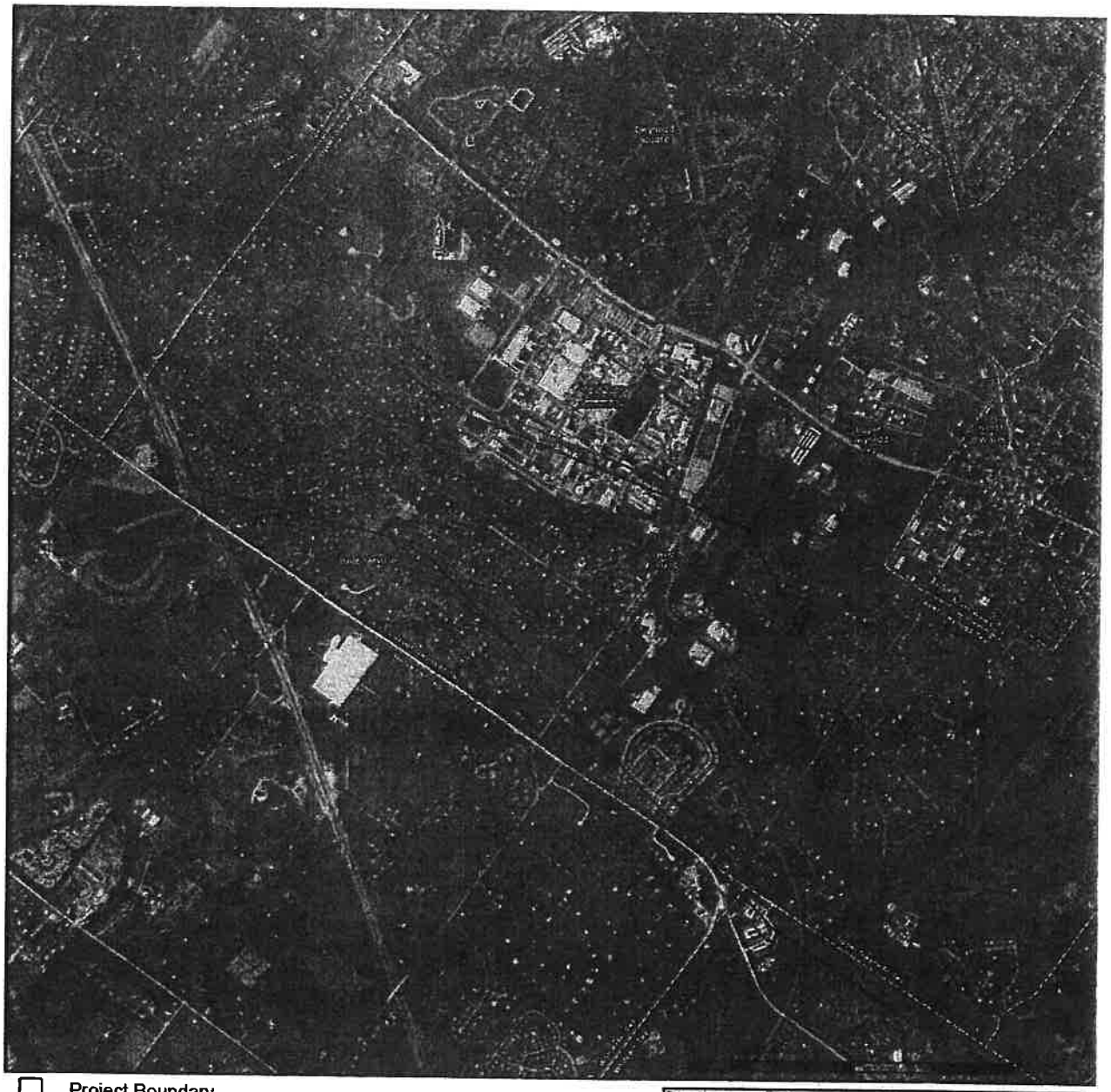

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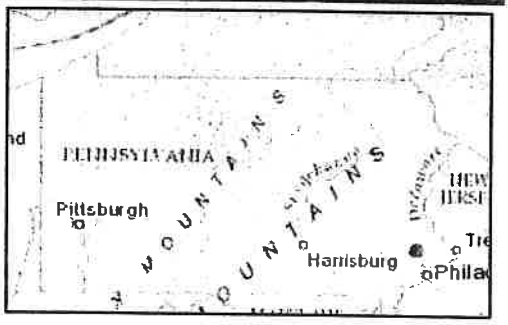

