
EXHIBIT P2
LIMERICK TOWNSHIP ACT 537 SPECIAL STUDY
POSSUM HOLLOW MARCH 2000

99-721-01

**LIMERICK TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA**

**ACT 537 SPECIAL STUDY
POSSUM HOLLOW STUDY AREA**

**JANUARY, 2000
Revised March, 2000**

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1. INTRODUCTION

1.1. DEFINITION OF SPECIAL STUDY AREA

Limerick Township is a 23± square mile municipality, located near the western corner of Montgomery County. The Possum Hollow Special Study Area (Special Study Area) consists of a 3.6± square mile area in the western corner of the Township, and contains all or part of the Hartenstine Creek, Sanatoga, Possum Hollow Run, and Brooke Evans Creek drainage areas. The area is bounded to the southwest and northwest by the municipal boundary, to the northeast by Hartenstine Creek, and to the southeast by a line which is near the limits of the Possum Hollow Run and Lower Brooke Evans Creek drainage areas. The Upper Brooke Evans Creek drainage area is located immediately northeast of the Special Study Area, and is considered a potential future addition to the Special Study Area as described later in this report. Figure 1 shows the boundaries of the Special Study Area and Upper Brooke Evans Creek drainage area.

1.2. PREVIOUS PLANNING

The Limerick Township Act 537 Plan is the sum of various updates and revisions conducted in the past several years. An Act 537 Sewage Facilities Management Plan Update, prepared by PSC, Inc., was adopted by the Limerick Township Board of Supervisors in May, 1992. In response to Pennsylvania Department of Environmental Resources (PADER) comments, Gilmore & Associates, Inc. (Gilmore) prepared and submitted an addendum to the plan in 1993, and the plan was then approved by PADER in September, 1993. Gilmore prepared an Act 537 Plan Revision for Limerick Township in 1997, but that revision did not involve the Special Study Area; no comprehensive planning has been conducted for the Special Study Area since the 1993 Act 537 Plan Update.

The 1993 Act 537 Plan Update called for construction of a wastewater treatment plant in the western portion of the Township, the "Possum Hollow Run WWTP," to provide "future" sanitary sewer service to the area described herein as the Special Study Area. The Plan Update also described a number of pump stations and force mains, as well as gravity sewer interceptors, to convey flows to the proposed treatment plant as shown in Figure 2. As documented in the 1993 Act 537 Plan Update, the installation of these facilities represented the most viable alternative to provide public sewer service to this area of the Township. The construction of a new treatment plant compared favorably to conveyance to and upgrading of the existing Limerick Township Municipal Authority (LTMA) WWTP, considering also the presence of soils which are generally unsuitable for on-site subsurface disposal.

In addition to the above, Gilmore prepared a feasibility study for providing public sewer service to a portion of Fruitville Road and Ridge Pike, dated July, 1998, which is included as Appendix A to this report. The basic sanitary sewer design described in that feasibility study was applied to that portion of the Special Study Area in describing planned sewer facilities in this report.

PURPOSE OF SPECIAL STUDY

This Special Study describes minor modifications to the planned sanitary sewer facilities described in the existing Limerick Township Act 537 Plan. These modifications include relocation and resizing of the proposed wastewater treatment plant, as well as revisions to location and sizing of some of the conveyance facilities. The proposed changes are based on existing conditions and the latest projections of development and public sewer service needs within the Special Study Area, with the purpose of creating a current plan which most effectively serves the area.

It should be noted that this Special Study is only intended to describe minor changes to specific elements of the existing Act 537 Plan, and is not intended to substantially modify or redefine existing or planned conditions or facilities within the study area. For that reason, the scope of this Study is limited to information which is pertinent to the aforementioned changes. Additional background and other information regarding the Special Study Area, as well as the Limerick Township Act 537 Planning Area overall, is contained in the existing Limerick Township Act 537 Plan.

1.3. APPENDICES

Appendix 'A' to this report includes the Fruitville Area Feasibility Study to Extend Public Sewers to the Fruitville Area, dated July, 1998. Appendix 'B' includes Development and Flow Projections for each of the drainage areas in the Special Study Area. Appendix 'C' includes Opinions of Probable Cost for the proposed sanitary sewer facilities. Appendix 'D' includes correspondence regarding Limerick Township and Montgomery County Planning Commission, and Montgomery County Health Department reviews. Appendix 'E' includes proof of publication of Public Notice of the proposed Act 537 Special Study adoption and the establishment of a thirty (30) day public comment period. Appendix 'F' includes copies of all written public comments received and the municipal responses thereto. Appendix 'G' includes the signed and sealed resolution of adoption by the Limerick Township Board of Supervisors.

2. DESCRIPTION OF SPECIAL STUDY AREA

2.1. EXISTING AND PROPOSED DEVELOPMENT

2.1.1. Special Study Area

The Special Study Area currently has light to moderate development, including scattered residential and commercial/industrial properties. As in the rest of Limerick Township, however, development pressure is increasing in this area, and a number of projects are currently in the planning stages. The majority of planned development is commercial or light industrial, which is consistent with the zoning which is predominantly Limited Light Industrial (LLI) and Office/Light Industrial (O/LI), as shown on the Limerick Township Zoning Map, last revised September 3, 1999.

In the evaluation of sanitary sewer needs as described later in this report, several major existing and proposed developments in the Special Study Area were considered. These developments are identified in Table 1, and are shown in Figure 3. Also listed in Table 1 for each development are the number of equivalent dwelling units (EDUs) as a measure of anticipated sanitary sewage flow, where one EDU is equivalent to one household, or 250 gallons per day of total flow, per LTMA regulations.

It should be noted that use of the 250 gallons per day per EDU LTMA standard in this analysis was considered appropriate for several reasons. First, the vast preponderance of land within the Study Area is zoned for office, business, or light industrial use, which is expected to produce 500 gallons per day per acre. Furthermore, the three (3) principal contributors to the system have known or directly projected flow rates, and thus the flow demands listed in Table 3 are the true basis of design and the EDU totals are simply "back calculated" from those flows. Finally, since the actual commercial/industrial land use in the area, other than PECO Energy and Limerick Partners, is still speculative, a reasonably conservative but not excessive flow per EDU (250 gpd) was necessary. With regard to the Upper Brooke Evans Drainage Area (see below), 250 gallons per day per EDU was also used since the area is dominated by single family detached dwellings and commercial/industrial properties (Table 2) that would tend to produce comparatively large quantities of sewage on a unit basis.

2.1.2. Upper Brooke Evans Drainage Area

The Upper Brooke Evans Drainage Area is much more developed than the Special Study Area, to the point where virtually the entire area is either existing or proposed development, with the majority existing. A large portion of existing improvements is residential, but some light industrial facilities exist and more are planned. The existing and proposed developments in the Upper Brooke Evans Drainage Area are identified in Table 2. Unless otherwise noted, all of the projects identified are publicly sewered and connected to the existing LTMA treatment plant, as described below.

2.2. EXISTING SEWAGE FACILITIES

2.2.1. Special Study Area

No public sewer facilities currently exist in the Special Study Area. Existing development in the area is served by on-lot sub-surface disposal systems, with the exception of the PECO Nuclear Generating Station. The PECO Station has an existing wastewater treatment plant located on-site. The plant has not operated in several years, but continues to be used by the station to provide storage in conjunction with a pump and haul operation. The plant's sanitary effluent is pumped from the defunct treatment plant and hauled to the Pottstown sewage treatment plant.

2.2.2. Upper Brooke Evans Drainage Area

The majority of the Upper Brooke Evans Drainage Area is served by public sewers, including a gravity collection system and two (2) pump stations as shown in Figure 4. The effluent from these sewers is conveyed to the Authority's treatment plant, located on King Road in another area of the Township. The Upper Brooke Evans Drainage Area also includes several residential and light industrial properties which are currently served by on-lot disposal systems.

TABLE 1

SPECIAL STUDY AREA EXISTING AND PROPOSED DEVELOPMENT

NAME	DESCRIPTION	EDUs¹
PECO (Generating Station)	Existing nuclear generating station	137
Providence Properties	Proposed light industrial park	200
Limerick Partners	Proposed electric power plant	400
PECO (Airport)	Existing light industrial park	100
	TOTAL	837

¹Based on capacity reserved or requested with the Limerick Township Municipal Authority.

TABLE 2

UPPER BROOKE EVANS D.A. EXISTING AND PROPOSED DEVELOPMENT

NAME	DESCRIPTION	EDUs¹
Ashford	Existing residential subdivision	22
Links	Existing residential land development	79
Fairways	Existing residential land development	80
Merion	Existing residential subdivision	84
Airport Business Center	Existing light industrial park	53
Reed and West Cherry	Existing residential properties	14
Heather Glen	Existing residential subdivision	215 ²
Tarragam	Proposed residential subdivision	6
Berman	Proposed light industrial park	25
Limerick Center Road (unsewered)	Existing residential properties	10
Airport Business Center (unsewered)	Existing light industrial park	72 ³
	TOTAL	660

¹ Based on capacity used, reserved or projected with the Limerick Township Municipal Authority.

² Portion of subdivision in Upper Brooke Evans Drainage Area only.

³ Estimated based on area (36 acres) and 500 gallons per day per acre as per the Act 537 Plan Update.

3. *POTENTIAL ULTIMATE AREA DEVELOPMENT*

As indicated previously, development pressure exists in the Special Study Area as it does throughout Limerick Township. In light of the current zoning in this area, the majority of the future development is expected to be office or light industrial.

For the purpose of assessing ultimate needs and planning accordingly, flow projections have been prepared and are included in Appendix B. These projections represent build-out of the area, and should be considered for a ten to twenty year planning period. The projections were prepared for each of the drainage areas within the Special Study Area, which are shown in Figure 4. In each case, flows from existing and proposed developments were combined with projected flows for the remainder of the drainage area, which in turn were calculated based on anticipated build-out of that area in accordance with the current township zoning ordinance.

The flow projections in Appendix B for the Special Study Area are summarized in Table 3. Also shown in Table 3 is the total flow for existing and proposed development in the Upper Brooke Evans Drainage Area, from Table 2, which as described in Section 2.1.2 does represent a reasonable projection of build-out in that area.

TABLE 3
PROJECTED FLOWS AT BUILD-OUT – 20 YEAR PLANNING PERIOD¹

DRAINAGE AREA	EDUs²	PROJECTED FLOW (GPD)
Hartenstine Creek	256	63,965
PECO / Airport	436	108,380
Sanatoga	169	42,240
Possum Hollow	352	87,950
Lower Brooke Evans ³	1,148	287,000
PECO / Generating Station	137	34,250
SUBTOTALS	2,498	623,785
Upper Brooke Evans ⁴	660	165,000
TOTALS	3,158	788,785

¹ From Appendix B except as noted.

² Based on one (1) EDU per 250 gallons per day of total flow. EDU counts may vary slightly between tables due to rounding of values.

³ Projected flow for Lower Brooke Evans Drainage Area includes a projected flow of 400 EDUs for the Limerick Partners property.

⁴ From Table 2.

4. PROPOSED SANITARY SEWER FACILITIES

The proposed sanitary sewer facilities which are described in this section represent an update to those described in the current Limerick Township Act 537 Plan Update, as noted previously, with only minor modifications based on existing conditions and current projections as described herein. The major components of the planned facilities are shown in Figure 5. All proposed sanitary sewer facilities would be owned and operated by the Limerick Township Municipal Authority.

The following two (2) subsections describe facilities proposed for initial (0-5 years) and ultimate (5-20 years) conditions, respectively, with the main differences between the two being the area to be served with sanitary sewers and the level of development within that service area.

In the case of both initial and future sewer facilities, two (2) options are presented which reflect either the inclusion or exclusion of the Upper Brooke Evans Drainage Area in the proposed sewer service area. The question of whether to provide service to the Upper Brooke Evans Drainage Area through facilities to be constructed in the Special Study Area remains an open issue at this time, and is partly dependent on the outcome of ongoing planning for other areas of the Township.

4.1. INITIAL SANITARY SEWER FACILITIES

The portion of the Special Study Area to be served initially by sanitary sewer consists of most of the area southwest of Route 422, as that highway presents a significant logistical barrier to the construction of sanitary sewers connecting the northeast portion of the Special Study Area to a system in the main part of the area. It is projected that only approximately 30% of the Lower Brooke Evans Drainage Area will be served initially, which includes the northeastern portion of the drainage area. Also not included in the initial facilities is the Sanatoga Drainage Area.

Conveyance facilities for the eastern part of the Possum Hollow Run Drainage Area are not planned for initial construction, although treatment plant capacity will be provided for the entire drainage area. The Township also has the option of providing sewer service to the Upper Brooke Evans Drainage Area through the planned Special Study Area system.

Tables 4A and 4B describe the two options for the area to be served initially, with or without the Upper Brooke Evans Drainage Area. Table 4A describes each option without flows from the proposed Limerick Partners power plant project, and Table 4B describes the options with Limerick Partners flows, as the fate of this project is uncertain and the potential flows associated with it are significant.

Please note that the initial flows shown in Tables 4A and 4B assume a short-term build-out of the drainage areas to be served by the proposed sewer. Also in the tables, the estimated costs provided for each of the options are based on the opinions of probable project cost included in Appendix C.

The major components of the initial sanitary sewer facilities, as shown in Figure 5, include the following:

- The Possum Hollow Run Interceptor, including approximately 4,300 feet of 18" and 1,600 feet of 12" PVC gravity interceptor, along Possum Hollow Run through the area to be served.
- A sewer extension from the interceptor to the PECO Generating Station, including approximately 700 feet of 8" gravity sewer, to connect at the existing PECO wastewater treatment plant.
- The Possum Hollow Run Pump Station, to convey flow from the interceptor to the Possum Hollow Run Wastewater Treatment Plant through approximately 1,100 feet of 10" force main. The initial sizing of the pump station would be as shown in Tables 4A and 4B.
- The Possum Hollow Run Wastewater Treatment Plant, to be constructed close to the Schuylkill River, near the low point of the Special Study Area. The plant would most likely employ sequenced batch reactor (SBR) treatment technology, and discharge to the Schuylkill River. The initial size of the plant would be based on the initial flows cited in Tables 4A and 4B, with provisions made to allow for expansion of the plant to meet the ultimate conditions described in the following section.
- The Brooke Evans Creek Pump Station to connect the Upper Brooke Evans Creek Drainage Area to the interceptor (Optional). This system would include approximately 5,200 feet of 10" gravity interceptor and 2900 feet of 8" gravity sewer, as well as 3,100 feet of 6" force main. The initial capacity of the pump station would be approximately 664 gallons per minute (gpm), based on the projected flow for the Upper Brooke Evans Creek Drainage Area (165,000 gpd) and a portion of the Lower Brooke Evans Drainage Area above Sanatoga Road (93,500), with a peaking factor per the PADEP Draft Sewage Pumping Station Guidance, rev. March 24, 1999.

