

**ACT 537 SPECIAL STUDY
WASTEWATER CONVEYANCE SYSTEM
CAPACITY ANALYSIS**

for

**WASHINGTON TOWNSHIP MUNICIPAL
AUTHORITY**

WASHINGTON TOWNSHIP, FRANKLIN COUNTY, PENNSYLVANIA

November 2009

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LIST OF ACRONYMS

DEP- Pennsylvania Department of Environmental Protection

MH- Manhole

PENNVEST- Pennsylvania Infrastructure Investment Authority

PHMC- Pennsylvania Historical and Museum Commission

PNDI- Pennsylvania Natural Diversity Inventory

SALDO- Subdivision and Land Development Ordinance

UER- Uniform Environmental Review

WTMA- Washington Township Municipal Authority

GLOSSARY

EDU- Equivalent Dwelling Unit; a dwelling occupied by one family, assumed to use 228.6 gallons per day; or a commercial development with a flow of 228.6 gallons per day.

I/I- Infiltration/Inflow; the penetration of groundwater into sanitary sewer pipes through defective joints, cracks, connections, or manhole walls, and the inflow of rainwater into sanitary sewers through manhole lids, roof leaders, sump pumps, or cleanouts.

Interceptors – Largest sewer lines that convey sewage to the wastewater treatment plant with little to no connections from the collection system.

NPDES- National Pollutant Discharge Elimination System; A provision of the Clean Water Act which prohibits discharge of pollutants into the waters of the United States.

Overflow- When flows exceed the overall sanitary sewer system capacity and sewage is discharged onto the ground or into a body of water.

Peak Flows- Highest flows experienced within the collection system during wet weather events.

Surcharging- When the level of flow within the sanitary sewer system is greater than the existing pipe diameter and flow backs up into the manholes.

Trunk lines- Sewer lines, generally larger than 8 inches in diameter, which intercept collection system sewers and then discharge into interceptors.

WWTP- Wastewater Treatment Plant; A facility that uses a series of tanks and other processes to remove pollutants from water.

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- 1 Hydraulic Analysis Report for Special Study-October 2009

EXECUTIVE SUMMARY

INTRODUCTION

Washington Township Municipal Authority (WTMA) initiated a capacity analysis of its wastewater conveyance system, due to Washington Township's plans for a Route 16 by-pass around the north side of Waynesboro (Washington Township Boulevard/Boulevard), and extensive rezoning of former agricultural land along the Boulevard corridor. Glace Associates, Inc. prepared the first report for WTMA entitled *Sewer Collection Report* dated April 19, 2005. The Glace report identified certain WTMA trunk lines that warranted further study with regards to the adequacy of capacity. As follow-up to the Glace report, in November 2006, CET Engineering Services prepared a draft report titled *System Capacity Analysis*, which focused on the trunk sewers that will serve most of the proposed new development along Washington Township Boulevard, specifically the area of the Township that lies to the east and northeast of the Borough of Waynesboro. CET's 2006 report recommended that certain trunk lines be metered to establish current base flows and peaking factors. In the interim, the Township and Authority have approved additional plans for land development in this area, and developers have submitted several other sketch plans that help define development potential throughout much of the subject service area. This study is a final evaluation of the existing WTMA trunk sewers that begin along Stottlemeyer Road and Country Club Road, join at the intersection of Country Club Road and Scott Drive, and head south along the East Branch of Antietam Creek to the Wastewater Treatment Plant (WWTP).

NEEDS ASSESSMENT

The results of metering and hydraulic modeling performed as part of this Special Study indicate that a sizable portion of the interceptor and study area trunk sewers experience a significant increase in peak flows during extreme wet weather events and these increased flows result in surcharging and the potential for overflows. During such an event, certain reaches of the conveyance system could experience surcharging above the existing in-pipe capacity. The worst bottleneck within the system appears to be experienced in the interceptor just below where the flows from the study area join with the flows from the southeast portion of the system at Welty Road. However, it should be noted that WTMA staff has not observed overflows at this location.

Steps need to be taken in the near future to implement upgrades to WTMA's wastewater conveyance system in order to provide for adequate capacity for approved and planned developments. Based on WTMA's anticipated growth rate of approximately 150 EDUs per year, the additional flow from the planned developments will likely exceed the capacity of several lines in 4 to 6 years. Therefore, it is recommended that the upper and lower interceptor segments, Lines 1- 4, and two runs of Line 5 be replaced in the immediate future so that these upgrades can be completed on pace with approved building construction.

