

# EAST COCALICO TOWNSHIP

## ***ACT 537*** **OFFICIAL *SEWAGE* FACILITIES** **PLAN UPDATE**

**APRIL 2007**

# **Plan Summary**

## **PS.1 Proposed Service Areas and Major Problems**

The intent of this Act 537 Official Sewage Facilities Plan Update is to address the entire area encompassing East Cocalico Township by identifying the existing and future wastewater collection and treatment needs within the Township. A Needs Identification evaluation was completed, including a sanitary survey of properties utilizing on-lot disposal systems (OLDS) to identify existing malfunctions, and an individual water supply survey to identify possible groundwater contamination by malfunctioning OLDS. The results of the survey indicated that there were no new areas of concern within the Township. Areas of concern are defined as having clusters or concentrations of confirmed, suspected, or potential OLDS malfunctions or groundwater contamination. The areas of concern identified from previous Act 537 Plan Amendments are the Lakeside area, Smokestown Road, and the Pinewood area. These areas are re-evaluated in the Alternatives Identification and Evaluation portion of this Plan Update. In combination with other factors including lot sizes, soil suitability, geology, topography, and age and design of systems, it appears unlikely that the long-term sewage disposal needs of these areas can be met with OLDS. Although it does not fit the definition of an "area of concern" as outlined above, the Stevens Pumping Station is also examined in this Plan Update, because the existing station will be unable to support proposed growth in the area.

## **PS.2 Alternative Identification, Institutional Arrangements and Municipal Commitments**

The selected alternative for the Lakeside area that involves the construction of a low-pressure sewer system along Lakeside Drive and Swartzville Road that will connect to the proposed Morganshire sewer facilities. Smokestown Road is proposed to be serviced by public sewer consisting of gravity sewage collection, a low-pressure sewer line, a pumping station, and a force main to connect to the existing East Cocalico Township Authority (ECTA) gravity sewer. Public sewer service is proposed for extension to the Pinewood area through one of two alternatives: a combination of new gravity and low-pressure sewer lines or an all gravity sewer line connecting to the Intermunicipal Group interceptor. The selected alternative for the Stevens Pumping Station is to construct a new pumping station on the site of the existing station, followed by developer funded force main and gravity sewer improvements, as necessary. The recommended alternatives can be implemented with the existing institutional structure currently in place in the Township. The construction of sewer extensions to the existing ECTA sewer system can be accomplished by ECTA in cooperation with the East Cocalico Township Board of Supervisors. All required ordinances, regulations and standards are currently in place. The Board of Supervisors will need to adopt a revision to the current Subdivision and Land Development Ordinance to address the requirements of a preliminary hydrogeologic investigation for new development as part of the land development planning process.

### **PS.3 Alternative Costs and Proposed Funding Method**

The capital design and construction cost to implement the selected alternative for the Lakeside area is estimated at \$543,000. The capital design and construction cost to implement the sewer extension alternative to Smokestown Road is estimated at \$2.50 million.

The capital design and construction cost to implement the least cost sewer extension alternative to the Pinewood area is estimated at \$2.17 million. Comparatively, implementation of the other selected alternative has a capital design and construction cost of \$2.41 million.

The capital design and construction cost for the Stevens Pumping Station alternative is \$1.92 million. However, the majority of this cost will be distributed to private developers.

The recommended capital financing plan selected as the preferable option in Section 6 of this Plan Update is the use of a bond issue or bank loan, supplemented if possible with Community Development Block Grants.

### **PS.4 Implementation Schedule**

Following approval of this Act 537 Plan Update by the Township, ECTA, and PADEP, the projected implementation plan for the selected alternatives is as follows:

<u>Activity</u>	<u>Milestone</u>
Stevens Pumping Station	Two Years after Plan Approval
Sewer Service to the Lakeside Area	Five Years after Plan Approval
Sewer Service to Smokestown Road	Eight Years after Plan Approval
Sewer Service to the Pinewood Area	Ten Years after Plan Approval
Implement Revised Subdivision & Land Development Ordinance	Three Months after Plan Approval

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# Section 1

## Previous Wastewater Planning

### 1.1 Introduction

The East Cocalico Township Authority (ECTA) provides wastewater collection and conveyance facilities to serve the sewage disposal needs of a portion of East Cocalico Township. Wastewater treatment is provided by Adamstown Borough and Ephrata Borough. A small portion of the Township is provided with sewer service and treatment from West Cocalico Township Authority. The remaining properties in the Township are serviced by on-lot disposal systems (OLDS). This Official Act 537 Sewage Facilities Plan Update addresses the existing and future wastewater collection and treatment needs within the Township and allows for planned growth. One of the key initial tasks in the performance of an Act 537 Plan Update is the review of existing wastewater planning documents to develop a comprehensive background for future planning efforts. The review and summary of existing planning documents is included in this section of the Plan Update.

### 1.2 Existing Wastewater Plans

Various wastewater planning efforts which include East Cocalico Township have been completed over the past 35 years. Planning has been done at state, county and local area levels. The following sections summarize these plans.

#### 1.2.1 State Planning

The Pennsylvania Department of Environmental Protection (PADEP, formerly known as the Pennsylvania Department of Environmental Resources) completed the *State Water Plan for Subbasin 7 - Lower Susquehanna River* in 1980. East Cocalico Township is located within the Conestoga River Watershed (Watershed J). As part of the overall State Water Plan, PADEP prepared the *Comprehensive Water Quality Management Plan* (COWAMP) in 1982. This plan developed water quality standards and wastewater facilities plans for municipalities and regions in the state including the Conestoga River Watershed.

In designated growth areas, COWAMP recommends that existing sewerage systems be extended into developing areas where public health or pollution hazards are believed to exist. Outside designated growth areas, it recommends that OLDS be utilized in residential developments where feasible. Non-municipally owned package treatment facilities and large-scale commercial or industrial developments are discouraged outside designated growth areas.

#### 1.2.2 County Planning

In 1970 the Lancaster County Planning Commission (LCPC) completed a Comprehensive Sewerage Plan for Lancaster County, but this was later replaced by future plans, including the Lancaster County Comprehensive Plan, most recently dated 1999, and the Growth Management Plan, which was updated in 1997.

In 1987 the LCPC completed a Sewer and Water Resources Study, which identified areas with OLDS problems in East Cocalico Township, but did not provide plans for public sewer extensions to serve the problem areas.

The LCPC created a Water Resources Plan in 1996. This Plan contains information concerning water resources planning, water supply and wellhead protection. It also includes a sample OLDS Ordinance for assisting county municipalities in managing OLDS and protecting their local water supply. The Township has established wellhead protection zones for each of their public wells and adopted an OLDS Management Ordinance.

The LCPC adopted a Subdivision and Land Development Ordinance in 1991 with revisions up to and including January 15, 1997. Section 609 of this ordinance is entitled Sanitary Wastewater Disposal and Water Supply. It recommends that, where possible, new developments are connected to public sewerage systems. Distances from existing public sewer are listed for developments of a certain size. If a development is located less than the designated distance from public sewer it must connect to public sewer. For example, developments of 15 units or more within one mile of public sewer must connect, unless adequate justification is provided showing that such a connection is not feasible.

The current Lancaster County Comprehensive Plan consists of three key parts: 1) Policy Element, 2) Growth Management Element, and 3) Functional Elements. The Policy Plan was adopted in 1999. This outlines the visions, goals, and focus areas of the Plan.

The LCPC Growth Management Plan, adopted in 1993 and updated in 1997, emphasizes that coordination between future land use planning and sewage facilities is extremely important. Planning will encourage staged or phased growth of urban centers. Public sewer and water are strongly discouraged outside of designated urban growth boundaries. The Growth Management Plan is currently being updated.

