FRANCONIA TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

DRAFT

ACT 537 PLAN REVISION: SPECIAL STUDY FOR MORWOOD AREA

PREPARED IN ACCORDANCE WITH
PA ACT 537 AND LATER REVISIONS
AND PADEP CHAPTER 71

APRIL 2016

S C Engineers, Inc.
P.O. Box 407
Fort Washington, PA 19034
(215) 836-9912

TABLE OF CONTENTS

		Page No.
1.0	PLAN SUMMARY	1-1
2.0	PREVIOUS WASTEWATER PLANNING	2-1
3.0	PHYSICAL AND DEMOGRAPHIC ANALYSIS	
3.1	Planning Area	3-1
3.2	Physical Characteristics	3-2
3.3	Population	3-4
3.4	Land Use	3-4
4.0	EXISTING SEWERAGE FACILITIES	
4.1	Sewerage Agencies	4-1
4.2	Public Sewer System	4-1
4.2.1	Wastewater Treatment Plant	4-2
4.2.2	Sewer System	4-3
4.2.3	Pumping Station	4-4
4.3	On-Lot Disposal Systems	4-6
4.3.1	Analysis of Existing Systems	4-6
4.3.2	Determination of Needs	4-6
5.0	ASSESSMENT OF GROWTH AND FUTURE FLOWS	
5.1	Current Flows	5-1
5.2	Wastewater Flow Projections	5-2
6.0	IDENTIFICATION AND EVALUATION OF ALTERNATIVES	
6.1	No Action Alternative	6-1
6.2	Public Sewerage Service	6-3
6.2.1	Collector Sewer System	6-3
6.2.2	Wastewater Treatment	6-4
6.2.3	Conveyance System	6-6
6.3	Evaluation of Sewerage Alternatives	6-8
7.0	DESCRIPTION OF SELECTED PLAN	
7.1	Plan Summary	7-1
7.2	Consistency Determinations	7-2
7.3	Anticipated Implementation Schedule	7-3
7.4	Capital Financing Plan	7-3
8.0	INSTITUTIONAL ARRANGEMENTS	8-1

TABLE OF CONTENTS
(continued)

APPENDICES

Appendix A	Cost Estimates for Township Act 537 Planning Committee Meetings
Appendix B	Documentation related to Adoption of Act 537 Plan Revision
Appendix C	Montgomery County Agency Reviews
Appendix D	Consistency Documentation
Appendix E	Comments and Responses

TABLES

Table 6-1	Alternative Conveyance Routes
Table 6-2	Pumping Station Design Flow Criteria
Table 6-3	Summary of Proposed Sewer System Project

FIGURES

Figure 3-1	Planning Area
Figure 3-2	Wetlands in Morwood Area
Figure 3-3	Wetlands in Gerhart Lane Area
Figure 3-4	Demographic History
Figure 3-5	Zoning Map
Figure 4-1	Franconia Sewer System in Telford District
Figure 4-2	Franconia Sewer System in Lower Skippack District
Figure 5-1	Franconia Flows to Telford WWTP
Figure 5-2	Flows to Franconia WWTP
Figure 5-3	Earlington Pumping Station Flows
Figure 5-4	Godshall Road Pumping Station Flows
Figure 5-5	Allentown Road Pumping Station Flows
Figure 6-1	Proposed Sewer System Location Map

1 PLAN SUMMARY

Franconia Township prepared their current and official *Act 537 Plan* for wastewater management in August 2004. This plan did not anticipate that public sewerage would be provided within 10 years in the lower sections (west of the PA Turnpike Northeast Extension) of the East Branch Perkiomen and Indian Creek basins. However, the plan did identify problems with on-lot disposal systems (OLDS) in the village of Morwood, among other locations. The 2004 *Act 537 Plan* recommended that an on-lot management program be implemented throughout the Township, although first priority would be given to the Perkiomen Creek basin, specifically the villages Earlington and Morwood.

The on-lot management program confirmed concentrated areas of OLDS malfunctions and recommended that public sewer service be provided. Accordingly, Franconia Township has undertaken planning to determine the best technical and economic means of providing sewer service to the affected areas described herein.

After identification and evaluation of alternatives, Franconia Township has selected a plan that proposes the following sewer system components:

- Collector sewers will be installed in four sections of the planning area. Pressure sewers will be installed in the collection areas of (a) Morwood village, (b) Gerhart Lane area and (c) Allentown Road, between Indian Creek Road and PA Route 113. Gravity sewers will be installed in Rittenhouse Place flowing to and along Indian Creek Road to the existing gravity sewer in Godshall Road. Pressure sewers will also be used to convey the collected wastewater to the discharge points.
- Conveyance sewers will discharge flows from (a) Morwood village to and along Creamery Road to the existing Earlington sewers and pumping station and ultimately to the Telford WWTP, and (b) Gerhart Lane area to and along Hunsicker Road to the proposed Morwood collector sewers.
- The existing Earlington, Godshall Road and Allentown Road pumping stations will need to be upgraded and the capacity increased as part of this project.

The proposed sewers have an estimated total project cost of $9.5 million. These costs can be allocated to the users at an assessment of roughly $36,000 per dwelling unit. Details of the proposed sewers are presented in Table 6-3 herein.

The planning efforts described in this report were conducted under the guidelines and approval of the Pennsylvania Department of Environmental Protection. This report is intended to supplement the Township's official *Act 537 Plan* and does not include information on items, which are included in and have not changed from that plan.

2 PREVIOUS WASTEWATER PLANNING

Several past wastewater management plans have been prepared for Franconia Township over the years. The following plans are relevant to the current planning for the Perkiomen and Indian Creek basins of Franconia Township.

Act 537 Plan Revision for Franconia Township, prepared by SC Engineers, August 2004

The report was prepared in accordance with PA Act 537 requirements for the entire Township of Franconia and represents the current and official plan for wastewater management in Franconia Township. The selected plan also called for various projects throughout the Township. The plan identified two projects with reference to the Perkiomen Creek basin of the Township:

❶ **Implementation of an on-lot disposal management program** (a) on, at least, an interim basis for the villages of Earlington and Morwood and (b) on a longer term basis for the remainder of the Township. The on-lot disposal management program will be initiated in the Earlington/Morwood villages and will be assessed after completion of inspections in that area.

❷ **Reassessment of on-lot disposal management program in Earlington and Morwood.** In the absence of development pressures, there is no immediate need to provide a public sewerage system to serve the approximately 280 existing residences. As indicated in item l, it is anticipated that an aggressive on-lot disposal management program will eliminate or, at least, reduce current concerns. However, the effectiveness of the program should be evaluated after the house inspections have been completed and the gathered data has been analyzed. Major rehabilitation of existing OLDS will not be required until after the reassessment has been completed. If necessary, the Township can reassess the installation of gravity and/or low-pressure sewers, which would discharge to either a new wastewater treatment plant (WWTP) on the Perkiomen Creek or the existing Telford WWTP.

This plan was approved by the Pennsylvania Department of Environmental Protection (PADEP) in a letter dated December 14, 2004. In the letter, the PADEP conditioned the approval on the stipulation that "upon completion of the assessment of the on-lot systems in Morwood and Earlington, Franconia Township must submit additional sewage facilities planning to provide for any needs in the villages that have not been addressed by the Township's sewage management program."

Sewage Management Program- Quadrant I Report, prepared by Schoor DePalma Engineers, January 2006

This report presented the results of inspections of on-lot disposal systems (OLDS) in the Perkiomen Creek basin of Franconia Township, including roughly 665 existing residents. The report identified concentrations of areas in Earlington and Morwood with confirmed or suspected malfunctioning OLDS.

Component 3m Planning Module for Minor Act 537 Update Revision for Earlington Village, prepared by SC Engineers, December 2006

This module was prepared to provide public sewerage in the village of Earlington in Franconia Township, including roughly 180 existing residents centered on Allentown and Morwood Roads. The proposed project would include three basic sewerage components.

- **Collector Sewers** in Allentown, Morwood, Rising Sun and Godshall Roads, and Sunset Lane in Franconia Township.
- **Pumping Station** on Allentown Road, near the East Branch Perkiomen Creek, serving the village of Earlington and 313 dwelling units in the Tylersport area of Salford Township. The station would have discharge through a force main to the pre-existing Godshall Road pumping station and ultimately to the Telford WWTP.
- **Godshall Road Pumping Station upgrading** as necessary, to accommodate the projected flows from the village of Earlington in Franconia Township and the Tylersport area of Salford Township.

This plan was ultimately approved by the PADEP in a letter dated February 13, 2008. The proposed sewerage system in the village of Earlington was constructed in 2009.

Sewage Management Program- Phase III Report, prepared by Schoor DePalma Engineers, March 2008

This report presented the results of inspections of on-lot disposal systems (OLDS) in the Indian Creek basin of Franconia Township, including roughly 323 existing residents. The report identified a concentration of confirmed or suspected malfunctioning OLDS along Allentown Road, between Harleysville Pike (PA Route 113) and Indian Creek Road.

The preceding reports provide a basis of reference for this current planning study. This report is intended to supplement the Township's official *Act 537 Plan* and does not include information on items, which are included in and have not changed from that plan.

Although the Township chose not to install sewers in Morwood at the same time as Earlington, the Township has continued in recent years to investigate alternative means to provide service. Planning for sewer service in the village of Morwood dates as far back as the early 1970s. The difficulty in providing service, then and now, has been the financial affordability of sewer service, due largely to the remote location of Morwood village.

3 PHYSICAL AND DEMOGRAPHIC ANALYSIS

3.1 PLANNING AREA

Franconia Township includes roughly 14 square miles located in central Montgomery County, Pennsylvania, surrounding the Boroughs of Souderton and Telford, as was shown on the Location Map (Figure 3-1) in the prior 2004 *Act 537 Plan*. There are three primary drainage basins in Franconia Township: (1) East Branch Perkiomen Creek, (2) Indian Creek and (3) Skippack Creek. The 2004 *Act 537 Plan* divided the Township into five study areas, which were delineated according to the three primary drainage basins and further subdivided according to existing sewerage service areas.

The village of Morwood is located in one of the last remaining rural portions of the Township, and continues to rely on on-lot disposal systems (OLDS) for wastewater handling. There have been historic concerns expressed by regulatory agencies with malfunctions of OLDS in the Township. The concerns with the conventional subsurface septic systems are primarily related to the unsuitability of the soils in the vast majority of the Township. The concerns are compounded by the relatively small lots in the village.

The primary impetus for this planning is to study sanitary sewerage service extension to the village of Morwood. However, the planning includes three other relatively small areas in the vicinity of Morwood. The first two of the four potential service sections in the planning area are located on the west side of the PA Turnpike Northeast Extension, while the latter two are on the east side. The four potential service sections in the planning area are shown in Figure 3-1 and may be generally described as follows:

1. **Morwood village** is centered at Morwood and Keller Creamery Roads and is located in the drainage basin of the East Branch Perkiomen Creek. The planning area includes 136 properties along the following road segments:
   (a) Morwood Road, between Hunsicker and Fell Roads,
   (b) Keller Creamery Road, between Morwood Road and Hunsicker Road,
   (c) Ridgeview Drive,
   (d) Camp Road, between Morwood Road and Branchwood Park,
   (e) Landis Road,
   (f) Alycia Lane,
   (g) Creamery Road, between Landis and Morwood Roads, and
   (h) Hunsicker Road, between Morwood and Heath Roads.

2. **Gerhart Lane area** is also located on the west side of the PA Turnpike and in the drainage basin of the Indian Creek. The planning area includes 63 properties along the following road segments:
   (a) Gerhart Lane,
   (b) Keller Creamery Road, between Hunsicker Road and the Indian Creek,
   (c) Eisenhauer Drive, and
   (d) Crestwood Drive.

3. **Allentown Road**, between Indian Creek Road and existing pumping station near Harleysville Pike (PA Route 113), including 32 properties, is also located in the planning area. This section of road is on the east side of the PA Turnpike and in the drainage basin of the Indian Creek.

4. **Rittenhouse Place**, near Indian Creek Road and Godshall Road, including 14 properties, is also located in the planning area. This road is on the east side of the PA Turnpike and in the drainage basin of the Indian Creek.

As indicated above, the planning area for this Act 537 Plan revision includes portions of the following sub-basins of Franconia Township, which are located in the northeastern quadrant of Franconia Township, north of PA Route 113 and on either side of the PA Turnpike Northeast Extension:

- **East Branch Perkiomen Creek basin** is generally located north of Morwood Road. The planning area for this study specifically includes the village of Morwood, which is centered at Morwood, Creamery, Keller Creamery and Camp Roads, and vicinity.

- **lower Indian Creek basin** is generally located west of Godshall Road between Morwood Road on the north and PA Route 113 on the south. The planning specifically includes (1) the residential area centered at Gerhart Lane and Keller Creamery Road, (2) Allentown Road, between Harleysville Pike (PA Route 113) and Indian Creek Road, and (3) Rittenhouse Place, at Indian Creek Road.

The various planning areas of Franconia Township were delineated in Exhibit 3-1 of the prior Township-wide *Act 537 Plan*, prepared in 2004. The preceding two sub-basins from the 2004 *Act 537 Plan* comprise the planning area for this study, as delineated in Figure 3-1 herein. An aerial view of the planning area is shown in Figure 3-1, contained herein.

3.2 PHYSICAL CHARACTERISTICS

Relevant information pertaining to physical characteristics, such as drainage basins, soils, topography, flood plains and wetlands, were presented in the 2004 *Act 537 Plan*.

3.2.1 Drainage Basins

As shown in the 2004 *Act 537 Plan*, the following stream basins encompass Franconia Township:

	Approx. Area	
Drainage Basin	(acres)	(% Total)
East Branch Perkiomen Creek	1,390	15.5%
Indian Creek	2,970	33.2%
Skippack Creek	4,300	48.0%
West Branch Neshaminy Creek	290	3.3%
Township Totals	**8,950**	**100%**

3.2.2 Soils

Soils within Franconia Township were mapped in Exhibit 3-3 in the 2004 *Act 537 Plan*. There are two general soil associations within Franconia Township:

Soil Association	Drainage Basin
Reaville-Penn-Klinesville	Perkiomen Creek, Indian Creek, and lower Skippack Creek
Abbotstown-Readington-Croton	upper Skippack Creek

- **Reaville-Penn-Klinesville** association soils, which are located in the planning area of this study, are shallow to moderately deep, well-drained to somewhat poorly soils underlain by shale. The soils are generally located on rolling uplands. The major soils are reddish brown, having developed in material weathered from red shale and been influenced by lime.

The large majority of these soils have severe limitations for on-lot disposal systems (OLDS).

3.2.3 Public Water Supply

Franconia Township is a member municipality of the North Penn Water Authority (NPWA). The NPWA provides public water supply in Franconia Township. The NPWA has not yet extended water supply mains in the village of Morwood, or the Gerhart Lane residential area. These sections of the planning area are served by private wells.

3.2.4 Wetlands

Wetlands within Franconia Township were mapped in Exhibit 3-2 in the 2004 *Act 537 Plan*. The wetlands mapping is based on the generalized delineation prepared by the US Department of Agriculture in the national inventory. The wetlands within (1) Morwood village and (2) Gerhart Lane sections of the planning area are specifically shown in Figures 3-2 and 3-3 herein, respectively.

National Wetlands Inventory indicates that the only wetlands in the vicinity of Morwood village are located along the East Branch Perkiomen Creek, while there are no wetlands in the vicinity of (a) Gerhart Lane, (b) Allentown Road, or (c) Rittenhouse Place areas. It does not appear that there any wetlands that would be impacted by any sewer construction. However, as will be described later, a more detailed wetlands delineation will be prepared for proposed sanitary sewer mains when the projects are in the design phase.

3.3 POPULATION

Population data for Franconia Township, including (a) historic data determined by the U.S. Census Bureau and (b) population projections estimated by the Delaware Valley Regional Planning Commission (DVRPC), are summarized as follows:

Year	Population (persons)		Housing Units (DU)	Household Size (person/DU)
1970	5,245		1,423	3.69
1980	6,545		2,031	3.22
1990	7,189		2,319	3.10
2000	11,523		4,236	2.72
2010	13,064		4,801	2.72
	DVRPC	MCPC		
2020	13,902	15,906		
2030	16,368	18,044		
2040	17,656			

The population determined by the U.S. Bureau of Census in 2000 indicated that Franconia Township was the 4th fastest growing of the 62 municipalities in Montgomery County at that time. Growth within the Township has slowed in the last decade with Franconia ranking 14th of the 62 municipalities in Montgomery County.

Past and projected demographic data are charted in Figure 3-4. Projections of population growth were prepared by both the (a) Delaware Valley Regional Planning Commission (DVRPC) in January 2012 and (b) Montgomery County Planning Commission (MCPC) in July 2011. These projections of future population differ slightly, but both anticipate that development in Franconia Township will continue for the foreseeable future. As shown in Figure 3-4, the projections by the MCPC are greater than those by the DVRPC.

3.4 LAND USE

Franconia Township has traditionally had an agricultural setting with the four villages of Franconia, Elroy, Earlington and Morwood contained therein. In the last twenty years though, there has been a transition to more of a suburban community. Significant housing development has occurred and continues to take place. However, there are still large portions of the Township that maintain the rural, farmland character. The challenge to Franconia Township has been to manage the growth while providing for the public health of the community through wastewater facilities management.