SELECTED APPROACH

Trunk and interceptor capacity upgrades are necessary to address the projected conveyance capacity system needs. Based on the known projected system growth and the existing potential for conveyance system surcharging during extreme wet weather events, a suggested two-phase approach is outlined as follows:

Phase I – Upgrades to handle existing peak wet weather and planned and proposed development flows:

Section	Existing Pipe Size	Replacement Pipe Size	Lineal Feet
Lower Inter.	24"	30"	9,300
Upper Inter.	21"	30"	4,300
Line 1	15"	24"	2,500
Line 2	12"	18" to 24"	3,000
Line 3	10"	15"	4,300
Line 4	8"	15"	1,400
Line 5	10"	18"	800
Total			25,600

Phase II – Additional upgrades to handle future build-out conditions:

Section	Existing Pipe Size	Replacement Pipe Size	Lineal Feet
Line 5	10"	15"	6,500
Line 6	10"	12"	2,200
Line 7	10"	12"	1,400
Total			10,100

The estimated total project costs for the phases are summarized below:

Phase I	\$5,848,000
Phase II	<u>\$2,180,000</u>
	\$8,028,000

WTMA will finance Phase I of the project using existing capital reserves, any grants received, and issuance of a public bond, bank loan, or Pennsylvania Infrastructure Investment Authority (PENNVEST) funding, whichever is most cost effective, to fund the remaining project costs. WTMA intends to apply for grant funding that may be available for the project. The final financing and debt structure will be determined after WTMA receives bids for the project. Sewer user fees and tapping fees will be adjusted as needed to provide adequate revenues to meet the Authority's expenses.

STUDY ADOPTION AND COMMENT PERIOD

The Township will adopt the Act 537 Special Study after the public and planning commissions' responses are received. A copy of the draft resolution is included in Appendix J.

The Special Study will be submitted to the Franklin County Planning Commission and Washington Township Planning Commission for their review and approval once it is reviewed by WTMA and the Washington Township Supervisors. A copy of the submission letters and any comments received will be included as Appendix K. In addition, a public notice indicating the Township Supervisors' intention to adopt the Special Study and announcing the required 30 day public comment period will be published in a local newspaper once it is approved by WTMA. The proof of public notice and any comments received will be included in Appendix L.

IMPLEMENTATION

WTMA intends to authorize Phase I of the Special Study recommendations after this Act 537 Special Study is approved by the Pennsylvania Department of Environmental Protection (DEP). The schedule is as indicated in the tentative schedule outlined below:

<u>Milestone Description</u>	<u>Milestone Date</u>
WTMA Acceptance of Act 537 Special Study (Plan)	November 2009
Preliminary approval of Plan by Washington Township Supervisors	December 2009
Submit Plan to Franklin County Planning Commission/ 30 Day Public Comment Period	December 2009 January 2010
Plan Adoption by Washington Township Supervisors	February 2010
Submit Act 537 Special Study Plan to DEP	February 2010
Receive DEP approval of Act 537 Special Study	June 2010 ⁽¹⁾
Begin Design Phase of Phase I	July 2010
Submit Permit Applications	October 2010
Receive Permits/Approvals	February 2011 ⁽¹⁾
Advertise Project for Bidding for Phase I	February 2011 ⁽²⁾
Receive/Evaluate Bids and Complete Financing	April 2011
Notice to Proceed for Phase I	May 2011
Substantial Completion for Phase I	May 2012
Final Completion	July 2012

Notes:

- (1) DEP dependent.
- (2) Following receipt of all DEP permits.

WTMA will only start design and construction of Phase II as it becomes necessary; therefore, no schedule has been provided for the Phase II of the project.