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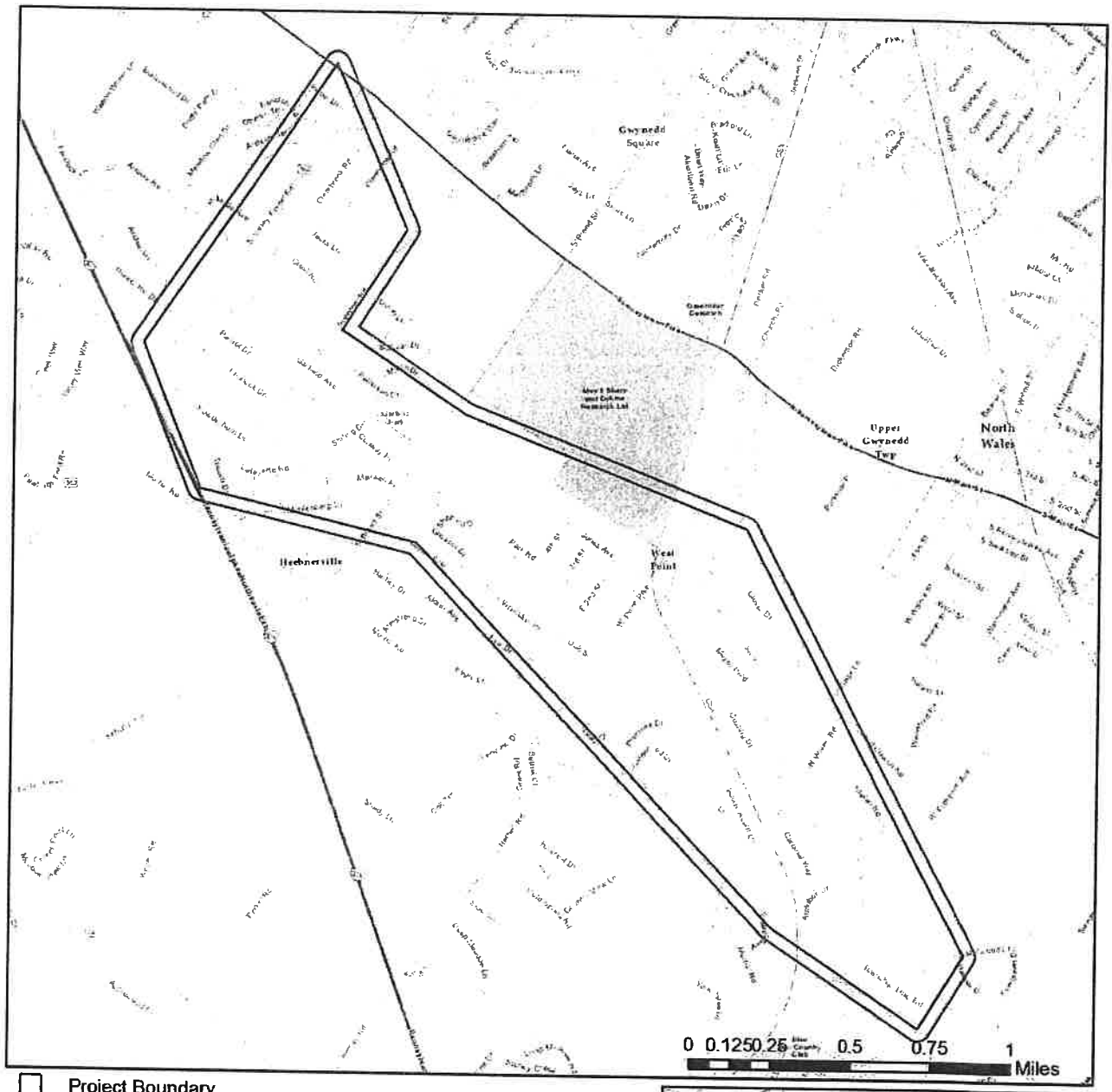

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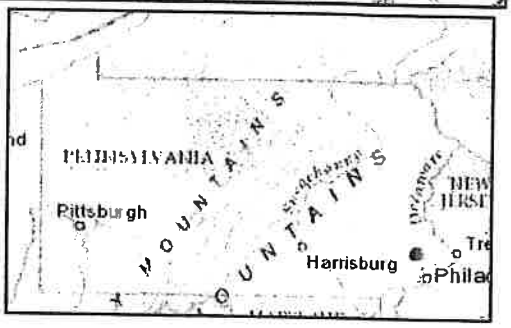

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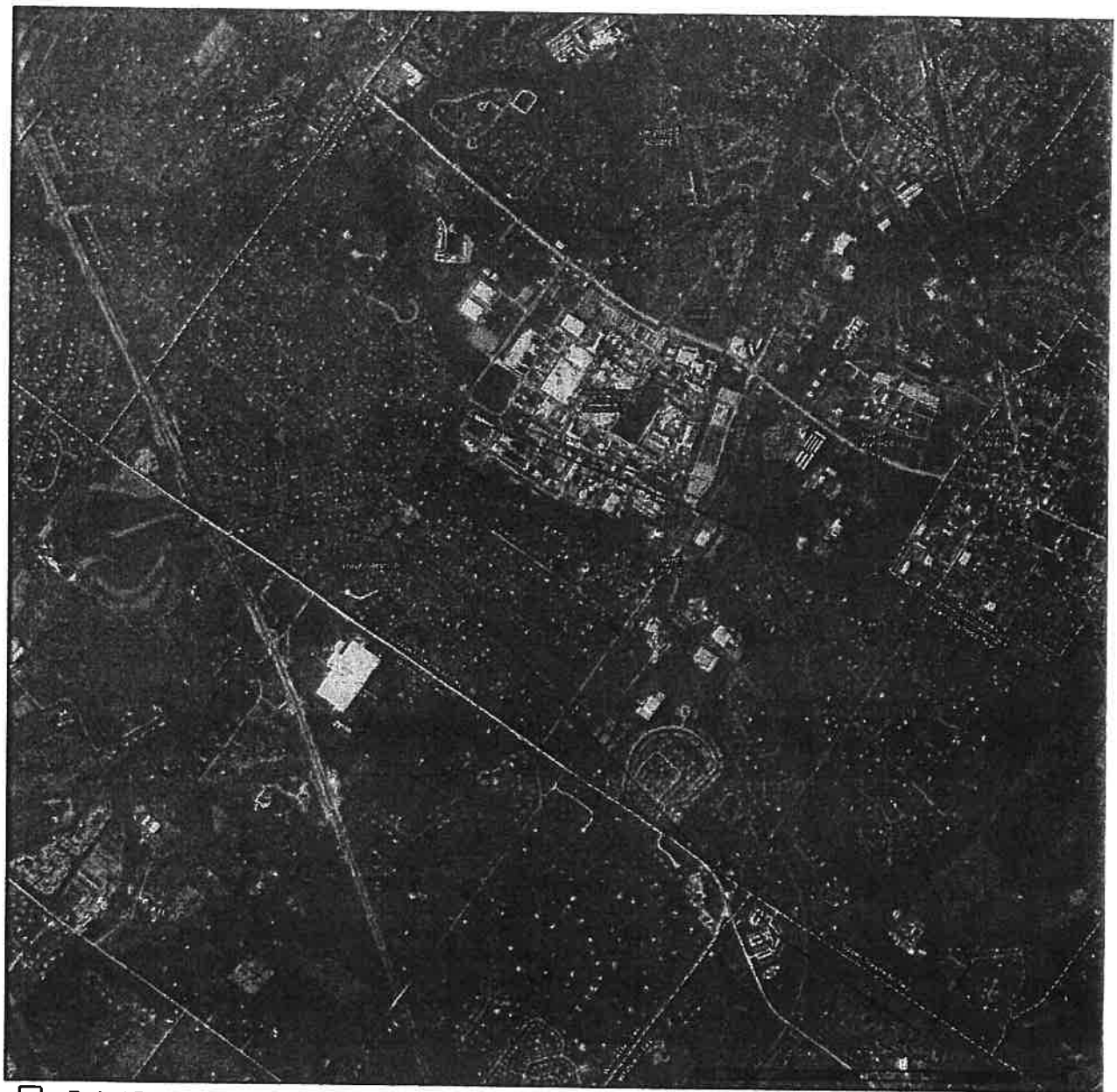