Existing land use in Franconia Township is regulated by the current zoning ordinance. Land use and zoning for the Township was presented in the 2004 *Act 537 Plan*. Significant changes in land use since 1994 are summarized as follows:

	Area of Township (% Total)		
Land Use	1994	2001	2013
Residential	37.7%		
Single Family Detached		26.1%	30.1%
Commercial	1.8%		
Industrial	2.3%		
Institutional	2.5%	3.5%	8.8%
Agricultural, Vacant	49.5%	37.3%	31.9%
Miscellaneous	6.2%		
Township Total	100.0%		

Source: *Indian Valley Regional Comprehensive Plan*, Draft January 2015

Franconia saw an increase in land devoted to single family detached housing and, conversely, a large decrease in the land devoted to agriculture. This was likely due to development pressure during the end of the last housing boom and prior to the most recent recession. Another significant change included an increase in institutional land use that can be partly attributed to the construction of the new Souderton Area High School.

Current zoning within the planning area of the Township has not changed from the time of the 2004 Township-wide Act 537 Plan and is shown in Figure 3-5. The zoning within the study area provides for:

Designation	Land Use	Min. Lot Size
R-130	Residential	35,000 sq. ft.
R-200	Residential	12,000 sq. ft.
C	Commercial	
LI	Limited Industrial	
REC	Recreational	

The residential areas in the village of Morwood are zoned R-200 and generally contain smaller lots. The Gerhart Lane area is zoned R-130, as is the section of Allentown Road contained in this planning area.

Franconia Township has taken extensive steps toward preserving open space in the Township. The preserved land in the vicinity of the planning area is shown in Figure 3-5. As is shown therein, there are large areas of preserved land in the lower Indian Creek basin of the Township.

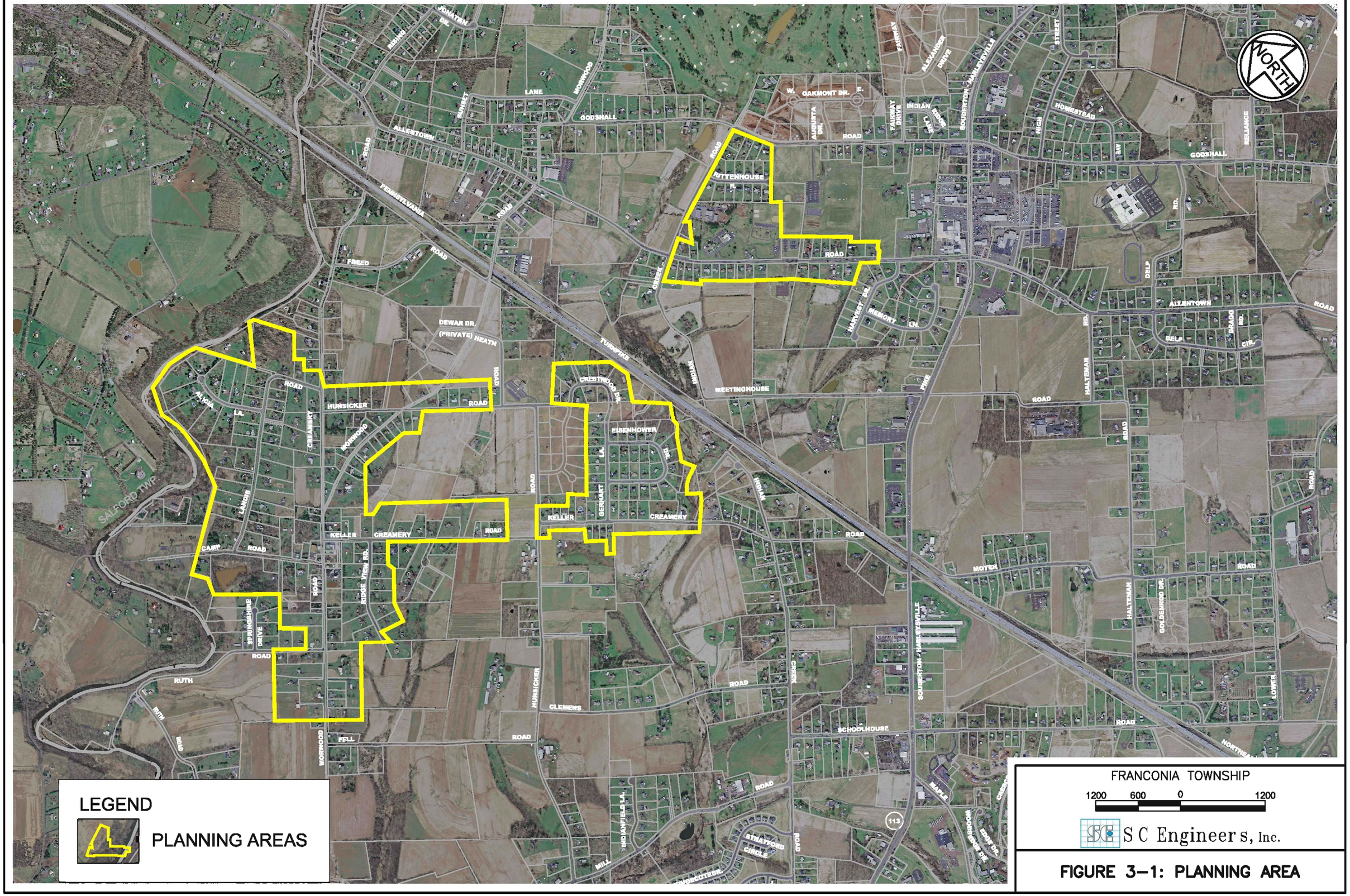
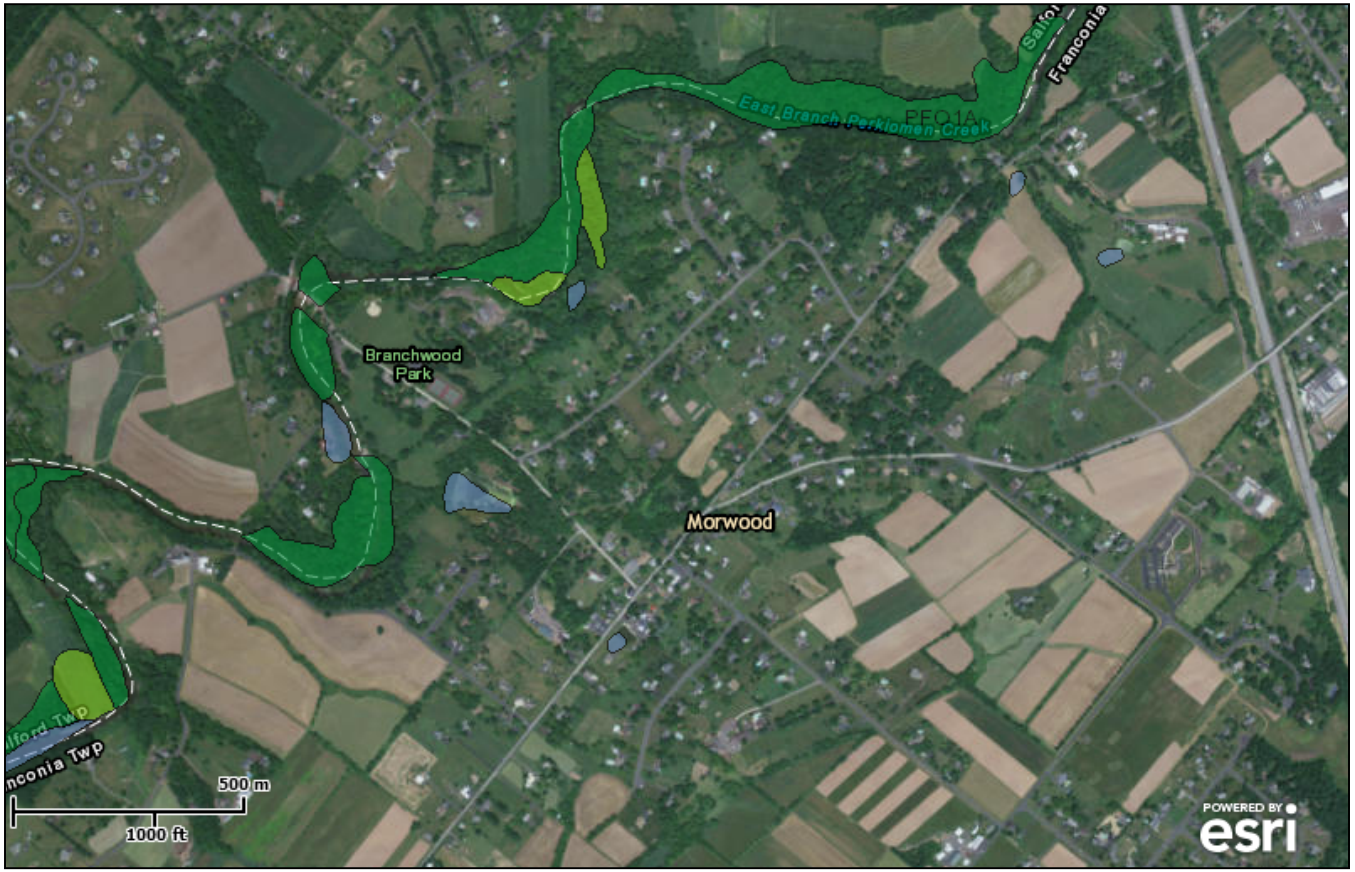


FIGURE 3–1: PLANNING AREA

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jan 29, 2016



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

FIGURE 3-2: WETLANDS IN MORWOOD AREA

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jan 29, 2016

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

FIGURE 3-3: WETLANDS IN GERHART LANE AREA

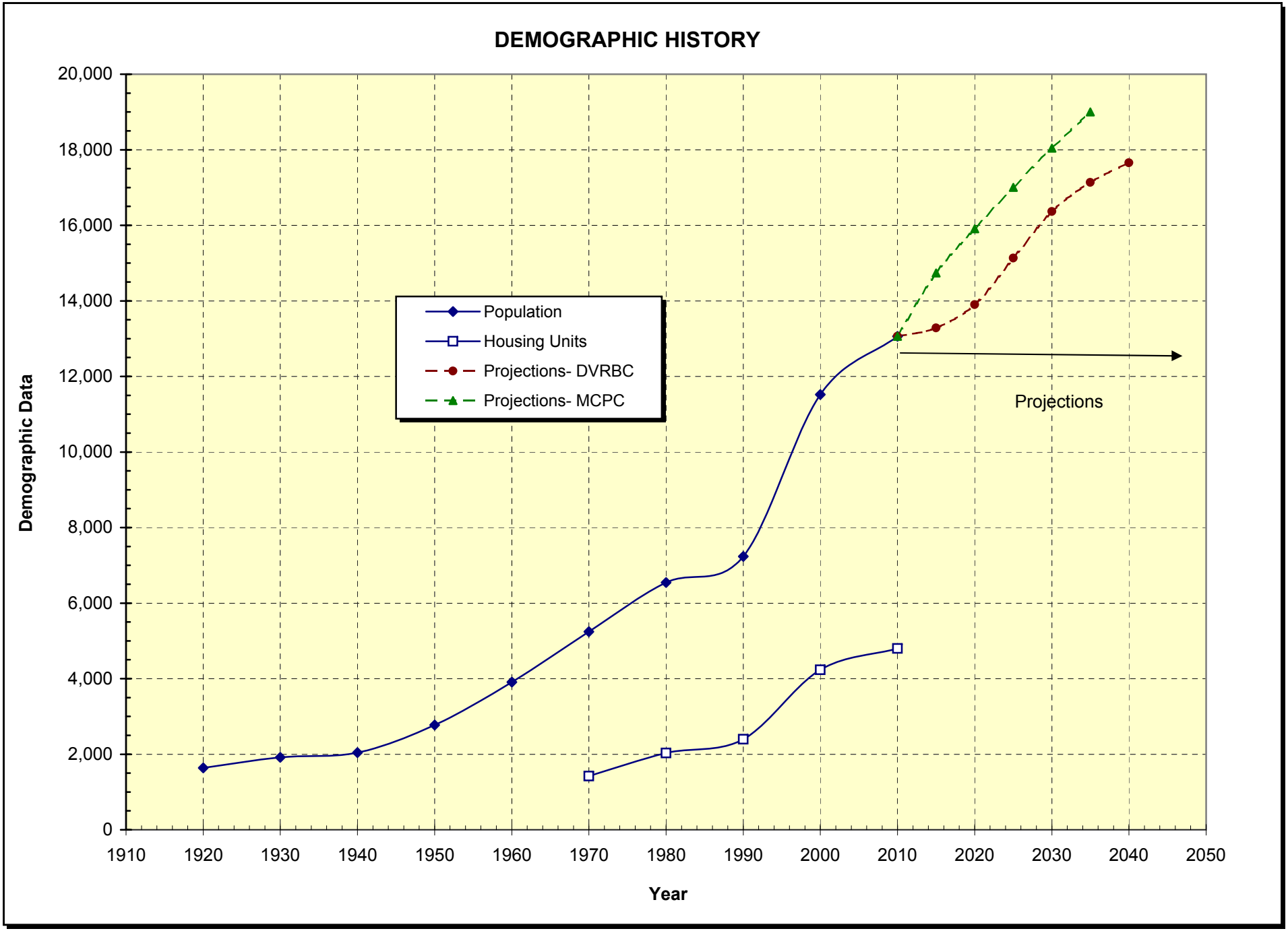


FIGURE 3-4: DEMOGRAPHIC HISTORY

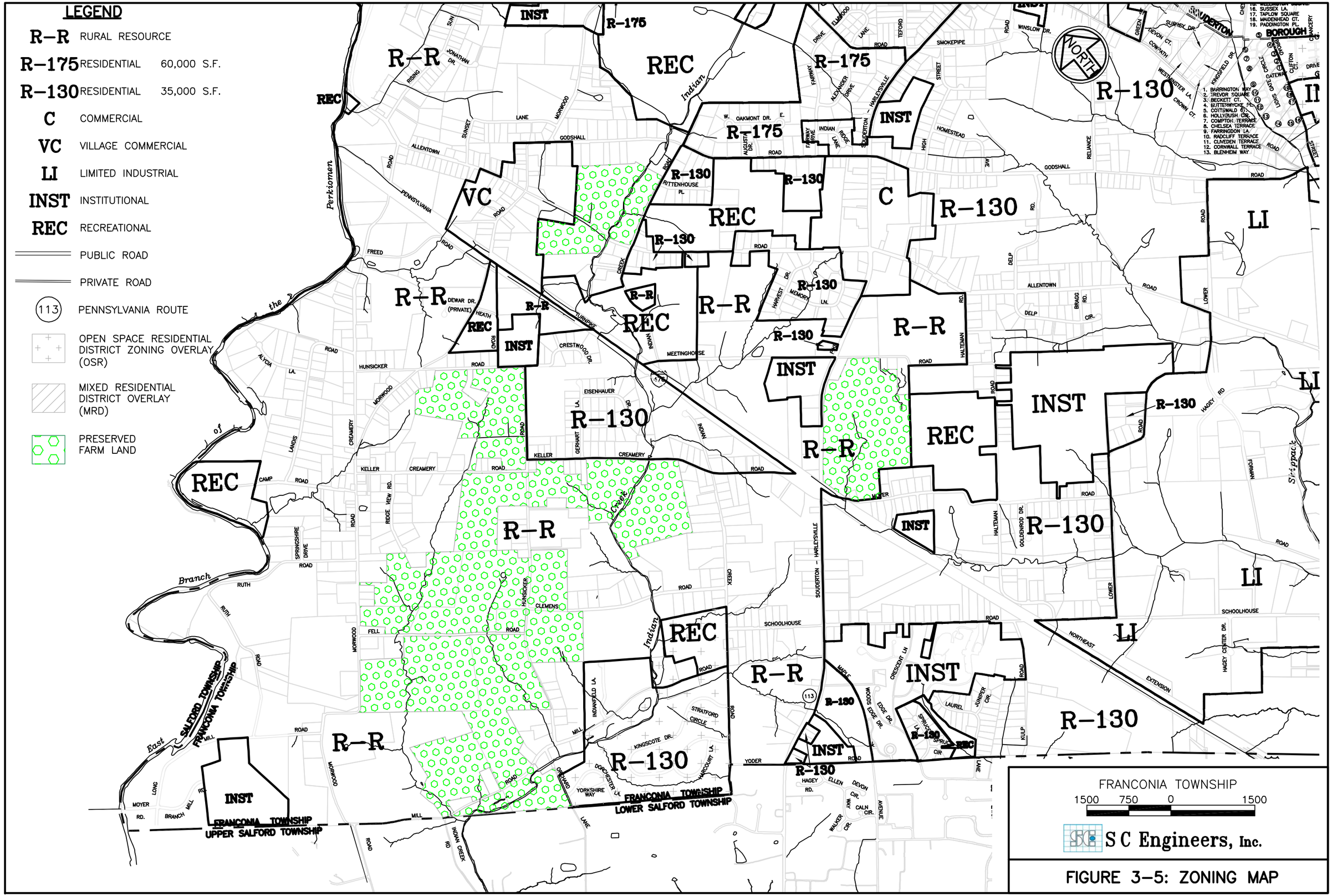


FIGURE 3–5: ZONING MAP

4 EXISTING SEWERAGE FACILITIES

4.1 SEWERAGE AGENCIES

The Franconia Sewer Authority (FSA) installed its first public sewer system in the village of Franconia in 1975 and subsequently in the village of Elroy in 1994 and the village of Earlington in 2009. The FSA currently collects the wastewater generated within the developed portions of the Township through over 35 miles of sewers and then conveys it to (a) its wastewater treatment plant (WWTP) located on Souder Road and (b) four WWTP operated by external municipal agencies.