INTRODUCTION

The Washington Township Municipal Authority (WTMA), on behalf of Washington Township, agreed to conduct an Act 537 Special Study (Special Study) in accordance with the Pennsylvania Sewage Facilities Act of 1966, P.L. 1535, No. 537 as amended and supplemented, generally referred to as “Act 537”, and codified in Chapter 71 of Title 25 adopted August 2, 1971, Sections 71.21 and 71.31, as amended. The purpose of this Special Study is to supplement the Township’s and Authority’s existing Act 537 Plan in order to evaluate the capacity of its wastewater conveyance system in the northeast quadrant of the Township. The capacity of the trunk sewers serving this area, as well as the interceptor sewers downstream of the service area to the WTMA wastewater treatment plant (WWTP), are being evaluated due to the new Route 16 by-pass around the north side of Waynesboro (The Washington Township Boulevard/Boulevard) and the extensive rezoning of former agricultural land along the Boulevard corridor. It is anticipated that the remainder of the Township will not be rezoned. The capacity of the trunk sewers serving the areas outside of this Special Study’s planning area were evaluated based on existing and currently proposed development (with a minor allowance for additional development and infill) to determine the impact of their flows on the main interceptor to the WWTP.

Attached as Appendix A is the Plan of Study and Task Activity Report for this Special Study, which were approved by the Pennsylvania Department of Environmental Protection (DEP) on November 24, 2008. As indicated in the Plan of Study, the primary focus of the Special Study will be on the potential upgrade of a portion of the existing collection/conveyance system; therefore, much of the scope of work typical of Act 537 plans for municipalities is not applicable. As approved by DEP, only the following items from DEP’s Act 537 Plan Content and Environmental Assessment Checklist need to be addressed in this Special Study:

- I. A. Previous Wastewater Planning
- II. A,B,E,F,G. Physical and Demographic Analysis
- III. A. Existing Sewage Facilities in the Planning Area – Identifying the Existing Needs
- IV. A, B. Future Growth and Land Development
- V. A, H. Identify Alternatives to Provide New or Improved Wastewater Disposal Facilities
- VI. A-G. Evaluation of Alternatives
- VII. A-D. Institutional Evaluation
- VIII. A-C. Justification for Selected Alternative

The required portions of the DEP Act 537 Planning Checklist are completed and attached as Appendix B.

1.0 PREVIOUS WASTEWATER PLANNING

WTMA’s latest Official Act 537 Plan was adopted by the Washington Township Board of Supervisors in July 1992 and approved by DEP in September 1992. The current 537 Plan remains in effect. Since the only significant change to the planning area since the 1992 Act 537 Plan Update was prepared is the proposed construction of the Washington Township Boulevard Corridor and the rezoning of the land around the Boulevard, a complete Act 537 Plan Update is not required at this time.

Glance Associates, Inc. previously prepared a report for WTMA entitled *Sewer Collection Report* dated April 19, 2005. The Glance report identified certain WTMA trunk lines that warranted further study with regards to the adequacy of capacity. As a follow-up to the Glance report, CET Engineering Services prepared a report in November 2006 titled *System Capacity Analysis* that focused on the trunk sewers that will serve most of the proposed new development along the Boulevard, specifically the area of the

Township that lies to the east and northeast of the Borough of Waynesboro. A copy of CET's 2006 report is included as Appendix C. CET's 2006 report recommended that certain trunk lines be metered to establish current base flows and peaking factors. Since the 2006 report was prepared, the Township and Authority have approved additional plans for land development in this area, and developers have submitted several other sketch plans that help define development potential throughout much of the subject service area. This proposed Special Study is the final capacity evaluation of the existing WTMA trunk sewers within the study area.

A Special Study addressing the nutrient reduction requirements imposed by Pennsylvania's Chesapeake Bay Tributary Strategy has been completed and was submitted to DEP on July 17, 2009 as an additional supplement to the current Act 537 Plan. This Special Study was approved by DEP on September 30, 2009.

2.0 PHYSICAL AND DEMOGRAPHIC ANALYSIS

The service area of the WTMA's wastewater conveyance system being evaluated under this Special Study consists of the northeast quadrant of Washington Township, Franklin County. The study area has recently been redefined from previous studies due to the construction of the Washington Township Boulevard Corridor, the rezoning of the land around the Boulevard, and ongoing developer submissions. The detailed study area generally extends from the Township boundary to the north, Michaux State Forest to the east, Waynesboro and Route 316 to the west, and Route 16 to the south. The subject trunk sewers convey sewage from the service area to the WTMA WWTP, which is located along the East Branch of Antietam Creek, along Lyons Road south of Waynesboro.

This Special Study includes mapping of the study areas physical characteristics, topography, and wetlands as shown on the Plates included in Attachment 1- Hydraulic Analysis Report for Special Study and Appendix E of this report. The soil types and geologic features of the study area are not relevant to this Special Study since the study only involves the existing conveyance system.