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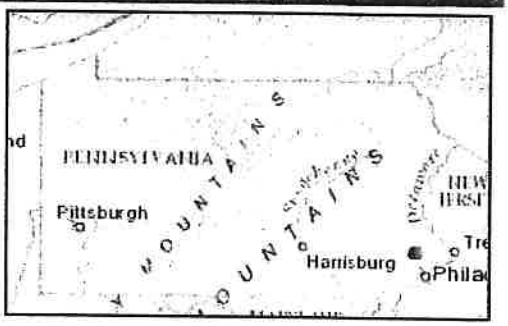

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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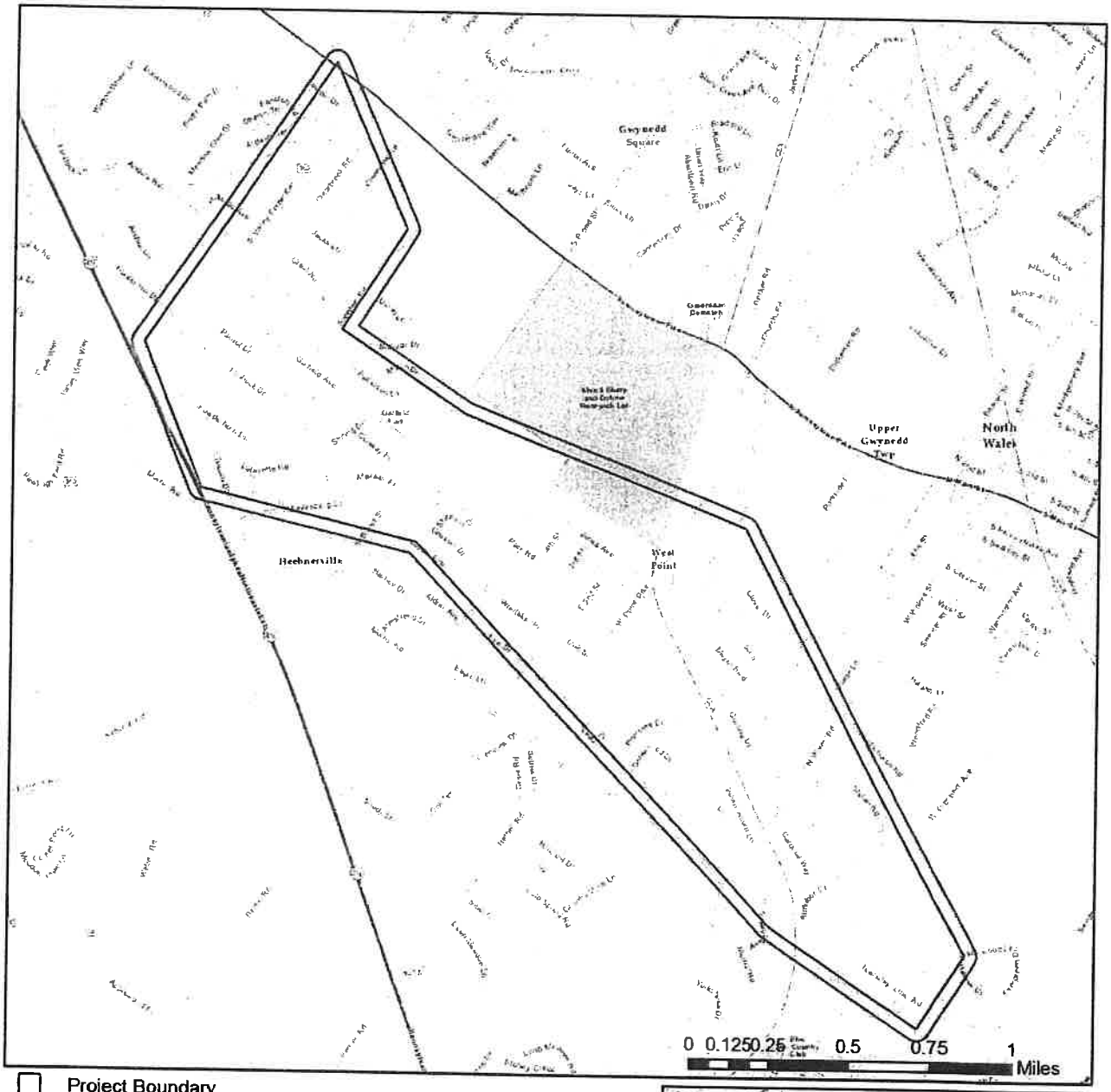
Upper Gwynedd Sewer Diversion



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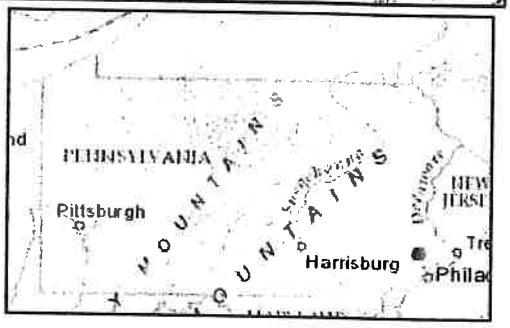

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RESPONSE:
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PA Department of Conservation and Natural Resources
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PA Fish and Boat Commission
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State College, PA 16801
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Name: William A. Brown II, P.E.
Company/Business Name: EEMA
Address: P.O. Box 232
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Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.com