The third component of the Comprehensive Plan, Functional Elements, contains individual plans specifically designed to address a particular issue. The Water Resources Plan outlined above is included in the Functional Elements.

### **1.2.3 Local Planning**

In 1980 the Township adopted an Official Wastewater Facilities Plan. The Plan identified areas for public sewer extensions and areas that were outside of the sewer service area that required use of OLDS for sewage disposal. The Plan recommended extending sewer service to six key areas. The proposed extensions serving (1) the Denver Road/Kurtz Road Area, (2) the Stevens Road Area, and (3) the Southwest Reamstown Area have been completed. Portions of the extensions for (4) the Stevens Area have been completed, with further extension to be the responsibility of property owners in the area. Sewer service has been extended to the existing facility in (5) the Pennsylvania Turnpike Interchange/U.S. Route 222 Area, and additional extensions will be installed by the property owners and then dedicated to the Authority once additional facilities are constructed in the area. In order to provide service to (6) the PA Route 897 North/ Muddy Creek Road/ Hill Road Area, ECTA is currently constructing a sewer extension that will serve portions of Route 897 North.

Following sewer installation in the new Morganshire development, public sewer service will also be provided to Lakeside Drive. Sewer has also been extended to provide service to North Muddy Creek Road. The Hill Road portion of this area has not yet received public sewer.

The Ephrata Area Wastewater Treatment and Collection System Act 537 Plan, adopted in 1995, covered six municipalities: Akron Borough, Clay Township, Denver Borough, East Cocalico Township, Ephrata Borough, and Ephrata Township. Flow projections for the Plan in East Cocalico were determined assuming that public sewer service would be extended to Pinewood Estates and Route 897 North/Lakeside Drive. The Plan recommended that the Ephrata Area decentralize wastewater treatment with three treatment plants. One of these plants, Ephrata Wastewater Treatment Facility (WWTF) No. 2, was designated to serve East Cocalico Township and Denver Borough. This plant was constructed in 1997. The Plan recommended that the Township consider adopting an OLDS management policy, which has been adopted and is outlined below. The Hahnstown Area, located in both Ephrata Township and East Cocalico Township, was identified as an area in need of further study to determine the optimum sewage disposal method. At this time no further study of the Hahnstown Area has been completed. The Plan also recommended further study of three particular areas to determine the most appropriate means of sewage disposal: (1) Lakeside Drive, (2) Pinewood Estates, and (3) Smokestown Road. The Township pursued further investigation in these areas and developed a Plan Amendment for each, as outlined below.

In 1998 Adamstown Borough and East Cocalico Township completed an Act 537 Plan. This Plan covered only the Adamstown watershed portion of East Cocalico Township. The alternative selected included upgrades to ECTA's main interceptor and Gehman School Pumping Station and diversion of East Cocalico flow away from Adamstown Borough. Several of the tasks in the recommended alternative have been completed, including upgrading the upper and lower sections of the ECTA main interceptor to convey higher flows to Ephrata WWTF No. 2, and constructing a new Gehman School Road Pumping Station. Additional items that were identified, but not yet completed, include construction of a bypass to direct flows away from the Adamstown WWTP. This bypass was recently constructed. The selected alternative also contemplated the phased diversion of all ECTA flows back to Ephrata WWTF No. 2 during the four year period following completion of the plan to accommodate anticipated sewage capacity requirements of Adamstown Borough. The plan recognized that this schedule could be extended, particularly if the Borough was able to successfully reduce infiltration/inflow, beyond the initial four year period. However, it was estimated that by no later than 2016, the Adamstown WWTP would not have adequate capacity for treatment of ECTA flows.

As a follow-up to the Ephrata Area Act 537 Plan, an Official Act 537 Sewage Facilities Plan Amendment was prepared for East Cocalico on April 26, 2000, focusing on three special study areas: (1) Pinewood Estates, (2) Lakeside Drive, and (3) Smokestown Road. After performing a needs assessment for the three areas, it was determined that public sewer should be extended to all three areas if it was economically feasible. As part of the amendment and a follow-up response to PADEP, a document titled Response to Comments of March 13, 2001 from the Department of Environmental Protection was prepared. In this

document the Township performed detailed alternatives analysis for each of the three areas, selecting the optimum alternative for each. However, each of the selected alternatives that would provide sewer service to each area was not selected for implementation, because they were not deemed economically feasible.

In follow-up to the 2000 Plan Amendment two other Official Act 537 Sewage Facilities Plan Amendments were prepared for (1) the Morganshire-Lakeside-Smokestown Study Areas and (2) the On-Lot Sewage Management Plan and Pinewood Area Sewage Facilities Plan, dated December 28, 2001 and July 17, 2002, respectively.

The Morganshire-Lakeside-Smokestown Amendment dated December 28, 2001 incorporated the Morganshire development, which extended public sewer in the vicinity of Smokestown Road and Lakeside Drive and thereby increased the feasibility of extending public sewer to Lakeside and Smokestown. Alternatives were selected to provide public sewer service to Lakeside Drive, portions of W. Swartzville Road, Poplar Road, portions of Adamstown Road, and portions of Mohn's Hill Road. The Poplar Road and W. Swartzville Road extensions have been completed. The Lakeside Drive extension is scheduled to be constructed in 2010 following completion of the Morganshire development's public sewer and pumping station construction in the final phase. The Smokestown Road extension is scheduled to be constructed in 2014. The Adamstown Road and Mohn's Hill Road sewer extensions are planned as a future project.

The Pinewood Area Sewage Facilities Plan was included in the July 17, 2002 Plan Amendment. After re-evaluating the alternatives from the April 26, 2000 Plan Amendment, the alternative-of-choice remained the same. The selected alternative involved constructing a sewer extension to serve the 66 EDUs in the Pinewood Area by way of S. Reamstown Road and Wabash Road and then connecting to the existing IMG interceptor. The Plan Amendment recommends construction of the extension in 2014.

A third Act 537 Official Sewage Facilities Plan Amendment was completed on June 12, 2002 for the Wabash Road Area. This study area includes the industrial Four Seasons development. The area was classified as having limited need for public sewer service. The selected alternative involved two sections: north of Route 272 and south of Route 272. The area north of Route 272 and west of Wabash Road has been partially served by Four Seasons, and service may be extended in the future to serve Long Avenue and a portion of Garden Spot Road, if it is funded by the property owners. The Authority does not plan to extend public sewer to serve the properties south of Route 272, but instead will leave this responsibility up to the developer of that land at the time of development.

ECTA prepares Chapter 94 Reports on an annual basis for its public sewer system. The ECTA reports are included in the Adamstown Borough and Ephrata Borough Chapter 94 Reports. The reports include sections on hydraulic and organic loading, proposed plans to reduce any projected overloads, industrial waste reports, extensions and connections to the sewer system, and condition of the system and pumping stations. The 2006 Chapter 94 Reports did not present any projected overload conditions or capacity limitations within the next five years.

## 1.3 Land Use Planning

Comprehensive land use planning, zoning, and subdivision regulations have been adopted by East Cocalico Township. The following sections summarize these documents.

### 1.3.1 Comprehensive Land Use Planning

East Cocalico Township, along with Adamstown Borough, Denver Borough, West Cocalico Township, and Cocalico School District, developed the Strategic Comprehensive Plan for the Cocalico Region that was adopted in December 2003. This Comprehensive Plan sets the direction for growth and development over the next twenty years for land use, transportation and utilities, economic development, and community services and facilities. Section 301-C of the Municipal Planning Code advises that comprehensive plans should be evaluated for consistency with the County Plan at 10-year intervals. Tasks outlined in the Implementation Schedule for East Cocalico include the extension of public sewer lines to serve the three areas outlined in the recently adopted Act 537 Plan Amendments, investigation of sanitary sewer regionalization and IMG expansion over the long range, and undertaking of a comprehensive update to the Official Sewage Facilities Plan to coordinate its sewage planning with its overall community planning program within one year.