It must be noted that the opinion of probable cost for diversion of the Upper Brooke Evans Drainage Area to the Possum Hollow Treatment Plant is approximately \$1,140,000, exclusive of the cost of treatment capacity. (Regardless of where Upper Brooke Evans flow is treated, new capacity must be constructed since the existing Limerick Township Municipal Authority treatment plant is at capacity and must be expanded to meet projected growth demands. It is assumed that the cost for constructing treatment capacity for the Upper Brooke Evans area will be similar at either treatment facility.) Operation and maintenance costs should be roughly equivalent regardless of where Upper Brooke Evans flow is treated, although diversion will allow elimination of two (2) existing problem pump stations. Diversion will also encourage immediate commercial development in the unsewered western portion of the Upper Brooke Evans Drainage Area and the portion of the Lower Brooke Evans Drainage Area above Sanatoga Road where the new pump station will be built.

4.2. ULTIMATE SANITARY SEWER FACILITIES

The proposed ultimate sanitary sewer facilities would provide service to the remaining portion of the Special Study Area which would not be served by initial facilities. These remaining areas, including the Sanatoga, PECO Airport and Hartenstine Creek drainage areas, would tie into the proposed interceptor along Possum Hollow Run, discharging to the proposed Possum Hollow Run Treatment Plant.

Table 5 describes the area to be served ultimately, including projected flows and estimated construction costs. The projected flows shown in the table assume a long-term build-out of the drainage areas to be served by the proposed sewer, and the estimated cost for the ultimate sewer facilities is based on the opinion of probable project cost included in Appendix C.

The major components of the ultimate sanitary sewer facilities, as shown in Figure 5, include the following:

- The Sanatoga Pump Station, to convey flow from the Sanatoga Drainage Area to the Possum Hollow Run Interceptor. This system would include approximately 3,200 feet of 8" gravity sewer and 3,200 feet of 4" force main. The ultimate capacity of the pump station would be approximately 117 gpm, based on the projected flow for the Sanatoga Drainage Area (42,240 gpd) with a peaking factor per the PADEP Guidance.
- An extension to the Possum Hollow Run Interceptor, including approximately 3,100 feet of 12" and 4,700 feet of 10" gravity interceptor, crossing Route 422 and extending to Ridge Pike.
- The Fruitville Pump Station, to convey flow to the interceptor from a collection system serving the Fruitville area and a portion of Ridge Pike in the PECO Airport Drainage Area. This system would include approximately 2,800 feet of 8" gravity sewer and 2,100 feet of 4" force main. The ultimate capacity of the pump station would be approximately 129 gpm, based on the projected flow with the PADEP peaking factor.
- The Hartenstine Creek Pump Station, to convey flow from the Hartenstine Creek Drainage Area to the Possum Hollow Run Interceptor. This system would include approximately 5,500 feet of 8" gravity sewer and 6,700 feet of 4" force main, with an ultimate pump station capacity of approximately 173 gpm based on the projected flow with the PADEP peaking factor.
- Expansion of the Possum Hollow Run Wastewater Treatment Plant to accommodate the additional, ultimate flow as shown in Table 5.

TABLE 4A**INITIAL SANITARY SEWER FACILITIES (WITHOUT LIMERICK PARTNERS)**

OPTION	DRAINAGE AREAS TO BE SERVED	EDUs ^{1,2}	CAPACITIES		OPINION OF PROBABLE COST
			PLANT (gpd) ^{1,2}	PUMP STN. (gpm) ³	
1	Lower Brooke Evans (30%), Possum Hollow, PECO Generating Station	741	185,206	476	\$3,458,663
2	Lower Brooke Evans (30%), Possum Hollow, PECO Generating Station, Upper Brooke Evans	1,401	350,206	851	\$5,896,103

TABLE 4B**INITIAL SANITARY SEWER FACILITIES (WITH LIMERICK PARTNERS)⁴**

OPTION	DRAINAGE AREAS TO BE SERVED	EDUs ^{1,2}	CAPACITIES		OPINION OF PROBABLE COST
			PLANT (gpd) ^{1,2}	PUMP STN. (gpm) ³	
1	Lower Brooke Evans (30%), Possum Hollow, PECO Generating Station	1,113	278,300	676	\$3,980,263
2	Lower Brooke Evans (30%), Possum Hollow, PECO Generating Station, Upper Brooke Evans	1,773	443,300	1,047	\$6,541,203

¹ Based on one (1) EDU per 250 gallons per day of total flow. EDU counts may vary slightly between tables due to rounding of values.

² From Table 3.

³ Possum Hollow Pump Station initial capacity based on projected flows, with peaking factor per PADEP Draft Sewage Pumping Station Guidance, rev. March 24, 1999.

⁴ Projected flow with Limerick Partners was calculated by subtracting the projected flow for the Limerick Partners property, based on (2) EDU per acre (45 EDUs), then adding the 400 EDUs projected for the Limerick Partners project.

TABLE 5**ULTIMATE SANITARY SEWER FACILITIES**

ADDITIONAL DRAINAGE AREAS TO BE SERVED	EDUs ^{1,2}	ADDITIONAL FLOW (gpd) ^{1,2}	OPINION OF PROBABLE COST
Lower Brooke Evans (70%), Hartenstine Creek, PECO Airport, Sanatoga	1,382	345,485	\$6,419,028

¹ Based on one (1) EDU per 250 gallons per day of total flow. EDU counts may vary slightly between tables due to rounding of values.

² From Table 3.

5. *PLAN SUMMARY AND IMPLEMENTATION*

This report describes proposed modifications to the sewage facilities plan for the Possum Hollow Special Study Area from that outlined in the current (1993) Limerick Township Act 537 Plan Update. These modifications are based on updated projections for area development, and the corresponding anticipated sanitary sewage flows, which are also described in this report.

Development and flow projections are made for initial conditions, representing facilities to be built within the next several years to serve the southwest portion of the Special Study Area and the associated development, as well as for ultimate conditions, representing service to and build-out of the remainder of the area. Several possible variations to the initial conditions are outlined, contingent on the status of the proposed Limerick Partners electric generating station and pending the decision by Limerick Township as to whether flows from the adjoining Upper Brooke Evans Drainage Area should be diverted to the proposed Possum Hollow Run Plant.

In summary then, the modified sewage facilities plan for this portion of Limerick Township will be as follows:

1. At minimum, a 200,000± gpd treatment plant will be initially constructed on PECO Energy property near the confluence of the Possum Hollow Run and Schuylkill River, with an initial conveyance system serving the Possum Hollow drainage area and the PECO Energy Generating Station. The opinion of probable cost for these initial facilities is \$3,500,000.
2. If the Limerick Partners generating station is included in the initial area to be served, a 280,000± gpd treatment plant will be initially constructed. The opinion of probable cost for this treatment plant and associated initial conveyance facilities is \$4,000,000.
3. If the Upper Brooke Evans drainage area is diverted to the new treatment plant, and Limerick Partners is not included, a 350,000± gpd treatment plant will be initially constructed. A conveyance system servicing the Upper Brooke Evans drainage area will also be built, along with the other drainage areas initially to be served. The opinion of probable cost for this treatment plant and associated initial conveyance facilities is \$ 5,900,000.
4. If the Upper Brooke Evans drainage area is diverted to the new treatment plant, and Limerick Partners is included in the initial sizing, a 440,000± gpd treatment plant will be initially constructed. The opinion of probable cost for this treatment plant and associated initial conveyance facilities is \$6,500,000.
5. Ultimate facilities are those that will serve the balance of the Lower Brooke Evans drainage area, Hartenstine Creek drainage area, Sanatoga drainage area and PECO Airport property. Additional conveyance facilities will be constructed and the treatment plant will be expanded by 350,000± gpd to serve these areas. The opinion of probable cost for the ultimate facilities and plant expansion is \$6,400,000.

The Possum Hollow treatment plant will be constructed by the Limerick Township Municipal Authority, via public contracts. Conveyance facilities will be built either by the Authority or by private developers, from plans prepared or approved by the Authority. Ultimate ownership, operation and maintenance of all treatment and conveyance facilities will be the responsibility of the Limerick Township Municipal Authority.

It is anticipated that the implementation of the initial facilities described in this Special Study will approximately follow the following schedule:

<u>Activity</u>	<u>Projected Date</u>
Issue Draft 537 Special Study	January, 2000
Township 537 Special Study Adoption	March, 2000
PADEP 537 Special Study Approval	May, 2000
Submit Part 1 NPDES Application	May, 2000
PADEP Part 1 Approval	September, 2000
Submit Part 2 Water Quality Management Application	March, 2001
PADEP Part 2 Approval	June, 2001
Issue Bid Documents	July, 2001
Award Construction Contracts	October, 2001
Complete Construction/Start Up	December, 2002

This schedule represents an aggressive program, principally geared toward meeting the projected start-up schedule of the Limerick Partners facility. As the project progresses, certain activities, particularly those associated with permit applications, will be advanced in the schedule whenever possible.

6. *SELECTED ALTERNATIVE*

On March 7, 2000, the Limerick Township Board of Supervisors adopted the Act 537 Special Study - Possum Hollow Study Area, Limerick Township, Montgomery County, Pennsylvania dated March, 2000 by Resolution #2000-11. A copy of the resolution is enclosed as Appendix G to this Study. The resolution specifies the alternative selected, based on the results of the Study, to provide sewer service to the Possum Hollow Study Area.

As stated in Resolution #2000-11, the alternative selected is the one described as Option No. 2 in Table 4B of this Study. Per the resolution, "this option provides initially for the construction of a minimum 450,000± gpd wastewater treatment plant along Longview Road near the confluence of Possum Hollow Run and the Schuylkill River to serve the Study Area. The plant will receive flow from approximately 4,300 lf of 18" and 1,600 lf of 12" gravity interceptor to be constructed along Possum Hollow Run, discharging to a 1,080± gpm pump station with 1,100± lf of 10" force main to convey flows to the plant. A second pump station would also be constructed on Sanatoga Road near the Brooke Evans Creek, which would receive flow from the Upper Brooke Evans and part of the Lower Brooke Evans Drainage Areas via approximately 5,200 lf of 10" and 2,900 lf of 8" gravity sewer. The second pump station would have a capacity of approximately 660 gpm and would discharge to the Possum Hollow Run Interceptor via 3,100± lf of 6" force main. Ultimately, this option provides for extension of sewer service to the remainder of the Study Area through construction of three (3) additional pump stations, with force mains as well as additional gravity sewer."

APPENDIX A

**FRUITVILLE AREA FEASIBILITY STUDY
TO EXTEND PUBLIC SEWERS TO THE FRUITVILLE AREA**

JULY 1998

Fruitville Area Feasibility Study
to Extend Public Sewers to the Fruitville Area

Prepared for
Limerick Township Municipal Authority
529 King Road
P.O. Box 29
Royersford, PA 19468

File No: 98-435

July 1998

Prepared By:
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331 Butler Avenue
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**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA PROPOSED SEWER EXTENSION
FEASIBILITY STUDY**

I. Introduction

In an effort to address on-lot sewage system problems among the existing residential and commercial properties in the Fruitville area, a study was conducted to determine the most feasible alternatives for a proposed sanitary sewer collection system. These facilities must accommodate the potential sewage handling need projected for the ten to twenty year planning horizon as outlined in the 1993 Limerick Township Act 537 Sewage Facilities Plan. As per the direction of the Authority, the study focused on serving the portion of Fruitville Road south of Hartenstine Creek, to the intersection of Ridge Pike, as well as the businesses along Ridge Pike at or near this intersection.

Two (2) sewage management alternatives were evaluated in accordance with a number of considerations including, but not limited to, technical feasibility, implementability, environmental impact, administrative issues and estimated cost of implementation.

II. Projected and Existing Flows

Utilizing USGS Maps for the area, the ultimate drainage area to the intersection of Fruitville Road and Hartenstine Creek was established. As the majority of this area is outside the existing Act 537 Sewer Service Area, the projected Equivalent Dwelling Units (EDUs) for the entire drainage area were not calculated at this time. The portion of the drainage area evaluated for this study is detailed in Figure 1.

In determining potential existing flows, tax parcel maps and field surveys were utilized to identify existing residential, commercial, and industrial developments in the Study Area. EDUs were assigned to each parcel on the basis of type of residential or commercial development currently occupying a particular parcel, according to Limerick Township Municipal Authority (LTMA) standards for determining EDUs. A total of sixty-nine (69) EDUs, or 17,250 gallons per day (gpd) with a peak rate of 43,125 gpd, is anticipated (see Table 1) from existing development.

The potential future EDUs for this area were calculated utilizing the Limerick Township Zoning Map to determine the extent of future development in this area. EDUs were assigned on the basis of type of development potential for each particular parcel, according to LTMA standards for determining EDUs. The total number of potential EDUs varies for each alternative and is explained in the flow calculations for each alternative (see Tables 2 and 3).

III. Sewage Management Alternative Issues

In the evaluation of alternatives several key factors were considered as follows;

- **Anticipated Drainage Area** - The existing topography and watershed boundaries are important in determining the most feasible location of sewage management facilities for each alternative.
- **Construction Feasibility** - In evaluating sewage management alternatives, consideration must be given to the ease of construction and the potential impact the construction would have on the area. The construction of the collection system and pump station would take place in existing roadways or acquired easements.
- **Implementability** - An important part of each alternative is the ability to be implemented. The ease of construction, operation and administration for each alternative must be assessed.
- **Environmental/Growth Impacts** - The ability to eliminate existing adverse environmental impacts, prevent future adverse conditions and strategically locate new sewage conveyance facilities so that other areas can be served in the future are considered.
- **Administrative Issues** - Each alternative must consider administrative issues such as land acquisition, permitting and maintenance of the proposed facilities.
- **Projected Costs** - Opinions of probable cost have been generated for each option. Construction costs are based upon unit prices obtained from actual bid data for similar projects in Limerick Township. The following major elements were considered:
 1. Sewer construction in roadways
 2. Sewer construction in open land
 3. Construction of pump station
 4. Decommissioning of existing pump station

Other project costs include easement acquisition, engineering, survey, inspection, legal and contingencies. The detailed opinions of probable costs of construction can be found in Appendix A.

VI. Alternative No. 1

Gravity Sewer Along Ridge Pike and Fruitville Road to Pump Station at Hartenstine Creek with Force Main to Manhole No. 214 in Ridge Pike

General

The collection system would begin at a point approximately 500 feet east of the intersection of Ridge Pike and Neiffer Road. Approximately 2,200 feet of 8" gravity sewer will convey flow west along Ridge Pike to Fruitville Road. A second section of 8"

gravity sewer will begin approximately 1,400 feet west of the intersection of Fruitville Road and Ridge Pike. This section will convey flow east along Ridge Pike to Fruitville Road. Two additional sections of approximately 600 feet of 8" gravity main each will convey flow along Faust Road to Fruitville Road. Flows converging at Fruitville Road will continue north along Fruitville Road to the proposed pump station site located on the south side of Hartenstine Creek (approximately 2,400 feet from intersection of Ridge Pike) (see Figure 2). The pump station will be sized for 80 gpm capacity in order to maintain scouring velocity in the four (4) inch diameter force main. All flow from the proposed pump station will be pumped up Fruitville Road to Ridge Pike where it will continue easterly to Manhole No. 214.