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William A Brown II
applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

Project Name: **Upper Gwynedd Sewer Diversion**
Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
County(s): **Montgomery**
Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
ZIP Code: **19422; 19446; 19454**
Quadrangle Name(s): **LANSDALE**
Watersheds HUC 8: **Schuylkill**
Watersheds HUC 12: **Skippack Creek; Upper Wissahickon Creek**
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Degrees Minutes Seconds: **40° 12' 28.5336" N, 75° 18' 15.2513" W**

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Agency	Results	Response
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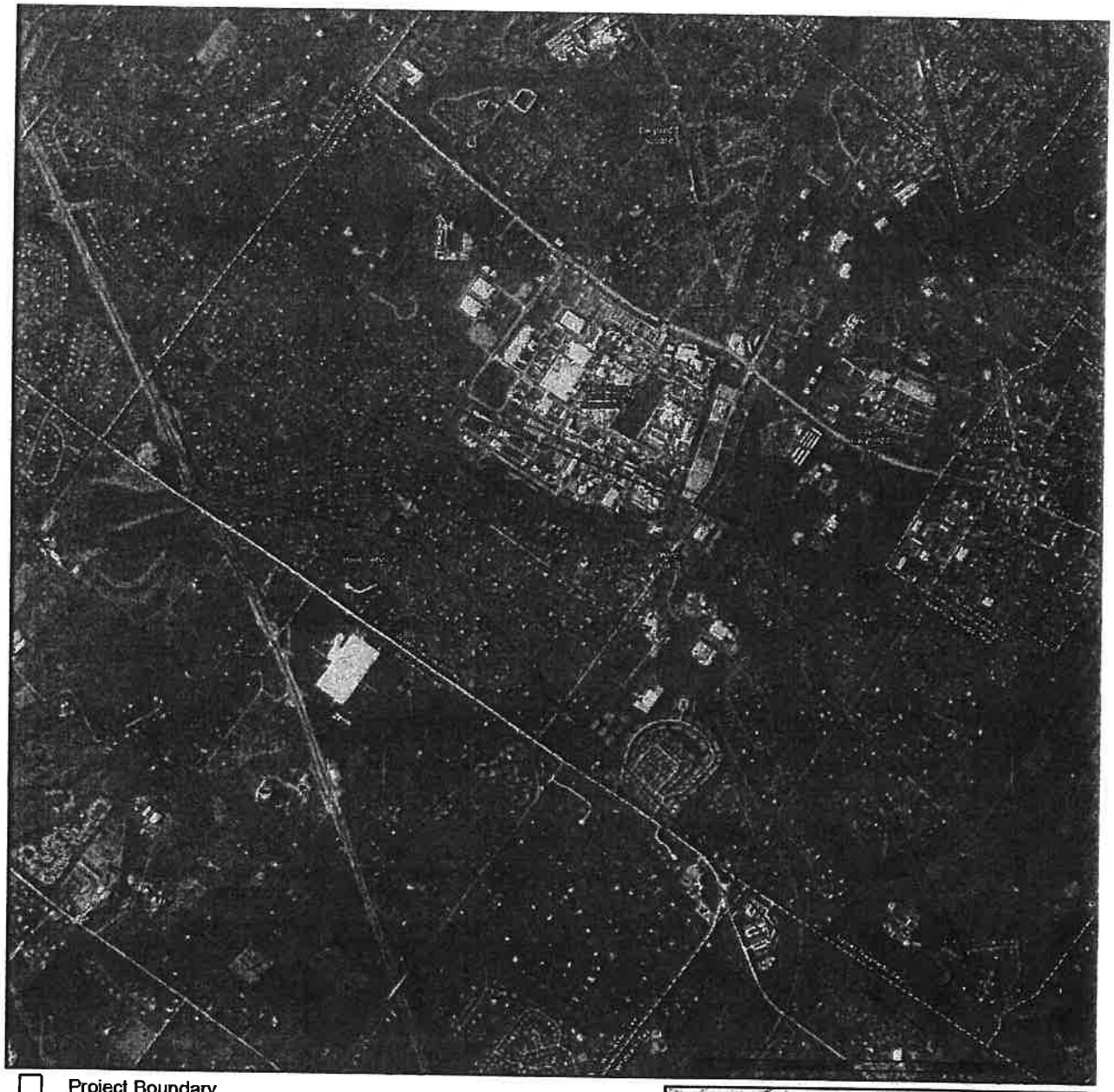
Upper Gwynedd Sewer Diversion



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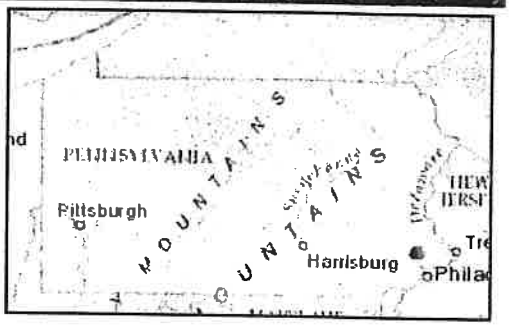