### 1.3.2 Zoning

The East Cocalico Township Zoning Ordinance of 2003 outlines acceptable land uses for eighteen zoning districts, five of which are overlay zones, including floodplains. The thirteen primary zones include an agricultural zone, a conservation zone, six residential zones, two commercial zones, two industrial zones, and a quarry zone. Each zone establishes various lot sizes based on the method of water service and sewage disposal. The zoning districts are delineated on the zoning map presented in Figure 1-1. The following is a summary of each district.

1. Agricultural Zone (A) - The principal purpose of this Zone is to promote the continuation and preservation of agricultural activities. Therefore, provisions restrict residential uses but provide for limited agricultural support businesses. The permitted uses include agriculture and horticulture (excluding intensive livestock and produce operations), forestry, houses of worship, municipal services/utilities structures, parks and playgrounds, private schools, and single family detached dwellings. For each 25 acres of contiguous land under single ownership, one new lot may be subdivided and/or a new principal use may be established. The minimum lot area per dwelling unit is one acre and the maximum is two acres. Properly sited and permitted OLDS are permitted in this Zone. The minimum lot area for agriculture, horticulture, and forestry is 20 acres.

Further efforts to protect agriculture include Act 319, the Pennsylvania Farmland and Forest Land Assessment Act of 1974, commonly known as the Clean and Green Program. The purpose of this Act is to provide owners of agricultural or forest land a tax incentive to maintain their property solely devoted to agricultural or forest uses. This incentive is a tax benefit that taxes the land on the basis of its use value rather than its market value. This results in a lower tax rate for those owners who participate in the program. To be eligible to participate in the Clean and Green program, agricultural property must be ten acres or more

of contiguous farmland, which has been farmed in the preceding three years. Farms of less than ten acres of contiguous land may also participate if they can show evidence of \$2,000 gross income for each of the three preceding years. Forested property is eligible to participate in the Clean and Green program if it is ten or more contiguous acres capable of producing in excess of 25 cubic feet per acre of annual growth.

There are currently 229 properties in East Cocalico Township enrolled in the Clean and Green Program. This represents a majority of the farms in the Township and approximately 50% of the total acreage of the Township. Figure 1-2 shows program participant properties.

There are currently not any properties in the Township designated as Pennsylvania Agricultural Security Areas (ASA), but approximately 521 acres of farmland are planned to become ASA properties in the future. ASA promotes farming operations and offers several benefits to farms. Four farms within the Township have been purchased through the Pennsylvania Agricultural Easement Purchase Program (APB), which insures the land will remain in agricultural use through a State conservation easement. Three of the four APB properties are also in the Clean and Green Program. In addition, one property is part of the Lancaster Farmland Trust (LFT), which is a private, nonprofit agency promoting farmland preservation. The LFT property in the Township is also a Clean and Green property.

2. Conservation Zone (C) - This Zone is designed to preserve and protect the Township's sensitive environmental features. Some of the permitted uses are agriculture/ horticulture/ forestry (excluding intensive livestock and produce operations), aquaculture and fisheries, fire observation towers, municipal services/public utilities structures, natural areas/wildlife refuges, parks/playgrounds, and single-family detached dwellings. For each tract of contiguous land in single ownership, one lot may be utilized or subdivided for a single family detached dwelling for every three acres of the parent tract or fraction thereof. Properly sited and permitted OLDS are permitted in this Zone.

3. Rural Residential Zone (R) - This Zone is designed to provide for the continuation of sparsely-developed areas in the Township. Agriculture (excluding commercial operations), cemeteries, horticulture, forestry, municipal services/public utilities structures, parks/playgrounds, and single family detached dwellings are permitted uses in this Zone. For single family detached dwellings, the minimum lot size is one acre. Properly sited and permitted OLDS are permitted in this Zone.

4. Suburban Residential Zone (R-1) - This Zone is designed to accommodate suburban detached residential growth within the Township. The permitted uses include agriculture (excluding commercial operations), cemeteries, forestry uses, municipal services and/or public utilities structures, parks and playgrounds, public schools, single family detached dwellings, and Village Overlay Zone developments. The minimum lot sizes for detached dwellings and other principle detached buildings are as follows:

- |                                  |                |
|----------------------------------|----------------|
| a. public water and public sewer | 10,000 sq. ft. |
| b. public water and on-lot sewer | 32,000 sq. ft. |

- |                                  |                |
|----------------------------------|----------------|
| c. on-lot water and public sewer | 20,000 sq. ft. |
| d. on-lot water and on-lot sewer | 43,560 sq. ft. |

5. High Density Residential Zone (R-2) - This Zone was developed to accommodate the high-density housing needs of the Township. The permitted uses include cemeteries, duplexes, forestry uses, multiple-family dwellings, municipal services and/or public utilities structures, parks/playgrounds, single family detached dwellings, and Village Overlay Zone developments. Public sewer and water facilities are required and can be made available for all properties in this Zone. The minimum lot sizes are as follows:

- |                           |                    |
|---------------------------|--------------------|
| a. single family dwelling | 10,000 sq. ft.     |
| b. duplex                 | 5,000 sq. ft./unit |
| c. townhouse              | 2,400 sq.ft./unit  |
| d. multi-family           | 87,120 sq.ft.      |
| e. other uses             | 10,000 sq.ft.      |

6. Traditional Residential Zone (R-3) - This Zone promotes the tightly knit character of the villages of Reamstown, Stevens, and Reinholds. The permitted uses include churches, duplexes, forestry uses, multiple-family dwellings, municipal services and/or public utilities structures, parks/playgrounds, single family detached dwellings, and Village Overlay Zone developments. Public sewer and water facilities are required and can be made available for all properties in this Zone. The minimum lot sizes are as follows:

- |                           |                    |
|---------------------------|--------------------|
| a. single family dwelling | 7,500 sq. ft.      |
| b. duplex                 | 4,500 sq. ft./unit |
| c. multi-family           | 5,000 sq.ft./unit  |
| d. other principal uses   | 5,000 sq.ft./unit  |

7. Mobile Home Park Residential Zone (MHP) - This Zone acknowledges the various mobile home park sites within the Township, and protects their continued existence. The permitted uses in this Zone include agricultural, horticultural, and forestry uses (excluding commercial livestock operations), existing mobile home parks, municipal services/public utilities structures, parks and playgrounds, and single-family detached dwellings. All mobile home parks must be served by community or public sewer and water. The minimum lot area for each mobile home shall be 6,000 sq. ft.

8. Village Overlay Zone (VO) - This overlay zone may be applied in the R-1, R-2, and R-3 Zones in order to impose regulations that seek to achieve a village-type setting. The overlay zone allows for increased density in exchange for meeting specific community guidelines. This zone allows for a density of up to eight dwellings per acre. Public sewer and water

shall be used throughout developments in the Village Overlay. The requirements of the Village Overlay Zone supersede the requirements of the R-1, R-2, or R-3 designation of that particular parcel.

9. Mixed Residential Zone (MR) - This Zone was specifically designed to continue a previously approved mixed residential use development under the former Zoning Ordinance. The permitted uses in this Zone include single-family detached dwellings, forestry uses, municipal services/public utilities structures, and parks and playgrounds. The minimum lot area was 15, 000 sq. ft. for a single-family detached dwelling.