Franconia Sewer Authority is responsible to install, own, operate and maintain the public sewers, pumping stations and wastewater treatment plant that collect, convey and treat wastewater within the Township. Franconia Township is responsible for determining the need for sewerage service within its municipal borders. When a need is determined, the FSA is then responsible for implementing the sewerage system.

The FSA provides public sewerage service and is responsible for wastewater collection and conveyance within Franconia Township. Wastewater treatment is provided through the FSA by four outside sewerage agencies depending on the drainage basin within the Township, including (1) Telford Borough Authority, (2) Souderton Borough, (3) Lower Salford Township Authority and (4) Hatfield Township Municipal Authority. In the upper Indian and Perkiomen Creek basins of the Township, wastewater treatment is provided by Telford Borough Authority (TBA).

Telford Borough Authority serves an area of Franconia Township generally south of Forrest and Morwood Roads, east of Allentown Road and north of Reliance Road, as shown on Figure 4-1. TBA treats wastewater from roughly 1,175 EDU in the service area in Franconia Township. The Telford service area includes Marcho Farms Inc., a veal processor located on Allentown Road, just south of PA Route 113.

4.2 PUBLIC SEWER SYSTEM

The existing sanitary sewerage system in Franconia Township was presented in Exhibit 4-1 of the 2004 *Act 537 Plan*. The existing FSA sanitary sewerage in closest proximity to the planning area is described in the following sections for (a) the Telford sewer district in the upper portion of the Perkiomen and Indian Creek basins of the Township, generally located north of PA Route 113 and east or upstream of Allentown Road, and (b) the Franconia WWTP service area in the lower Skippack Creek basin of the Township, generally located south of PA Route 113 and west or downstream of Allentown Road. The sewerage systems for the two districts are shown in Figures 4-1 and 4-2, respectively.

4.2.1 Wastewater Treatment Plants

There are two wastewater treatment plants (WWTP) that have the potential to serve the planning area.

Telford Borough Authority WWTP is located in Franconia Township on Telford Pike between Fourth Street and Cowpath Road. The plant provides advanced secondary treatment and discharges treated effluent to the Indian Creek under the conditions of NPDES permit #PA0036978. The plant is currently rated to handle a maximum monthly flow of 1.23 million gallons per day (mgd). The treatment process employed at the plant includes primary clarification, the oxidation ditch process for BOD_5 removal and nitrification, chemical precipitation for phosphorus removal, chlorination, and post aeration. Sludge handling facilities consist of gravity thickening, belt filter press dewatering, with final disposal by landfilling.

The Franconia Sewer Authority reserved and purchased a capacity of 0.3 mgd or 31.6 percent of the Telford WWTP at the time of the 1987 expansion. In accordance with the terms of the intermunicipal agreement (dated February 12, 1987), Franconia's capacity was increased to 0.347 mgd (31.6 percent) when the capacity of the Telford WWTP was re-rated to a capacity of 1.1 mgd by the PADEP in September 2000. The FSA has also purchased an additional 185 EDU from the TBA share of the WWTP capacity over the years, increasing its currently reserved capacity to 0.408 mgd. The two authorities have finalized an addendum (no. 8) which would (a) convey to the FSA its share of the WWTP re-rating to 1.23 mgd and (b) transfer an additional 400 EDU to the FSA, increasing its capacity in the Telford plant to 0.581 mgd.

Current FSA flows to the Telford WWTP are subsequently presented in Chapter 5. As will be shown in Figure 5-1, the FSA still has available capacity in the Telford plant.

Franconia WWTP was constructed by the FSA in 2010 and is located on a subdivided parcel acquired from MOPAC along the Skippack Creek near Schoolhouse and Souder Roads. The WWTP and sewerage system in the lower Skippack Creek basin was implemented by the FSA pursuant to the 2007 *Act 537 Plan Revision: Special Study*.

The WWTP design is based on an average annual flow of 150,000 gallons per day (gpd), with a hydraulic design capacity to treat a maximum monthly flow of 250,000 gpd. The WWTP provides advanced treatment to meet NPDES effluent limits established by the Pennsylvania Department of Environmental Protection (PADEP). The treatment process includes (a) fine screens, (b) sequential batch reactor, followed by membrane filtration, considered a membrane bioreactor (MBR), and (c) ultraviolet disinfection.

The location of the Franconia WWTP is shown on Figure 4-2 in relation to the lower Skippack Creek sewer district, as described previously.

The PADEP issued an NPDES discharge permit for the WWTP on June 2, 2008. The NPDES permit (no. PA0244295) contains the following monthly average effluent limits:

Pollutant	Time Period	Effluent Limit (mg/l)	Notes
$CBOD_5$	Year-round	10	
Suspended Solids	Year-round	10	
Ammonia-Nitrogen	May-October	1.5	
”	November-April	3.0	
Total Nitrogen	Year-round	6.0	
Phosphorus	Year-round	0.1	
Dissolved Oxygen	Year-round	6.0	minimum
Fecal Coliform	Year-round	200/100 ml	

The WWTP was started up in March 2011. As indicated by the preceding discharge limits, the WWTP produces a high quality effluent, with a phosphorus content less than 0.1 mg/l and total nitrogen less than 6 mg/l.

4.2.2 Sewer System

The descriptions of the sewer systems are based on the WWTP to which they discharge.

Telford Sewer District. The FSA sewerage system that discharges to the Telford WWTP includes roughly 90,000 feet of sewers, 390 manholes, 5 pumping stations and 2 meter chambers at the discharge. The Telford sewer district is shown on Figure 4-1.

The original sewer system was constructed by the Franconia Sewer Authority (FSA) in the village of Franconia in 1975. The original construction consisted of roughly 18,200 feet of asbestos cement pipe. Since that time, portions of the original ACP sewers have been replaced through more recent FSA contracts. Three projects, completed in 1996, 2006 and 2007, replaced 5,630 feet of older ACP sewers or a little over 30% of the ACP sewers originally installed in the Franconia system.

Since the original construction in 1975, the sewer system has been extended over the years, generally by developers. PVC pipe has been used exclusively for the past 40 years. Although the majority of the subsequent sewer construction was done by developers, there were two significant contracts issued by the FSA.

A trunk sewer along the Indian Creek was constructed by the FSA in 2004-05. The trunk sewer collects flows from the basin and conveys flows to the Godshall Road pumping station. The Godshall Road pumping station discharges flows to a gravity sewer immediately upstream of the Telford WWTP. The force main from the station generally follows the Indian Creek to the Telford WWTP.

The Earlington village sewer system was completed by the FSA during the first half of 2009. However, connections to these sewers had not been possible until construction of the Earlington pumping station was completed in the spring of 2011. Portions of Salford Township are also served as part of the Earlington sewerage system. The Earlington pumping station conveys flows to the Godshall Road

station from ultimately 450 EDU in (a) the village of Earlington in Franconia Township and (b) Tylersport and new developments in Salford Township. The station discharges through 7,075 feet of 8-inch force main to a gravity sewer in Morwood Road near Godshall Road.

Lower Skippack Sewer District. The public sewer system tributary to the Franconia WWTP currently consists of roughly 15,000 feet or almost 3 miles of gravity sewers. There are no pumping stations in the collector sewer system of the Lower Skippack District, only an influent pumping station at the Franconia WWTP. The Lower Skippack sewer district is shown on Figure 4-2.

The existing sewer system includes three existing trunk sewers that flow to the Franconia WWTP:

a. 12-inch interceptor sewer along the Skippack Creek, flowing from Allentown Road, just south of Lower Road to the WWTP site.
b. 15-inch interceptor sewer along a tributary of the lower Skippack Creek, generally paralleling Schoolhouse Road and flowing from Lower Road to the Skippack Creek and the WWTP site in the vicinity of Forman and Schoolhouse Roads.
c. 8-inch trunk sewer extending to and along Souder Road from the WWTP site.

These three trunk sewers provide the framework for service to the lower Skippack Creek basin of Franconia Township. For purposes of this study, the most significant of these trunk sewers is the 12-inch Skippack Creek interceptor sewer. A branch sewer extends along Allentown Road from this interceptor to a summit manhole just south of PA Route 113. This manhole would represent the closest point from the Gerhart Lane residential area to the Lower Skippack sewer district.

4.2.3 Pumping Stations

There is an existing pumping station located near the ridge line of the Indian Creek and Skippack Creek basins of Franconia Township. The station is just on the Indian Creek side of the ridge line and currently discharges to the Telford sewer district.

Earlington pumping station is located on Allentown Road, on the southern side of the East Branch Perkiomen Creek. The station was completed in the spring of 2011 and designed to handle flows from an anticipated 459 EDU in (a) the village of Earlington in Franconia Township and (b) Tylersport and new developments in Salford Township. The average annual flow to the station was estimated at 126,450 gpd during the Act 537 planning process. The station was designed to have a hydraulic capacity of 550 gpm to handle peak flow rates. The pump capacity included an allowance for the potential future service extension to the village of Morwood.

The station conveys flows to the Godshall Road station through 7,075 feet of 8-inch force main that discharges to a gravity sewer in Morwood Road near Godshall Road. At that point, wastewater flows by gravity sewer in Godshall Road to the existing pumping station. Metered flows through the station for past years are presented graphically in Chapter 5.

Godshall Road pumping station, located at the north side of the Indian Creek, was operationally complete in April 2005. A trunk sewer along the Indian Creek also constructed in 2004-05 conveys flows to the Godshall Road pumping station. As mentioned above, the station now also receives flows from the Earlington service area. The average annual flow to the station was estimated to increase from

163,000 gpd to 306,100 gpd during the Act 537 planning for the Earlington service area. Correspondingly, it was recognized at the time that the hydraulic capacity of the station would have to be increased from 500 to 850 gpm to handle peak flows. The capacity increase was deferred at that time until such time as the flows to the station increased.
The force main from the station generally follows the Indian Creek to the Telford WWTP. Past flows from the Godshall Road pumping station are presented graphically in Chapter 5.

Allentown Road pumping station was constructed in 1975 and is located on Allentown Road, just north of Route 113 inside the Pilgrim's Pride (formerly Longacre Inc. before that) fence. The station is a dry well/wet well type and serves the Route 113 corridor generally between Godshall and Allentown Roads. The station has a pumping capacity of 200 gpm and discharges flows through a 6-inch force main in Route 113 to an FSA sewer east of Godshall Road and, ultimately to the Telford WWTP. Flows through the station are not metered, but are believed to be approaching the pumping capacity.

The pumping station provides service to:

a. Commercial properties along (1) Route 113 from Godshall Road to just west of Allentown Road and (2) Allentown Road, just south of Route 113. The two largest commercial dischargers are Marcho Veal Products and the Bergey's automobile complex. Commercial flows averaged roughly 36,500 gpd during 2009 and 2010.
b. Residential properties in the development originally known as Derstine Estates, located just northwest of Route 113 and Allentown Road. These 28 residential properties are served by a combination of gravity and pressure sewers. There are miscellaneous other residential properties, generally along Allentown Road served by the station.

The pumping station is not equipped with a flow meter. A generalized estimate of the average flow to the station would be roughly 50,000 gpd.

During storm events, Telford will notify the FSA if flows exceed the allocated peak hourly capacity and direct that "excess flows be eliminated." Given the pumping station location near the ridge line, the FSA has extended a force main roughly 1,500 feet southward across Route 113 to a sewer in Allentown Road that drains to the FSA lower Skippack Creek sewerage system and the Franconia WWTP. The diversion of flows has been approved by the PADEP and the Telford Borough Authority. Diverting flows from the Telford sewer district to the FSA lower Skippack system would (a) eliminate periodic peak hourly flow exceedances and (b) free up maximum monthly capacity in the Telford WWTP for sewer service to other areas in the Indian and Perkiomen Creek basins of Franconia Township.

There are no pumping stations in the collector sewer system tributary to the Franconia WWTP currently. As discussed previously, there are plans to divert flows from the existing Allentown Road pumping station into Franconia WWTP service area in the near future.

4.3 ON-LOT DISPOSAL SYSTEMS

The majority of properties in the lower Perkiomen and Indian Creek basins of Franconia Township rely on on-lot disposal systems (OLDS) for wastewater management. The older residential areas in the basin use conventional subsurface systems. However, there have been some elevated sand mounds installed more recently.

4.3.1 Analysis of Existing Systems

As part of the on-lot disposal management program implemented throughout the Township pursuant to the 2004 *Act 537 Plan*, properties in the planning area were inspected in 2005. The results of the OLDS inspections are contained in a report dated January 2006.

4.3.2 Determination of Needs

Historic data on OLDS problems have shown a need for wastewater management. Prior analyses have included (a) a report submitted to the PADEP in July 1989 by the then Sewage Enforcement Officer (SEO) for Franconia Township and (b) surveys prepared by the Montgomery County Health Department (MCHD) as part of their SEO responsibilities.

The prior MCHD surveys indicated that 10 of the 13 residential OLDS inspected in the village of Morwood had malfunctioning systems.

The results of the more recent OLDS inspections performed in 2006 were assessed to better determine the need to extend public sewer service in the Perkiomen Creek basin. The report entitled *Sewage Management Program, Quadrant I: 2005 Annual Report*, prepared by Schoor DePalma in January, 2006 recommended certain sewer extensions in the Morwood area to alleviate OLDS problems.

The following excerpt from the 2006 report provides a "*recommendation for addressing the malfunctioning OLDS in Quadrant I:*

1) *Any properties with Confirmed Malfunctioning OLDS that currently has public sewer access should be required to connect to public sewer within three to six months. Any properties with Suspected Malfunctioning OLDS that currently have public sewer access should be given the option to connect to public sewers. The properties with Suspected Malfunctioning OLDS in these areas that choose not to connect to public sewers should be monitored during the spring and fall and with all changes in occupancy.*

2) *In this current cycle of the SMP, there are three general concentrations of smaller lots (generally 0.75 acre or less) with Confirmed or Suspected Malfunctioning OLDS. It is unlikely that Confirmed or Suspected Malfunctioning OLDS can be adequately repaired or replaced in these areas of smaller lots in a manner that would be cost effective to the residents. The Township should determine the best way to provide public sewer to these, and surrounding, residents. This would require the installation of collection piping, and either a localized*

treatment/disposal facility or a conveyance system to transport sewage to an existing facility. The areas that should be included, at a minimum are:

b. Morwood
   i. Morwood Road – from Creamery Road to Fell Road
   ii. Camp Road – from Morwood Road to Landis Road
   iii. Keller Creamery Road – from Morwood Road to Ridgeview Road

3) Small lots outside of the areas listed in (2), above, with Confirmed or Suspected Malfunctioning OLDS should implement temporary, interim methods – such as more frequent pumping, water conservation, diversion of stormwater away from drainfield, and/or minor structural repairs – to reduce the potential for public health concerns, but await the determination of areas to receive public sewer before affecting major repairs or replacement. The sewer main may, by virtue of its route to the treatment facility, provide for public sewer connections for these more isolated problem lots. This process eliminates the potential for double costs – first attempting to perform major repairs or replacement an OLDS, then connecting to public sewer.

4) As with (3), above, large lots (1+ acres) with Confirmed or Suspected Malfunctioning OLDS should also consider implementing temporary, interim methods to reduce the potential for public health concerns, but await the determination of areas to receive public sewer before affecting major repairs or replacement. The following are areas that should be considered for public sewers if by virtue of its route to the treatment/disposal facility, or a cost effective extension can be provide for public sewer connections:

a. Earlington
   i. Godshall Road – the entire length

b. Morwood
   i. Landis Road – the entire length
   ii. Ridgeview Road – the entire length

c. Northeast Quadrant
   i. Forrest Road – the entire length
   ii. Cowpath Road – from Morwood Road to Forrest Road

These areas contain several confirmed and suspected malfunctions currently and are directly adjacent to the areas recommended for a public system. If any of these lots are sufficiently large, and the location of the dwelling is such that tie-in to potential public sewer would be unlikely, these owners may want to move forward on correcting their OLDS problem.

6) After determining the areas that will have public sewer availability, all lots with Confirmed or Suspected Malfunctioning OLDS outside of the sewer service area should have their on-lot disposal systems repaired or replaced. A description of OLDS that may be available for replacement follows.

Similarly, the results of the OLDS inspections performed in 2007 were assessed to better determine the need to extend public sewer service in the lower Indian Creek basin. The report entitled *Sewage*

Management Program, Phase III Annual Report, prepared by Schoor DePalma in March 2008 recommended certain sewer extensions in Allentown Road to alleviate OLDS problems.