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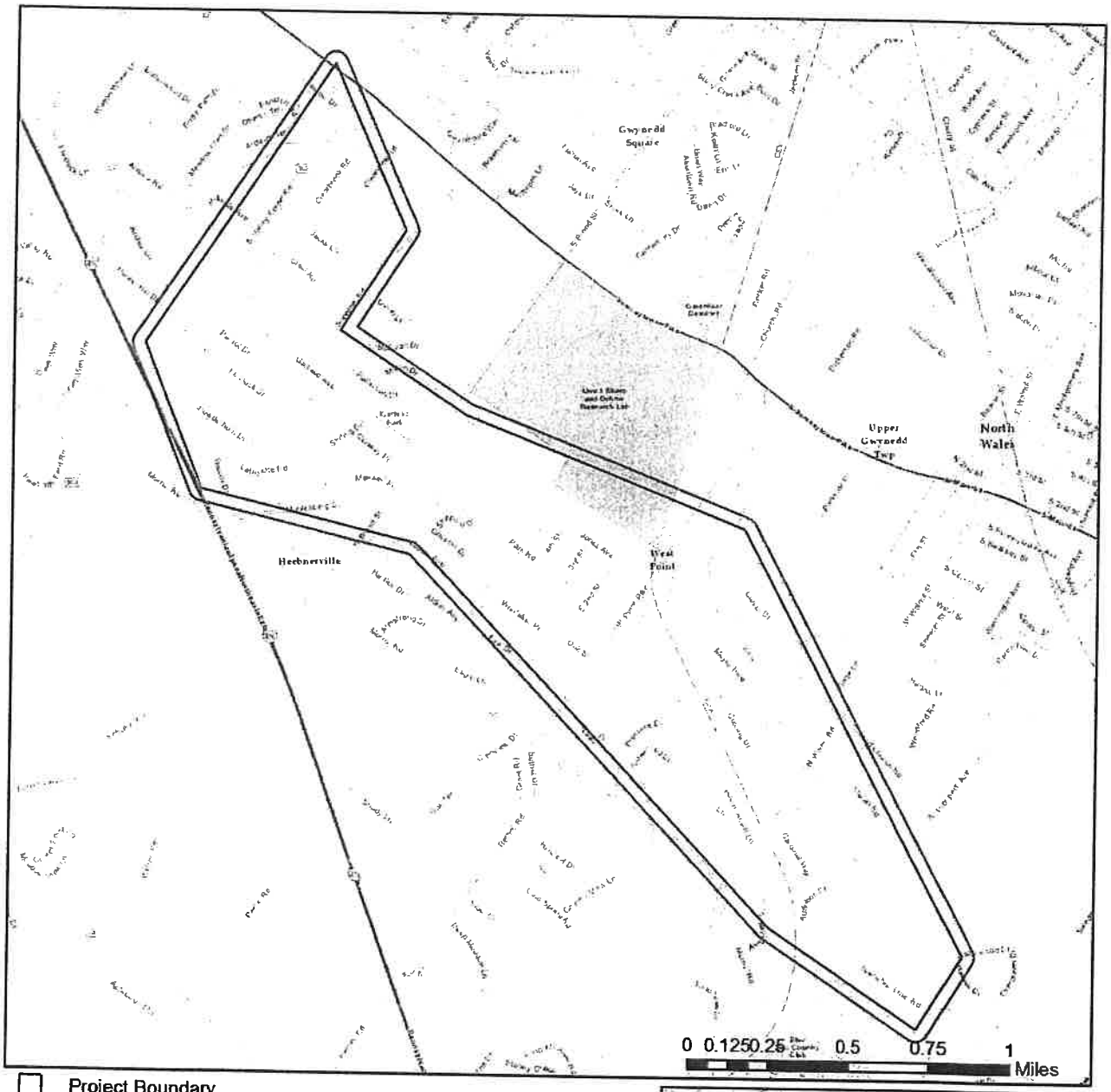

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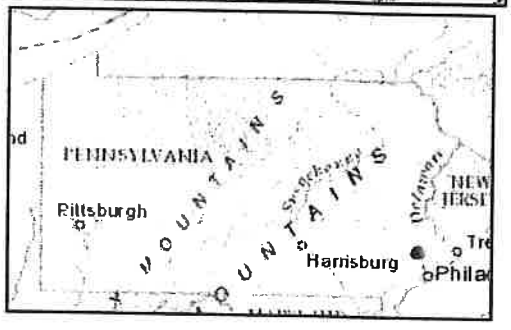

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applicant/project proponent signature

6/27/16
date

1. PROJECT INFORMATION

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Date of Review: **6/27/2016 04:52:13 PM**
Project Category: **Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Sewage module/Act 537 plan**
Project Area: **1,321.72 acres**
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Township/Municipality(s): **TOWAMENCIN; UPPER GWYNEDD; WHITPAIN; WORCESTER**
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Upper Gwynedd Sewer Diversion

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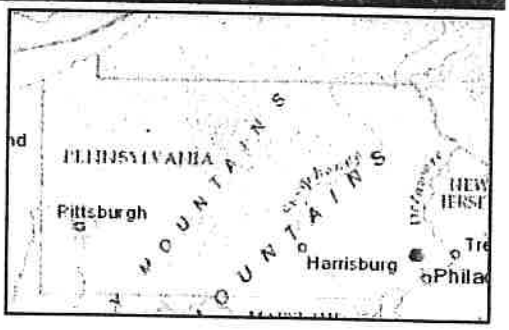