Implementation

Based on the existing flows, as presented in Table 1, the pump station would initially handle peak flows of 43,125 gpd (30 gpm) with the potential to accommodate all future flows from the Study Area without changes (see Table 2). With expansion, the pump station could handle sewage generated from the areas along Fruitville Road north of Hartenstine Creek.

The depth of excavation required to install the gravity sewer for this alternative should be minimal (6 to 8 feet) due to the steep slopes along this area. The gravity sewer and force main can be installed in the same trench, eliminating the need for additional excavation work. Additionally, property acquisition would be required for the proposed pump station.

A number of permits and reviews by outside agencies would be required for this option, including, but not limited to; DEP Part II Water Quality Management Permit for the pump station; PennDOT Highway Occupancy Permit for construction in Ridge Pike; and Bucks County Conservation District review of soil erosion control measures.

Other Criteria

As noted in the previous section, the ability to implement this alternative requires the acquisition of property for the proposed pump station. This alternative would also result in the operation and maintenance of an additional pump station by the LTMA. The existing adverse environmental impacts associated with failing on-lot disposal systems would be eliminated. The construction impacts would be limited as all construction, with the exception of the pump station, would be in public streets.

Costs

The costs associated with this alternative are outlined in Appendix A, Table A1, and include the construction of collection and pumping facilities. The opinion of probable cost for this alternative is approximately \$1,039,000. The estimated O&M cost is approximately \$4,800 per year.

V. Alternative No. 2

Gravity Sewer Along Fruitville Road to Pump Station at Hartenstine Creek with Force Main to Connect to Existing Force Main at Neiffer Road Pump Station

General

The collection system would begin at a point approximately 500 feet east of the intersection of Ridge Pike and Neiffer Road. Approximately 2,200 feet of 8" gravity sewer will convey flow west along Ridge Pike to Fruitville Road. A second section of 8" gravity sewer will begin approximately 1,400 feet west of the intersection of Fruitville Road and Ridge Pike. This section will convey flow east along Ridge Pike to Fruitville Road. Two additional sections of approximately 600 feet of 8" gravity main each will convey flow along Faust Road to Fruitville Road. Flows converging at Fruitville Road will continue north along Fruitville Road to the proposed pump station site located on the south side of Hartenstine Creek (approximately 2,400 feet from intersection of Ridge Pike) (see Figure 3). The pump station will be sized for 200 gpm to accommodate projected flows from the Study Area as well as the Neiffer Road Pump Station service area. All flow from the proposed pump station would be pumped, via a six (6) inch force main, approximately 2,800 linear feet through an undeveloped parcel, Block 27, Unit 26, to the existing pump station on Neiffer Road. An 8" gravity line would be constructed from the Neiffer Road Pump Station to the proposed Fruitville Road Pump Station. The force main from the Fruitville Road would connect to the existing six (6) inch force main leaving the Neiffer Road Pump Station. This pump station could then be decommissioned.

Implementation

Based on the existing flows from the Fruitville Area, as presented in Table 1, the pump station would initially handle the projected peak flow of 43,125 gpd (approximately 30 gpm) from the Study Area plus the anticipated 84,375 gpd (59 gpm) peak flow from the Neiffer Road Pump Station (135 EDUs in Deer Run, Kugler Road, and Betty/Roberta Lanes), with the potential to accommodate, with expansion, future flows from the area along Fruitville Road north of Hartenstine Creek.

The depth of excavation required to install the gravity sewer for this alternative should be minimal (6 to 8 feet) due to the steep slopes along this area. The gravity sewer and force main through Block 27, Unit 26 can be installed in the same trench, eliminating the need for additional excavation work.

Property would be required for the proposed pump station and an easement for the section of gravity sewer and force main between the Fruitville Road Pump Station and Neiffer Road Pump Station.

A number of permits and reviews by outside agencies would be required for this option, including, but not limited to; DEP Part II Water Quality Management Permit for the pump station; PennDOT Highway Occupancy Permit for construction in Ridge Pike; and Bucks County Conservation District review of soil erosion control measures. Implementation of this alternative would require a revision to the LTMA Act 537 Plan as the proposed force main and part of the gravity sewers would be located outside of the existing Act 537 Plan Sewer Service Area. This final issue makes this alternative somewhat less implementable than Alternative No. 1.

Other Criteria

As noted in the previous section, the ability to implement this alternative requires the acquisition of property and an easement area for the proposed pump station, force main and a section of the gravity sewer. This alternative minimizes pump stations as it would allow the LTMA to decommission the Neiffer Road Pump Station. The existing adverse environmental impacts associated with failing on-lot disposal systems would be eliminated. The construction impacts would be moderate in that approximately half of the construction would be in undeveloped areas which would require extensive clearing operations prior to the installation of sewers. The remainder of the construction would be in public streets.

The upgrade of the proposed pump station from the 80 gpm pump station necessary for Alternative #1 to the 200 gpm pump station necessary for Alternative #2 could be a significant investment on the part of the LTMA. Alternative #2, however, includes the decommissioning of the Neiffer Road Pump Station. A number of mechanical items at that pump station could potentially be utilized at the new pump station, as detailed in the next section, thus reducing the overall cost.

Costs

The costs associated with this alternative are outlined in Appendix A, Table A2, and include the construction of collection and pumping facilities. The opinion of probable cost for this alternative is approximately \$1,331,000, with an estimated O&M cost of approximately \$4,800 per year. However, with this alternative a number of mechanical items from the Neiffer Road Pump Station could be utilized in the construction of the Fruitville Road Pump Station. The potential reuse of the generator, comminuter and auto dialer could result in cost savings of approximately \$36,000 (see Table A3). Additionally, the projected O&M costs for the Neiffer Road Pump Station (approximately \$4,800 per year) would be eliminated. While the amount of work in the PennDOT right-of-way would be lessened with this alternative (thereby lessening the associated HOP fees), this alternative would require the acquisition of additional easement areas for the force main and gravity sewer through Block 27, Unit 26.

VI. Conclusions

Table 4 details the components considered with each alternative. Each alternative has been summarized and rated based on technical feasibility, implementability, impacts during construction, long term environmental impacts and estimated construction costs. The ratings assigned to each component include poor, fair or good with the exception of construction impacts which were rated either moderate or limited. A component rating of poor typically denotes inadequacy. A component rating of fair or moderate indicates that the respective component is of sufficient adequacy. A component rating of good or limited signifies a favorable condition.

The opinions of probable costs for each of the alternatives has been developed for the purposes of comparison only in evaluating each alternative's cost effectiveness and are not intended to be used as capital costs.

Alternative No. 1 - Gravity Sewer Along Ridge Pike and Fruitville Road to Pump Station at Hartenstine Creek with Force Main to Manhole No. 214 in Ridge Pike - This alternative had consistently good ratings associated with all aspects considered.

Due to the minimum requirements for sizing a pump station with a four (4) inch force main, this pump station would initially be constructed with capacity for full development of the Study Area. Further upgrades to the pump station would not be required unless the study area was expanded. This configuration would also limit the number of connections to those in the Study Area.

This alternative was given a rating of good for implementability as it would not require modifications to the Act 537 Sewer Service Area and minimizes the amount of land acquisition required for construction. A significant drawback of this option would be the addition of another pump station to the LTMA system.

The construction impacts associated with this alternative would be minimal as all construction (with the exception of the pump station site) would be in public streets.

This alternative is significantly less expensive than Alternative No. 2 and had a lower cost per existing EDU. It would generate approximately \$286,700 in tapping fee income, at \$4,300 per EDU. This represents a 29% return on the initial cost.

Alternative No. 2 - Gravity Sewer Along Fruitville Road to Pump Station at Hartenstine Creek with Force Main to Connect to Existing Force Main at the Neiffer Road Pump Station - This alternative was predominantly rated as fair for the various aspects considered.

The implementability of this alternative was rated as fair primarily due to the very high level of administrative effort necessary to construct sewer main in areas currently outside of the Act 537 Sewer Service Area. Approximately fifty-two (52) acres would be opened for development if this alternative were implemented. In addition to the issues associated with modification of the Act 537 Sewer Service Area, the LTMA would need to acquire a substantial amount of easement area.

The technical feasibility of this option was rated as good as this alternative would enable the LTMA to decommission the Neiffer Road Pump Station. However, the size of this pump station would be significantly larger than the pump station proposed in Alternative No. 1.

The construction impacts associated with this alternative were rated as moderate due to the large amount of construction through currently undeveloped, privately owned properties.

This alternative is more expensive than Alternative No. 1 with a higher cost per existing EDU. This alternative would also generate approximately \$286,700 in tapping fee income, at \$4,300 per EDU. This represents a 21% return on the initial cost.

VII. Recommendations

If the Authority is intent on pursuing the installation of sewer in the Fruitville Area we would recommend Alternate No. 1 due to its lower initial cost and lack of impacts outside the current 537 Sewer Service Area.. We must, however, remind the Authority of its current treatment plant capacity and present financial obligations to projects already underway and in the five (5) year capital plan. It is therefore our recommendation that this project be pursued at a later date, unless the potential health hazards associated with on-lot sewage system malfunctions make action necessary.

TABLE 1

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

**EXISTING FLOWS
FOR FRUITVILLE ROAD STUDY AREA**

Description	Total	Projected EDUs	Projected Average Daily Flow (gpd)	Projected Peak Flow ¹ (gpd)
Existing Dwellings ²	35	35	8,750	21,875
Restaurants ²	3	17	4,250	10,625
Car Dealers and Garages ²	2	7	1,750	4,375
Industrial Areas ³	4.75 acres	10	2,500	6,250
	TOTAL:	69	17,250	43,125 gpd 30 gpm

1. Calculated using a peaking factor of 2.5

2. Projected flow calculated based on 250 gpd/EDU

3. Projected flow calculated based on 500 gpd/acre as outlined in the "Act 537 Plan Sizing/Cost Review"

TABLE 2

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

**PROJECTED POTENTIAL FLOWS
ALTERNATE #1**

Zoning District	Total Acres	Allowable Dwelling Units/Acre	Total EDUs	Projected Flow (gpd)
R3	51	1.65 ¹	84	21,000 ²
O/LI	49	N/A	98	24,500 ³
R4	1.5	2.5 ¹	4	1000 ²
		Subtotal:		46,500
		Peaking Factor:		2.5
		TOTAL:	186 EDUs	116,250 gpd 81 gpm

1. Calculated for single family detached dwellings with public sewer.
2. Projected flow calculated based on 250 gpd/EDU
3. Projected flow calculated based on 500 gpd/acre as outlined in the "Act 537 Plan Sizing/Cost Review"

TABLE 3

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

**PROJECTED POTENTIAL FLOWS
(INCLUDING EXISTING FLOWS)
ALTERNATE #2**

Zoning District	Total Acres	Allowable Dwelling Units/Acre	Total EDUs	Projected Flow (gpd)
R3	51	1.65 ¹	84	21,000 ²
R3	52	2 ⁴	104	26,000 ²
O/LI	49	N/A	98	24,500 ³
R4	1.5	2.5 ¹	4	1,000 ²
Subtotal:				72,500
Peaking Factor:				2.5
STUDY AREA TOTAL:			290 EDUs	181,250 gpd 126 gpm
TOTAL NEIFFER ROAD PUMP STATION SERVICE AREA:			173 EDUs	108,150 gpd 75 gpm
TOTAL:			463 EDUs	289,400 gpd 201 gpm

1. Calculated for single family detached dwellings with public sewer.
2. Projected flow calculated based on 250 gpd/EDU
3. Projected flow calculated based on 500 gpd/acre as outlined in the "Act 537 Plan Sizing/Cost Review"
4. The EDU estimate for Alternative #2 accounts for potential flows from Block 27, Unit 26, which would now have development potential due to the presence of a sanitary sewer collection system. The maximum dwelling units per buildable acre was assumed for this parcel.

TABLE 4

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

ALTERNATIVE SUMMARY ANALYSIS

	Projected EDUs Served	Existing EDUs Served	Estimated Construction Cost ²	Cost Per Projected EDU	Cost Per Existing EDU	Technical Feasibility	Implementability	Construction Impacts	Environmental Impact	Overall Rating
Alternative 1	186	69	\$1,039,000.00	\$5,600.00	\$15,100.00	Good	Good	Limited	Good	Good
Alternative 2 ¹	290	69	\$1,331,000.00	\$4,600.00	\$19,300.00	Good	Fair	Moderate	Good	Fair

1. In calculating the costs per EDU for this alternative the 173 EDUs currently (or potentially) served by the Neiffer Road Pump Station were not considered.

2. The costs per EDU are for cost comparison only, and are not indicative of actual fees that may be necessary to implement an alternative.

TABLE A1

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

OPINION OF PROBABLE COST

ALTERNATIVE #1

#	DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	AMOUNT
1	8" PVC Sanitary Sewer (0'-8' Deep)	LF	5200	\$27.00	\$140,400.00
2	8" PVC Sanitary Sewer (8'-10' Deep)	LF	2000	\$33.00	\$66,000.00
3	4" Force Main	LF	4200	\$21.00	\$88,200.00
4	Manhole (0'-8' Deep)	UN	17	\$1,500.00	\$25,500.00
5	Manhole (8'-10' Deep)	UN	7	\$1,700.00	\$11,900.00
6	Connection to Existing Manhole	UN	1	\$1,300.00	\$1,300.00
7	Stone Bedding and Pipe Envelope	LF	7400	\$10.00	\$74,000.00
8	Select Backfill	LF	7400	\$4.00	\$29,600.00
9	4" Sanitary Sewer Lateral	UN	45	\$400.00	\$18,000.00
10	Pump Station (80 gpm)	LS	1	\$150,000.00	\$150,000.00
11	Easement Aquisition	SF	2000	\$0.75	\$1,500.00
12	Vegetated Area Restoration	SY	300	\$6.00	\$1,800.00
13	Road Restoration	SY	6600	\$15.00	\$99,000.00
14	Traffic Maintenance and Protection	LS	1	\$35,000.00	\$35,000.00
SUBTOTAL:					\$742,200.00
Contingencies (@20%):					\$148,440.00
Engineering and Inspection (@20%):					\$148,440.00
TOTAL ESTIMATED COST:					\$1,039,080.00

Note:

1. Costs do not include Rock Removal

TABLE A2

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER EXTENSION**

OPINION OF PROBABLE COST

ALTERNATIVE #2

#	DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	AMOUNT
1	8" PVC Sanitary Sewer (0'-8' Deep)	LF	8000	\$27.00	\$216,000.00
2	8" PVC Sanitary Sewer (8'-10' Deep)	LF	2000	\$33.00	\$66,000.00
3	6" Force Main	LF	2800	\$24.00	\$67,200.00
4	Manhole (0'-8' Deep)	UN	23	\$1,500.00	\$34,500.00
5	Manhole (8'-10' Deep)	UN	7	\$1,700.00	\$11,900.00
6	Connection to Existing Force Main	UN	1	\$2,500.00	\$2,500.00
7	Stone Bedding and Pipe Envelope	LF	10000	\$10.00	\$100,000.00
8	Select Backfill	LF	10000	\$4.00	\$40,000.00
9	4" Sanitary Sewer Lateral	UN	45	\$400.00	\$18,000.00
10	Pump Station (200 gpm)	LS	1	\$210,000.00	\$210,000.00
11	Easement Aquisition	SF	57000	\$0.75	\$42,750.00
12	Vegetated Area Restoration	SY	6400	\$6.00	\$38,400.00
13	Road Restoration	SY	6300	\$15.00	\$94,500.00
14	Decommission Pump Station	LS	1	\$10,000.00	\$10,000.00
15	Salvage Value of Existing Equipment	LS	1	(\$36,000.00)	(\$36,000.00)
16	Traffic Maintenance and Protection	LS	1	\$35,000.00	\$35,000.00
SUBTOTAL:					\$950,750.00
Contingencies (@20%):					\$190,150.00
Engineering and Inspection (@20%):					\$190,150.00
TOTAL ESTIMATED COST:					\$1,331,050.00