2) *In this current cycle of the SMP, there is a general concentration of smaller lots (generally 0.75 acre or less) with Confirmed or Suspected Malfunctioning OLDS. It is unlikely that Confirmed or Suspected Malfunctioning OLDS can be adequately repaired or replaced in these areas of smaller lots in a manner that would be cost effective to the residents. The Township should determine the best way to provide public sewer to these, and surrounding, residents. This would require the installation of collection piping, and either a localized treatment/disposal facility or a conveyance system to transport sewage to an existing facility. The area that should be included, at a minimum is:*

    a. *Allentown Road*
        i. *The entire length of non-sewered lots from Memory Lane to Indian Creek Road*

The preceding recommendation from the *Sewage Management Program Annual Reports* provided the basis for the proposed sewer extensions subsequently described in Chapter 6. The recommended sewer extensions described in Chapter 6 address only those within the lower Perkiomen and Indian Creek basins, which is the scope of this planning.

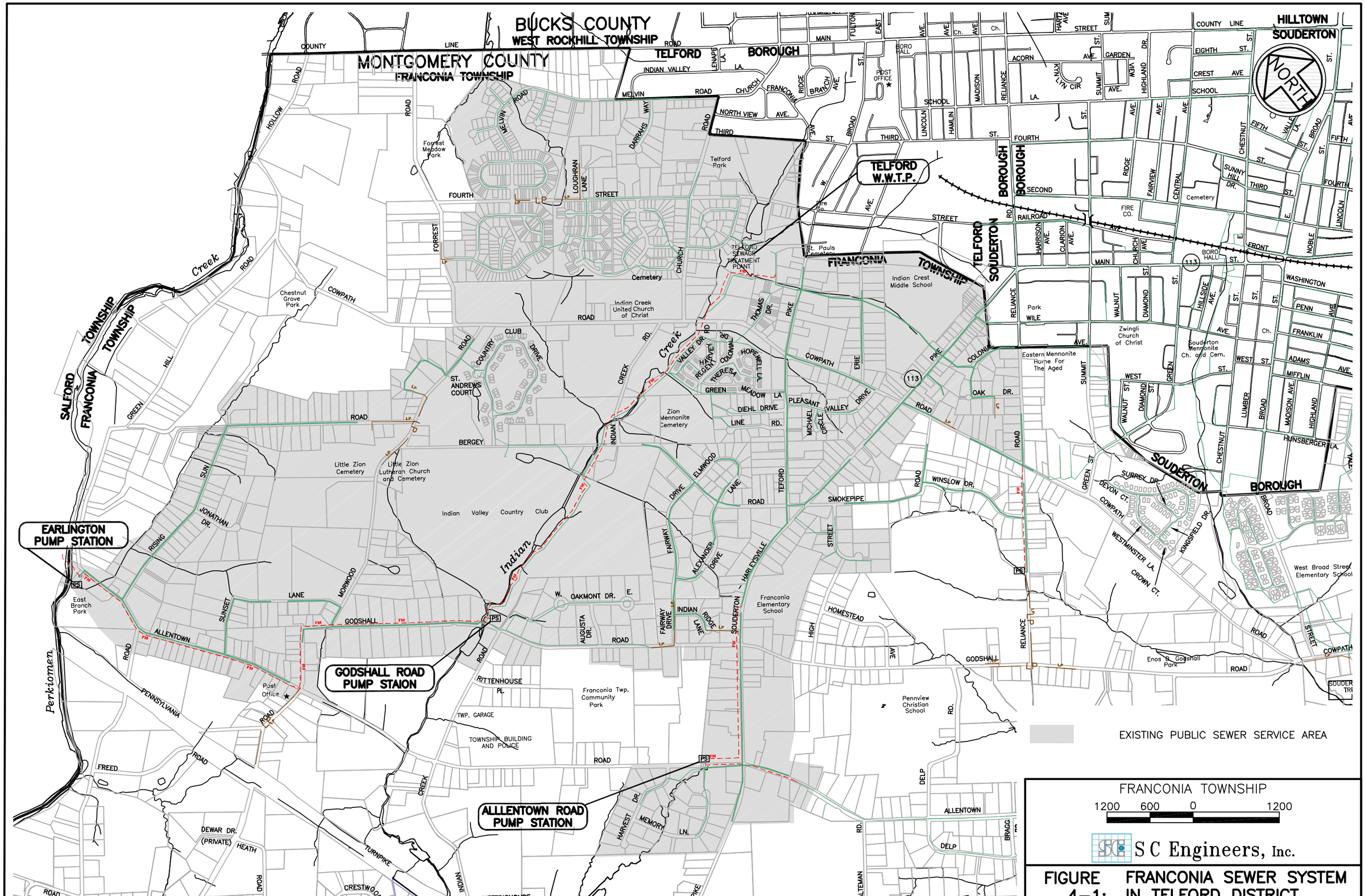


FIGURE 4–1: FRANCONIA SEWER SYSTEM IN TELFORD DISTRICT

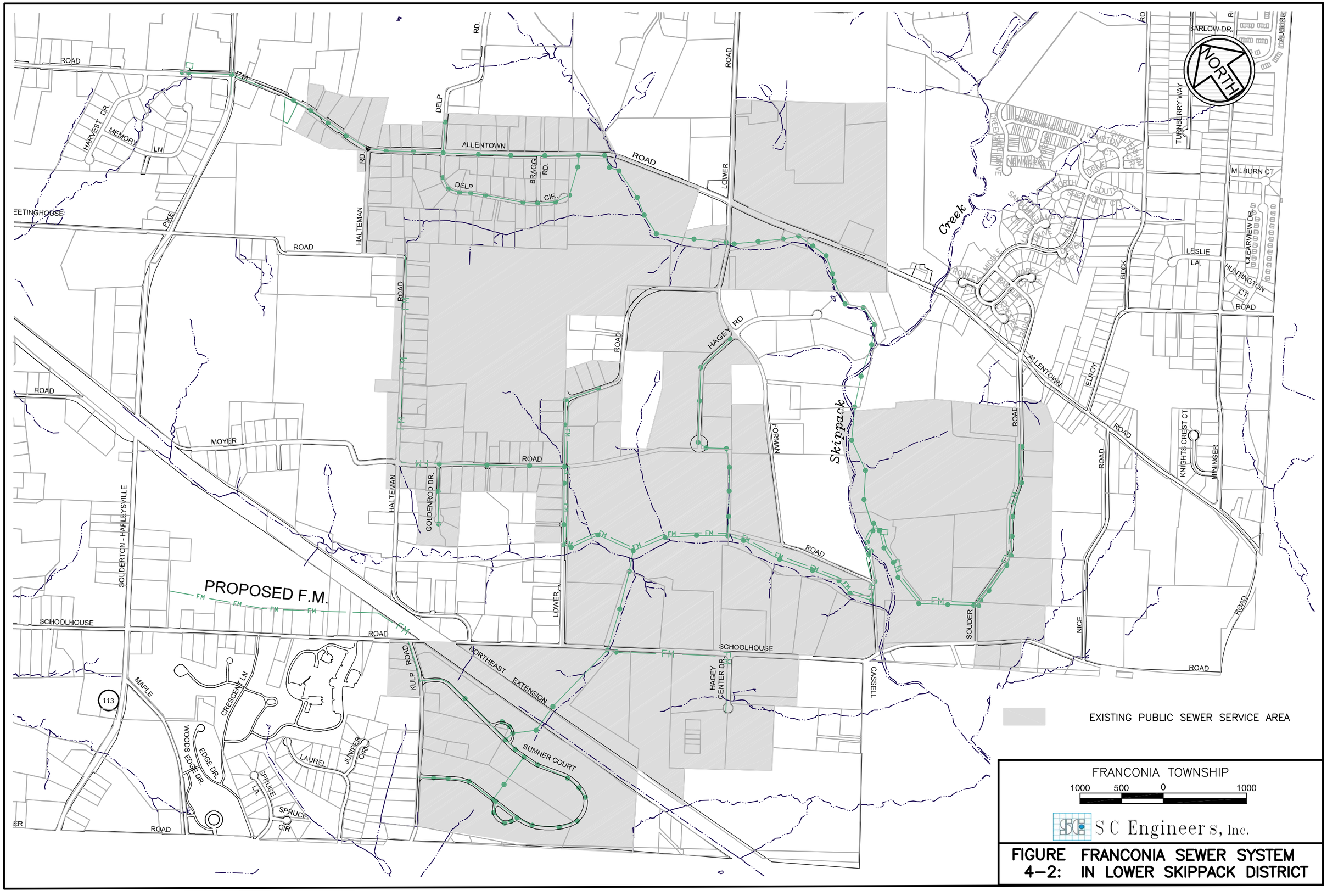


FIGURE 4–2: FRANCONIA SEWER SYSTEM IN LOWER SKIPPACK DISTRICT

5 ASSESSMENT OF CURRENT AND FUTURE FLOWS

5.1 CURRENT FLOWS

Current flows to the wastewater treatment plants (WWTP) in the vicinity of the planning area are reviewed to analyze available capacity. As described in section 4, there are two WWTP that could potentially provide service to the planning area.

1. **Telford WWTP** flows are presented in Figure 5-1. As shown in the chart, the maximum3-month flow at the Telford WWTP during the past 5 years has been roughly 1.1 million gallons per day (mgd). Comparing that flow to the hydraulic capacity of 1.23 mgd indicates that there is an available capacity of 130,000 gallons per day (gpd) in the Telford WWTP.

   More importantly, the maximum3-month flow from Franconia to the Telford WWTP during the past 5 years has been roughly 0.49 mgd. Comparing that flow to the FSA reserve capacity of 0.58 mgd indicates that Franconia currently has an available capacity of 90,000 gpd in the Telford WWTP.

2. **Franconia WWTP** flows are presented in Figure 5-2. Current maximum3-month flows at the Franconia WWTP have been roughly 30,000 gpd. Comparing that flow to the hydraulic capacity of 250,000 gpd indicates that there is sufficient available capacity in the Franconia WWTP.

In addition to the maximum 3-month flows, peak hourly flows to both the Telford and Franconia WWTP must be considered. The FSA receives a surcharge form the TBA if flows exceed a certain rate of flow to the Telford WWTP. The majority of flow to the Franconia WWTP comes from non-residential users, such as Souderton Area high school, JBS Meats (formerly Moyer Packing Co.) and HbO2 Therapeuticals (formerly Biopure). Actual flow rates to the WWTP are actually greater considering that the three primary non-residential users generally discharge flows (a) during a 10-hour period each weekday and (b) five days per week. Consequently, flow rates are greater during the daylight hours of weekdays and lower on weekends and evenings on weekdays.

In addition to evaluating capacity in the WWTP, the conveyance facilities, including the pumping stations, must be considered. The closest pumping stations to the planning area include the (a) Earlington station, which discharges to the Godshall Road station, and (b) the Allentown Road station. As indicated in Chapter 4, flows to the Allentown Road pumping station are not metered. However, current flows to the Earlington and Godshall Road pumping stations are presented graphically in Figures 5-3 and 5-4, respectively.

Based on review of the graphic flow charts and general operating indications, the following conclusions regarding available capacity in the existing pumping stations have been drawn:

1. **Earlington** pumping station appears to have available capacity to potentially serve the planning area. Records indicate that 60% of the planned connections had been made through

2015. However, average flows during 2015 were only about 30% of the projected flow. Unit flows to date have been less than the 275 gpd per EDU that was used for the station design. If unit flows continue to be lower than the design value, expansion of the station may need to be re-assessed in the future.

2. **Godshall Road** pumping station capacity may have been approached in 2015, as was anticipated during the Earlington sewerage system planning. Although the average annual flow did not exceed the previously estimated value, the maximum 3-month average did approach that value, as shown in Figure 5-4. Considering the additional connections still to be made in the Earlington service area, the station capacity will need to be increased in the near-future, as originally planned. The station expansion will need to include the projected flows from the Morwood planning area.

3. **Allentown Road** pumping station capacity is assumed to be limited based on general operating indications. In addition to a capacity increase, the station is 40 years old and in need of an overall upgrade.

5.2 WASTEWATER FLOW PROJECTIONS

Wastewater flow projections have been developed for the four service sub-areas, which may be described as follows:

1. Morwood village is centered at Morwood and Keller Creamery Roads, and includes (a) Morwood Road, between Hunsicker and Fell Roads, (b) Keller Creamery Road, between Morwood and Hunsicker Roads, (c) Ridgeview Drive, (d) Camp Road, (e) Landis Road, (f) Alycia Lane, (g) Creamery Road, between Landis and Morwood Roads, and (h) Hunsicker Road, between Morwood and Heath Roads.

2. Gerhart Lane area includes (a) Gerhart Lane, (b) Keller Creamery Road, between Hunsicker Road and the Indian Creek, (c) Eisenhauer Drive, and (d) Crestwood Drive.

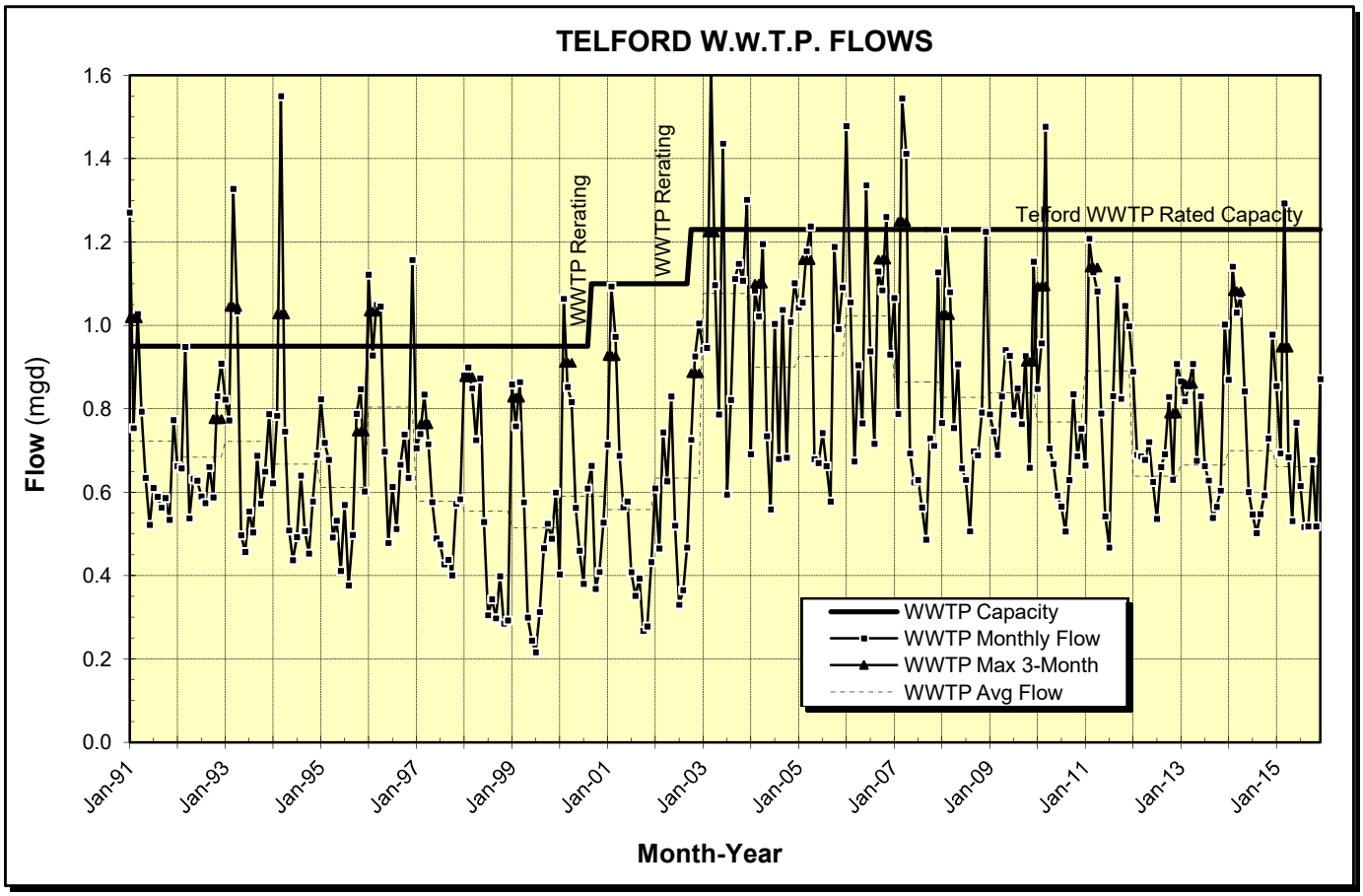
3. Allentown Road, between Indian Creek Road and the existing pumping station near Harleysville Pike (PA Route 113).