3.0 EXISTING SEWAGE FACILITIES IN THE PLANNING AREA – IDENTIFYING THE EXISTING NEEDS

3.1 Existing Sewer System

WTMA owns and operates the existing collection and conveyance system and WWTP within Washington Township, Franklin County, Pennsylvania. The WWTP currently operates under National Pollutant Discharge Elimination System (NPDES) Permit No. PA 0080225 with a final effluent discharge to the East Branch of Antietam Creek. The original WWTP and collection system was built in 1979; and the WWTP was upgraded/expanded in 1998. There have been numerous additions to the collection system since the original project to serve the expanding development.

The trunk sewers being modeled under this Special Study are the trunk sewers that start at Stottlemeyer Road and Mentzer Gap Road, join at the intersection of Country Club Road and Scott Drive, and head south along East Branch of Antietam Creek. These sewers are labeled as Lines 1 through 7 on Plate 1 included in Attachment 1. The trunk sewers consist of the following:

- Line 1- The trunkline is 15 inches in diameter, approximately 2,500 feet long, and is located between manholes 749 and 931 within Welty Road and along Buchanan Trail (Route 16)
- Line 2- The trunkline is 12 inches in diameter, approximately 3,000 feet long, and is located between manholes 931 and 1045 within Scott Drive between Route 16 and Scott Drive at Country Club Road.
- Line 3- The trunkline is 10 inches in diameter, approximately 4,300 feet long, and is located between manholes 1045 and 1154 between Scott Drive and Country Club Road and along Ivanhoe Drive and Spring Run to Gehr Road.
- Line 4- The trunkline is 8 inches in diameter, approximately 1,400 feet long, and starts at downstream manhole 1154 within Stottlemyer Road and continuing upstream to future Washington Township Boulevard in Johnny Knepper Estates.
- Line 5- The trunkline is 10 inches in diameter, approximately 7,300 feet long, and is located between manholes 1045 and 3020A within Country Club Road.
- Line 6- The trunkline is 10 inches in diameter, approximately 2,200 feet long, and is located between manholes 3020A and 3028 within Country Club Road.
- Line 7- The trunkline is 10 inches in diameter, approximately 1,400 feet long, and is located between manholes 3028 and 4006 within Mentzer Gap Road.

After completing several of the initial modeling scenarios, as described in Attachment 1, it became apparent that the combination of the projected flow increases and the anticipated trunkline improvements would have an impact on the available capacity of the interceptor lines downstream of the initial study area that were not originally considered. Approval was given by WTMA for CET to extend the model from the initial extent of the study area downstream to the WWTP and include these additional lines in the hydraulic analysis. Plate 1 and Appendix D of Attachment 1 highlight the extended service area to include the seven (7) trunklines that were part of the initial study area and the two (2) additional sections of the main interceptor that were added to the overall study. These additional lines are labeled Upper and Lower Interceptor and consist of the following:

- Upper Interceptor- The interceptor is 21 inches in diameter, approximately 4,300 feet long, and is located between manholes 735 and 749.
- Lower Interceptor - The interceptor is 24 inches in diameter, approximately 9,300 feet long, and is located between the WWTP and manhole 735.

WTMA is not aware of any existing overflows within the above wastewater conveyance system and has not been cited for any violations by DEP.

4.0 FUTURE GROWTH AND LAND DEVELOPMENT

4.1 Municipal and County Planning Documents

Washington Township has an existing Subdivision and Land Development Ordinance (SALDO) dated November 2002 and a Zoning Ordinance dated December 2004. All of the proposed developments comply with the existing SALDO and the equivalent dwelling unit (EDU) projections for the undeveloped land used in the modeling conform to the zoning requirements under the existing ordinance. A zoning map of the study area is included as Plate 8 of Attachment 1.

4.2 Projected Growth

During 2004 and 2005, the Washington Township Supervisors approved a new roadway within the service area, the Washington Township Boulevard, and rezoned the property adjacent to the proposed roadway from agricultural to residential and commercial uses. Developers quickly purchased many of the rezoned farms. Therefore, much potential for future growth exists within the study area. Several subdivision and land development plans have been approved within the study area over the past several years. In addition, Washington Township has received sketch plans for the proposed development of additional properties within the study area. WTMA has also had ongoing dialogue with the Township to acquire updated EDU projections and land development projections for those properties within the Special Study service area. These properties are shown in Plates 5 and 6 of Attachment 1. A table listing all of the existing and proposed developments with remaining or new EDUs is included in Appendix D.