Note:

1. Costs do not include Rock Removal
2. Alternative #2 does not include a bypass pumping allowance

TABLE A3

**LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
FRUITVILLE AREA SEWER FEASIBILITY STUDY**

**OPINION OF PROBABLE COST SAVINGS
OBTAINED THROUGH THE ABANDONMENT OF
THE NEIFFER ROAD PUMP STATION**

#	DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	AMOUNT
1	Reuse of Neiffer Road Pump Station Generator	LS	1	\$20,000.00	\$20,000.00
2	Reuse of Neiffer Road Pump Station Comminuter	LS	1	\$15,000.00	\$15,000.00
3	Reuse of Neiffer Road Pump Station Auto Dialer	LS	1	\$1,000.00	\$1,000.00
TOTAL ESTIMATED SAVINGS:					\$36,000.00

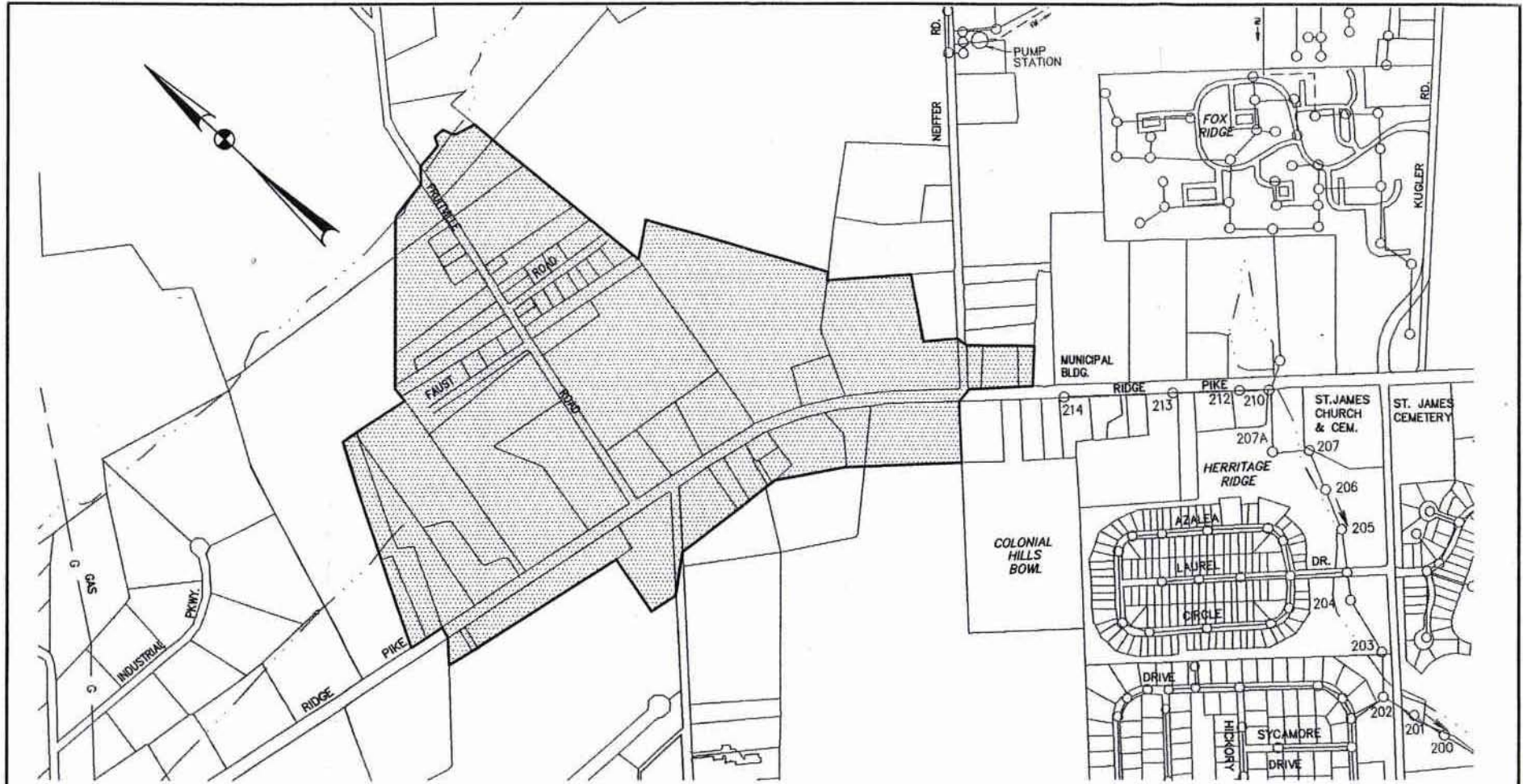


FIGURE 1
FRUITVILLE AREA SEWER FEASIBILITY STUDY
STUDY AREA
 LIMERICK TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

			GILMORE & ASSOCIATES, INC. CONSULTING ENGINEERS & LAND SURVEYORS		
			331 BUTLER AVENUE, NEW BRITAIN, PA 18901 184 WEST MAIN STREET, SUITE 300, TRAPPE, PA 19426		
500 0 500 1000 			JOB NO.: 98-435		
SCALE IN FEET			DATE: JUNE 1998		
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE: 1"=500'		
B.A.	M.A.B.	S.L.R.			

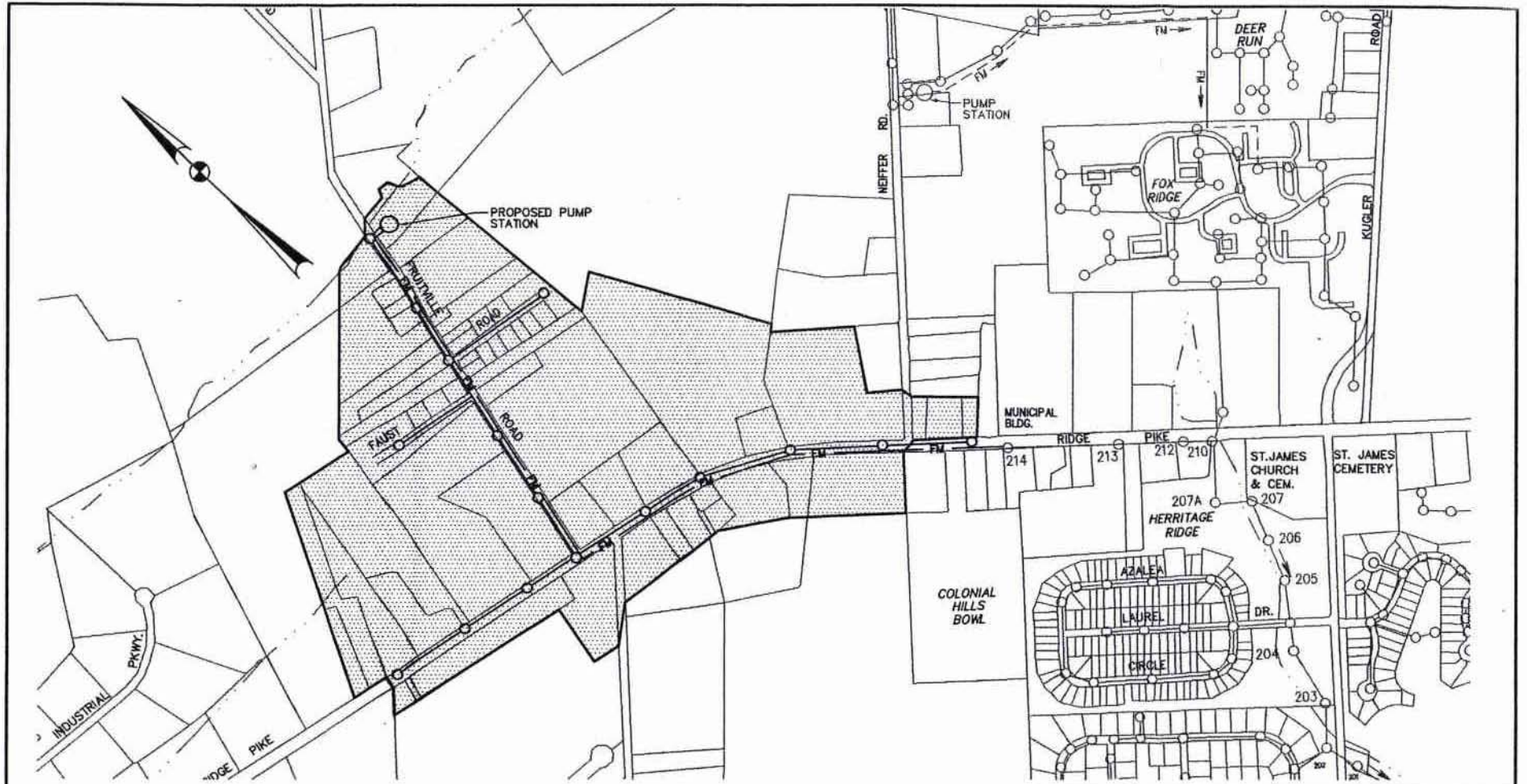


FIGURE 2
FRUITVILLE AREA SEWER FEASIBILITY STUDY
ALTERNATIVE #1

LIMERICK TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

			GILMORE & ASSOCIATES, INC. CONSULTING ENGINEERS & LAND SURVEYORS 331 BUTLER AVENUE, NEW BRITAIN, PA 18901 184 WEST MAIN STREET, SUITE 300, TRAPPE, PA 19426		(215) 345-4330 (610) 489-4849
			JOB NO.: 98-435	DATE: JUNE 1998	SCALE: 1"=500'
500 0 500 1000 	SCALE IN FEET		DESIGNED BY: B.A. DRAWN BY: B.A./M.A.B. CHECKED BY: S.L.R.		

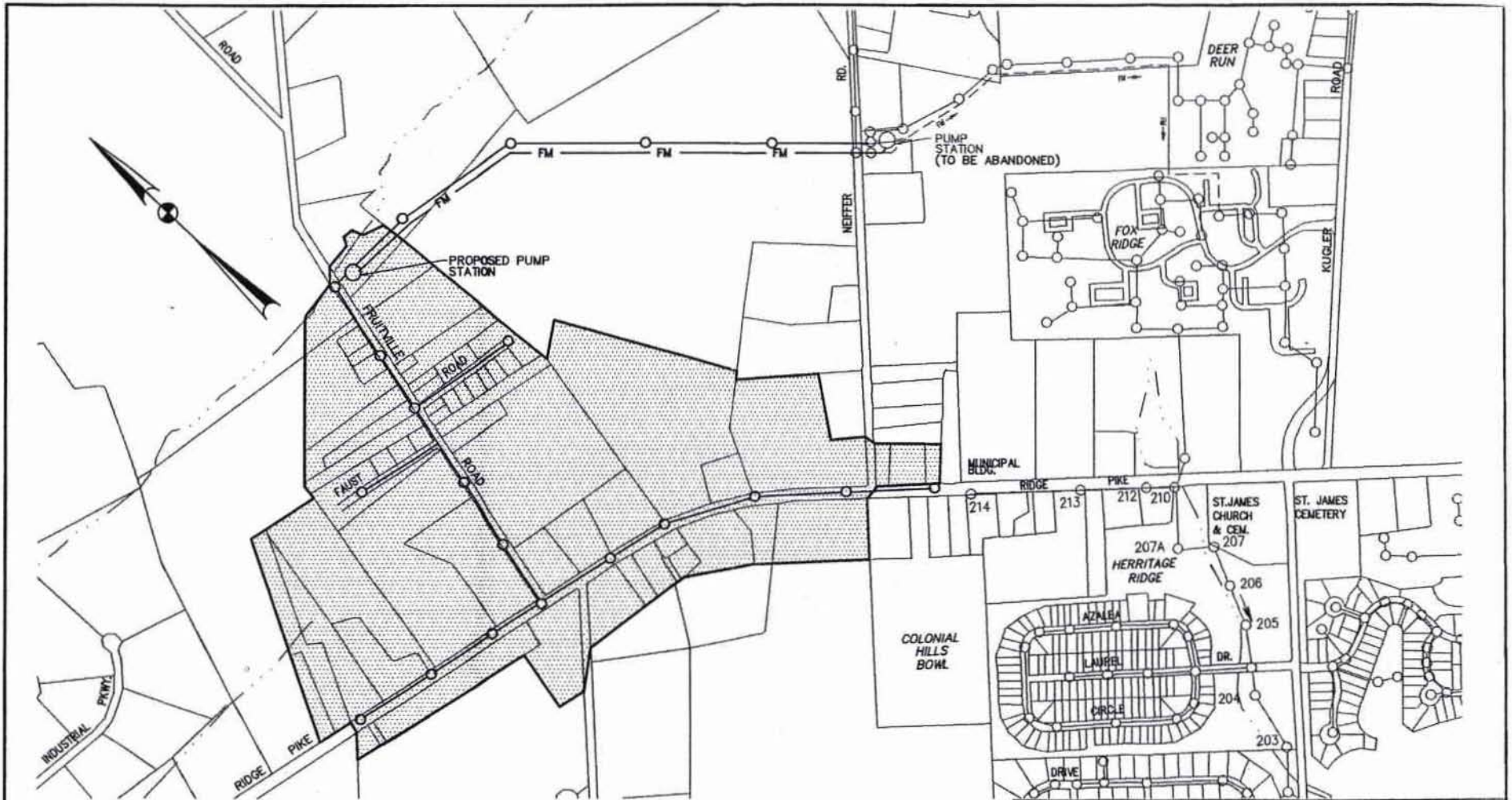




FIGURE 3
FRUITVILLE AREA SEWER FEASIBILITY STUDY
ALTERNATIVE #2
 LIMERICK TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

 GILMORE & ASSOCIATES, INC. CONSULTING ENGINEERS & LAND SURVEYORS <small>331 BUTLER AVENUE, NEW BRITAIN, PA 18901 (215) 345-4330 184 WEST MAIN STREET, SUITE 300, TRAPPE, PA 19428 (610) 489-4949</small>			JOB NO.: 98-435
500 0 500 1000  SCALE IN FEET			DATE: JUNE 1998
DESIGNED BY: B.A.	DRAWN BY: M.A.B.	CHECKED BY: S.L.R.	SCALE: 1"=500'

APPENDIX B

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

**DEVELOPMENT AND FLOW PROJECTIONS
(REFER TO FIGURES 3&4)**

A. HARTENSTINE CREEK DRAINAGE AREA

1. Total Acreage of Drainage Area within Special Study Area = 318

2. Buildable Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
O/LI (Office/Light Industrial)	132.1	105.7
RB (Retail Business)	10.8	8.6
LLI (Limited Light Industrial)	2.5	2.0

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area

(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
O/LI	N/A
RB	N/A
LLI	N/A

4. Projected Average Daily Flow From Buildable Land

(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Limerick Township Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
O/LI	N/A	52,850
RB	N/A	4,300
LLI	N/A	1,000
Subtotal		58,150
10% Contingency		5,815
Total		63,965

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

7. Projected Flow 63,965 GPD
(Total from Sections 4, 5 and 6)

B. PECO/AIRPORT DRAINAGE AREA

1. Total Acreage of Drainage Area within Special Study Area = 456

2. Buildable Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
R-2	7.1	5.7
R-3	35.1	28
O/LI	152	121.6

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area

(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
R-2	0.7
R-3	2.0
O/LI	N/A

4. Projected Average Daily Flow From Buildable Land

(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
R-2	4	1,000
R-3	56	14,000
O/LI	N/A	60,800
Subtotal		75,800
10% Contingency		7,580
Total		83,380

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
PECO / Airport	100*	25,000

* Based on PECO projection of site development in accordance with current usage.