4. Rittenhouse Place, at Indian Creek Road.

The wastewater projections are based on 275 gpd per equivalent dwelling unit (EDU) and may be summarized as follows:

Service Region	Sewer Length (feet)	Service Projection (EDU)	Projected Avg. Flow (gpd)
Morwood village	16,980	128	35,200
Gerhart Lane area	6,480	63	17,325
Allentown Road	3,660	32	8,800
Rittenhouse Place	1,680	14	3,850
Totals	28,800	237	65,175

The values in the preceding tabulation include only the sections where collector sewers would be located. As will be described in the subsequent section, the conveyance piping from the service area to the point of connection to an existing sewer will add increased length of sewer and potential service customers, depending on the selected routing.



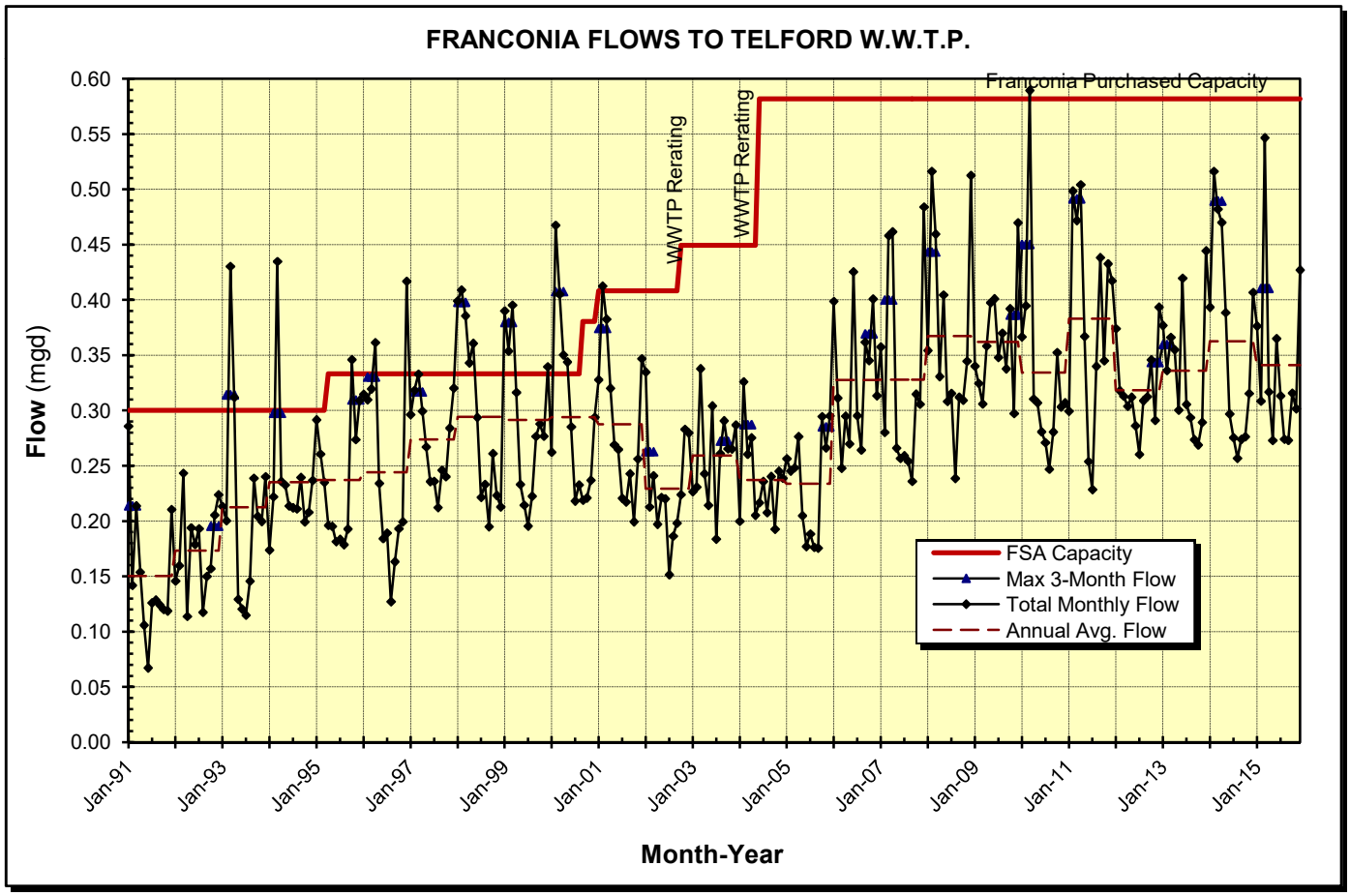


FIGURE 5-1: TELFORD W.W.T.P. FLOWS

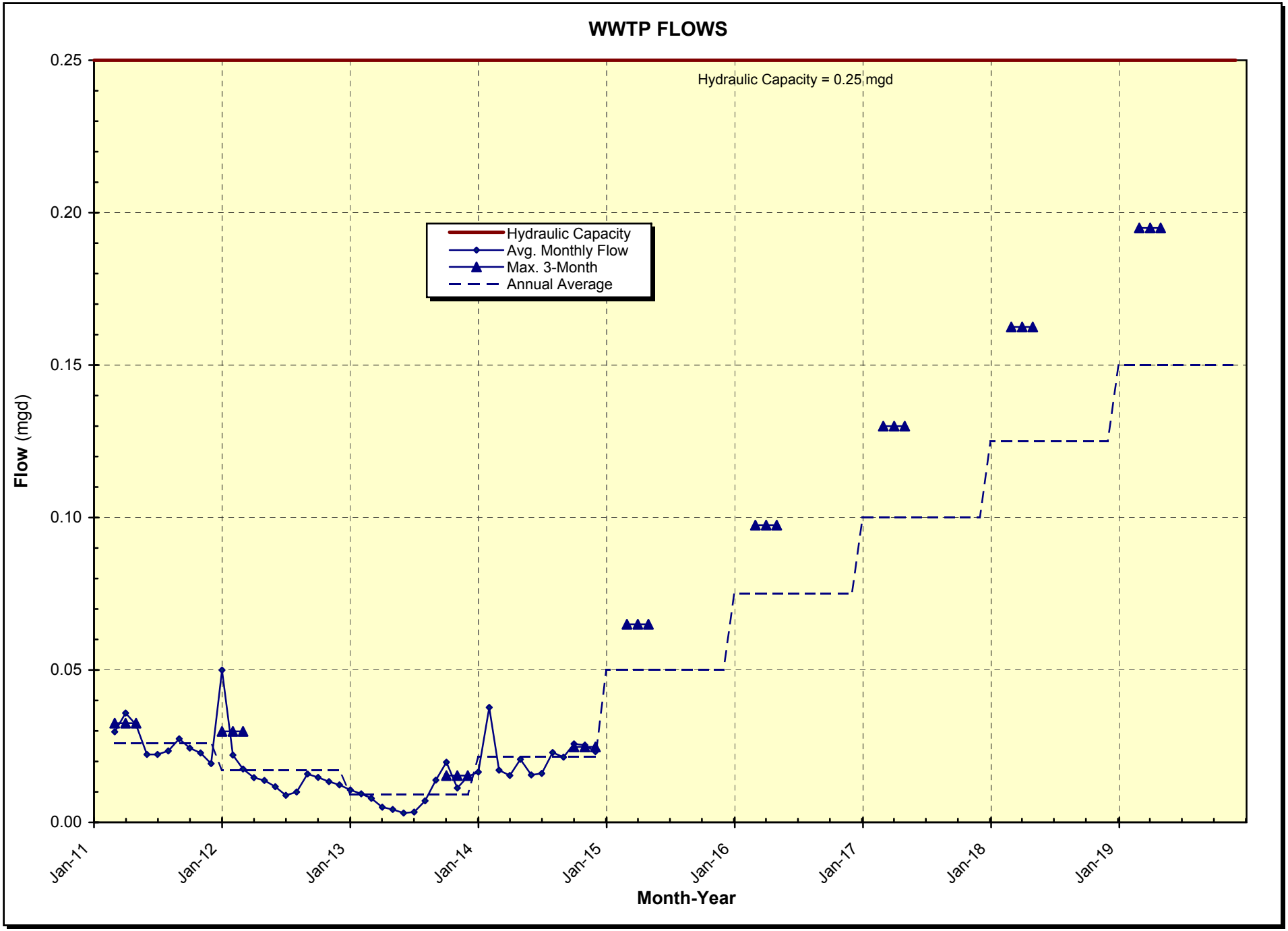


FIGURE 5-2: FLOWS TO FRANCONIA WWTP

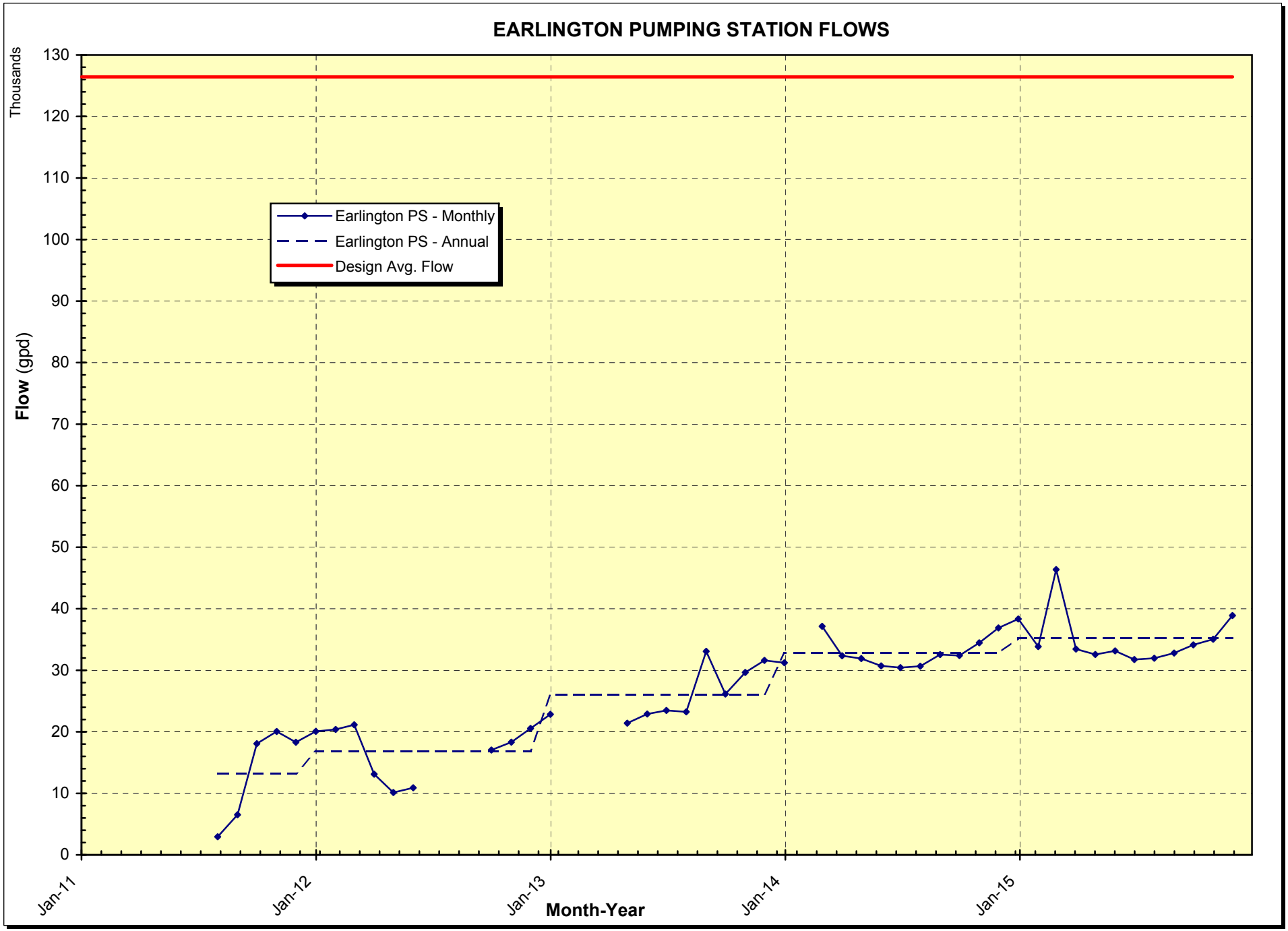


FIGURE 5-3: EARLINGTON PUMPING STATION FLOWS

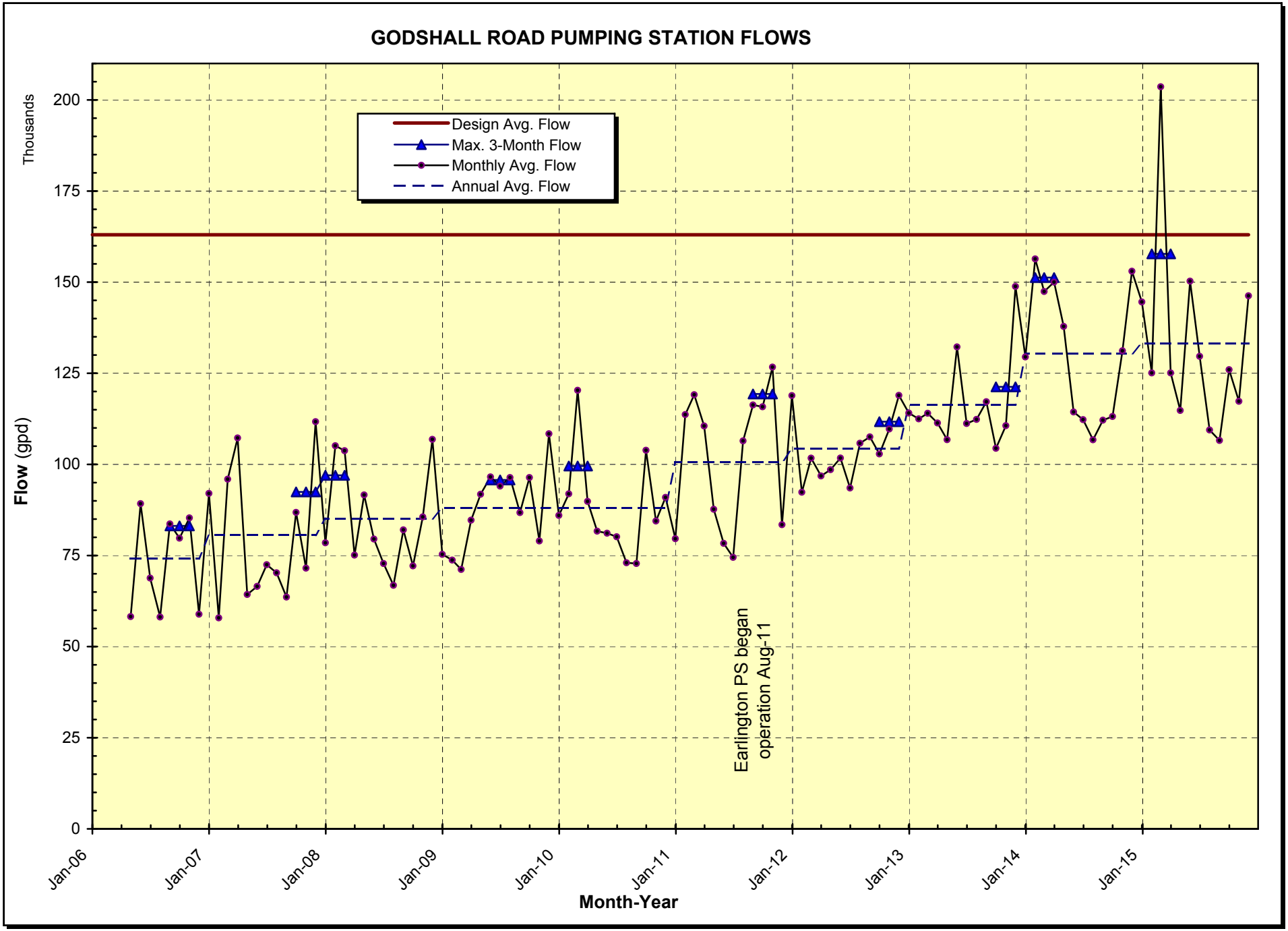


FIGURE 5-4: GODSHALL ROAD PUMPING STATION FLOWS

6 IDENTIFICATION AND EVALUATION OF ALTERNATIVES

As part of the development of the 2004 *Act 537 Plan*, Franconia Township developed a selected plan for the entire municipality. Key components of that plan as they relate to the current planning area included:

❶ **Implementation of an on-lot disposal management program** (a) on, at least, an interim basis for the villages of Earlington and Morwood and (b) on a longer term basis for the remainder of the Township. The on-lot disposal management program will be initiated in the Earlington/Morwood villages and will be assessed after completion of inspections in that area.

❷ **Reassessment of on-lot disposal management program in Earlington and Morwood.** In the absence of development pressures, there is no immediate need to provide a public sewerage system to serve the approximately 280 existing residences. As indicated in item l, it is anticipated that an aggressive on-lot disposal management program will eliminate or, at least, reduce current concerns. However, the effectiveness of the program should be evaluated after the house inspections have been completed and the gathered data has been analyzed. Major rehabilitation of existing OLDS will not be required until after the reassessment has been completed. If necessary, the Township can reassess the installation of gravity and/or low-pressure sewers, which would discharge to either a new wastewater treatment plant on the Perkiomen Creek or the existing Telford wastewater treatment plant (WWTP).