All remaining undeveloped properties are shown in Plates 5 and 6 of Attachment 1. The potential wastewater flows from the developable lands were projected by analyzing the Township and County planning documents, zoning, and allowable lot sizes. Potential EDUs for these properties were developed using the property's size and the current zoning. A table listing all of the undeveloped land is included in Appendix D, along with Plate D-1, which shows all parcels in the tables and their Parcel ID numbers.

The WTMA's records show that approximately 100 EDUs per year were connected to the sanitary sewer system over the past three years. WTMA's Chapter 94 report is projecting a future growth rate of 150 EDUs per year. The number of total potential EDUs to be served by the modeled sewers within the service area, based on approved developments, sketch plans, and the zoning of undeveloped land, is approximately 5,110 EDUs. However, due to the current down-turn in the housing market, it is uncertain when the service area will be built-out.

5.0 ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER TREATMENT FACILITIES

5.1 Conventional Collection, Conveyance, Treatment and Discharge Alternatives

As previously discussed, the treatment of the existing and proposed flows was evaluated in a previous Special Study approved to DEP on September 30, 2009 and is not part of this Special Study.

WTMA's wastewater conveyance system was evaluated as presented in Attachment 1 to this report. This evaluation describes the modeling and assessment performed to determine which trunklines need to be upgraded and when. The model results highlight that a sizable portion of the trunklines/interceptors within the study area could experience a significant increase in peak flows during extreme wet weather events, resulting in surcharging and the potential for overflows. During such an event, the model indicates portions of the conveyance system could experience surcharging above the existing in-pipe capacity and that potential overflows may be experienced in the flattest runs of the Upper Interceptor, just below where the flows from the study area join with the flows from the southeast portion of the system at Welty Road. These restricting sections are presented on the system map provided as Plate 2 in Attachment 1. WTMA staff has not observed overflows at any locations within the subject trunk sewers, and they are planning to meter the Upper Interceptor to determine whether the model results can be verified.

Attachment 1 developed improvement recommendations for addressing restricting sections under multiple scenarios. The following is a recommendation of estimated pipe sizes needed to convey the projected peak future flows for the study area under build-out conditions:

Section	Existing Pipe Size	Replacement Pipe Size	Approx. Lineal Feet
Lower Inter.	24"	30"	9,300
Upper Inter.	21"	30"	4,300
Line 1	15"	24"	2,500
Line 2	12"	18" to 24"	3,000
Line 3	10"	15"	4,300
Line 4	8"	15"	1,400
Line 5	10"	15" to 18"	7,300
Line 6	10"	12"	2,200
Line 7	10"	12"	1,400

Steps need to be taken in the near future to implement upgrades to the system in order to provide for adequate wastewater conveyance capacity for the approved and planned development growth. Based on WTMA's anticipated growth rate, the additional flow from the planned EDUs will likely exceed the capacity of certain segments of the conveyance system in 4 to 6 years. Therefore, it is recommended that the upper and lower interceptor segments, Lines 1- 4, and the first two runs of Line 5 be considered for upgrades in the immediate future (within 5 years) so that these upgrades can be completed on pace with approved building construction.

WTMA should consider the feasibility of installing a parallel trunk sewer to Line 1 along the East Branch of the Antietam Creek, south of Route 16 instead of replacing the existing trunkline with a larger pipe as shown in Figure IX-1 of Attachment 1. Constructing a parallel trunk would create a straighter path for the majority of the flows north of Route 16 that are tributary to this Line 1 and would also reduce the flow restriction at manhole 749 where the flows from the Amsterdam Road trunkline combine with Line 1.

WTMA should also consider revising the current flow monitoring and infiltration/inflow (I/I) program and consider purchasing additional wastewater flow meters for permanent and temporary installations to get a better handle on when Phase II will be required as discussed in Attachment 1.