10. General Commercial Zone (C-1) - This Zone provides suitable locations for highway-oriented retail, service and entertainment businesses. A few examples of permitted uses in this zone include automobile sales, hotels, offices, and restaurants. The minimum lot area varies depending on the sewer and water service provided, as shown below:

a. public water and public sewer	20,000 sq. ft.
b. public water and on-lot sewer	32,670 sq. ft.
c. on-lot water and public sewer	20,000 sq. ft.
d. on-lot water and on-lot sewer	43,560 sq. ft.

11. Planned Commercial Zone (C-2) - This Zone provides suitable locations for businesses that rely on a regional market area for customers. A few examples of permitted uses include banks, offices, retail stores, and restaurants. The minimum lot area shall be 5 acres, however, this can include several businesses that are developed in a coordinated fashion.

12. Light Industrial Zone (I-1) - This Zone accommodates a variety of light industrial practices, including health and recreation clubs, laboratories, manufacturing facilities, and warehouses. The minimum lot area is 1 acre.

13. Heavy Industrial Zone (I-2) - This Zone reserves locations for large-scale and heavy industries that have existed within the Township for some time. All of the uses in this zone are listed as special exception uses in order to provide for adequate input from the community. The minimum lot area is 5 acres.

14. Quarry Zone (Q) - This Zone reserves appropriate areas of the Township for quarrying and processing of quarry raw materials.

15. Floodplain Zone (F) - This Zone includes the areas of the Township that are subject to periodic inundation by floodwaters. The Zone strictly limits building within the floodplain in order to minimize damage and prevent flooding hazards. Sanitary sewer lines and wastewater treatment plants are permitted in this zone by special exception. The Ordinance states the following regarding sanitary sewer facilities and systems: All new or replacement water and sanitary sewer facilities and systems shall be located, designed and constructed to minimize or eliminate flood damages and the infiltration of flood water. Sanitary sewer

facilities and systems shall be designed to prevent the discharge of untreated sewage into flood waters. No part of any on-site sewage system shall be located within any identified floodplain area except in strict compliance with all State and local regulations for such systems. If any such system is permitted, it shall be located so as to avoid impairment to it, or contamination from it, during a flood.

16. Wellhead Protection Overlay Zone (WP) - This Overlay Zone was developed to safeguard the public health, safety and welfare, by providing regulation of land use and the manufacture, use, storage, transport, or disposal of hazardous substances which pose a threat to the quality and quantity of groundwater being extracted from the Authority's municipal wells.

17. Historic Overlay Zone (H) - The purpose of this Overlay Zone is to provide a means for the protection of inventoried historic sites from immediate demolition.

18. Riparian Buffer Overlay Zone (RB) - This Overlay Zone is to provide a means for the protection of valuable surface watercourses that are located within the Township and contribute to its environmental health and bio-diversity, recreation amenity and economic prosperity.

Section 317: Zoning Requirements for Use of On-Lot Sewage Disposal Systems states that the maximum lot area requirements may be exceeded in certain cases if deemed necessary by PADEP. During the sewer module review process, PADEP may determine that a larger lot is necessary to ensure an acceptable level of nitrate-nitrogen in the adjoining groundwaters. This section of the Ordinance also states that all on-lot sewers must comply with Township Ordinances No. 99-2 and 92-5 (which have been replaced by No. 2003-02) and PADEP Title 25 Chapters 71, 72, and 73.

### **1.3.3 Subdivision and Land Development Ordinances**

The East Cocalico Township Official Subdivision & Land Development Ordinance of 2003 outlines the procedures and regulations for development in the Township. Section 520 addresses sanitary sewage disposal. It states that where OLDS are to be used the lot must be of a size/ shape that is able to accommodate the necessary subsurface sewage disposal system and a replacement system at a safe distance from the building and water supply in accordance with the Pennsylvania Sewage Facilities Act, Act 537 of 1966, as amended. When a Sewage Facilities Plan Revision or Supplement is required by Act 537, approval of such must be submitted with the Final Plan Application for the development.

### **1.3.4 Subdivision and Land Development Activity**

Subdivision activity within the Township has been steady since the previous Act 537 Plan Updates. There have been several medium to large scale developments that have been built, all of which have involved sanitary sewer extensions. Due to a restricted amount of public water available for the last few years, development has been limited and many developers have divided the projects into several phases. One or more phases of the Carriage Hill, Heatherwoods, Morganshire, Old Homestead, Quail Hollow, and Rose Hill developments have been constructed. Several industrial facilities have also connected to the Authority's

system over the last few years, including ACME and Four Seasons. Once additional water capacity is available, the Township is anticipating a large increase in development in the area. A significant increase in public water availability is anticipated to occur in 2007 after the development of additional water supplies. Nearly all of the anticipated projects will involve sanitary sewer extensions.

## **Section 2**

# **Physical and Demographic Analysis**

### **2.1 Planning Area Description**

East Cocalico Township is located in northeastern Lancaster County. The Township consists of 20.4 square miles or 13,056 acres of land area.

The Township Zoning Map presented in Figure 1-1 shows the municipal boundaries. East Cocalico Township is bounded by Spring Township, Berks County to the northeast, Brecknock Township and Adamstown Borough to the east, Earl Township to the southeast, Ephrata Township to the southwest and West Cocalico Township and Denver Borough to the northwest. The Township is intersected by the traffic corridors of U.S. Route 222, the Pennsylvania Turnpike, PA Route 272, and PA Route 897.

The Township lies within the Conestoga River Watershed (Watershed J), which is located in the Lower Susquehanna Subbasin (Subbasin Number 7) of the Susquehanna River Basin.

The entire Township is the subject of this Plan, with the planning boundaries being the political boundaries of the Township. A base map showing parcels, hydrology, road names, the planning area boundary and urban growth boundaries is presented in Figure 2-1.

### **2.2 Physical Characteristics**

Physical characteristics used to describe the Township include topography, floodplains and wetlands, soil types, the underlying geological formations and agricultural areas. Each characteristic contributes to the overall physical description of East Cocalico Township and the ability of the area to sustain viable OLDS.

There are many environmental limitations for OLDS, resulting in many areas within the Township that have some restrictions for OLDS. Moderate and severe restrictions include areas with excessive slopes, slow percolation rates, depth to rock (shallow soils), poor filter, wetlands or floodplains.

Ultimately, individual site investigations by the Township's Sewage Enforcement Officer (SEO) will determine the suitability of any specific location for on-site wastewater disposal. Therefore, the information on OLDS limitations presented in this section of the Plan should not be used for specific site identification, but rather as the probability of any particular location being suitable for on-site wastewater disposal. Also, site characteristics need to be considered in addition to the physical characteristics mentioned above, such as property rights-of-way and lot sizes to determine whether a specific site is suitable for on-site wastewater disposal and water supply.

#### **2.2.1 Topography, Floodplains and Wetlands**

Figure 2-2 presents the topography and the locations of the floodplains and wetlands in East Cocalico Township.

Floodplains in East Cocalico Township are along Cocalico Creek and Stony Run. The Cocalico Creek flows north to south in the western portion of the Township. Its floodplain averages between widths of 130 and 530 feet. Stony Run flows north to south, draining into the Cocalico Creek in the southwestern part of the Township. The Stony Run floodplain has average widths between 40 and 220 feet.

There are numerous small creeks, ponds, and wetlands from underground springs scattered throughout the Township. These are also subject to flooding as a result of excessive rain events.

### 2.2.2 Soils

The soils of East Cocalico Township are divided into two major soil units based upon specific characteristics and land use restrictions. These two major soil units are Duffield-Hagerstown and Ungers-Bucks-Lansdale with their associated minor soil series. Other minor soil types also exist in East Cocalico Township. The following soil descriptions refer to the major soil series existing within the Township. Several minor soil series may exist within the major soil series and are briefly described. Since soil characteristics often vary from site to site and within one soil type, an on-site investigation must be conducted to determine whether a site will function properly for the intended purposes.