As was described in Chapter 2, inspections of on-lot disposal systems (OLDS) in the Perkiomen Creek basin of Franconia Township, including Earlington and Morwood, were completed in 2005. The January 2006 report summarizing the inspections identified concentrations of areas in Earlington and Morwood with confirmed or suspected malfunctioning OLDS. Act 537 planning for the Earlington village was completed in December 2006 and approved by the PADEP in February 2008. The proposed sewerage system in the village of Earlington was subsequently constructed in 2009.

The purpose of this plan is to identify and evaluate collection, conveyance and treatment alternatives required to meet the needs of the village of Morwood and surrounding areas of Franconia Township.

6.1 NO ACTION ALTERNATIVE

As described previously, provision of a public sewerage system in the village of the Morwood had been deferred pending the results of an on-lot sewage management program. The results of the on-lot sewage management program are described in section 4.3 herein. The inspections of OLDS in Morwood performed in 2005 as part of the program identified “a general concentration of smaller lots with confirmed or suspected malfunctioning OLDS.”

The applicability of continued reliance on OLDS management program in Morwood must be evaluated. The applicability of the program is dependent on the ability to maintain, repair or replace OLDS in the planning area such that they can function effectively. The viability of OLDS relies on factors such as:

- **Soils Suitability.** As described in Section 4.3, the soils in Franconia Township are generally unsuitable for conventional subsurface OLDS and marginal for elevated sand mounds. The primary factor involved is the limited depth of the soils, although soils percolation is also a factor. The MCHD has not found soils with the depth of 60 inches required by PADEP standards for conventional subsurface OLDS. Consequently, these conventional systems can be expected to have problems in the absence of proper and continuing maintenance. Replacement with elevated sand mounds (or some other alternate OLDS) may be a probable solution to the problem areas, provided that the required soils depth of 20 inches can be found on the property.

- **Lot Size.** Given that replacement with elevated sand mounds or other alternative system is a probable solution, the property must be sufficiently large to accommodate the alternate OLDS. Typically, an elevated sand mound (or alternate drip irrigation system) requires an area of roughly 3,000 square feet.

As discussed above and in Section 4.3.2, conventional subsurface OLDS are generally not applicable for the soils in Franconia Township. Alternate OLDS will ultimately have to be utilized for the replacement of failing systems. These alternate systems include:

- Elevated Sand Mounds
- Drip Irrigation Systems
- Small Flow Treatment Facility
- Individual Residential Spray Irrigation Systems

Replacement of conventional subsurface OLDS with alternate systems can be costly, ranging from $25,000 to $40,000. Additionally, these systems generally require more land area:

Alternate OLDS	**Approx. Land Area** (square feet)
Elevated Sand Mounds	3,000
Drip Irrigation Systems	3,000
Spray Irrigation Systems	15,000

Considering the preceding factors, it appears that an OLDS management program for the smaller lots in the center of Morwood village may be limited.

This conclusion is consistent with the 2006 report that recommended that "it is unlikely that confirmed or suspected malfunctioning OLDS can be adequately repaired or replaced in these areas of smaller lots in a manner that would be cost effective to the residents. The Township should determine the best way to provide public sewer to these, and surrounding, residents." Given that recommendation and the potential public health concerns, no action does not appear to be a viable alternative.

6.2 PUBLIC SEWERAGE SERVICE

Public sewerage service can be provided to an area of need by three general components:

1. **Collector sewer system** would generally be located in the roads fronting the properties to be served. As will be discussed later, the collector sewers can be gravity or pressure driven.

2. **Conveyance system** discharges wastewater from a collector sewer system to either (a) an existing sewerage system or (b) a wastewater treatment plant (WWTP). Conveyance systems in gravity sewer systems generally would involve (a) interceptor or trunk sewers, generally following natural drainage features, and/or (b) pumping station(s) and discharge force main(s).

3. **Wastewater treatment plant** provides the ultimate conditioning of the flow, generally followed by discharge to a stream. The WWTP could involve either (a) construction of a new WWTP or (b) discharge to an existing, remote WWTP.

The evaluation of sewerage alternatives is complicated by the interrelationship of the preceding three components. The WWTP or discharge point obviously affects potential alignments of the conveyance system. Additionally, the topography between the collector sewers and the WWTP/discharge point determines whether a gravity interceptor sewer can be used or a pumping station is required. Similarly, the topography in the collector sewer area determines type of conveyance.

6.2.1 Collector Sewer System

Traditionally, the local collector sewers in residential areas have been constructed of 8-inch gravity sewers with intermediate manholes. These gravity sewers provide homeowners with the benefit of virtually no maintenance requirements. In isolated areas of Franconia Township where topography precludes the use of gravity sewers, pressure sewers have been used. Pressure sewers require grinder pumps to discharge wastewater from the houses to a 2-inch up to a 3-inch pressure sewer in the roads. Pressure sewers have the benefit of lower initial construction cost, but have the disadvantage of (a) being reliant on electric power for operation and (b) requiring the periodic maintenance and eventual replacement of the grinder pumps by the homeowners.

The topography in the village of Morwood complicates the use of gravity sewers. Morwood village is generally located on the Perkiomen Creek side of its ridge line with the Indian Creek. However, a tributary stream runs through the village generally following Camp Road. As a result, the village core drains toward Camp Road, while other roads (including large portions of Landis, Hunsicker and Creamery Roads) drain toward the PA Turnpike. Therefore, at least one pumping station would be required for a gravity sewer system, depending on the WWTP/discharge point. Additionally, Alycia Lane and the lower end of Ridgeview Drive drain in the opposite direction, requiring some type of pumping for these small sections.

Gerhart Lane area and Allentown Road are located in the Indian Creek basin. Collector sewer systems in these sections of the planning area obviously would not flow in the same direction as Morwood, which is in the Perkiomen basin. As a result, a pumping station would be needed to connect the gravity collector sewer systems, if they are to discharge to the same point.

6.2.2 Wastewater Treatment

Public sewerage service alternatives for the Morwood planning area can be described by two general categories:

1. **Discharge to existing treatment plant.** This alternative would involve construction of a pumping station to discharge wastewater from a new sewer system to an existing, municipal WWTP.

2. **Construction of new treatment plant.** This alternative would involve the construction of a new sewer system and new WWTP to be owned and operated by the FSA.

These general alternatives available to Franconia Township are described in the following sections.

6.2.2.1 Construction of New WWTP

Due to the remote location of Morwood village, the initial thought was to construct a new wastewater treatment plant (WWTP) in proximity to the planning area. These alternatives are further subdivided by the necessary consideration of the following factors:

- Location of WWTP
- Type of treatment process

Location of WWTP. Alternative locations considered for the siting of a new WWTP are generally compared in terms of the following factors:

- ✓ Size of property. A WWTP site should be sufficiently large to allow future expansion to meet the ultimate needs of the service area. The site should also allow for a sufficient buffer from adjacent properties. The PADEP recommends that "the treatment plant be at least 250 feet from an occupied dwelling or recreational area."
- ✓ Assimilative capacity of receiving stream. The greater the flow capacity in the receiving stream, the better the stream is capable of assimilating the WWTP effluent discharge.
- ✓ Public impacts. PADEP suggests that "in general, to avoid local objections, a WWTP site should be as far as practicable from any present built-up area or any area which will probably be built up within a reasonable future period."
- ✓ Potential service area. Typically, a WWTP is located at the bottom of the drainage basin in a municipality. This allows the municipality to be served by gravity interceptor sewers, rather than requiring a pumping station to convey flows upstream.
- ✓ Conveyance sewerage requirements. The benefits of locating a WWTP downstream, as described above, must be balanced with the cost of the conveyance piping required to deliver the collected wastewater to the downstream site.

- ✓ Site limitations, such as floodplain, wetlands, and steep slopes. Floodplain represents the major limitation for a WWTP. The WWTP must be "protected from physical damage by the 100-year flood" and "remain operational and accessible during the 25-year flood," according to PADEP requirements.

Considering the preceding factors, three potential sites were considered for the site of a new WWTP. Each site was deemed feasible based on the following factors:

1. Camp Road, near the Perkiomen Creek, would be the natural drainage point for the village core of Morwood. There is a property owned by the North Penn Water Authority that might be obtained. Discharge to the Perkiomen Creek would also provide the greatest assimilative capacity. Conversely, the site would be limited and near the municipal Branchwood Park.

2. Keller Creamery Road, near the Indian Creek, would be the natural drainage point for the Gerhart Lane area. Initial discussions indicated that a site might be acquired near an old mill. A disadvantage would be that flows from the larger Morwood service area would need to be pumped to the site. If the Morwood collector system used gravity sewers, at least two pumping stations would be required.

3. Creamery Road, on the west side of the PA Turnpike along the Perkiomen Creek, was a site considered as early as the 1970s for a WWTP to serve the villages of Earlington and Morwood. The site is sufficiently large, could be acquired and is buffered by the PA Turnpike. However, the site has limitations, including floodplain and wetlands.

Each site has advantages and disadvantages, as described above.

Type of Treatment Process. In selecting the type of treatment process to be employed at a WWTP, the following factors are generally considered:

- ✓ Effluent requirements for the present and future
- ✓ Topography and location of plant site
- ✓ Industrial wastes likely to be encountered
- ✓ Costs of both initial Construction and ongoing Operation and Maintenance (O&M)
- ✓ Supervisory and operational staffing expertise required

Provided that the treatment process satisfies the other factors, the primary factors in selecting the type of treatment process are usually (1) Costs of construction and O&M and (2) Staffing expertise required.

Preliminary effluent limits were requested for the Perkiomen Creek and determined by the PADEP. These preliminary effluent limits would require an advanced level of treatment for phosphorus removal. Project cost estimates for the construction of a new WWTP need to be based on that level of advanced treatment.

6.2.2.2 Discharge to Existing WWTP

In lieu of constructing a new WWTP, the Township could convey wastewater from the collector sewer systems to an existing municipal WWTP. Existing WWTP that could provide service to the Morwood planning area of Franconia Township were previously described in section 4.2.1 and are summarized in the following tabulation along with the currently available capacity and the tapping capacity fee:

Treatment Plant	Capacity (mgd) Total	Capacity (mgd) Available	Tapping Fee ($/EDU)
Telford Borough Authority	1.23	0.09	$5,300
Franconia Sewer Authority	0.25	0.1	$9,967

As was discussed previously, it may be necessary at some time to divert flows at the Allentown Road pumping station from the Telford WWTP to the Franconia WWTP. The diversion of flows at the Allentown Road pumping station would be required to (a) make capacity available in the Telford WWTP and/or (b) reduce surcharges from the Telford Borough Authority.

6.2.3 Conveyance System

Discharge to the existing Telford WWTP would involve conveying flows to the existing FSA sewer system tributary to the Telford WWTP. There are two possible points of connection:

1. existing FSA sewer in Allentown Road at Creamery Road, just upstream of the Earlington pumping station at the Perkiomen Creek, or
2. existing FSA sewer in Allentown Road near Harvest Drive, just upstream of the Allentown Road pumping station and north of Harleysville Pike (PA Route 113).

Discharge to the existing Franconia WWTP would also involve conveying flows to the existing FSA sewer system tributary to the plant. There are two possible points of connection:

2. existing FSA sewer in Allentown Road near Harvest Drive, just upstream of the Allentown Road pumping station. Although the station currently discharges ultimately to the Telford WWTP, the FSA has completed a force main roughly 1,500 feet southward across Route 113 to a sewer in Allentown Road that drains ultimately to the Franconia WWTP. The diversion of flows has not been done, but has been approved by the PADEP and the Telford Borough Authority.
3. existing FSA sewer in Schoolhouse Road. The existing sewer in Schoolhouse Road is a pressure sewer that currently terminates at Kulp Road. However, design plans have been completed to extend the pressure sewer in rear yard easements along Schoolhouse Road to Harleysville Pike (PA Route 113).

There are two options for routing a pressure conveyance sewer to each of the preceding two points of connection to the existing Franconia WWTP. The conveyance options are summarized as follows and further quantified subsequently in Table 6-1.

Discharge Point Sewer Location	Sewer Length (LF)	No. of Service s (EDU)
Morwood village Conveyance Alternatives		
1. Earlington PS and Telford WWTP		
Creamery Rd. to Allentown Rd.	3,990	18
Gerhart Lane area Conveyance Alternatives		
2. Morwood Conveyance and Telford WWTP		
Hunsicker Rd. to Morwood Rd.	2,200	8
3. Allentown Rd PS		
a Eisenhauer Dr. to Harvest Dr.	4,140	12
b Eisenhauer Dr. to Allentown Rd.	5,960	40
4. Route 113 & Schoolhouse Rd and Franconia WWTP		
a Keller Creamery Rd. to Rte 113	5,760	49
b Fell Rd. to Rte 113	9,480	35

A gravity conveyance sewer would not be feasible. Depending on the route, there are two major ridge lines that may need to be crossed: (1) the ridge between the Perkiomen and Indian Creeks and (2) the ridge between the Indian and Skippack Creeks. There are additional minor stream basins that would also make a gravity sewer impossible. Discharge to the Allentown Road pumping station would require the collector sewers in Morwood to cross only one of the two major ridge lines. Discharge to a sewer at Route 113 and Schoolhouse Road would require the collector sewers in Morwood to cross both of the two major ridge lines in the Township.

If gravity collector sewers were selected, pumping stations and force mains would be required to convey the wastewater to the discharge point. The evaluation of alternatives in the following section includes the number and costs of the pumping station(s) in the analysis.

Pressure collector sewers would require the grinder pumps to produce sufficient head to drive the flow over the major and minor ridge lines involved. A hydraulic analysis has determined that a domestic grinder pump does not develop sufficient head to discharge the flow from Morwood to either (a) the Allentown Road pumping station or (b) a sewer at Route 113 and Schoolhouse Road. Consequently, these conveyance alternatives would be applicable only for the Gerhart Lane area, but not the village of Morwood.

6.3 EVALUATION OF SEWERAGE ALTERNATIVES

Evaluations of alternatives to provide sewer service to the planning area have been ongoing by Franconia Township since 2011. The Township formed an Act 537 planning committee that meets periodically to review alternatives. Initial planning began with the concept of gravity collector sewers with a new wastewater treatment plant to be constructed. This sewerage concept had been envisioned for the village of Morwood since 1973. The problem that has stalled the sewerage concept since that time has been the affordability of the project.

The Act 537 planning committee has come to certain conclusions over the years. The two basic conclusions are summarized as follows in the chronological order in which they were reached.

1. **Discharging to an existing WWTP is less expensive than constructing a new WWTP.** Franconia staff met with DEP representatives on April 6, 2011 to explore alternative treatment/disposal alternatives, including (a) transfer and use of the soon to be abandoned Pilgrims Pride WWTP at Route 113 and Allentown Road, (b) spray irrigation of treated effluent from a new WWTP, (c) drip irrigation of treated effluent from a new WWTP, and (d) potential relaxation of the effluent limits proposed by the DEP for the Perkiomen Creek. These alternatives were subsequently considered and then eliminated.
   a. Franconia Township Supervisors ruled out a WWTP on the former Pilgrims Pride site and the pre-existing WWTP was then demolished.
   b. The 90-day storage requirements, limited soil suitability and consequent land requirements precluded the spray irrigation alternative.
   c. Franconia engaged a soil scientist to evaluate three potential sites for drip irrigation. All of the sites were determined to be unsuitable due to the unsuitable soils.
   d. The DEP was unwilling to consider an effluent phosphorus limit other than the proposed 0.04 mg/l in the summer months and 0.08 mg/l in the winter months.

   The conventional alternatives of (a) constructing a new WWTP and (b) discharge to an existing municipal WWTP were then evaluated. The alternatives are generally described in section 6.2.2 above. Three sites were considered as possible locations for a new WWTP: (1) Camp Road in the village core of Morwood, near the Perkiomen Creek, (2) Keller Creamery Road adjacent to the Indian Creek, near the Gerhart Lane area, and (3) Creamery Road, immediately east of the PA Turnpike and adjacent to the Perkiomen Creek. Two existing municipal WWTP were evaluated as possible discharge points: (1) Telford WWTP located on Telford Pike and discharging to the Indian Creek and (2) Franconia located on Souder Road and discharging to the Skippack Creek.

   Cost estimates for the treatment alternatives were presented at meetings of the Township Act 537 planning committee in June and July of 2011. The cost estimates presented at the meetings are included in Appendix A. The estimates included gravity collection and pumped conveyance requirements. The estimates also considered options for discharging the flows from the two primary service areas to the same WWTP or dividing the service area flows to separate, closer WWTP. Based on the cost estimates, the Township came to the following conclusions:

   1. Discharging to an existing WWTP is less expensive than constructing a new WWTP.

2. If a new WWTP were to be constructed, it is less expensive to construct two WWTP, each of which would be closer to the two primary service areas.

In either case, the cost to the users would be on the order of $45,000 per dwelling unit. This was considered to be unaffordable to the users. As a result, planning was paused as other alternatives were developed.