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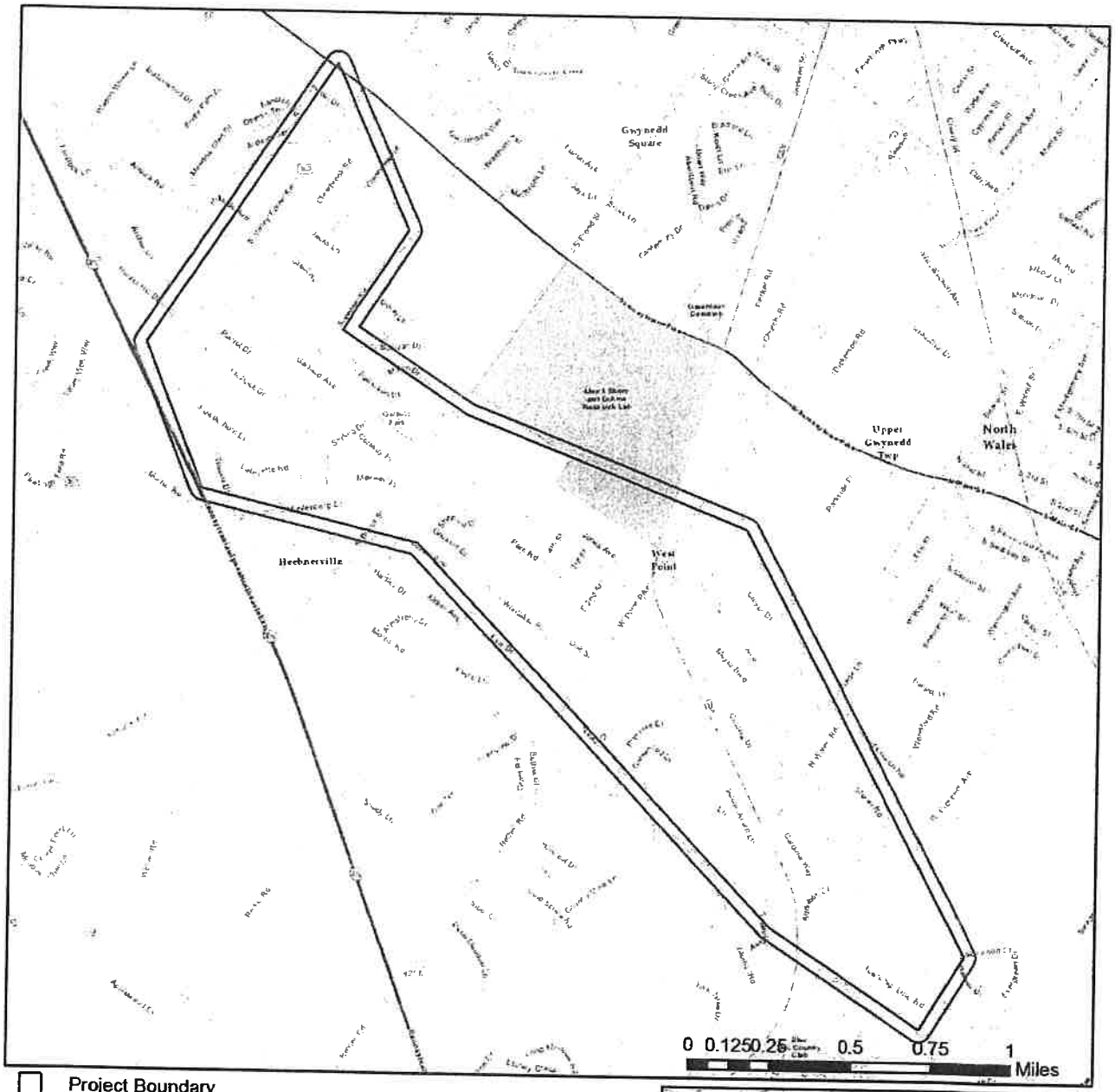

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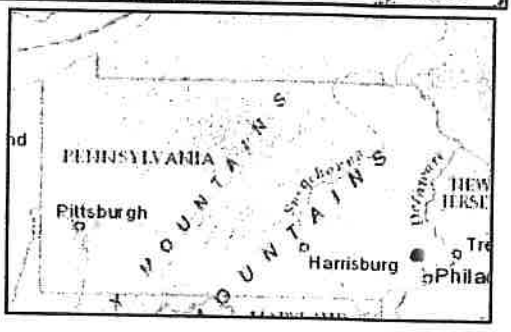

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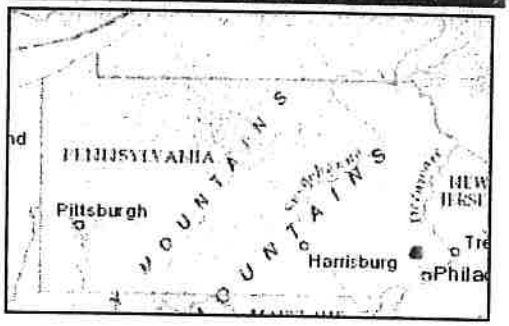
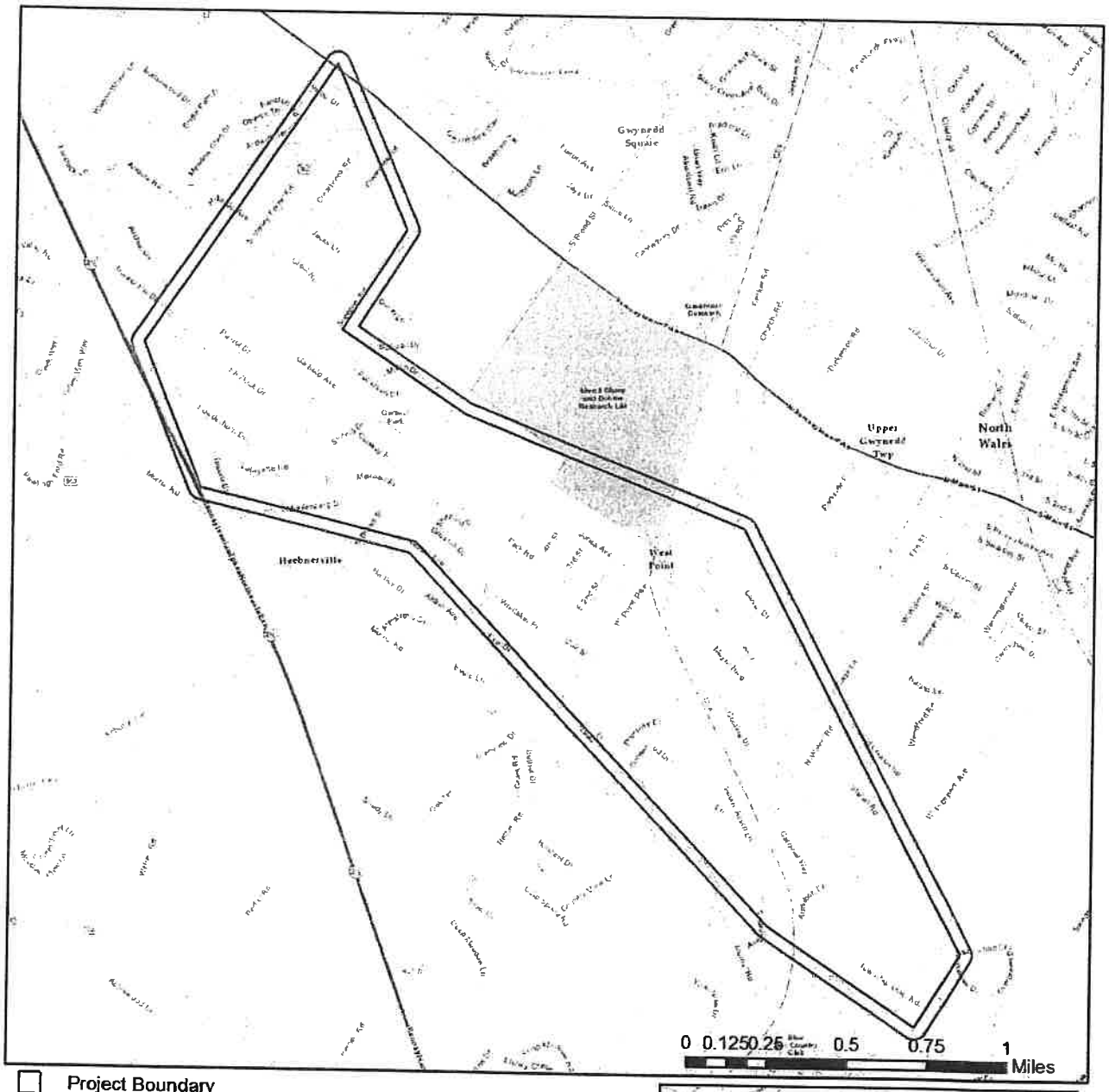