Table 2-1, located in Appendix A, is intended to compare general soil characteristics and suitability as well as potential advantages and disadvantages for selection of on-site disposal areas within East Cocalico Township. The column labeled OLDS Suitability categorizes the soils into one of the following three categories:

**Suitable for Subsurface Systems:** soils which are considered generally suitable for subsurface systems possess a typical depth to limiting zone of 60 inches or more and a slope of 0 to 25 percent.

**Suitable for Elevated Sand Mound Systems:** elevated sand mound systems are typically required in soils with a depth to limiting zone between 20 and 60 inches and a slope of less than twelve percent.

**Unsuitable:** soils which are generally unsuitable for an olds system possess slopes in excess of 25 percent, soils with a shallow limiting zone (less than 20 inches), soils with a depth to limiting zone between 20 and 60 inches combined with slopes in excess of 12 percent, hydric soils, and soils classified as "quarry", "pits", "urban", and "water".

Referring to Table 2-1, it is also important to consider other soil characteristics listed under Limitations to OLDS.

Figure 2-3 presents the soil types in East Cocalcio Township. Descriptions for the soil units depicted in Figure 2-3 and listed below are referenced from the United States Department of Agriculture Soil Conservation Service's Soil Survey of Lancaster County (1985).

*Soil Type I: Duffield-Hagerstown (DbA, DbB, HaB, HbC, HbD, Hc, CkA, Ln)*

Soil Type I occurs in the southwestern portion of the Township. These soils are generally deep, nearly level to moderately steep, and well drained. The landscape consists of nearly level to rolling hills in limestone valleys dissected by drainage ways. The unit is about 42 percent Duffield soils, 40 percent Hagerstown soils, and 18 percent minor type soils.

The Duffield soils have brownish, moderately fine textured subsoil. The soils are nearly level and gently sloping. The Duffield soils are located on broad convex slopes and are deep and well drained. They have high water capacity, moderate permeability, medium runoff, and are medium acidic to neutral. Most areas of the soil are used for cultivated crops or are in non-farm uses. Some small areas are in pasture or woodland. Limitations of this soil type for OLDS are a shallow depth to bedrock and a potential for groundwater contamination due to solution features and cavernous bedrock.

The Hagerstown soils have reddish, moderately fine textured and fine textured subsoil. The soils mainly are nearly level to sloping, but some areas are moderately steep or steep. The Hagerstown soils are found on low hills and in valleys and are generally well drained. They have high available water capacity, moderate permeability, medium to rapid surface runoff, and are neutral to very strongly acidic. Most areas of this soil are farmed or in non-farm uses, but a few small areas are pasture or woodland. Limitations of this soil type for OLDS are sinkholes and the potential for groundwater contamination due to solution features and cavernous bedrock, as well as slope, permeability, and shrink-swell potential.

The minor soils included in this soil type found in East Cocalico Township are the Clarksburg and Linden. Clarksburg is in depressions and broad drainage ways, but with low permeability and seasonal high water table this soil is limited for septic tank absorption fields. Lindsides is located in floodplains, and flooding and seasonal high water table are the main limitations for OLDS.

*Soil Type II: Ungers-Bucks-Lansdale (BuA, BuB, BuC, BuD, BxC, LaB, UaB, UaC, UaD, UbB, UbD, UbE, AbB, AsB, Bo, BrC, BsC, Hg, RaB, RbB, Rd)*

Soil Type II covers the majority of East Cocalico Township. These soils are generally nearly level to very steep, well drained soils on ridges, side slopes, and foot slopes formed in residuum from Triassic siltstone, conglomerate, shale, and sandstone. The landscape consists of dissected rolling hills and moderately wide foot slopes. This unit is about 34 percent Ungers, 19 percent Bucks, 13 percent Lansdale, and 34 percent minor soils.

The Ungers soils have red, medium textured and moderately fine textured subsoil and are more than 5 percent rock fragments in the surface layer and upper part of the subsoil. The soils are sloping and moderately steep, but some areas are gently sloping, steep, or very steep. The soils are deep, with moderate permeability, medium to very rapid runoff, high water capacity, and are neutral to extremely acidic. Most areas with low slope are farmed, while areas with greater slope and/or stone content are typically wooded. Limitations for OLDS include slope, depth to rock, and stones on the surface.

The Bucks soils have red, medium textured and moderately fine textured subsoil and are less than 5 percent rock fragments in the surface layer and upper part of the subsoil. The soils mainly are gently sloping and sloping, but some areas are nearly level or moderately steep. The soils are deep, well drained, and very strongly acidic to neutral with medium to rapid runoff, high water capacity, and moderate or moderately slow permeability. Most areas are used for cultivated crops and a few areas for home sites, pasture, or woodland, with the exception of Bucks very stony silt loam which is typically wooded. Limitations to OLDS include permeability of soil, depth to bedrock, and slope.

The Lansdale soils have brown, moderately coarse textured and moderately fine textured subsoil. The soils are gently sloping and sloping, but some areas are moderately steep. The soils are deep, well drained, and very strongly acidic to neutral with medium to rapid runoff, moderate to high water capacity, and moderate or moderately rapid permeability. Most areas are farmed, with a few small areas wooded or non-farm areas. Limitations to OLDS include depth to bedrock, permeability of the soil, and slope.

The minor soils present in East Cocalico are the Abottstown, Bowmansville, Brecknock, Holly, Readington, and Rowland. Abottstown soils are somewhat poorly drained and located in depressions and drainage ways and are limited for OLDS due to slow permeability and a seasonal high water table. Bowmansville soils are poorly to somewhat poorly drained and located on floodplains of larger streams, and are limited for OLDS due to flooding, moderately slow permeability, and a seasonal high water table. Brecknock soils are deep, well drained, and located on upland side slopes and ridges but are limited for OLDS due to permeability, slope, and depth to bedrock. Holly silt loam is located on flood plains and is poorly drained, which limits the suitability of OLDS. Readington soils are gently sloping, deep, and moderately well drained located on lower slopes and in upper drainage ways on uplands. Limitations for OLDS in Readington include permeability and seasonal high water table. Rowland silt loam is deep and moderately well drained to somewhat poorly drained located in flood plains, and flooding, seasonal high water table, and permeability limit suitability for OLDS.

#### *Minor Soil Types::*

Other minor soil types also located in the Township include Elk (EcA, EcB), Linden (Lg), and Udorthents loamy (Ud).

Elk soil is found on stream terraces. This soil is nearly sloping and gently sloping, deep, and well drained. The permeability of Elk soil is moderate and the available water capacity is high. Runoff is medium. The soil is suitable for farming, pastures and trees. Limitations of this soil type for OLDS include high water capacity and permeability that increases the potential for groundwater contamination due to solution features and cavernous carbonate bedrock.

Linden silt loam is nearly level, deep, well drained and located on floodplains of larger streams. The permeability is moderately rapid to rapid, water capacity is high, and runoff is slow. Most areas are farmed with a few areas that are wooded or in non-farm uses. Flooding is the primary limitation for OLDS.

Udorthents soils are highly variable and unable to be classified as the other soil series are. In general the soils are well drained and located on uplands with depths ranging from shallow to deep.

Limitations associated with these soil types described above pertain to OLDS, such as septic tank absorption fields. These systems rely on soils to distribute and filter sewage effluent safely and efficiently. Limitations occurring due to soil conditions can affect the suitability for the design purposes and result in reduced efficiency, health problems, or groundwater contamination. Factors which can be considered unsuitable for OLDS include excessive slopes, impermeable soils, shallow depth to bedrock, sinkholes, or high groundwater levels. Soils possessing unfavorable characteristics for OLDS require additional planning and/or design to overcome these limitations.