2. **Pressure sewers make service feasible.** Review of the project cost estimates from 2011 indicates that the preferred gravity collector sewer systems represent a substantial cost to the user. Accordingly, pressure sewers were evaluated as an alternative to reduce the user cost. Planning committee meetings resumed in 2013 to consider the alternatives and the acceptability of grinder pumps to homeowners.

   Cost estimates, which are included in Appendix A, were prepared to compare gravity to pressure collector sewers. The comparative cost estimates were presented to the Township Act 537 planning committee in September and October of 2013. Based on the cost estimates, the committee came to the following conclusions:

   1. Pressure sewers make service more affordable to the users.
   2. Discharge to the Telford WWTP is less costly, but involves uncertainty regarding potential future costs of upgrading the plant to meet Indian Creek TMDL standards proposed by DEP.

   At the time of the 2013 planning committee meetings, Franconia understood that Telford anticipated that the cost to upgrade the WWTP to meet proposed DEP standards would be on the order of $13 million. Based on their reserved capacity, Franconia would be responsible for approximately 47% of the upgrading costs for the Telford WWTP.

   Subsequently, additional information was requested and obtained from Telford. In response to our request, the Telford engineer provided a May 23, 2014 letter-report estimating the cost to upgrade the Telford WWTP to meet Indian Creek TMDL standards proposed by DEP at $4.5 million. This reduced cost estimate similarly mitigated the uncertainty of discharging to the Telford WWTP.

   A hydraulic analysis in 2015 determined that pressure sewers in Morwood village could not produce the head required to pump over two major ridge lines into the Indian and then the Skippack basins. Consequently, the only existing WWTP to which Morwood pressure sewers could discharge would be the Telford WWTP.

Based on the preceding evaluations and conclusions, the Township Act 537 planning committee has decided on a plan at their meeting in April 2016 that includes the following components:

- Pressure sewers in the collection areas of Morwood village, Gerhart Lane and Allentown Road. Topography allows the use of gravity sewers to collect flows from Rittenhouse Place and convey them a short distance along Indian Creek Road to an existing sewer in Godshall Road.
- Conveyance of flows from (a) Morwood village along Creamery Road to the existing Earlington sewers and pumping station and ultimately to the Telford WWTP, and (b) Gerhart Lane area

across the PA Turnpike and along Indian Creek and Allentown Roads to the existing Allentown Road pumping station. The conveyance pressure sewer will also provide service to residents along Allentown Road.

- The capacities of the existing Earlington, Godshall Road and Allentown Road pumping stations will need to be increased to accommodate the various sub-areas of the Act 537 planning area. These pumping station needs are presented in Table 6-2.

  Earlington pumping station design included an allowance for future service to the Morwood planning area. The construction of any pumping station upgrade should be deferred to the future until the Morwood planning area is connected to the system and the capacity needs can be further assessed.

  Godshall Road pumping station may be approaching its capacity as a result of the increased flows from the Earlington sewer sub-system. The station capacity will need to be expanded in the near-future.

  Allentown Road pumping station has reached its capacity and needs to be upgraded. The station currently discharges to the Telford WWTP, but is permitted to be redirected to the Franconia WWTP, as described previously in Section 4.2.3. The station will need to expanded and upgraded as part of this project.

The proposed sewerage system is shown on Figure 6-1. The cost of providing public sewerage service to the planning area is summarized in Table 6-3. Based on the project cost estimate and the allocated cost per dwelling unit, sewer service in the planning area appears feasible.

TABLE 6-1
ALTERNATIVE CONVEYANCE ROUTES

Discharge Point / Sewer Location	Sewer Length (LF)	No. of Services (EDU)	Estimated Project Cost
Morwood Conveyance Alternatives			
1 to Earlington PS and Telford WWTP			
Creamery Rd to Allentown Rd	3,990	18	$650,000
Gerhart Lane Area Conveyance Alternatives			
2 to Morwood conveyance and Telford WWTP			
Hunsicker Rd to Morwood Rd	2,200	8	$350,000
3 to Allentown Rd PS			
a Eisenhauer Rd. to Harvest Dr.	4,140	12	$850,000
b Eisenhauer Rd. to Allentown Rd.	5,960	40	$1,440,000
4 to Route 113 & Schoolhouse Rd and Franconia WWTP			
a Keller Creamery Rd. to Rte 113	5,760	49	$1,110,000
Schoolhouse Rd (Rte 113 to Lower Rd)	6,840	31	$1,180,000
Total Sewer System	12,600	**80**	**$2,290,000**
b Fell Rd. to Rte 113	9,480	35	$1,460,000

Note:

1 The alternatives involving discharge to the vicinity of Route 113 assume that the pending project to serve Schoolhouse Road, from Route 113 to Lower Road, would be constructed as part of another, pending project.

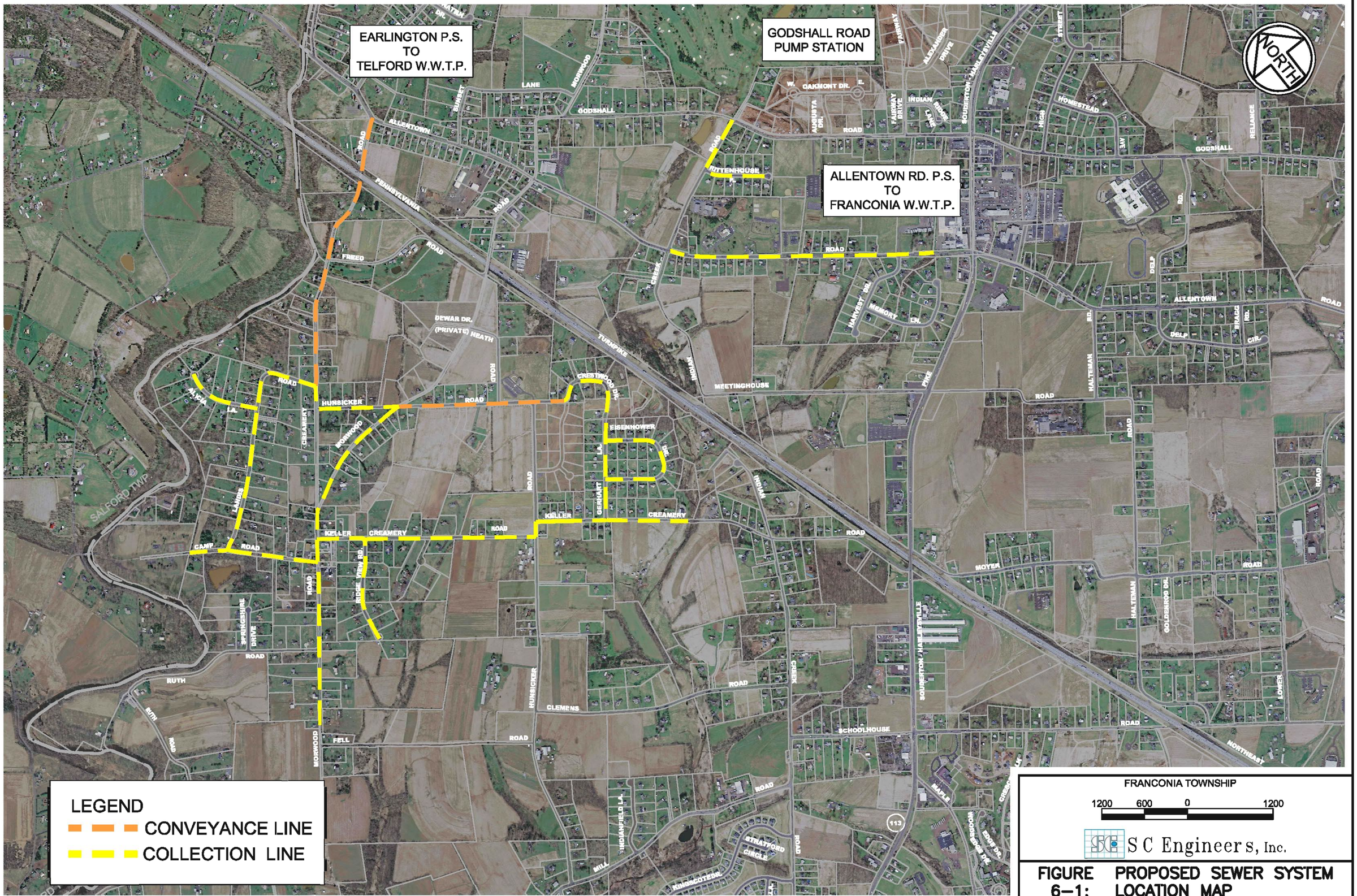


FIGURE 6–1: PROPOSED SEWER SYSTEM LOCATION MAP

TABLE 6-2
PUMPING STATION DESIGN FLOW CRITERIA

Service Area	Connections (EDU)	Design Flow Avg. (gpd)	Design Flow Peak (gpm)
EARLINGTON P.S.			
Original Design:			
Earlington area (Franconia Twp)	146	40,150	
Tylersport area (Salford Twp)	313	86,300	
Design Flow	**459**	**126,450**	**550**
Morwood 537 Planning Area	217	59,675	
Upgrade required for Morwood	**676**	**186,125**	**570**
GODSHALL ROAD P.S.			
Original Design:			
Upper Indian Creek Basin	543	**163,000**	**500**
Earlington Service Area Needs:			
Earlington PS Flow	459	126,450	
Earlington (Godshall Rd gravity)	34	9,350	
Misc. Infilling	27	7,425	
Upgrade required for Earlington	1,063	**306,100**	**850**
Morwood 537 Planning Area			
Earlington PS Flow Increase	217	59,675	
Rittenhouse Place	12	3,300	
Twp. Public Works	5	1,250	
	234	64,225	
Upgrade required for Morwood	**1,297**	**370,325**	**1,010**
ALLENTOWN ROAD P.S.			
Current Conditions		50,000	**200**
Morwood 537 Planning Area			
Allentown Rd pressure sewer extensior	34	9,350	
Upgrade required for Morwood		**59,350**	**230**

Note:

Average Flows are based on unit flow of 275 gpd/EDU.

TABLE 6-3
SUMMARY OF SELECTED SEWERAGE PLAN

Sewerage Component	Sewer System: Sewer Length (LF)	Sewer System: No. of Exist. EDU	Estimated Project Cost
Proposed Sewerage System			
Collector Sewers	28,800	237	$5,900,000
Conveyance Piping	6,190	26	1,000,000
WWTP Tapping Fees			2,630,000
Total Project Cost	34,990	263	**$9,530,000**
Unit Cost ($/EDU)			**$36,240**
Estimated Flow (gpd)		72,325 gpd	

Notes:

1. Collector Sewers are based on pressure sewers, with the exception of Rittenhouse Place.
2. WWTP Tapping Fees assume that the Allentown Road pumping station flows will have to be diverted from the Telford WWTP to the Franconia WWTP to provide capacity in the Telford WWTP for the planning area.
3. Conveyance Piping alternatives to the Franconia WWTP are presented in a prior table. The data in this table is based on routing (a) the Gerhart Lane area along Hunsicker Rd to Morwood Rd and (b) the Morwood village area along Creamery Rd to Allentown Road.
4. Estimated flows are based on 275 gpd/EDU.
5. Cost estimates do not include costs for sewer laterals on private property.
6. Cost estimates need to be considered preliminary at this time (until construction bids are received) and should not be presented to homeowners as a firm cost. Homeowners should be responsible for the actual costs of sewer system installation.

7 DESCRIPTION OF SELECTED PLAN

7.1 PLAN SUMMARY

The selected sewerage project to serve the village of Morwood and other segments of the planning area in Franconia Township was presented previously in Section 6.3. The plan selected by Franconia Township calls for the implementation of the following proposed sewerage project.

- Pressure sewers in the collection areas of Morwood village Gerhart Lane and Allentown Road.

  Collector sewers in the village of Morwood will include roughly 17,000 feet of pipe serving 136 properties along the following roads:
  (a) Morwood Road, between Hunsicker and Fell Roads,
  (b) Keller Creamery Road, between Morwood Road and Hunsicker Road,
  (c) Ridgeview Drive,
  (d) Camp Road, between Morwood Road and Branchwood Park,
  (e) Landis Road,
  (f) Alycia Lane,
  (g) Creamery Road, between Landis and Morwood Roads, and
  (h) Hunsicker Road, between Morwood and Heath Roads.

  Collector sewers in the Gerhart Lane area will include roughly 6,500 feet of pipe serving 63 properties along the following roads:
  (a) Gerhart Lane,
  (b) Keller Creamery Road, between Hunsicker Road and Indian Creek,
  (c) Eisenhower Drive, and
  (d) Crestwood Drive.

  Collector sewers in Allentown Road will include roughly 3,700 feet of pipe serving 32 properties, including the Franconia Township municipal complex and a church, along the following stretch of the road:
  (a) Allentown Road, from Indian Creek Road to the existing pumping station near Harleysville Pike (PA Route 113).

- Gravity sewers in the collection area of Rittenhouse Place, including 14 properties. Gravity sewers will flow along Rittenhouse Place and Indian Creek Road to an existing sewer in Godshall Road.

- Pressure sewers will also be used to convey the collected wastewater to the discharge points. Conveyance of flows will be by pressure sewers from (a) Morwood village along Creamery Road to the existing Earlington sewers and pumping station and ultimately to the Telford WWTP, and (b) Gerhart Lane area along Hunsicker Road to the proposed Morwood village collector sewers at Morwood Road.

- The capacities of the existing Earlington, Godshall Road and Allentown Road pumping stations will need to be increased to accommodate the various sub-areas of the Act 537 planning area. Design flow data for these pumping stations were presented previously in Table 6-2.

Collection and conveyance sewers presented in the preceding summary are proposed for immediate construction. Upgrading of the Allentown Road pumping station is also proposed for immediate construction. Increasing the Godshall Road pumping station capacity is proposed for construction in the near-future, as determined necessary. Increasing the Earlington pumping station capacity is proposed for construction in the future, as determined necessary based on an ongoing assessment of flows.

7.2 CONSISTENCY DETERMINATIONS

As described in the preceding section, the selected plan involves a sewerage project for immediate construction. The plan was evaluated and found to be consistent with the following requirements:

- ☑ **PA Title 25, Environmental Protection**
  - ✓ Chapter 71, *Act 537 Sewage Facilities Planning Program*
  - ✓ Chapter 93, *Water Quality Standards*. The Perkiomen and Indian Creeks are not classified as a high quality or exceptional value stream. However, the Indian and Skippack Creeks to which the existing WWTP discharge have been designated as "impaired streams" under section 303(d) of the Federal Clean Water Act. The existing WWTP provide advanced treatment to meet effluent limits established by the PADEP.
  - ✓ Chapter 94, *Municipal Wasteload Management*. The Franconia and Telford WWTP are not currently nor projected to be overloaded.
  - ✓ Chapter 95, *Wastewater Treatment Requirements*. As indicated previously, the proposed WWTP will provide advanced treatment to meet effluent limits established by the PADEP.
  - ✓ Chapter 102, *Soil Erosion and Sedimentation Control*. Appropriate permits will be obtained from the Montgomery County Conservation District and controls installed and maintained during construction.
  - ✓ Chapter 105, *Wetland Protection*. A wetlands delineation will be performed as appropriate along the proposed conveyance sewer route. Appropriate permits will be obtained and precautions taken during construction.
- ☑ **Federal Clean Water Act** (Section 208). Antidegradation requirements are addressed under PADEP Chapter 93, above.
- ☑ **PA State Water Plan**
- ☑ **PA Municipalities Planning Code** (Act 247)
- ☑ **PA Storm Water Management Act**. There is no approved stormwater management plan for the Skippack Creek basin in Montgomery County. A study has been initiated but not completed nor approved, according to the PADEP.
- ☑ **PA Natural Diversity Inventory** (PNDI). PNDI search was completed by the PADEP for the proposed project. The PNDI Environmental Review indicated "no known impacts." Documentation is provided in Appendix D.
- ☑ **PA Historical Protection Act of 1978**. Submittals were made to the PA Historical and Museum Commission (PHMC) for the proposed sewerage project. In a letter dated June 16, 2009, the PHMC stated that they "agree with the recommendations of this report and … project activities

should have no effect on archaeological resources in the surveyed areas." Documentation is provided in Appendix D.

☑ **Prime Agricultural Land Preservation Policy**. The 1995 *Environmental Resource Protection Plan* identifies the area along the streams as "Prime Farmland" and the vast majority of the remainder of Franconia Township as "Farmland of Statewide Importance." The stated policy of PADEP is to provide a review of new land development "because the availability of public sewer and water lines increases the probability that an area will be developed further." The selected plan does not propose sewers in permanently preserved agricultural lands.

7.3 ANTICIPATED IMPLEMENTATION SCHEDULE

A tentative schedule for implementation of the selected sewerage project has been developed. The following tabulation provides a generalized implementation schedule for the sewer project proposed for immediate implementation. The schedule is based on time from initiation of the project.

Project Task	Tentative Schedule
Design of construction project (from authorization to permit application)	6 months
Construction Permitting (from application to DEP approval)	4 months
Bidding for construction contracts (from Advertisement to contract award)	3 months
Contract Initiation (from contract award to Notice to Proceed)	2 months
Project Construction (from Notice to Proceed to completion)	9 months

The preceding schedule is tentative at this time and could vary as the project proceeds. However, the tentative schedule indicates that it will take at least 2 years from the time of design authorization to the completion of construction and the availability of public sewer service.