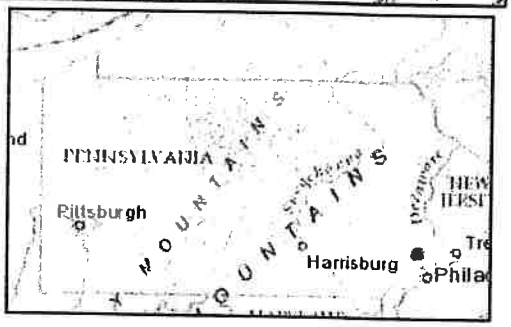
Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, Mapmyindia, © OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,

Upper Gwynedd Sewer Diversion



☐ Project Boundary

☐ Buffered Project Boundary



Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

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
Email: RA-HeritageReview@pa.gov
Fax:(717) 772-0271

PA Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane, Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
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
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: William A. Brown II, P.E.
Company/Business Name: EEMA
Address: P.O. Box 232
City, State, Zip: Kulpsville, PA 19443
Phone:(215) 368-3375 Fax:(215) 368-6739
Email: wbrown@eema-inc.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.

William A Brown II
applicant/project proponent signature

6/27/16
date

APPENDIX Q

CAPITAL COST ANALYSIS

FLOW DIVERSION CAPITAL COST ANALYSIS

FLOW DIVERSION ALTERANTIVE

1. COST TO DIVERT FLOW = $27,000,000

2. PAYMENT RECEIVED FROM TOWAMENCIN TOWNSHIP = $7,100,000

3. RESERVE FUNDS HELD BY UGT = $4,900,000

4. COST TO BE FINANCED BY UGT = $15,000,000

COST TO NOT DIVERT FLOW

1. LONG TERM UGT SHARE OF COST AT TMA WWTP = $33,800,000[1]

COST SUMMARY

NET LONG TERM CAPITAL COST SAVINGS TO UGT = $6,800,000[2]

1. BASED ON HAZEN & SAWYER INDEPENDENT STUDY APPROVED BY UGT AND TT.
2. $33,800,000 MINUS $27,000,000.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SEP 13 2017

Mr. Michael Lapinski
Assistant Manager
Upper Gwynedd Township
P.O. Box 1
West Point, PA 19486

Re: Act 537 Plan Update
Upper Gwynedd Township Sewage Flow Diversion
APS ID No. 593641, AUTH ID No. 1195962
Upper Gwynedd Township
Montgomery County

Dear Mr. Lapinski:

The Department of Environmental Protection (DEP) has reviewed the proposed Official Sewage Facilities Plan Update (Plan) titled *Upper Gwynedd Township Sewage Flow Diversion,* as prepared by Environmental Engineering & Management Associates, Inc. (EEMA), dated October 2016. The Plan proposes the diversion of sewage flow in portions of Upper Gwynedd Township (UGT) from the Towamencin Municipal Authority's Kriebel Road Interceptor (TMA KRI) to the Upper Gwynedd Township Wastewater Treatment Facility (UGT WWTP), the construction of two new pumping stations, associated force mains and upgrades to the UGT WWTP. The submission is consistent with the planning requirements in Chapter 71 of DEP's regulations.

This Plan is approved and provides for the following:

1. The diversion of 0.95 MGD from the TMA KRI. The portions of Upper Gwynedd Township that will be diverted are the areas tributary to the Sumney Forge Shopping Center and the PA Turnpike bridge (on Valley Forge Road) crossing points. These areas are shown on Figure 2 in Appendix A of the January 27, 2017, submission. The specific properties are listed in the Valley Forge Road North Pump Station (VFRNPS) and Valley Forge Road South Pump Station (VFRSPS) tables in the May 9, 2017, resubmission.

2. Five properties in Towamencin Township will also be diverted to the UGT WWTP. Those properties are listed in the Towamencin Township Valley Forge Road South Pump Station table in the May 9, 2017, resubmission.

3. The construction of the VFRNPS and VFRSPS and associated force mains. The approved sewage flows are as follows:

SEP 13 2017

a. The annual average sewage flow for the VFRNPS will be 0.96 MGD. Its peak capacity will be 6.0 MGD. The associated proposed force main leaving the pump station will be a combination of 20" and 24" sized pipe. The force main will also have an annual average capacity of 0.96 MGD.

b. The annual average sewage flow for the VFRSPS is 0.14 MGD. Its peak capacity will be 1.5 MGD. The associated proposed force main will be an 8" sewer line with an annual average capacity of 0.14 MGD.

These annual average sewage flows identified above include the sewage flow being diverted from the TMA KRI and anticipated future sewage flows in the respective drainage area of each pump station. The specific locations of the pump stations and routes of the force mains are illustrated in the figures in Appendix J of the January 27, 2017, submission.

4. The new force mains will combine on Garfield Avenue near Sterling Drive and a new force main will be constructed. The new 20"/24" force main will have an annual average capacity of 1.1 MGD. Its peak capacity will be 7.5 MGD.