5.2 No-Action Alternative

Based on current meter data, the size of the existing facilities, and anticipated future flows, the no-action alternative is not a viable alternative for WTMA since many of the existing trunklines may already be surcharging under wet weather conditions and it is WTMA's intention to accept the flows from new development. Without expanding the existing facilities, overflows will likely occur throughout the trunklines under various future flow conditions. Not accepting the new development is not practical since many new developments have already been approved by WTMA and Washington Township.

6.0 EVALUATION OF ALTERNATIVES

6.1 Consistency Determinations

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

The following sections discuss the eleven categories under the consistency analysis. Consistency analyses were performed for only those components related to this Special Study. Based on the following, it appears that the selected approach is consistent with the criteria.

6.1.1 Clean Streams Law/ Clean Water Act

Sections 4 and 5 of the Clean Streams Law require that consideration be given to water quality management and pollution control in a watershed as a whole. Section 208 of the Clean Water Act calls for the development of plans that identify the facilities necessary to meet anticipated municipal and industrial waste treatment needs. This Special Study is consistent with the Clean Streams Law since it addresses WTMA's ability to meet future capacity needs.

6.1.2 Municipal Wasteload Management Plans

WTMA submits a Chapter 94 Municipal Wasteload Management Report to DEP for its WWTP annually. The proposed Boulevard construction is discussed in WTMA's 2007 and 2008 Chapter 94 Reports. The future flow projections provided in Section 4 of this Special Study are consistent with the projections provided in the Chapter 94 Report. WTMA is not under any DEP imposed Corrective Action Plans.

6.1.3 Title II of the Clean Water Act

Title II of the Clean Water Act requires the development and implementation of wastewater treatment management plans and practices which provide the application of the best practical waste treatment technology before discharging into receiving waters. The selected approach in this study does not propose any new discharges to receiving waters and is; therefore, consistent with this act.

6.1.4 Comprehensive Planning

Washington Township and Waynesboro Borough recently adopted a Joint Comprehensive Plan. The plan is posted on Washington Township's website. The population projections developed for this study and the proposed alternatives are consistent with the Joint Comprehensive Plan.

6.1.5 Antidegradation Requirements

Chapters 93 and 95 under Pennsylvania's Clean Stream Law classifies all surface waters according to uses to be protected and establishes water quality criteria which need to be maintained in the surface waters. No new surface water discharges are proposed under this Special Study.

Chapter 102 requires a soil erosion and sedimentation control plan to be prepared and followed for any construction activity impacting greater than one acre. Before construction begins for either phase, an erosion and sedimentation control plan will be prepared and approved by the appropriate agency.

6.1.6 State Water Plans

The Water Resources Planning Act required water plans to be prepared for all major watersheds within Pennsylvania. WTMA is located within the Potomac River Basin Subbasin Number 13, Watershed C-Conococheague - Antietam Creeks. No new surface water discharges are proposed under this Special Study; therefore, the selected approach is consistent with the state water plan.

6.1.7 Prime Agricultural Land Policy

The Prime Agricultural Land Policy was established to protect prime agricultural land from irreversible conversions to uses that result in the loss of the land as an environmental or essential food source resource. The map included in Appendix E shows the soils that are considered prime agricultural soils within Washington Township. As can be seen on the map, the majority of Washington Township consists of prime agricultural soils. However; the selected approach is consistent with the Prime Agricultural Land Policy by not promoting new public sewer service in designated agricultural areas.

6.1.8 County Stormwater Management Plans

Franklin County does not have a county-wide stormwater management plan; therefore, no conflict exists.

6.1.9 Wetlands

Areas classified as wetlands are shown on the portion of the US Fish and Wildlife Service National Wetlands Inventory map included in Appendix F. None of the future sanitary sewer construction appears to directly impact a wetland; however, some of the sewers appear to be adjacent to a couple of existing wetlands since the existing interceptors follow streams in some locations. A wetlands delineation will be performed as part of the design for each phase of the project and any permits required will be obtained prior to construction. It should be noted, that all of the sewer replacement is anticipated in the same location of existing sanitary sewers.

6.1.10 Protection of Rare, Endangered or Threatened Plant and Animal Species

A search of the Pennsylvania Natural Diversity Inventory (PNDI) electronic database was done for Phase I of the project. A PNDI search for Phase II will be completed during the design phase of Phase II. The PNDI Project Environmental Review Receipts for Phase I indicate that there are no known impacts to threatened and endangered species and/or special concern species and resources for the existing sanitary sewers being replaced in the same location. The PNDI search for the proposed alternate route indicated that if a new sanitary sewer line is constructed to parallel a portion of the existing sewer, avoidance measures will need to be taken. The avoidance measures include maintaining a 100-foot buffer between the proposed sanitary sewer activity and any spring seeps, sinkholes, and caves. As discussed in section 6.1.11 below, the alternate route is no longer being considered. The PNDI Project Environmental Review Receipts are enclosed as Appendix G.