7. Projected Flow **108,380 GPD**
(Total from Sections 4, 5 and 6)

C. SANATOGA DRAINAGE AREA

1. Total Acreage of Drainage Area within 537 Plan Area = 96

2. Undeveloped Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
L/LI	96	76.8

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area

(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
L/LI	N/A

4. Projected Average Daily Flow From Undeveloped Buildable Land

(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
L/LI	N/A	38,400
Subtotal	N/A	38,400
10% Contingency		3,840
Total (Section 4)		42,240

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

7. Projected Flow **42,240 GPD**
(Total from Sections 4, 5 and 6)

D. POSSUM HOLLOW DRAINAGE AREA

1. Total Acreage of Drainage Area within 537 Plan Area = 392

2. Buildable Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
O/LI	74	59
L/LI	12	10

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area

(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
O/LI	N/A
L/LI	N/A

4. Projected Average Daily Flow From Buildable Land

(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
O/LI	N/A	29,500
L/LI	N/A	5,000
Subtotal		34,500
10% Contingency		3,450
Total		37,950

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
Providence Properties	200	50,000

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

7. Projected Flow **87,950 GPD**
(Total from Sections 4, 5 and 6)

E. LOWER BROOKE EVANS DRAINAGE AREA

1. Total Acreage of Drainage Area within 537 Plan Area = 548

2. Buildable Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
R-3	96	77
O/LI	127	101
L/LI	203	162

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area

(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
R-3	2.0
O/LI	N/A
L/LI	N/A

4. Projected Average Daily Flow From Buildable Land

(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
R-3	154	38,500
O/LI	N/A	50,500
L/LI	N/A	81,000
Subtotal		170,000
10% Contingency		17,000
Total (Section 4)		187,000

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
Limerick Partners	400	100,000

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
Somerton Springs Golf Course	0	0

7. Projected Flow 287,000 GPD
(Total from Sections 4, 5 and 6)

REVISED MARCH 3, 2000

F. PECO/NUCLEAR GENERATING STATION DRAINAGE AREA

1. Total Acreage of Drainage Area within Special Study Area = 478

2. Buildable Land Per Zoning District

<u>Zoning District</u>	<u>Acreage</u>	<u>Buildable Land *</u>
HI (Heavy Industrial)	0	0

* Zoning Area less 20% to account for wetlands, easements, etc.

3. Density per Zoning Area
(Allowable dwelling units per net buildable acre as per the Limerick Township Zoning Ordinance, June 1999)

<u>Zoning District</u>	<u>Dwelling Units (EDUs)</u>
HI	N/A

4. Projected Average Daily Flow From Buildable Land
(Projected flow calculated based on 250 gallons per day per EDU for residential usage and 500 gallons per day per acre for business, commercial or industrial areas as outlined in the approved Act 537 Plan)

<u>Zoning District</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
HI	N/A	0

5. Projected Average Daily Flow from Identified Proposed Development

<u>Development Project</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
None Identified in this Drainage Area	0	0

6. Projected Average Daily Flow from Existing/Approved Developments

<u>Project/Site Description</u>	<u>EDUs</u>	<u>Flow (GPD)</u>
PECO / Nuclear Generating Station	137	34,250

7. Projected Flow **34,250 GPD**
(Total from Sections 4, 5 and 6)

G. **SUMMARY**

<u>Drainage Area</u>	<u>Projected EDUs*</u>	<u>Projected Flow</u>
Hartenstine Creek	256	63,965
PECO / Airport	434	108,380
Sanatoga	169	42,240
Possum Hollow	352	87,950
Lower Brooke Evans	1,148	287,000
PECO / Generating Station	137	34,250
TOTAL	2,496	623,785

- Based on one (1) EDU per 250 gallons per day of total flow. EDU counts may vary slightly between tables due to rounding of values.

APPENDIX C

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

OPINIONS OF PROBABLE COST

OPINION OF PROBABLE PROJECT COST #1

GILMORE & ASSOCIATES, INC.
 350 BUTLER AVENUE
 NEW BRITAIN, PA 18901

Client: Limerick Township Municipal Authority
 Project Name: Possum Hollow Special Study
 Project Number: 99-721-01

INITIAL SANITARY SEWER FACILITIES WITHOUT LIMERICK PARTNERS, WITHOUT UPPER BROOKE EVANS

Item No.	Construction Items	Units	Quantity	Unit Price	Total Amount
1	8" PVC gravity sewer (open land)	LF	5,101	\$35.00	\$178,535.00
2	8" DI gravity sewer (add'l)	LF	510	\$10.00	\$5,101.00
3	12" PVC gravity sewer (open land)	LF	1,566	\$55.00	\$86,130.00
4	12" DI gravity sewer (add'l)	LF	157	\$30.00	\$4,698.00
5	18" PVC gravity sewer (open land)	LF	4,269	\$65.00	\$277,485.00
6	18" DI gravity sewer (add'l)	LF	427	\$40.00	\$17,076.00
7	4' Precast Manhole (@250')	EA	44	\$2,100.00	\$92,400.00
8	Possum Hollow Run WWTP & PS @ 0.20 MGD	EA	1	\$1,910,000.00	\$1,910,000.00
Construction Cost Total					\$2,571,425.00
	Easements	LF	1,581	\$10.00	\$15,810.00
	Contingency (10%)				\$257,142.50
	Survey				\$50,000.00
	Engineering (10%)				\$257,142.50
	Observation (10%)				\$257,142.50
	Legal/Administrative				\$50,000.00
Total Project Cost					\$3,458,662.50

Notes:

1. Assumes land and easement costs will be reduced due to granting of ground by PECO Energy and Providence Properties.
2. Prevailing wage allowance applied to Possum Hollow Run Treatment Plant and Pump Station construction only.
3. Prices based on recent bid results, including bids received by Providence Properties in September, 1997 for construction of the treatment plant with pump station and force main and of the interceptor. Accordingly, contingency has been set at 10%, rather than the 20% often used for concept level estimates.
4. Prices do not include rock excavation.

OPINION OF PROBABLE PROJECT COST #2

GILMORE & ASSOCIATES, INC.
350 BUTLER AVENUE
NEW BRITAIN, PA 18901

Client: Limerick Township Municipal Authority
Project Name: Possum Hollow Special Study
Project Number: 99-721-01

INITIAL SANITARY SEWER FACILITIES WITHOUT LIMERICK PARTNERS, WITH UPPER BROOKE EVANS

Item No.	Construction Items	Units	Quantity	Unit Price	Total Amount
1	8" PVC gravity sewer (open land)	LF	7,845	\$35.00	\$274,575.00
2	8" PVC gravity sewer (road)	LF	880	\$80.00	\$70,400.00
3	8" DI gravity sewer (add'l)	LF	873	\$10.00	\$8,725.00
4	10" PVC gravity sewer (open land)	LF	5,206	\$40.00	\$208,240.00
5	10" DI gravity sewer (add'l)	LF	521	\$25.00	\$13,015.00
6	12" PVC gravity sewer (open land)	LF	1,566	\$55.00	\$86,130.00
7	12" DI gravity sewer (add'l)	LF	157	\$30.00	\$4,698.00
8	18" PVC gravity sewer (open land)	LF	4,269	\$65.00	\$277,485.00
9	18" DI gravity sewer (add'l)	LF	427	\$40.00	\$17,076.00
10	4' Precast Manhole (@250')	EA	80	\$2,100.00	\$168,000.00
11	Brooke Evans Creek Pump Station	EA	1	\$400,000.00	\$400,000.00
12	6" DIP FM (road)	LF	3,103	\$81.00	\$251,343.00
13	Abandon Ex. Pump Station (#1, 8)	EA	2	\$10,000.00	\$20,000.00
14	Possum Hollow Run WWTP & PS @ 0.37 MGD	EA	1	\$2,579,000.00	\$2,579,000.00
Construction Cost Total					\$4,378,687.00
	Easements	LF	7,256	\$10.00	\$72,560.00
	Land	AC	0.25	\$25,000.00	\$6,250.00
	Contingency (10%)				\$437,868.70
	Survey				\$75,000.00
	Engineering (10%)				\$437,868.70
	Observation (10%)				\$437,868.70
	Legal/Administrative				\$50,000.00
Total Project Cost					\$5,896,103.10

Notes:

1. Assumes land and easement costs will be reduced due to granting of ground by PECO Energy and Providence Properties.
2. Prevailing wage allowance applied to Possum Hollow Run Treatment Plant and Pump Station construction only.
3. Prices based on recent bid results, including bids received by Providence Properties in September, 1997 for construction of the treatment plant with pump station and force main and of the interceptor. Accordingly, contingency has been set at 10%, rather than the 20% often used for concept level estimates.
4. Prices do not include rock excavation.

OPINION OF PROBABLE PROJECT COST #3

GILMORE & ASSOCIATES, INC.
 350 BUTLER AVENUE
 NEW BRITAIN, PA 18901

Client: Limerick Township Municipal Authority
 Project Name: Possum Hollow Special Study
 Project Number: 99-721-01

**INITIAL SANITARY SEWER FACILITIES
 WITH LIMERICK PARTNERS, WITHOUT UPPER BROOKE EVANS**

Item No.	Construction Items	Units	Quantity	Unit Price	Total Amount
1	8" PVC gravity sewer (open land)	LF	5,101	\$35.00	\$178,535.00
2	8" DI gravity sewer (add'l)	LF	510	\$10.00	\$5,101.00
3	12" PVC gravity sewer (open land)	LF	1,566	\$55.00	\$86,130.00
4	12" DI gravity sewer (add'l)	LF	157	\$30.00	\$4,698.00
5	18" PVC gravity sewer (open land)	LF	4,269	\$65.00	\$277,485.00
6	18" DI gravity sewer (add'l)	LF	427	\$40.00	\$17,076.00
7	4' Precast Manhole (@250')	EA	44	\$2,100.00	\$92,400.00
8	Possum Hollow Run WWTP & PS @ 0.29 MGD	EA	1	\$2,292,000.00	\$2,292,000.00
Construction Cost Total					\$2,953,425.00
	Easements	LF	1,581	\$10.00	\$15,810.00
	Contingency (10%)				\$295,342.50
	Survey				\$50,000.00
	Engineering (10%)				\$295,342.50
	Observation (10%)				\$295,342.50
	Legal/Administrative				\$75,000.00
Total Project Cost					\$3,980,262.50

Notes:

1. Assumes land and easement costs will be reduced due to granting of ground by PECO Energy and Providence Properties.
2. Prevailing wage allowance applied to Possum Hollow Run Treatment Plant and Pump Station construction only.
3. Prices based on recent bid results, including bids received by Providence Properties in September, 1997 for construction of the treatment plant with pump station and force main and of the interceptor. Accordingly, contingency has been set at 10%, rather than the 20% often used for concept level estimates.
4. Prices do not include rock excavation.
5. Assumes sewer connection from Limerick Partners will be built at developer's expense.

OPINION OF PROBABLE PROJECT COST #4

GILMORE & ASSOCIATES, INC.
 350 BUTLER AVENUE
 NEW BRITAIN, PA 18901

Client: Limerick Township Municipal Authority
Project Name: Possum Hollow Special Study
Project Number: 99-721-01

**INITIAL SANITARY SEWER FACILITIES
 WITH LIMERICK PARTNERS, WITH UPPER BROOKE EVANS**

Item No.	Construction Items	Units	Quantity	Unit Price	Total Amount
1	8" PVC gravity sewer (open land)	LF	7,845	\$35.00	\$274,575.00
2	8" PVC gravity sewer (road)	LF	880	\$80.00	\$70,400.00
3	8" DI gravity sewer (add'l)	LF	873	\$10.00	\$8,725.00
4	10" PVC gravity sewer (open land)	LF	5,206	\$40.00	\$208,240.00
5	10" DI gravity sewer (add'l)	LF	521	\$25.00	\$13,015.00
6	12" PVC gravity sewer (open land)	LF	1,566	\$55.00	\$86,130.00
7	12" DI gravity sewer (add'l)	LF	157	\$30.00	\$4,698.00
8	18" PVC gravity sewer (open land)	LF	4,269	\$65.00	\$277,485.00
9	18" DI gravity sewer (add'l)	LF	427	\$40.00	\$17,076.00
10	4' Precast Manhole (@250')	EA	80	\$2,100.00	\$168,000.00
11	Brooke Evans Creek Pump Station	EA	1	\$400,000.00	\$400,000.00
12	6" DIP FM (road)	LF	3,103	\$81.00	\$251,343.00
13	Abandon Ex. Pump Station (#1, 8)	EA	2	\$10,000.00	\$20,000.00
14	Possum Hollow Run WWTP & PS @ 0.46 MGD	EA	1	\$3,056,000.00	\$3,056,000.00
Construction Cost Total					\$4,855,687.00
	Easements	LF	7,256	\$10.00	\$72,560.00
	Land	AC	0.25	\$25,000.00	\$6,250.00
	Contingency (10%)				\$485,568.70
	Survey				\$75,000.00
	Engineering (10%)				\$485,568.70
	Observation (10%)				\$485,568.70
	Legal/Administrative				\$75,000.00
Total Project Cost					\$6,541,203.10

Notes:

1. Assumes land and easement costs will be reduced due to granting of ground by PECO Energy and Providence Properties.
2. Prevailing wage allowance applied to Possum Hollow Run Treatment Plant and Pump Station construction only.
3. Prices based on recent bid results, including bids received by Providence Properties in September, 1997 for construction of the treatment plant with pump station and force main and of the interceptor. Accordingly, contingency has been set at 10%, rather than the 20% often used for concept level estimates.
4. Prices do not include rock excavation.
5. Assumes sewer connection from Limerick Partners will be built at developer's expense.