### **2.2.3 Geology**

East Cocalico Township is located in the northern region of Lancaster County. Lancaster County is underlain by three distinct geologic sections, two of which are found in East Cocalico Township. The Triassic Lowlands section covers most of the Township, while the Conestoga Valley section occupies only the western to southwestern corner of the Township. The Triassic Lowlands section is comprised of conglomerate, sandstone, shale, and diabase. The geologic formations included in the Triassic Lowlands section are Diabase (Trd), Hammer Creek (Trh), Hammer Creek Conglomerate (Trhc), and New Oxford (Trn). The Conestoga Valley section is composed of primarily carbonate rocks with some shales. The Antietam-Harpers (Cah), Buffalo Spring (Cbs), Millbach (Cm), Richland (Cr), Snitz Creek (Csc), Cocalico (Oco), Epler (Oe), and Stonehenge (Os) formations make up the Conestoga Valley section in East Cocalico.

The rocks of the Conestoga Valley section are significantly faulted and folded from recurring stress, while the Triassic Lowlands rocks are much less deformed. The carbonate composition of Conestoga Valley section makes this area more prone to groundwater contamination due to the dissolution of the rock in slightly acidic water. Water is able to migrate through the interstitial pore spaces and voids, which results in greater dissolution and erosion creating larger voids. The features found mainly in limestones, such as large interconnected channels and voids within the rock unit, also increase the potential for contamination by allowing surface water to enter the water table with little or no renovation. Renovation is generally accomplished by the absorption, filtration, and the slower migration rate provided by the soil and less permeable rock. Additional hazards that exist in carbonate regions are sinkholes and subsidence. Unremediated sinkholes can potentially become larger, resulting in structural damage or collapse, groundwater degradation, and personal injury. Areas underlain by carbonate rocks require additional site characterization, ideally in the planning stages, to assure that such potential hazards are identified and managed properly.

The geological formations underlying the Township are delineated on Figure 2-4 based on the PADEP Atlas of Preliminary Quadrangle Maps of Pennsylvania. A description of the geological and engineering characteristics of each formation follows:

*Cali - Antietam-Harpers*

The Antietam-Harpers Formation is an isolated section in the southern portion of the Township and consists of two formations, each of which will be outlined here.

The Antietam formation consists of light-gray fine-grained buff-weathering quartzite and quartz schist with some ferruginous quartzite, finely laminated, siliceous limestone with interbeds of dolomite. The maximum thickness is about 300 feet, and the overlying mantle is thin. The formation is highly resistant to weathering, being slightly to moderately weathered to a shallow depth. Natural slopes are steep and stable. Joint and cleavage planes display a blocky pattern; they are moderately developed and moderately abundant. Fractures are steeply dipping and widely open, but spaced fairly regularly with large spaces in between. The beds for this formation are thick and moderately well to well developed.

The Harpers formation is composed of gray, coarse-grained phyllite and albite-mica schist and abundant quartz. The maximum thickness is about 1300 feet with a thin overlying mantle. Harpers formation is moderately resistant to weathering with complete breakup of rock in many places that are highly and deeply weathered. Natural slopes are moderately steep and stable. Fractures are moderately developed and highly abundant with close spacing and an irregular distribution. Fractures are open and steeply dipping to moderately dipping. The beds are fissile and moderately well developed.

*Chs - Buffalo Springs Formation*

The Buffalo Springs Formation occurs in a northeast to southwest trending band in the southwestern portion of the Township in the Conestoga Valley Section. The formation consists of a light-gray to pinkish-gray, fine to coarsely-crystalline limestone with interbedded dolomite and shaley laminae. This formation is over 700 feet thick.

Bedrock-mantle interface is characterized by pinnacles and little surface drainage. The bedrock is moderately resistant to weathering, and is moderately weathered to a shallow depth. Natural slopes are gentle and stable. Sinkhole development is characteristic of the Buffalo Springs Formation.

Joints are moderately abundant and irregular with moderate distance between fractures, and are steeply dipping. Bedding in the Buffalo Springs Formation is well-bedded, and massive to flaggy.

*Cm - Millbach*

The Millbach formation is located in the western portion of the Township, covering the largest portion of the Conestoga Valley Section in the Township. This formation consists of pinkish-gray and medium gray, laminated limestone with interbeds of light- to medium-gray dolomite. The maximum thickness is approximately 1500 feet. The bedrock-mantle interface is characterized by pinnacles, and the mantle thickness is variable. The rock is moderately resistant to weathering with slight weathering to a shallow depth resulting in irregularly shaped, large-sized blocks. Solution cavities are common with this type of rock.

Fractures are moderately abundant and well developed with a blocky pattern. Fractures are open and nearly vertical with even spacing and a moderate distance in between.

*Cr - Richland*

The Richland formation is located on the western-most tip of the Township covering a relatively small area in the Conestoga Valley Section. This formation consists of gray finely crystalline dolomite interbedded with medium-gray, oolitic limestone, chert, calcarenite, and conglomerate. It is approximately 1300 feet thick. The interface between bedrock and mantle is characterized by pinnacles. The rock is moderately resistant to weathering with slight weathering to a shallow depth. Decomposition results in medium-sized blocky fragments. The overlying mantle is thin in most places. Joints have a blocky pattern with regular spacing of a moderate distance in between. Joints are well developed, open and steeply dipping. Solution cavities are common with this type of rock.

*Csc - Snitz Creek*

The Snitz Creek formation is located in three sections on the western side of the Township in the Conestoga Valley Section. This formation is composed of gray, medium-to coarsely crystalline dolomite and oolitic with sandstone interbeds. The maximum thickness is approximately 500 feet. The bedrock-mantle interface is characterized by pinnacles. This formation is moderately resistant to weathering, resulting in slight to moderate weathering at a shallow depth. Irregularly shaped, medium sized blocks result from prolonged weathering. Joints are moderately developed, have a blocky pattern, and are moderately to highly abundant. Fractures are open and steeply dipping with regular spacing and a moderate distance in between. Solution cavities are common with this type of rock.

*Oco - Cocalico*

The Cocalico Formation is found as a small band in the central-western part of the Township in the Conestoga Valley Section. This formation is a gray shale that is highly phyllitic, with interbeds of red shale. In Pennsylvania, the Cocalico Formation ranges in thickness from 2,000 feet to 3,000 feet.

The bedrock surface is overlain by a thin mantle and the formation is slightly resistant to weathering, being moderate to highly weathered to a moderate to deep depth. Natural slopes are moderate and stable with good surface drainage.

Joints are well developed and moderately abundant with a blocky pattern. The fractures in the Cocalico Formation are open and vertical and evenly spaced with a moderate distance between fractures. This formation is well bedded and thick.

*Oe - Epler*

The Epler Formation lies in a large band in the central-western part of the Township in the Conestoga Valley Section. A second area of this formation is on the southern tip of the Township. This formation consists of a medium-gray, very finely crystalline limestone,

interbedded with gray dolomite and coarsely crystalline limestone lenses. This formation has reported thickness ranging from 650 to 1000 feet.

The pinnacled bedrock surface is overlain by a mantle of various thickness, reportedly up to 80 feet. Sinkhole development, including caverns, is characteristic of this formation. Surface drainage is good and natural slopes are gentle and stable. The formation is moderately resistant to weathering, being slightly weathered to shallow depths.