6.1.11 Historical and Archaeological Resource Protection

CET sent a cultural resource notice request to the Pennsylvania Historical and Museum Commission (PHMC) on September 4, 2009 requesting information on any actual/potential adverse effects from WTMA replacing approximately 25,600 feet of its existing sanitary sewer. The request indicated that the Authority is considering two separate options; to replace all of the 25,600 feet of sanitary sewer in the same location or to parallel with a new route and replace the remaining length of sewer in the same location (as shown in Figure IX-1 of Attachment 1 and as shown on the map provided with the cultural resource notice request included in Appendix G). PHMC responded on September 15, 2009 by indicating that there are significant archaeological sites located in or near the project area and that a Phase I archaeological survey is required. A copy of PHMC's response is included in Appendix G. During a subsequent phone call to PHMC, PHMC indicated that a Phase 1 archaeological survey will only be required for those areas of the project where the sanitary sewer is not being replaced in the same location as the existing pipe and then only when the new location is outside of an existing street. Therefore, the Phase 1 archaeological survey is only required if the potential new route is selected. The Authority has since eliminated the potential new route from further consideration and will replace the existing sanitary sewer in the same location; as a result, a Phase 1 archaeological survey is no longer required.

6.2 Resolution of Inconsistencies

Based on the above analyses, it does not appear that there are any inconsistencies, during the planning phase, between the selected approach and the policies of the Commonwealth of Pennsylvania.

6.3 Evaluation with Respect to Applicable Standards

The selected approach does not appear to conflict with any applicable water quality standards or any other technical, legislative or legal requirements required by DEP or WTMA.

6.4 Estimated Project Costs and Present Worth Analysis

The total estimated project costs to address the upgrades needed in the entire study area at build-out conditions are approximately \$8,028,000. This estimate is in 2009 dollars. A detailed breakdown of the costs is included in Appendix H.

Section	Downstream MH to Upstream MH	Alt. MH Numbering	Length (ft)	Replacement Pipe Size	Estimated ⁽¹⁾ Project Cost
Lower Interceptor	0-1-735	0-1-1030	9,345	30	\$2,265,200
Upper Interceptor	735-749	1030-1043	4,343	30	\$876,400
Line 1	749-931	1044-1054	2,484	24	\$770,600
Line 2	913-1045	1054-1064	2,984	18-24	\$586,500
Line 3	1045-1154	1064-5016	4,254	15	\$876,700
Line 4	1154-1101	5016-5022	1,436	15	\$355,600
Line 5	1045-3020A	1064-1087	7,336	15-18	\$1,734,300
Line 6	3020A-3028	1087-1097	2,196	12	\$349,600
Line 7	3028-4006	1097-1103	1,362	12	\$213,000
TOTAL			35,267		\$8,027,900

Notes:

(1) Estimated Project Costs includes 15% contingencies and another 15% for additional project costs including engineering, legal, admin, construction inspection, etc.

6.5 Funding Method Analysis

WTMA will finance Phase I of the project using any grants received, and issuance of a public bond, bank loan, or Pennsylvania Infrastructure Investment Authority (PENNVEST) funding, whichever is most cost effective, to fund the project costs. If PENNVEST funding is available and determined to be a competitive offer, a Uniform Environmental Review (UER) and all other requirements of PENNVEST will be performed and submitted to DEP at a later date. WTMA also intends to apply for any grant funding that may be available for the project. The final financing will be determined after WTMA receives bids for the project.

The WTMA's current sewer user rates are \$69.62 per quarter per EDU. After additional borrowing needs are determined for this project and the WWTP Upgrade Project proposed under the Nutrient Removal Alternatives Act 537 Special Study, WTMA will revise its user rates. In addition, WTMA will update its tapping fees periodically, in accordance with Act 57, to include eligible costs associated with the conveyance system upgrades and the WWTP upgrades.