OPINION OF PROBABLE PROJECT COST #5

GILMORE & ASSOCIATES, INC.
350 BUTLER AVENUE
NEW BRITAIN, PA 18901

Client: Limerick Township Municipal Authority
Project Name: Possum Hollow Special Study
Project Number: 99-721-01

ULTIMATE SANITARY SEWER FACILITIES EXTENSION OF SERVICE AREA & WWTP EXPANSION

Item No.	Construction Items	Units	Quantity	Unit Price	Total Amount
1	8" PVC gravity sewer (open land)	LF	2,710	\$35.00	\$94,850.00
2	8" PVC gravity sewer (road)	LF	10,762	\$80.00	\$860,960.00
3	8" DI gravity sewer (add'l)	LF	1,347	\$10.00	\$13,472.00
4	10" PVC gravity sewer (open land)	LF	4,663	\$40.00	\$186,520.00
5	10" DI gravity sewer (add'l)	LF	466	\$25.00	\$11,657.50
6	12" PVC gravity sewer (open land)	LF	3,111	\$55.00	\$171,105.00
7	12" DI gravity sewer (add'l)	LF	311	\$30.00	\$9,333.00
8	4' Precast Manhole (@250')	EA	85	\$2,100.00	\$178,500.00
9	Sanatoga Pump Station	EA	1	\$225,000.00	\$225,000.00
10	Hartenstine Creek Pump Station	EA	1	\$250,000.00	\$250,000.00
11	Fruitville Pump Station	EA	1	\$225,000.00	\$225,000.00
12	4" DIP FM (road)	LF	3,208	\$78.00	\$250,224.00
13	4" DIP FM (road w/ sewer)	LF	6,136	\$50.00	\$306,800.00
14	4" DIP FM (open land w/ sewer)	LF	2,710	\$40.00	\$108,400.00
15	Possum Hollow Run WWTP & PS Expansion by 0.36 MGD	EA	1	\$1,900,000.00	\$1,900,000.00
Construction Cost Total					\$4,791,821.50
	Easements	LF	7,091	\$10.00	\$70,910.00
	Land	AC	0.75	\$25,000.00	\$18,750.00
	Contingency (10%)				\$479,182.15
	Survey				\$50,000.00
	Engineering (10%)				\$479,182.15
	Observation (10%)				\$479,182.15
	Legal/Administrative				\$50,000.00
Total Project Cost					\$6,419,027.95

Notes:

1. Assumes land and easement costs will be reduced due to granting of ground by PECO Energy and Providence Properties.
2. Prevailing wage allowance applied to Possum Hollow Run Treatment Plant and Pump Station construction only.
3. Prices based on recent bid results, including bids received by Providence Properties in September, 1997 for construction of the treatment plant with pump station and force main and of the interceptor. Accordingly, contingency has been set at 10%, rather than the 20% often used for concept level estimates.
4. Prices do not include rock excavation.

APPENDIX D

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

**PLANNING COMMISSION AND
HEALTH DEPARTMENT REVIEWS**



RECEIVED
R 3/8/00

LIMERICK TOWNSHIP

646 WEST RIDGE PIKE
LIMERICK, PENNSYLVANIA 19468

ADMINISTRATION
(610) 495-6432
FAX (610) 495-0982
FINANCE (610) 495-5151
CODE ENFORCEMENT/ZONING/PERMITS
(610) 495-0951
PUBLIC WORKS DEPARTMENT
(610) 495-7522
POLICE DEPARTMENT
(610) 495-7909

7 March 2000

Limerick Township Board of Supervisors

**RE: 537/POSSUM HOLLOW DRAINAGE AREA: Township Planning
Commission review**

The above referenced study was submitted to the Township Planning Commission at the same time the study was released for public review and comment.

On Tuesday, 6 March 2000, the Township Planning Commission conducted a special public meeting to discuss their review of the study. Present were: Gregg Richardson, Jack Lanyon, Carol Gehret, Jason Gribbs and Bob Robinson. Mr. Robinson stated he would not participate in the review since he only received the study earlier that day and did not have sufficient time to read the review and prepare for comments.

The remaining members indicated they felt they were unable to perform a comprehensive review absent the presence of Gilmore Engineering (Consulting Engineer for the LTMA) who prepared the study.

Following discussion, questions and comments, the Planning Commission adopted a motion authorizing the Township Manager to write a letter to the Township Board of Supervisors advising the Planning Commission has reviewed the 537 Possum Hollow Drainage Study Area. By this letter, please stand advised.

Thank you,



Edward J. Fink

Township Manager

C: 7 March BOS Agenda

BOS/out

Barbara Frankel, Manager, Limerick Township Municipal Authority

Stu Rosenthal, P.E., Gilmore and Associates

Act 537: Possum Hollow Treatment Plant file

NO COMMENTS WERE RECEIVED FROM THE MONTGOMERY COUNTY
PLANNING COMMISSION OR HEALTH DEPARTMENT DURING THE
60 DAY REVIEW PERIOD FOR THOSE AGENCIES.



Gilmore & Associates, Inc.

Engineering and Consulting Services

www.gilmore-assoc.com

350 Bunge Ave
New Britain, PA 18901
(215) 845-4330
Fax (215) 345-8606

184 W. Main St
Trappe, PA 19426
(610) 489-4949
Fax (610) 489-8447

Info@gilmore-assoc.com

PS Form 3800, April 1995

99-0721-01

US Postal Service Receipt for Certified Mail No Insurance Coverage Provided. Do not use for International Mail (See reverse)	
Sent to <i>Montgomery Co Health Dept</i>	Street & Number <i>1430 DeKalb St</i>
Post Office, State & ZIP Code <i>19404 PA 19404</i>	Postage <i>3.20</i>
Certified Fee <i>1.40</i>	Special Delivery Fee, ps <i>1.25</i>
Restricted Delivery Fee	Return Receipt Showing to Whom & Date Delivered <i>1.25</i>
Return Receipt Showing to Whom, Date & Addressee's Address	TOTAL Postage & Fees <i>\$ 5.85</i>
Postmark or Date	

Z 360 550 187

January 19, 2000

CERTIFIED MAIL - RETURN RECEIPT

File No. 99-0721-01

Montgomery County Department of Health
1430 DeKalb Street
Norristown, PA 19404

Reference: Limerick Township Act 537 Special Study for the Possum Hollow Study Area

Gentlemen:

Enclosed for your review and comment are two (2) copies of the draft Act 537 Special Study for Limerick Township's Possum Hollow Study Area. The Special Study is a modification to the approved Act 537 Sewage Management Plan, which was adopted by the Limerick Township Board of Supervisors in 1992. This Special Study resizes and relocates sewage management facilities associated with that 1992 plan, but does not change the basic premise of public sewer service to the Study Area and construction of a new sewage treatment plant. The figures attached to the Special Study include not only the proposed plan modifications, but also the existing plan as adopted in 1992.

In recognition of the pressing need for sanitary sewer service to this portion of Limerick Township, the Board of Supervisors has made the construction of such facilities one of its top most priorities. Therefore, your prompt review of this submission will be greatly appreciated.

If you have any questions with regard to this matter, please do not hesitate to contact me.

Very truly yours,

Stuart L. Rosenthal, P.E.
Vice President
Manager - Water/Wastewater Services

SLR/pap

Enclosure: Two (2) Copies of the Draft Act 537 Special Study

- cc: Barbara P. Frankel, Manager - Limerick Township Municipal Authority
- Edward Fink, Manager - Limerick Township
- Howard E. Kalis, III, Esq., Solicitor - Binder, Kalis & Proctor, P.C.
- Joseph J. McGrory, Esq. - Pizonka, McGrory, Reilley, Bello & McGrory, P.C.
- Alexander Dyke, P.E., Project Engineer - Gilmore & Associates, Inc.

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: Montgomery County Dept. of Health 1430 N. Kalb St. Norristown, PA 19404	4a. Article Number Z-360-550-187	7. Date of Delivery 20 2005 USPS
4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD	5. Received By: (Print Name) MONTGOMERY COUNTY COURT HOUSE CHARLES MASON AUTHORIZED AGENT	
6. Signature: (Addressee or Agent) X	8. Addressee's Address (Only if requested and fee is paid)	

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Is your RETURN ADDRESS completed on the reverse side?

SENDER: ■ Complete items 1 and/or 2 for additional services. ■ Complete items 3, 4a, and 4b. ■ Print your name and address on the reverse of this form so that we can return this card to you. ■ Attach this form to the front of the mailpiece, or on the back if space does not permit. ■ Write "Return Receipt Requested" on the mailpiece below the article number. ■ The Return Receipt will show to whom the article was delivered and the date delivered.		I also wish to receive the following services (for an extra fee): 1. <input type="checkbox"/> Addressee's Address 2. <input type="checkbox"/> Restricted Delivery Consult postmaster for fee.
3. Article Addressed to: Montgomery County Planning Commission 1 Montgomery Plaza Ave. & Swede Sts. MONTGOMERY COUNTY COURT HOUSE NORRISTOWN, PA 19404	4a. Article Number Z-360-550-199	7. Date of Delivery 20 2005 USPS
4b. Service Type <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified <input type="checkbox"/> Express Mail <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> COD	5. Received By: (Print Name) CHARLES MASON AUTHORIZED AGENT	
6. Signature: (Addressee or Agent) X	8. Addressee's Address (Only if requested and fee is paid)	

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

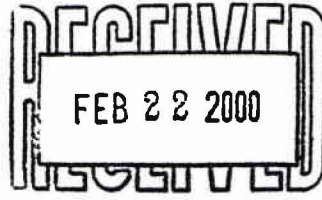
APPENDIX E

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

PROOF OF PUBLICATION

→ *ITMA*

Stu



THE MERCURY

Publishers of The Mercury, The Penny Pincher and Real Estate Today

PROOF OF PUBLICATION OF NOTICE

Under Act No. 587, Approved May 6, 1929

STATE OF PENNSYLVANIA
COUNTY OF MONTGOMERY SS:

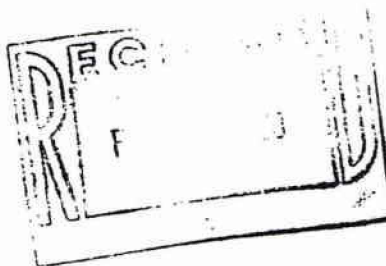
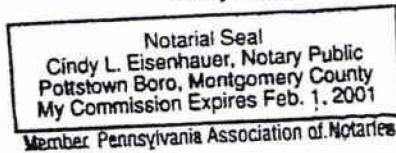
Mary Ann Edleman, of The Mercury, of the County and State aforesaid, being duly sworn, deposes and says that THE MERCURY, a newspaper of general circulation published at 24 N. Hanover Street, Borough of Pottstown, County and State aforesaid, was established September 29, 1931 since which time, The Mercury has been regularly issued in said County, and that the printed notice of publication attached hereto is exactly the same as printed and published in the regular editions and issues of the said THE MERCURY on the following dates; viz.

January 23, 2000

Affiant further deposes that he/she is duly authorized by Dennis Pfeiffer, Publisher of said MERCURY, a newspaper of general circulation, to verify the foregoing statement under oath, and affiant is not interested in the subject matter of the aforesaid notice of advertisement, and that all allegations in the foregoing statements as to time, place and character of publication are true.

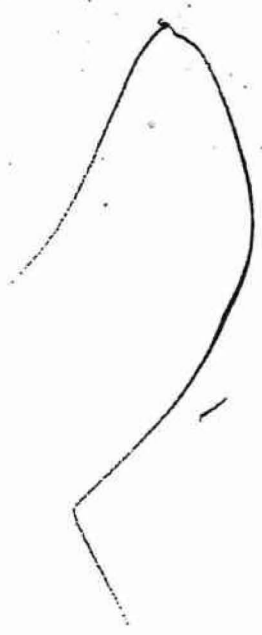
Mary Ann Edleman
Mary Ann Edleman, Classified Manager

Sworn to and subscribed before me this 17th
day of February, 2000
Cindy L. Eisenhower
Notary Public



LEGAL NOTICE
Notice is hereby given that the Limerick Township Board of Supervisors will consider for adoption a special study revision to the Limerick Township Act 537 Sewage Facilities Plan at their regular meeting on March 7, 2000 commencing at 7:00 pm at the Limerick Township Administration Building, Montgomery County, Pennsylvania. The Act 537 Special Study Area includes approximately 3.6 square miles of land in the western corner of the Township, and contains all or part of the Hartenstine Creek, Sanatoga, Possum Hollow Run, and Brooke Evans Creek drainage areas. The study area is principally zoned for O/L (Office Light Industrial) and L/L (Limited Light Industrial), and also includes the PECO Energy Nuclear Generating Station. The Sewage Facilities Plan for this area was originally adopted by the Limerick Township Board of Supervisors in May, 1992, and approved by the PA Department of Environment Resources in September, 1993. Modifications proposed by the Special Study include changing the location and reducing the size of the proposed Possum Hollow Sewage Treatment Plant and also re-

character of publication are true.



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The Sewage Facilities Plan for this area was originally adopted by the Limerick Township Board of Supervisors in May, 1992, and approved by the PA Department of Environment Resources in September, 1993. Modifications proposed by the Special Study include changing the location and reducing the size of the proposed Possum Hollow Sewage Treatment Plant and also reducing the size of certain pumping and sewer facilities. The overall concept of public sanitary sewer service to this portion of the Township has not been altered. The minimum treatment plant capacity to be initially provided for service to the Special Study Area will be approximately 300,000 gpd, although this figure could rise as high as approximately 460,000 gpd if certain areas and projects are also included in the initial phase of the plan. The ultimate treatment plant capacity required for the Special Study Area will be approximately 820,000 gpd.

A public comment period will extend for thirty (30) days from the date of publication of this notice. The proposed Act 537 Special Study for the Possum Hollow Study Area can be viewed at the Limerick Township Administration Building at 646 W. Ridge Pike, Limerick, Pennsylvania during regular business hours. Written comments may be directed to: The Limerick Township Board of Supervisors, 646 W. Ridge Pike, Limerick, PA 19468.

Richard Fiddler
Chairman,
Board of
Supervisors

Mary
Mary Ann E
Sworn to and subscribed before
day of *Feb*
Cindy L

APPENDIX F

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

PUBLIC COMMENTS



LIMERICK TOWNSHIP

646 WEST RIDGE PIKE
LIMERICK, PENNSYLVANIA 19468

ADMINISTRATION (610) 496-6412
FAX (610) 496-0823
FINANCE (610) 496-8181
CODE ENFORCEMENT/ZONING/FERRETS (610) 496-0951
PUBLIC WORKS DEPARTMENT (610) 496-7522
POLICE DEPARTMENT (610) 496-7909

VIA FAX TRANSMISSION @ (610) 948-0145 and REGULAR MAIL

13 March 2000

Ms. Barbara Frankel, Manager
Limerick Township Municipal Authority
529 King Road, Box 29
Royersford, PA 19468

RE: 537/Possum Hollow Drainage Area Study

Dear Barbara:

Enclosed herein is copy of Limerick Township Resolution No. 2000-11 whereby the Limerick Township Board of Supervisors approved the Possum Hollow Drainage Area Study including the Upper Brook Evans drainage area.