The new force main will connect directly to the UGT WWTP, as illustrated on the *Pump Station Locations and Pipe Routes* map in Appendix J of the January 27, 2017, submission.

5. The UGT WWTP will be upgraded from 5.7 MGD to 6.4 MGD annual average flow. Per the e-mail from EEMA, dated August 30, 2017, modifications at the UGT WWTP will be made to accommodate peak sewage flows realized by the sewage flow diversion.

Upper Gwynedd Township must secure a Water Quality Management (Part II) permit(s) for the construction and operation of the proposed sewage facilities and WWTP upgrades. Issuance of a Part II permit will be based upon a technical evaluation of the permit application and supporting documentation. Starting construction prior to obtaining a permit is a violation of the Clean Streams Law.

Please note that the permitted annual average capacity of sewage facilities is the number upon which Act 537 sewage facilities planning capacity is based. No capacity may be used for new connections to these facilities beyond their permitted annual average capacities without first obtaining additional sewage facilities planning approvals for the rerate/upgrade of these facilities.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa. C.S.

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Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800.654.5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717.787.3483) FOR MORE INFORMATION.

If you have any questions or concerns, please contact Ms. Stefanie Rittenhouse at 484.250.5186.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Clean Water

cc: Montgomery County Health Department
Montgomery County Planning Department
Mr. Ford - Towamencin Township
TMA
Environmental Engineering and Management Associates, Inc
Planning Section
Re 30 (GJE17CLW)250-7

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

In re: Application of Pennsylvania-American Water Company under Sections 1102(a) and 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. §§ 1102(a) and 1329, for approval of (1) the transfer, by sale, to Pennsylvania-American Water Company, of substantially all of the assets, properties and rights related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority, and (2) the rights of Pennsylvania-American Water Company to begin to offer or furnish wastewater service to the public in the Township of Towamencin and portions of the Townships of Franconia, Lower Salford and Worcester and the Borough of Lansdale, all in Montgomery County, Pennsylvania	Docket No. A-2023-3039900
In re: Application of Pennsylvania-American Water Company under Section 1329 of the Pennsylvania Public Utility Code, 66 Pa C.S. § 1329, for approval of the use for ratemaking purposes of the lesser of the fair market value or the negotiated purchase price of the assets related to the wastewater collection and treatment system owned and operated by Towamencin Municipal Authority and the Township of Towamencin	Docket No. A-2023-_____
In re: Petition of Pennsylvania-American Water Company, related to its acquisition of the wastewater collection and treatment system owned and operated by Towamencin Municipal Authority and the Township of Towamencin, for approval under Section 1329 of the Pennsylvania Public Utility Code, 66 Pa. C.S. § 1329, to (i) collect a distribution system improvement charge, (ii) for book and ratemaking purposes, accrue Allowance for Funds Used During Construction for post-acquisition improvements not recovered through the distribution system improvement charge, (iii) for book and ratemaking purposes, defer depreciation related to post-acquisition improvements not recovered through the distribution system improvement charge, and (iv) include, in its next base rate case, a claim for transaction and closing costs.	Docket No. P-2023-_____

In re: Filing by Pennsylvania-American Water Company under Section 507 of the Pennsylvania Public Utility Code, 66 Pa. C.S. § 507, of (i) the Asset Purchase Agreement By and Among the Towamencin Municipal Authority, the Township of Towamencin and NextEra Water Pennsylvania, LLC, and the First Amendment to the Asset (ii) the Assignment and Assumption Agreement of Asset Purchase Agreement By and Among the Towamencin Municipal Authority, the Township of Towamencin, NextEra Water Pennsylvania, LLC and Pennsylvania-American Water Company, and (ii) seven agreements with municipal corporations to be assumed by Pennsylvania-American Water Company upon closing of its acquisition of substantially all of the assets related to the wastewater collection and treatment system owned and operated by Towamencin Township and Towamencin Municipal Authority	:	Docket Nos. U-2023-_____, *et al*.

CERTIFICATE OF SERVICE

I hereby certify that I have served a true copy of the foregoing Responses to Set 2 of Pennsylvania-American Water Company to the 66 Pa. C.S. Section 1329 Application Completeness Review Pennsylvania-American Water Company – Wastewater Division Acquisition of Township of Towamencin Wastewater System Assets, dated July 27, 2023, upon the parties, listed below in accordance with the requirements of 52 Pa. Code §1.54 (relating to service by a party).

PARTIES SERVED ON AUGUST 10, 2023, IN THE MANNER SPECIFIED

Carrie B. Wright
Prosecutor
Pennsylvania Public Utility Commission
Bureau of Investigation and Enforcement
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120
carwright@pa.gov
(***VIA*** *electronic mail – OneDrive Link*)

Sharon E. Webb
Assistant Small Business Advocate
Commonwealth of Pennsylvania
Office of Small Business Advocate
555 Walnut Street, 1st Floor
Harrisburg, PA 17101
swebb@pa.gov
(***VIA*** *electronic mail – OneDrive Link*)

Christopher M. Andreoli
Assistant Consumer Advocate
Darryl A. Lawrence
Senior Assistant Consumer Advocate
Harrison W. Breitman
Assistant Consumer Advocate
Office of Consumer Advocate
555 Walnut Street
5th Floor, Forum Place
Harrisburg, PA 17101-1923
candreoli@paoca.org
dlawrence@paoca.org
hbreitman@paoca.org
(***VIA*** *electronic mail – OneDrive Link*)

Lauren A. Gallagher, Esq.
Samantha L. Newell, Esq.
Seven Neshaminy Interplex, Ste. 200
Trevose, PA 19053
lgallagher@rudolphclarke.com
snewell@rudolphclarke.com
Counsel for Upper Gwynedd Township
(***VIA*** *electronic mail – OneDrive Link*)

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E-mail: teresa.harrold@amwater.com

David P. Zambito, Esquire (PA ID 80017)
Jonathan P. Nase, Esquire (PA ID 44003)
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Attorneys for
Pennsylvania-American Water Company