Joints are moderately abundant, ranging from well-to-poorly developed with a seamy pattern. Fractures are steeply dipping to vertical, open and moderately spaced. This formation is moderately well to well bedded, and thin to flaggy.

#### *Os - Stonlienge*

The Stonehenge Formation occurs in a small section on the western-most tip of the Township in the Conestoga Valley Section. The Stonehenge formation consists of gray, finely crystalline limestone and dark-gray, laminated limestone, with numerous flat-pebble breccia beds and shaley interbeds. It outcrops with a reported exposed thickness of 600 feet.

A highly variable mantle thickness, often reaching 80 feet, overlies a pinnacled bedrock surface. Sinkholes are a characteristic feature of this formation. The formation is moderately resistant to weathering, being slightly weathered to a moderate depth. Natural slopes are gentle and stable.

Joints are moderately abundant, occur in a seamy pattern, and range from well to poorly developed. Fractures are open and steeply dipping to vertical, with a moderate distance separating each fracture. The formation is moderately-well to well bedded, with beds being thin and flaggy.

#### *Trd - Diabase*

The Diabase formation is located in three distinct sections in the Township: one in the southern part of the Township and two in the central part of the Township, all of which are located in the Triassic Lowland Section. Diabase is typically present as dikes with thickness ranging from 5 to 100 feet and sheets which are much thicker. The rock is dark gray to black, dense, and very fine grained, and consists of 90 to 95 percent labradorite and augite. This formation is highly resistant to weathering with only slight weathering at shallow depth. Natural slopes are steep and stable. Fractures are well developed and moderately abundant with a blocky pattern. The fractures are open and steeply dipping with regular spacing and a moderate distance in between.

#### *Trh - Hammer Creek*

The Hammer Creek Formation is the predominate geology in East Cocalico, covering nearly all of the Triassic Lowland Section. This formation is reddish-brown, coarse-grained sandstone having interbeds of red shale and quartz-pebble conglomerate. The thickness of one section is 9,360 feet. This formation has thick to massive bedding with a moderately

thick overlying mantle. Hammer Creek is moderately resistant to weathering, but varies, depending on the predominate rock. Shales are highly weathered to a moderate depth. Sandstones weather less rapidly. Conglomerates weather least rapidly. Joints have blocky pattern and are moderately developed and moderately abundant. The fractures are open and steeply dipping and occur regularly with moderate spacing. Natural slopes are steep and stable.

*Tritc - Hammer Creek, Conglomerate*

The Hammer Creek Formation, Conglomerate is dispersed throughout the northern part of the Township, with concentrated bands in the central part of the Township. This formation consists of very coarse quartz conglomerate with abundant pebbles and cobbles of gray quartzite and minor interbeds of coarse red sandstone. The measured thickness is 2,580 feet. The bedding is thick to massive and the overlying mantle is thin. This formation is moderately resistant to weathering and disintegration ranges from large blocks to individual pebbles, cobbles, and sand grains. Joints are moderately developed and moderately abundant with a blocky pattern. The joints are open and steeply dipping with a moderate distance in between and regularly spaced.

*Trn - Diabase, New Oxford*

The New Oxford formation is located in three distinct sections of the Township: one on the southern tip, a second in the central portion, and a third on the western side. This formation consists of light-colored sandstone, arkosic sandstone, and conglomeratic sandstone including red to purplish-red sandstone, shale, and mudstone. The total thickness is approximately 4,000 feet and represents the upper half of the formation. This formation is well-bedded with thin to flaggy bedding. The overlying mantle is thin. This formation is only slightly resistant to weathering, and exposures are quickly weathered to a moderate depth, forming very small, pencil-like, platy fragments. This rock is highly fractured with joints having a seamy to platy pattern. The fractures are moderately developed with very close spacing.

## 2.2.4 Groundwater

Groundwater occurs in openings within the rock formation as a result of precipitation infiltrating the soil and collecting in these openings. These openings can range from small pores, such as the spaces between sand grains in sandstone, to large subsurface caverns. However, these openings usually occur as fractures, faults, and bedding features. The concentration and dimensions of these openings is typically high in carbonate rocks. For this reason, carbonate rocks have the potential to transmit and store large quantities of groundwater.

The same features that produce a good yielding aquifer, such as greater transmission capabilities of groundwater, also enhance the potential for groundwater degradation. In rocks with fewer and smaller openings, water is transmitted slowly. Should contamination occur, it would produce a generally localized contamination area. In areas where the rock has large interconnected voids or channels and faults, particularly if they extend close to the

surface, groundwater is transmitted rapidly. If contamination occurs, it will travel quickly and to greater distances.

Sinkholes, as discussed in the previous sections, are produced when dissolution of carbonate rocks occurs. This can create conduits that funnel surface water quickly to the groundwater. Thin soil mantles and rock outcrops can also act as direct conduits to the water table by allowing contaminants to rapidly pass downward.

Common sources of groundwater contamination include on-lot sewage failures, over-application of fertilizer and manure, chemical spills, dumps, and leaking underground storage facilities. To reduce degradation of the Township's groundwater resources and prevent unnecessary health risks, careful planning and thorough site investigations are essential.

Groundwater quality characterization, soil limitations, and solution-prone geology are among the many site features that must be identified when a development is proposed. This information should be used to determine the suitability of the project location, its relationship to sensitive hydrogeological areas, and the possibility that the project may contribute to or aggravate existing hydrogeological problems.

The geological formations presented in Figure 2-4 have been summarized on Table 2-2, reflecting the general water supply capabilities of each unit, and are intended to describe the aquifers in the Township for planning purposes. Actual yields will depend on several factors associated with the well placement and the drilling process, such as topographic control, fracture occurrence, well depth, and well drilling methods.

Table 2-2 also provides an overview of reported aquifer yields and selected water quality values to be used to evaluate general protection schemes, as well as determine future groundwater capacities. These can include identifying geologically sensitive or hazardous areas, groundwater and wellhead protection strategies, future planning capacity of the area, and general development projections.

**Table 2-2**

**Summary of Reported Aquifer Capacities and Selected Water Quality Results**

Formation Name	Median Yield (gpm)	Maximum Yield (gpm)	Quality	Comments
Antietam-Harpers	5-10	40-100	Soft to hard; low total dissolved solids	
Buffalo Springs	10	30	Very hard, high nitrate and total dissolved solids	
Millbach		30	Very hard, high nitrate and total dissolved solids	
Richland		30	Very hard, high nitrate and total dissolved solids	
Snitz Creek		30	Very hard, high nitrate and total dissolved solids	
Cocalico	20	100	Moderately hard	
Epler	30	600	Very hard, high nitrate	High yields possible
Stonehenge	30	600	Very hard, high nitrate	High yields possible
Diabase	10	15	Moderately hard to hard; poor quality	Small yields, strong seasonal influence
Hammer Creek	16	94	Soft to hard; good quality; high total dissolved solids	Yield varies: high for shale, low for sandstone
Hammer Creek Conglomerate	Too discontinuous & interbedded w/ coarse red sandstone to be evaluated as a separate aquifer			
Diabase	12	450	Soft to hard	

### **2.2.5 Agricultural Areas**

One of the primary reasons for identifying agricultural areas within the Township is to determine the amount and manner in which they will be impacted by any proposed alternatives identified and evaluated in the Act 537 Plan Update. There is presently no farmland in the Township in Pennsylvania Agricultural Security Areas (ASA). However, 521 acres are proposed for designation as Agricultural Security in the future.

Numerous properties are enrolled in the Clean and Green program and their locations were presented in Figure 1-2 as referred to in Section 1 of this Plan. Four farms within the Township have been purchased through the Pennsylvania Agricultural Easement Purchase Program (APB). In addition, one property is part of the Lancaster Farmland Trust (LFT). Farmland located in existing agricultural zoning or planned for agricultural uses is identified in the Agricultural Zoning areas of the Township Zoning Map presented in Figure 1-1 in Section 1 of this Plan.