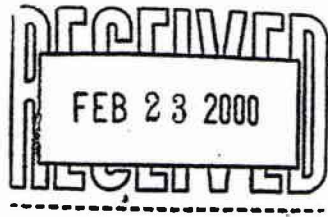
Also enclosed herein is copy of one (1) letter submitted to Limerick Township during the public review/comment period. Other than the one (1) enclosed letter, and by this letter, please be advised there were no other written comments submitted to Limerick Township. Ms. Karen Willman, Township Secretary, provided Stu Rosenthal, Gilmore & Associates, this information and letter from the Township on the evening of the public hearing, Tuesday, 7 March 2000.

Please contact Ms. Karen Willman, Township Secretary in the event you or your staff may require additional information regarding same.

Sincerely,
Limerick Township

Edward J. Fink
Township Manager

C: Township Board of Supervisors
5437/Possum Hollow Treatment Plant project file
LTMA/out file



Jay S. Berman
3277 W. Ridge Pike
Pottstown, Pa. 19464
610-495-7166

2/23/00

Ed Fink
Township Manager
Limerick Township
646 W. Ridge Pike
Limerick, Pa. 19468

*C: Bos (Jy S)
Ed Fink / Mgr.
ITMA
Correspondence*

Dear Ed,
It has been brought to my attention that the west end of Limerick Township has not been included the last sewer authority study for inclusion in the next expansion.

I sincerely hope that this is not the case.

I own Montgomery Corporate Center, a fifteen thousand square foot office building on Ridge Pike which presently is on a sand mound, a ninety five hundred square foot flex building on a holding tank, and another soon to be constructed twenty thousand square foot flex building also to be on a holding tank.

I am bringing new businesses as well as new jobs to Limerick Township with no burden to the school system. The buildings that already exist are paying over twenty thousand dollars in taxes, yet have no public amenities such as sewer and water, yet I am being held to same standards in building as if I were located in full service area.

Respectfully,
Jay S. Berman



Gilmore
& Associates, Inc.

Engineering and
Consulting Services

March 21, 2000

File No. 99-721-01

Jay S. Berman
3277 W. Ridge Pike
Pottstown, PA 19464

Reference: Act 537 Special Study – Possum Hollow Study Area
Limerick Township, Montgomery County, Pennsylvania

Dear Mr. Berman:

This letter is in response to comments contained in your February 23, 2000 letter regarding the above referenced Study.

As per the Study, sewer service to the Ridge Pike area in the western portion of Limerick Township would not be part of the proposed "initial" (0-5 years) sewer facilities. This is primarily because the funding necessary to extend the sewer to Ridge Pike as part of the initial construction is simply not available at this time. The Study does call for extension of sewer service to Ridge Pike as part of the proposed "ultimate" (5-20 years) sewer facilities in the area, in recognition of the belief that these areas should be served as soon as it becomes economically feasible.

It should be noted that although the Limerick Township Municipal Authority is responsible for directing the construction and operation of sanitary sewers in conjunction with planning by Limerick Township, it is often developers and/or potential sewer customers who provide the financial impetus for the installation of facilities to serve particular areas of the Township.

By copy of this letter, we believe the above also addresses the comments contained in Mr. Kenneth W. Sperring, Jr.'s February 29, 2000 letter, which was received by Limerick Township after the advertised public comment period.

Sincerely,

Alexander Dyke, P.E.
Gilmore & Associates, Inc.

AD/cbs

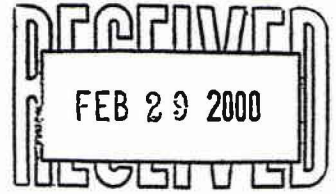
cc: Kenneth W. Sperring, Jr.
Edward J. Fink, Manager - Limerick Township
Barbara P. Frankel, Manager - Limerick Township Municipal Authority
Howard E. Kalis, III, Esq. - Binder, Kalis & Proctor
Stuart L. Rosenthal, P.E., Vice President - Gilmore & Associates, Inc.

350 Bunc-Ann
New Britain, PA 19001
(215) 345-4330
Fax (215) 345-8506

184 W. Main St.
Troy, PA 19426
(610) 489-4949
Fax (610) 489-3447

info@gilmore-assoc.com

Limerick Collision Center
Limerick Township
44 Industrial Parkway
Pottstown, PA 19464
(610) 495-2000



February 29, 2000

7 MARCH BOS (537 Study)
LTMA
537/ Pottsum Hollow jetel

Limerick Township
646 W. Ridge Pike
Limerick, PA 19468


Attn: Ed Fink

Re: Public Sewer Request

Dear Ed,

As per our conversation last Tuesday, 2/22/00, I as well as Jay Berman, Bruce Monteiro (Rhino Liners of Limerick), John Maddoni (JRM Contractors) and all of Industrial Parkway of Limerick Township find it necessary to have public sewer hooked up. There is, as you are well aware, a new electric provider and Heritage Builders coming into this area. As a result of all of this new development, we strongly urge you to consider this matter as we will expect to see public sewer installed in a reasonable amount of time. As we were recently informed, Limerick Sewer Authority is going to be building a new sewer plant at this end of town sometime in the future. We just want the opportunity to get our sewer tied in, when the time comes.

Sincerely,


Kenneth W. Sperring, Jr.
Limerick Collision Center, Inc.

APPENDIX G

**LIMERICK TOWNSHIP ACT 537
POSSUM HOLLOW SPECIAL STUDY**

RESOLUTION OF ADOPTION

**LIMERICK TOWNSHIP
RESOLUTION NO. 2000-11**

**RESOLUTION OF THE SUPERVISORS OF LIMERICK TOWNSHIP,
MONTGOMERY COUNTY, PENNSYLVANIA (hereinafter "the municipality").**

WHEREAS, Section 5 of the Act of January, 1966, P.L. 1535, No. 537, known as the "Pennsylvania Sewage Facilities Act," as amended, and the Rules and Regulations of the Department of Environmental Protection (Department) adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the municipality to adopt an Official Sewage Facilities Plan for providing 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, Gilmore & Associates, Inc. has prepared an Amendment to the Limerick Township Act 537 Sewage Facilities Plan which provides for sewage facilities in a portion of Limerick Township; and

The alternative of choice to be implemented is identified in the Act 537 Special Study - Possum Hollow Study Area, Limerick Township, Montgomery County, Pennsylvania dated March, 2000 as Option No. 2 as described in Table 4B. This option provides initially for the construction of a minimum 450,000± gpd wastewater treatment plant along Longview Road near the confluence of Possum Hollow Run and the Schuylkill River to serve the Study Area. The plant will receive flow from approximately 4,300 lf of 18" and 1,600 lf of 12" gravity interceptor to be constructed along Possum Hollow Run, discharging to a 1,080± gpm pump station with 1,100± lf of 10" force main to convey flows to the plant. A second pump station would also be constructed on Sanatoga Road near the Brooke Evans Creek, which would receive flow from the Upper Brooke Evans and part of the Lower Brooke Evans Drainage Areas via approximately 5,200 lf of 10" and 2,900 lf of 8" gravity sewer. The second pump station would have a capacity of approximately 660 gpm and would discharge to the Possum Hollow Run Interceptor via 3,100± lf of 6" force main. Ultimately, this option provides for extension of sewer service to the remainder of the Study Area through construction of three (3) additional pump stations, with force mains as well as additional gravity sewer. The key implementation activities/dates include:

- | | |
|---|-----------------|
| 1. Township 537 Special Study Adoption | March, 2000 |
| 2. PADEP 537 Special Study Approval | May, 2000 |
| 3. Part 1 NPDES Application Submission | May, 2000 |
| 4. PADEP Part 1 NPDES Approval | September, 2000 |
| 5. Part 2 Water Quality Management Application Submission | March, 2001 |
| 6. PADEP Part 2 Water Quality Management Approval | June, 2001 |
| 7. Bid Document Issuance | July, 2001 |
| 8. Construction Contracts Award | October, 2001 |
| 9. Construction Completion / Start-up | December, 2002 |

WHEREAS, Limerick 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 the Township of Limerick hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the "Official Plan" of the municipality, the above referenced Facility Plan. The municipality hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Pennsylvania Sewage Facilities Act as amended).

Adopted this 7th day of March, 2000.

LIMERICK TOWNSHIP
BOARD OF SUPERVISORS

ATTEST:

Karen T. Killmer, Secy.

Frederick L. Giller

Bonnie C. Reese

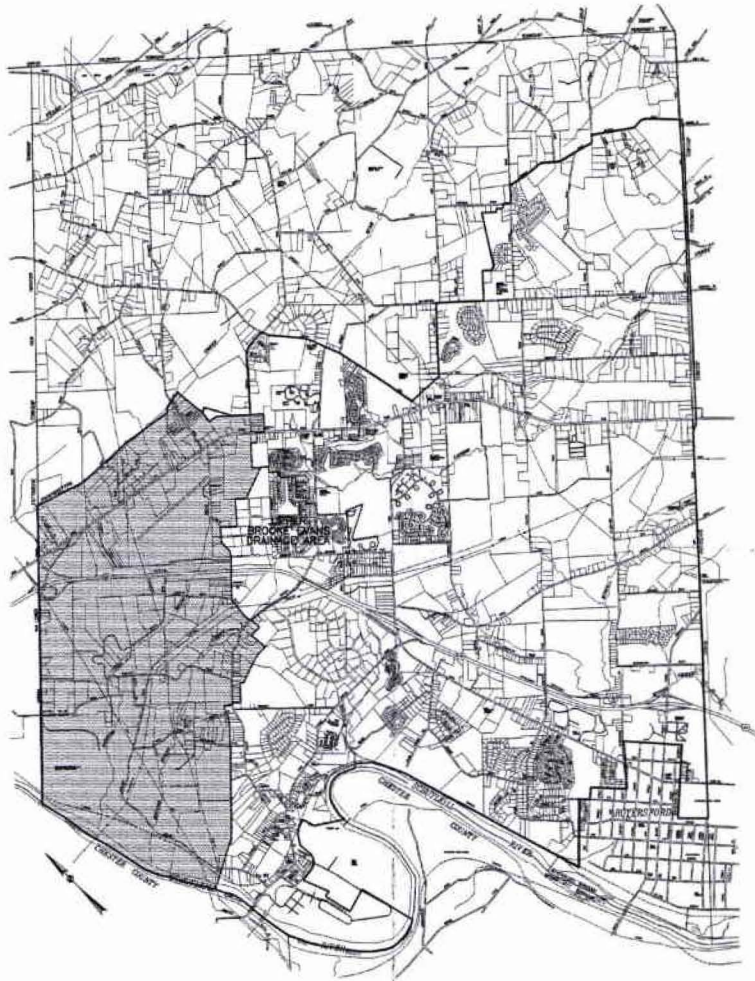
Thomas E. Pank

I, Edward J. Fink, Secretary, Limerick Township Board of Supervisors, hereby certify that the foregoing is a true copy of the Township's Resolution No. 2000-11 adopted 7 March, 2000.

AUTHORIZED SIGNATURE

TOWNSHIP SEAL

Edward J. Fink



**LIMERICK TOWNSHIP 537 PLAN
POSSUM HOLLOW SPECIAL STUDY
SPECIAL STUDY AREA BOUNDARIES**

MONTGOMERY COUNTY, PENNSYLVANIA
CBA No. 95-721-01
(MAPPING BASED ON COMPREHENSIVE SEWER PLAN LAST REVISED JANUARY 20, 1990)