7.4 CAPITAL FINANCING PLAN

Financing of the selected sewerage plan is expected to come from two primary sources:

$ **Sewer Assessments**. Properties abutting and/or served by the installed sewers will be charged a fee for their share of the service.

In the event that there are property owners who do not pay the sewer assessment, a lien will need to be recorded on those properties and the FSA has the following interim means of financing.

- **Bond Issue.** The balance of the project costs could be financed through a municipal bond issue. The annual debt service on the bond issue would be incorporated into the rates of existing sewer users.

8 INSTITUTIONAL ARRANGEMENTS

The institutional arrangements that currently exist are adequate to provide for the current and future sewerage service needs of Franconia Township. The Franconia Sewer Authority (FSA) in conjunction with Franconia Township has the capabilities to implement the recommended wastewater facilities plan. The FSA is responsible for all wastewater collection and conveyance within the municipality. There is no apparent need for any new institutional arrangements to provide for public sewerage service.

Financial Status. The Franconia Sewer Authority currently has limited capital reserve funds and has a good financial standing. The FSA, with the backing of Franconia Township, issued an $8.305 million bond in December 2006. The FSA refunded a portion of those 2006 bonds through a $5.845 million guaranteed sewer revenue bonds in January 2013. The FSA subsequently fully refunded the 2006 bonds through $9.18 million guaranteed sewer revenue note in December 2015.

Legal Authority. The Franconia Sewer Authority has the existing legal authority to:

- ☑ Implement the wastewater planning recommendations contained herein,
- ☑ Negotiate agreements with other parties.
- ☑ Condemn property and/or easements for public sewerage facilities in the event that agreements can not be reached.
- ☑ Raise capital for the construction of facilities. As mentioned above, the FSA has the financial status to issue a bond to provide capital for the project.
- ☑ Set user rates to cover annual debt service requirements and provide for the operation and maintenance of facilities,
- ☑ Provide for system-wide operation and maintenance activities, and
- ☑ Take enforcement actions against ordinance violators in conjunction with the Township.

Operation and maintenance of the existing sanitary sewerage system is conducted with Township staff. Additionally, Township enforcement of local ordinances can be required for isolated significant events.

- ➢ **Staffing.** The current practice of using Township public works crews to operate and maintain the sewer system and pumping stations continues to be functional. It is not anticipated that additional staffing arrangements will be needed as this plan is implemented.

If it is determined in future years that additional staffing is required, those needs can be met through either (a) additional personnel within the Township/Authority framework or (b) contract services.

APPENDIX A

COST ESTIMATES
FOR TOWNSHIP ACT 537 PLANNING COMMITTEE MEETINGS

The following important points should be understood when reviewing the data in this Appendix:

1. **The data herein was prepared as long as 5 years ago, and cost estimates have since been updated.**
2. **The cost comparison tables may be specific to certain project components (such as collection, conveyance or treatment) and may not include all the project component costs.**

TABLE 2

SUMMARY OF ALTERNATIVE SEWERAGE PROJECT COSTS

Alt. No.	Point of Treatment	Connections (EDU) Morwood	Indian basin	Total	Est. Project Cost Morwood	Indian basin	Total
Pump to exist. WWTP							
1	Telford WWTP	121	89	210	$5,475,000 $45,248/DU	$3,209,000 $36,056/DU	**$8,684,000** $41,352/DU
2	Franconia WWTP	109	89	198	$4,840,000 $44,404/DU	$3,089,000 $34,708/DU	**$7,929,000** $40,045/DU
New WWTP							
3	@ Camp Rd	108	89	197	$5,290,000 $48,981/DU	$4,614,000 $51,843/DU	**$9,904,000** $50,274/DU
4	@ Creamery Rd	121	89	210	$6,905,000 $57,066/DU	$4,614,000 $51,843/DU	**$11,519,000** $54,852/DU
5	along Indian Creek	109	89	198	$6,890,000 $63,211/DU	$3,364,000 $37,798/DU	**$10,254,000** $51,788/DU
Best Separate Options for New WWTP							
3/5		108	89	197	$5,290,000	$3,364,000	**$8,654,000** $43,929/DU

GENERAL CONCLUSIONS - 2011:

1. Discharging to an existing WWTP is less expensive than constructing a new WWTP.
2. Developer funding (available at that time) made sewers in the Indian Creek basin more economical.
3. Local facilities were more economical than remote facilities.

TABLE 1

ESTIMATED COSTS OF ALTERNATIVE SEWERAGE PLANS

No.	Alternative Method of Treatment	Sewerage Components	Morwood Village System Quantities Pipe Length (LF)	Morwood Village System Quantities Exist. EDU	Morwood Village Estimated Project Cost	Indian Creek basin System Quantities Pipe Length(LF)	Indian Creek basin System Quantities Exist. EDU	Indian Creek basin Estimated Project Cost	Total System Reqmts.
	PUMP TO EXIST. WWTP								
1	**Telford WWTP**								
		Collector Sewers	13,830	108	$3,040,000	9,500	89	$1,580,000	23,330 LF
		Pumping Station			540,000			540,000	
		Conveyance Piping	6,580	13	1,370,000	4,720	0	710,000	11,300 LF
		Land/Easements			15,000			4,000	
		WWTP		33,275 gpd	510,000		24,475 gpd	375,000	57,750 gpd
		Project Totals	20,410	121	**$5,475,000**	14,220	89	**$3,209,000**	**$8,684,000**
					$45,248/DU			$36,056/DU	$41,352/DU
2	**Franconia WWTP**								
		Collector Sewers	13,830	108	$3,040,000	9,500	89	$1,580,000	23,330 LF
		Pumping Station			540,000			540,000	
		Conveyance Piping	6,300	1	900,000	4,400	0	650,000	10,700 LF
		Land/Easements			0			25,000	
		WWTP		29,975 gpd	360,000		24,475 gpd	294,000	54,450 gpd
		Project Totals	20,130	109	**$4,840,000**	13,900	89	**$3,089,000**	**$7,929,000**
					$44,404/DU			$34,708/DU	$40,045/DU
	NEW WWTP								
3	**Camp Road**								
		Collector Sewers	13,830	108	$3,040,000	9,500	89	$1,580,000	23,330 LF
		Pumping Station			0			540,000	
		Conveyance Piping			0	4,720	0	710,000	4,720 LF
		Land/Easements			250,000			4,000	
		WWTP		29,700 gpd	2,000,000		24,475 gpd	1,780,000	54,175 gpd
		Project Totals	13,830	108	**$5,290,000**	14,220	89	**$4,614,000**	**$8,984,000**
					$48,981/DU			$51,843/DU	$45,604/DU

ESTIMATED COSTS OF ALTERNATIVE SEWERAGE PLANS

No.	Alternative Method of Treatment	Sewerage Components	Morwood Village System Quantities Pipe Length (LF)	Morwood Village System Quantities Exist. EDU	Morwood Village Estimated Project Cost	Indian Creek basin System Quantities Pipe Length(LF)	Indian Creek basin System Quantities Exist. EDU	Indian Creek basin Estimated Project Cost	Total System Reqmts.
4	**Creamery Road**								
		Collector Sewers	13,830	108	$3,040,000	9,500	89	$1,580,000	23,330 LF
		Pumping Station			540,000			540,000	
		Conveyance Piping	4,675	13	830,000	4,720	0	710,000	9,395 LF
		Land/Easements			355,000			4,000	
		WWTP		33,275 gpd	2,140,000		24,475 gpd	1,780,000	57,750 gpd
		Project Totals	18,505	121	**$6,905,000**	14,220	89	**$4,614,000**	**$10,569,000**
					$57,066/DU			$51,843/DU	$50,329/DU
5	**Indian Creek Road**								
		Collector Sewers	13,830	108	$3,040,000	9,500	89	$1,580,000	23,330 LF
		Pumping Station			540,000			0	
		Conveyance Piping	6,300	1	900,000	0		0	6,300 LF
		Land/Easements			400,000			4,000	
		WWTP		29,975 gpd	2,010,000		24,475 gpd	1,780,000	54,450 gpd
		Project Totals	20,130	109	**$6,890,000**	9,500	89	**$3,364,000**	**$9,334,000**
					$63,211/DU			$37,798/DU	$47,141/DU

Note:

1 Costs for New Wastewater Treatment Plant (WWTP) reflect economy of scale. The costs for a total combined system are not the sum of of the individual basin treatment costs.

TABLE 3
ESTIMATED COSTS OF ALTERNATIVE PRESSURE SEWERAGE PLANS

Sewerage Component	Sewer System: Sewer Length (LF)	Sewer System: No. of Exist. EDU	Estimated Cost: Project	Estimated Cost: ($/EDU)
MORWOOD				
New WWTP on Camp Road				
Morwood Collector Sewers	13,830	108	$1,750,000	$16,204
Pumping Station				
Conveyance Piping				
Land/Easements			250,000	2,315
WWTP			2,000,000	18,519
Total Project Cost	13,830	108	**$4,000,000**	**$37,037**
Discharge to Telford WWTP (thru Earlington)				
Morwood Collector Sewers	13,830	108	$1,750,000	$13,889
Pumping Station				
Conveyance Piping	3,150	18	380,000	3,016
Land/Easements				
WWTP			531,000	4,214
Total Project Cost	16,980	126	**$2,661,000**	**$21,119**
DISCHARGE TO TELFORD W.W.T.P. (thru Earlington)				
Indian Creek basin				
Indian Crk. Collector Sewers	6,480	63	$870,000	$12,254
Pumping Station				
Conveyance Piping	2,200	8	250,000	3,521
Land/Easements				
WWTP			299,000	4,211
Total Project Cost	8,680	71	**$1,419,000**	$19,986
Combined: Morwood and Indian Creek basin				
Collector Sewers	20,310	171	$2,620,000	$13,299
Pumping Station				
Conveyance Piping	5,350	26	630,000	3,198
Land/Easements				
WWTP			830,000	4,213
Total Project Cost	25,660	197	**$4,080,000**	**$20,711**

TABLE 3
ESTIMATED COSTS OF ALTERNATIVE PRESSURE SEWERAGE PLANS

Sewerage Component	Sewer System: Sewer Length (LF)	Sewer System: No. of Exist. EDU	Estimated Cost: Project	Estimated Cost: ($/EDU)
DISCHARGE TO FRANCONIA W.W.T.P. (thru Allentown Rd PS)				
Morwood				
Morwood Collector Sewers	13,830	108	$1,750,000	$15,086
Pumping Station				
Conveyance Piping	2,200	8	250,000	2,155
Land/Easements				
WWTP			1,157,000	9,974
Subtotal Project Cost	16,030	116	**$3,157,000**	$27,216
Indian Creek basin				
Indian Crk. Collector Sewers	6,480	63	$870,000	$8,447
Pumping Station				
Conveyance Piping	5,960	40	1,030,000	10,000
Land/Easements				
WWTP			1,027,000	9,971
Total Project Cost	12,440	103	**$2,927,000**	**$28,417**
Combined: Morwood and Indian Creek basin				
Collector Sewers	20,310	171	$2,620,000	$11,963
Pumping Station				
Conveyance Piping	8,160	48	1,280,000	5,845
Land/Easements				
WWTP			2,184,000	9,973
Total Project Cost	28,470	219	**$6,084,000**	**$27,781**

TABLE 4
SUMMARY OF ALTERNATIVE SEWERAGE PLANS

Sewerage Component	Estimated Cost: Pressure Sewers	Estimated Cost: Gravity Sewers
MORWOOD		
New WWTP on Camp Road		
Total Project Cost	$4,000,000	$5,290,000
Unit Cost ($/EDU)	$37,037	$48,981
Discharge to Telford WWTP (thru Earlington)		
Total Project Cost	$2,661,000	$5,475,000
Unit Cost ($/EDU)	$21,119	$45,248
DISCHARGE TO TELFORD W.W.T.P. (thru Earlington)		
Combined: Morwood and Indian Creek basin		
Total Project Cost	$4,080,000	$8,684,000
Unit Cost ($/EDU)	$20,711	$41,352
DISCHARGE TO FRANCONIA W.W.T.P. (thru Allentown Rd PS)		
Indian Creek basin		
Total Project Cost	$2,927,000	$3,702,000
Unit Cost ($/EDU)	$28,417	$40,681
Combined: Morwood and Indian Creek basin		
Total Project Cost	$6,084,000	$9,269,000
Unit Cost ($/EDU)	$27,781	$46,345

CONCLUSIONS:

1. Pressure sewers make service feasible (as compared to gravity sewers).
2. Discharge to Franconia WWTP is slightly more costly, but offsets existing FSA debt on WWTP.
3. Discharge to Franconia WWTP also eliminates uncertainty regarding potential future costs of upgrading Telford WWTP to meet PADEP requirements.

TABLE 5
ALTERNATIVE CONVEYANCE ROUTES
TO FRANCONIA W.W.T.P.

	Sewer Location	Sewer Length (LF)	No. of Services (EDU)	Estimated Cost Project	Estimated Cost ($/EDU)
Allentown Rd PS					
1	Eisenhower Rd. to Harvest Dr.	4,140	12	$640,000	$53,333
2	Eisenhower Rd. to Allentown Rd.	5,960	40	$1,030,000	$25,750
Route 113 (potential sewer project on Schoolhouse Rd)					
3	Keller Creamery Rd. to Rte 113	5,760	49	$750,000	$15,306
4	Fell Creek Rd. to Rte 113	9,480	35	$1,040,000	$29,714

Note:

1 The alternatives involving discharge to the vicinity of Route 113 assume that the project serving Schoolhouse Road from Route 113 to Lower Road is constructed. The costs for the Schoolhouse Road project are not included in the preceding estimates.

APPENDIX B

DOCUMENTATION RELATED TO ADOPTION OF ACT 537 PLAN REVISION

RESOLUTION NO. _____
RESOLUTION OF ADOPTION FOR ACT 537 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 PA Department of Environmental Protection (PADEP) 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, Franconia Township has prepared and re-evaluated its prior Act 537 revision, which provides for sewage facilities in Franconia Township, and

WHEREAS, Franconia Township finds that the Facility Plan 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 Supervisors of Franconia Township hereby adopt and submit to the PA Department of Environmental Protection for its approval as a revision to its already approved "Official Plan" of the municipality, the above referenced facility plan. The Township hereby assures the PADEP of the complete and timely implementation of the said plan as required by Section 5 of the Pennsylvania *Sewage Facilities Act*, as amended.

The selected plan proposes the installation of sanitary sewer within the lower Indian and Perkiomen Creek basins of Franconia Township. The proposed sewer project includes:

- ⇨ Pressure collector sewers in the planning area, including (a) 16,980 feet of sewer serving 128 properties in Morwood village, (b) 6,480 feet of sewer serving 63 properties in the Gerhart Lane area, and (c) 3,660 feet of sewer serving 32 properties on Allentown Road,
- ⇨ Gravity collector sewers on Rittenhouse Place serving 14 properties,
- ⇨ Conveyance pressure sewers that would discharge to the existing Earlington pumping station,
- ⇨ Upgrading of the Godshall Road and Allentown Road pumping stations.

I, Jon Hammer, Township Manager for the Franconia Township Board of Supervisors hereby certify that the foregoing is a true copy of Franconia Township Resolution No. _____ adopted on _____ , 2016.

AUTHORIZED SIGNATURE

(Municipal Seal)

_____
(Name, Title)

PUBLIC NOTICE

As required by the Pennsylvania Sewage Facilities Act (Act 537), Franconia Township hereby gives notice that it intends to revise its Official Sewage Facilities Plans as follows:

After consideration of alternatives, the selected plan for the Franconia Township recommends the installation of sanitary sewer within the lower Indian and Perkiomen Creek basins of Franconia Township. The proposed sewer project includes:

- ⇨ Pressure collector sewers in the planning area, including (a) 16,980 feet of sewer serving 128 properties in Morwood village, (b) 6,480 feet of sewer serving 63 properties in the Gerhart Lane area, and (c) 3,660 feet of sewer serving 32 properties on Allentown Road,
- ⇨ Gravity collector sewers on Rittenhouse Place serving 14 properties,
- ⇨ Conveyance pressure sewers that would discharge to the existing Earlington pumping station,
- ⇨ Upgrading of the Godshall Road and Allentown Road pumping stations.

User costs are estimated at $36,000 per EDU.

A thirty-(30) day public comment period has been established. Copies of the revised plan are available for public inspection at the municipal building:

Franconia Township Building
671 Allentown Road
Franconia, PA 19460

Any comments regarding the proposed plan revision shall be in writing and will be forwarded to the PA Department of Environment Protection along with the plan revision. Comments should be addressed to Mr. Jon Hammer, Franconia Township Manager, at the preceding address.

After the thirty-(30) day public comment period, Franconia Township intends to forward the plan to the PA Department of Environmental Protection for approval.

APPENDIX C

MONTGOMERY COUNTY AGENCY REVIEWS

APPENDIX D

CONSISTENCY DOCUMENTATION

APPENDIX E

COMMENTS AND RESPONSES