6.6 Phased Implementation Analysis

Although a significant portion of the recommended upgrades are necessary to provide adequate capacity for existing, approved and currently proposed development, it is feasible to phase out a portion of the project corresponding to the actual growth demand. Based on the projected system growth and the existing potential for significant surcharging during extreme wet weather events, a two-phase approach is suggested as outlined below:

Phase I – Upgrades to handle existing peak wet weather and planned and proposed development flows:

Section	Existing Pipe Size	Replacement Pipe Size	Lineal Feet
Lower Inter.	24"	30"	9,300
Upper Inter.	21"	30"	4,300
Line 1	15"	24"	2,500
Line 2	12"	18" to 24"	3,000
Line 3	10"	15"	4,300
Line 4	8"	15"	1,400
Line 5	10"	18"	800
Total			25,600

Phase II – Additional upgrades to handle future build-out conditions:

Section	Existing Pipe Size	Replacement Pipe Size	Lineal Feet
Line 5	10"	15"	6,500
Line 6	10"	12"	2,200
Line 7	10"	12"	1,400
Total			10,100

While it is only recommended that Phase I be implemented at this time, the sanitary sewers being replaced should be sized so that they are able to adequately convey the ultimate projected peak flows for build out conditions. Phase II should be implemented as the service area builds out.

Based on the table in Section 6.4 of this report and as shown in Appendix H, the total project costs of Phase I are estimated at \$5,848,000 and the total project costs for Phase II are estimated at \$2,180,000.

6.7 Evaluation of Legal Authority for Implementation

WTMA has the existing administrative organizations and legal authority in place to implement the recommendations of this Special Study.

7.0 INSTITUTIONAL EVALUATION

WTMA is and will continue to be the owner and operator of the existing collection and conveyance system. WTMA is the institution through which the projects will be designed, financed, constructed, owned and operated. WTMA has the resources, including staff, certified personnel, facilities ownership, etc. to remain as the legal entity to provide comprehensive wastewater services for its service area. The replacement facilities will be constructed in either public streets or utility easements obtained during the original construction. WTMA has the ability to incur debt for construction of facilities and is the purveyor of capital projects. In addition, WTMA has the ability to set user fees and negotiate agreements with other parties. A copy of WTMA's latest sewer budget illustrating the 2009-2010 projected revenues and expenses are included in Appendix I.

8.0 IMPLEMENTATION SCHEDULE AND JUSTIFICATION FOR SELECTED ALTERNATIVE

8.1 Identification of Selected Collection/Conveyance Alternative

The majority of the trunkline and intercepting sewers that were evaluated in this study need upgraded to be able to convey the projected peak flows. WTMA plans to implement the Phase I project to accommodate the existing, planned, and proposed development by installing larger sewers in the existing trench. WTMA will proceed with Phase II of the project if and when the future development warrants.

8.2 Implementation Schedule for Recommended Plan

WTMA will be implementing Phase I of the Special Study recommendations as indicated in the tentative schedule outlined below.

<u>Milestone Description</u>	<u>Milestone Date</u>
WTMA Acceptance of Act 537 Special Study (Plan)	November 2009
Preliminary approval of Plan by Washington Township Supervisors	December 2009
Submit Plan to Franklin County Planning Commission/ 30 Day Public Comment Period	December 2009 January 2010
Plan Adoption by Washington Township Supervisors	February 2010
Submit Act 537 Special Study Plan to DEP	February 2010
Receive DEP approval of Act 537 Special Study	June 2010 ⁽¹⁾
Begin Design Phase of Phase I	July 2010
Submit Permit Applications	October 2010
Receive Permits/Approvals	February 2011 ⁽¹⁾
Advertise Project for Bidding for Phase I	February 2011 ⁽²⁾

Receive/Evaluate Bids and Complete Financing	April 2011
Notice to Proceed for Phase I	May 2011
Substantial Completion for Phase I	May 2012
Final Completion	July 2012

Notes:

- (1) DEP dependent.
- (2) Following receipt of all DEP permits.

WTMA currently proposes to implement the Special Study recommendations as indicated above. The proposed dates are contingent on WTMA receiving the necessary permits and approvals from the Department as anticipated; therefore, WTMA reserves the right to revise the schedule if any of the permits are received at a later date. In addition, WTMA will only start design and construction of Phase II as it becomes necessary; therefore, no schedule has been provided for the Phase II of the project.