LEGEND

-  LIMERICK TOWNSHIP 537 PUBLIC SEWER AREA
-  POSSUM HOLLOW SPECIAL STUDY AREA

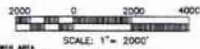


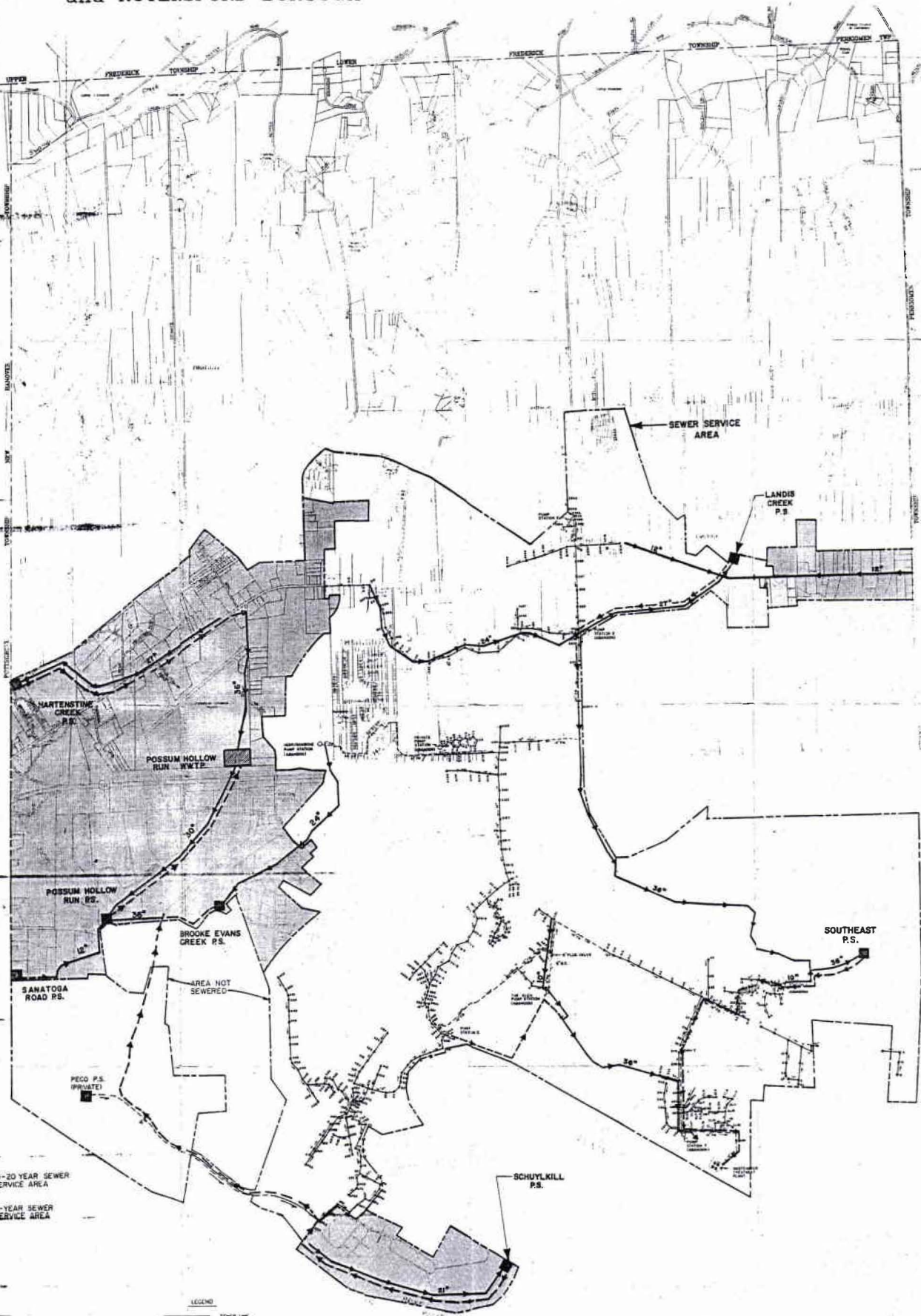
FIGURE 1

GILMORE & ASSOCIATES INC.
CONSULTING ENGINEERS & LAND SURVEYORS
331 BUTLER AVENUE, NEW BRITAIN, PA. 18901

LAST REVISED: MARCH 3, 2000

LIMERICK TOWNSHIP and ROYERSFORD BOROUGH

MONTGOMERY COUNTY, PENNSYLVANIA



10-20 YEAR SEWER SERVICE AREA
 5-YEAR SEWER SERVICE AREA

FIGURE 2

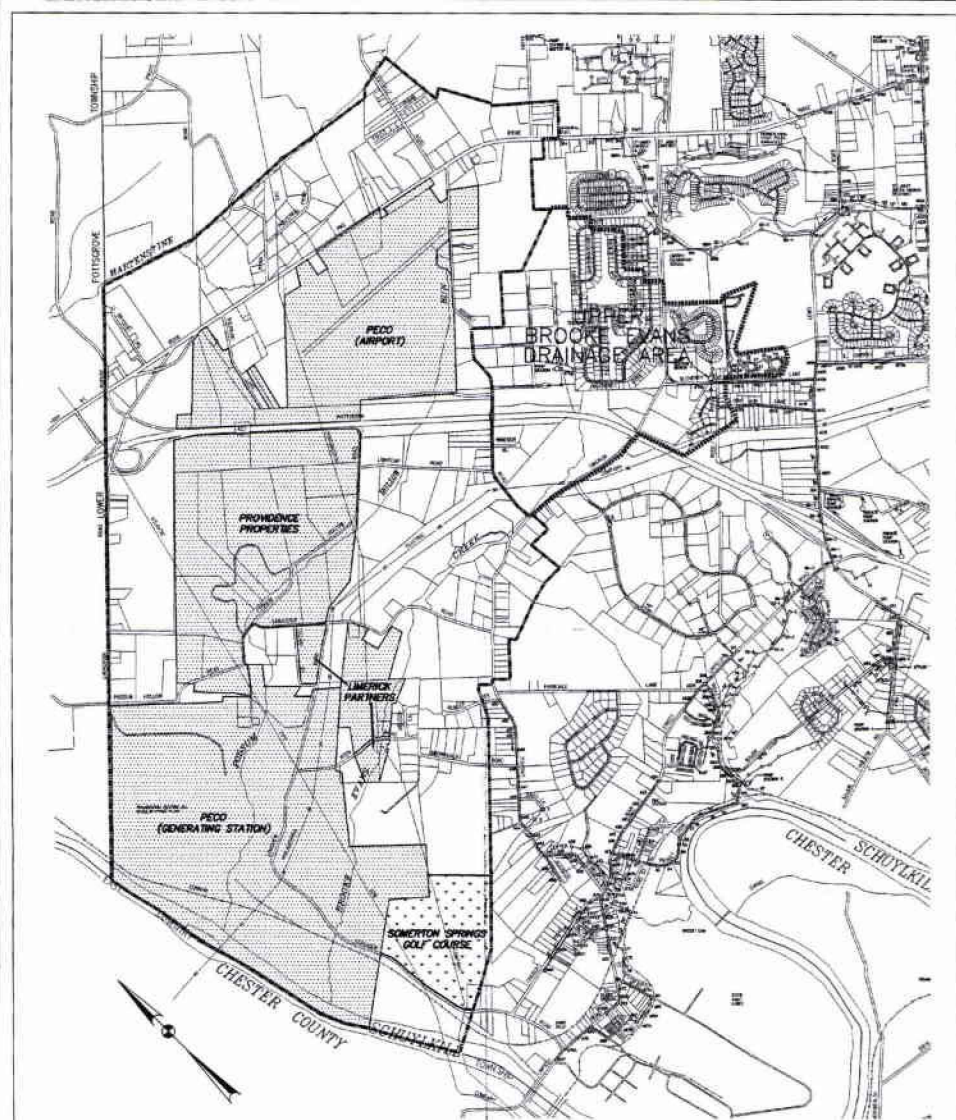
LEGEND

- SEWER LINE
- FORCE MAIN
- DIRECTION, NUMBER, FLOW, MANHOLE AND PIPE SIZE
- UNINCLUDED SEWER SERVICE AREA
- PROPOSED SEWER INTERCEPTOR
- PROPOSED FORCE MAIN
- PROPOSED PUMPING STATION
- PROPOSED WWTP

SEWER LINE PIPE SIZE IS 18" UNLESS NOTED OTHERWISE

PBC ENGINEERS & CONSULTANTS, INC.
 848 NORTH LEWIS ROAD
 LIMERICK, PENNSYLVANIA 17842

ALTERNATIVE SD-1 PLAN
 FUTURE SEWAGE FACILITIES
 LIMERICK TOWNSHIP MUNICIPAL AUTHORITY
 MONTGOMERY COUNTY, PENNSYLVANIA



LIMERICK TOWNSHIP 537 PLAN
 POSSUM HOLLOW SPECIAL STUDY
 EXISTING AND PROPOSED
 DEVELOPMENT
 MONTGOMERY COUNTY, PENNSYLVANIA
 O&A No. 99-721-01
 (MAPPING BASED ON COMPREHENSIVE SEWER PLAN LAST REVISED JANUARY 20, 1999)

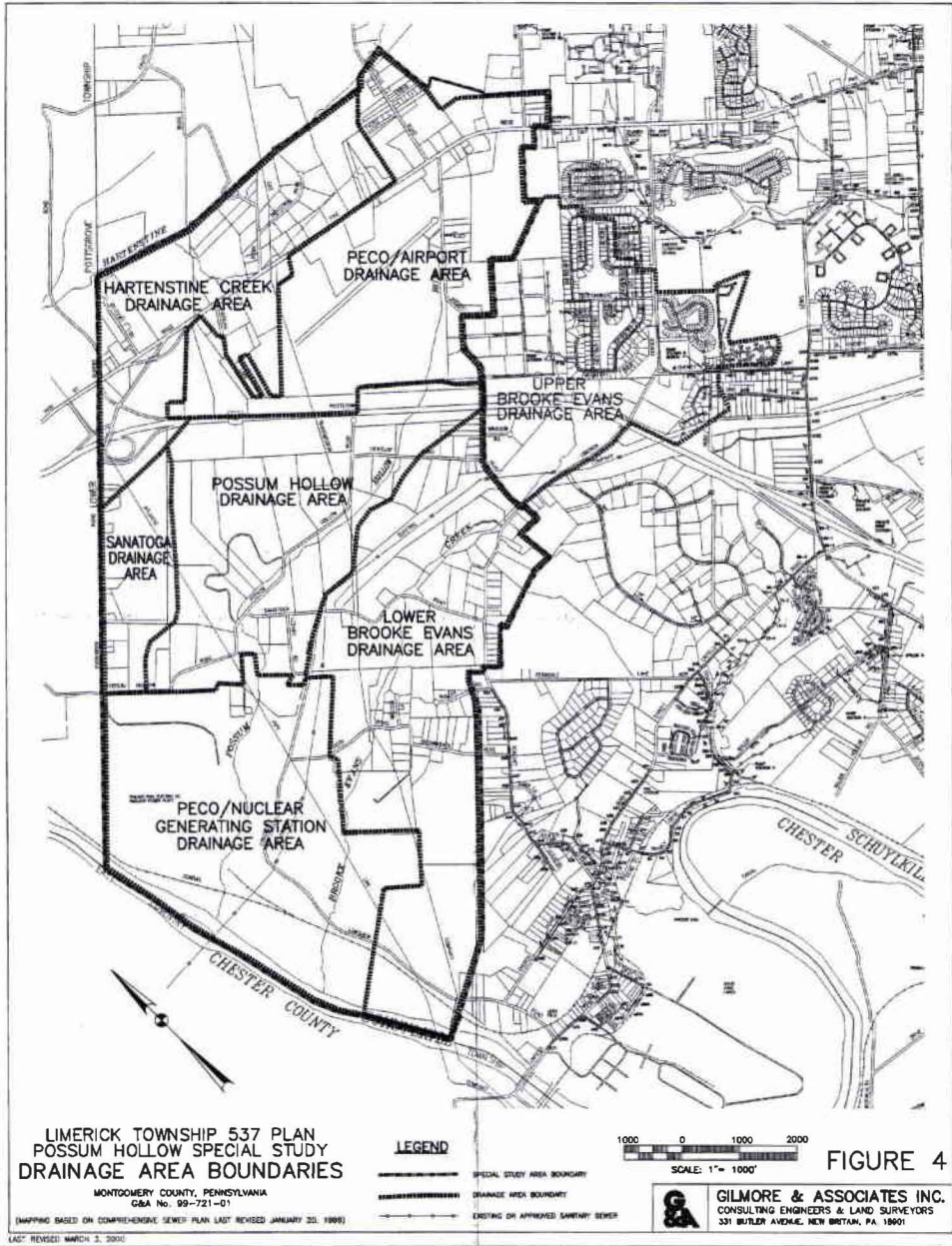
LAST REVISED MARCH 2, 2000

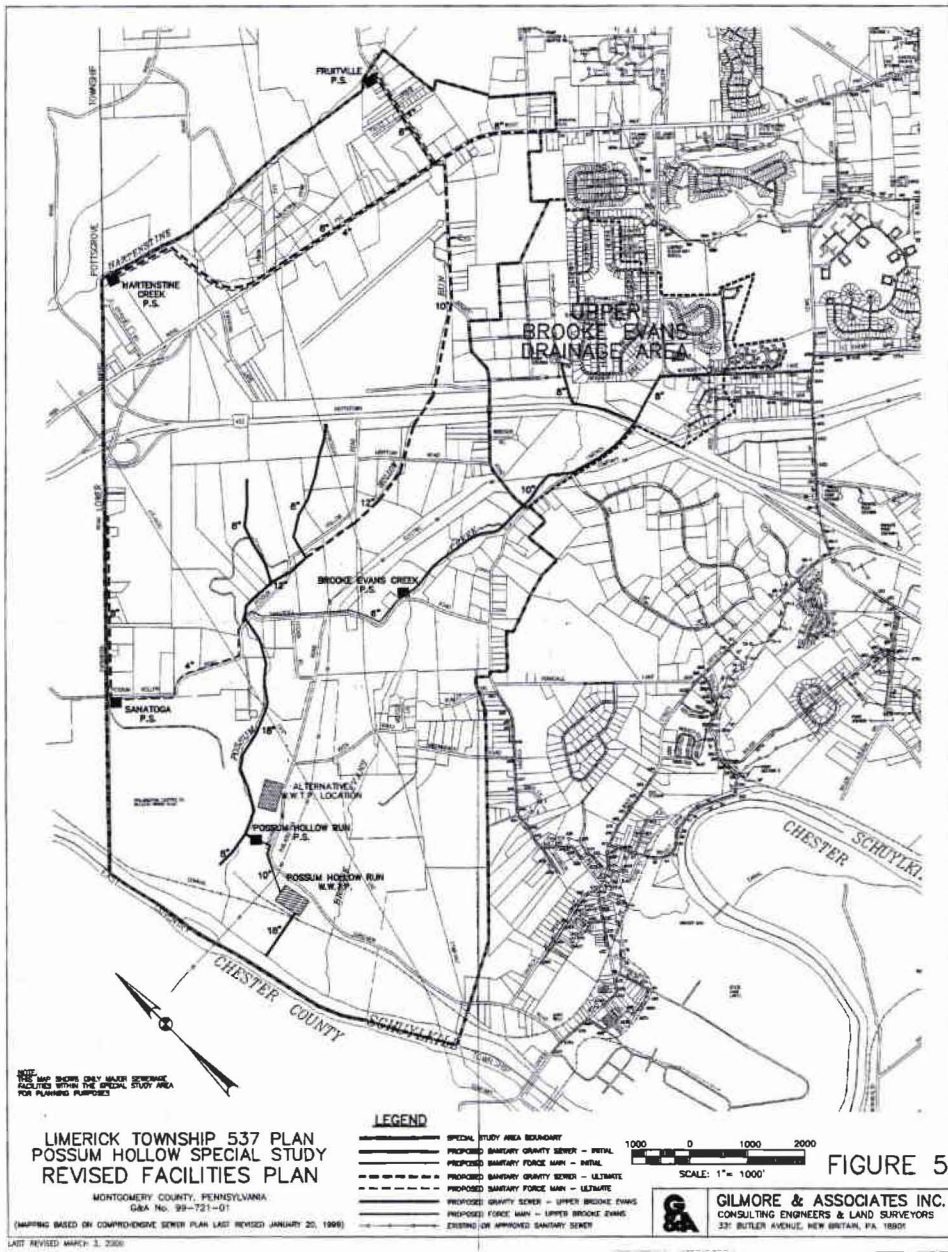
- LEGEND**
- SPECIAL STUDY AREA BOUNDARY
 - EXISTING OR APPROVED BARRIERY SEWER
 - ▨ EXISTING AND PROPOSED INDUSTRIAL DEVELOPMENT
 - ▤ EXISTING GOLF COURSE INFRASTRUCTURE AND SAFETY BARRIERS FLOW



FIGURE 3

GILMORE & ASSOCIATES INC.
 CONSULTING ENGINEERS & LAND SURVEYORS
 331 BUTLER AVENUE, NEW BRITAIN, PA. 19001





NOTE: THIS MAP SHOWS ONLY MAJOR SEWERAGE FACILITIES WITHIN THE SPECIAL STUDY AREA FOR PLANNING PURPOSES.

LIMERICK TOWNSHIP 537 PLAN
 POSSUM HOLLOW SPECIAL STUDY
 REVISED FACILITIES PLAN
 MONTGOMERY COUNTY, PENNSYLVANIA
 G.M.A. No. 99-121-01
 (MAPPING BASED ON COMPREHENSIVE SEWER PLAN LAST REVISED JANUARY 20, 1996)
 LAST REVISED MARCH 3, 2000

- LEGEND**
- SPECIAL STUDY AREA BOUNDARY
 - PROPOSED SANITARY GRAVITY SEWER - RETAIL
 - PROPOSED SANITARY FORCE MAIN - RETAIL
 - PROPOSED SANITARY GRAVITY SEWER - ULTIMATE
 - PROPOSED SANITARY FORCE MAIN - ULTIMATE
 - PROPOSED GRAVITY SEWER - UPPER BROOKE EVANS
 - PROPOSED FORCE MAIN - UPPER BROOKE EVANS
 - EXISTING OR APPROVED SANITARY SEWER

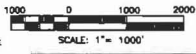


FIGURE 5

GILMORE & ASSOCIATES INC.
 CONSULTING ENGINEERS & LAND SURVEYORS
 237 BUTLER AVENUE, NEW BRITAIN, PA. 18901