## **Section 3**

# **Existing Sewerage Facilities and Identification of Existing Needs**

### **3.1 Introduction**

The East Cocalico Township Authority (ECTA) provides wastewater conveyance services to portions of East Cocalico Township. The Authority's facilities consist of gravity sewers ranging in size from 8 inches through 24 inches, force mains ranging in size from 4 inches through 12 inches, low pressure lines ranging in size from 2 to 2.5 inches, and four pumping stations with design pumping capacities up to 1200 gallons per minute (gpm).

Three of the pumping stations are currently owned by the Authority. These pumping stations are the Gehman School Road Pumping Station (PS #1), Stevens Pumping Station (PS #2), and the North Muddy Creek Road Pumping Station (PS #3). The ACME Building 264 Pumping Station (PS #4) is currently owned by Albertson's, Inc. but is being operated by the Authority. It is expected to be dedicated to the Authority sometime in 2007.

The wastewater from the Authority's service area is treated at two wastewater treatment facilities. One treatment facility is the Ephrata Wastewater Treatment Facility (WWTF) No. 2, and the second facility is the Adamstown Wastewater Treatment Plant (WWTP). The Adamstown WWTP receives flow from Pumping Station #4, the Rose Hill development and portions of the Adamstown basin under an agreement with the Authority that conveyance will not exceed 100,000 gallons per day (gpd). The Ephrata WWTF No. 2 receives flow from Pumping Stations #1, 2, 3 and all other gravity flow lines in the Authority's service area.

East Cocalico Township also permits OLDS for sewage treatment. The following sections present information about these existing facilities.

### **3.2 Public and Private Sewer Systems**

Figure 3-1 presents a sewer index map of the pumping stations, force mains and gravity sewer lines throughout the Township, as well as the wastewater treatment plants in neighboring municipalities where the Township's sewage is conveyed. Figure 3-1 also shows the planned sewer extensions that were established from previous Act 537 planning efforts and summarized in Section 1 of this Plan. To show the Lakeside Extension, a portion of a future development's sewer is also presented on Figure 3-1. Additionally, the portion of West Cocalico Township Authority sewer located in East Cocalico Township is shown.

### **3.2.1 Wastewater Treatment Plants**

#### *Ephrata Wastewater Treatment Facility No. 2*

Approximately 97 percent of the Township's sewage that is conveyed via public sewer is treated at the Ephrata Wastewater Treatment Facility No. 2. The facility was constructed in 1997, primarily to handle flows from East Cocalico Township and Denver Borough, as well as parts of Ephrata Borough and Ephrata Township. Those four municipalities make up the Intermunicipal Group (IMG) and jointly own the facility. The facility contains a three-stage anaerobic selector and BioDenipho mode phased oxidation ditches, two final clarifiers, two chlorine contact tanks, and a dechlorination system. The treated effluent is discharged to the Cocalico Creek. The treatment process is depicted in Figure 3-2.

The annual average daily design flow for WWTF No. 2 is 2.3 million gallons per day (MGD) with a maximum monthly design flow of 3.5 MGD. The total capacity allocated for East Cocalico at WWTF No. 2 was 1.68 MGD in the 1995 Ephrata Area Act 537 Plan. However, in accordance with the current IMG Sewage Service Agreement there are no set allocations for each municipality. The average daily flow to the facility in 2006 was 1.17 MGD, with 0.683 MGD contributed from East Cocalico Township. The sludge handling processes are described in Section 3.5 of this Plan.

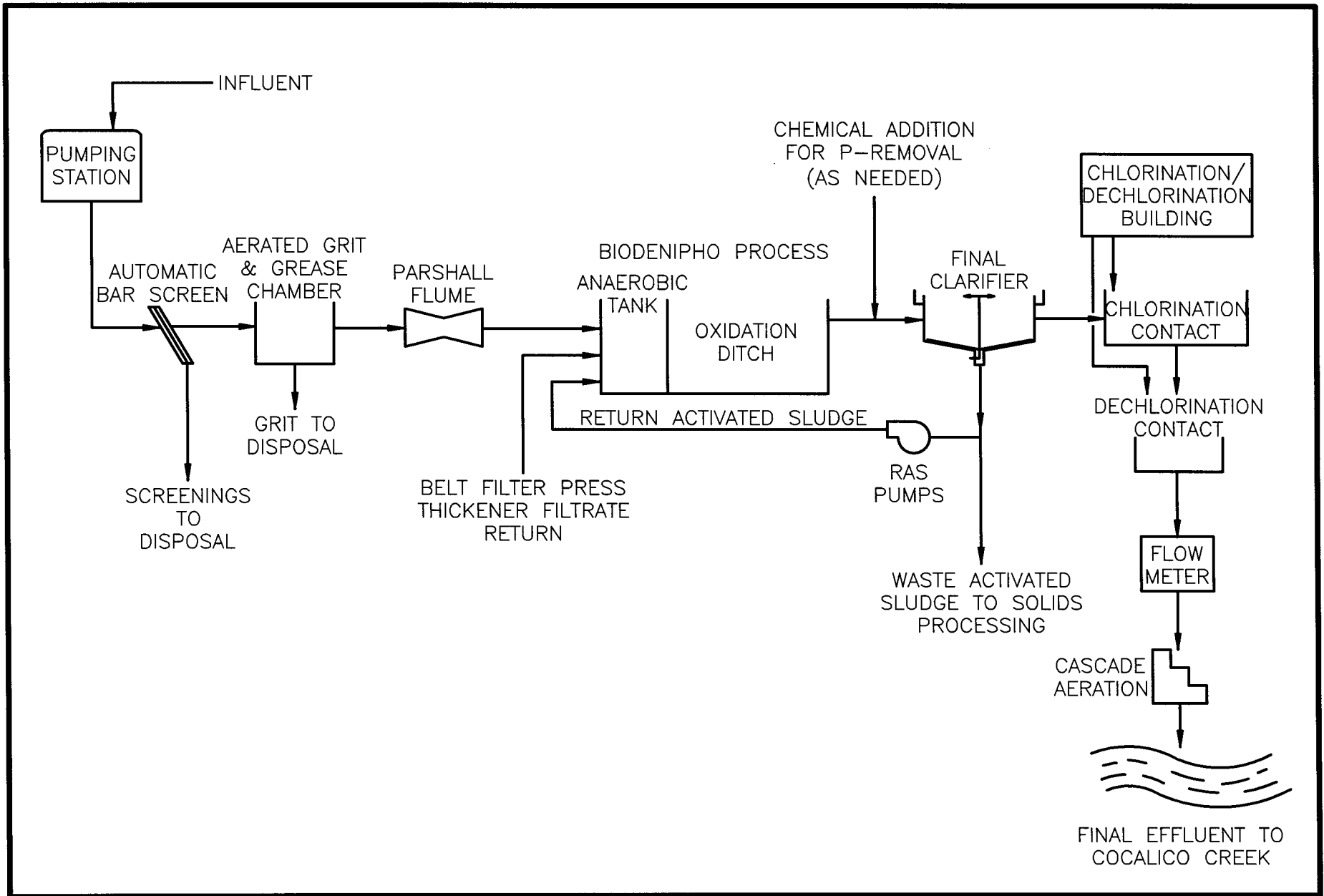
#### *Adamstown Wastewater Treatment Plant*

Approximately three percent of the Township's sewage that is conveyed via public sewer is treated at the Adamstown WWTP. The treatment processes at the plant include coarse screening and grinding, oxidation ditches or extended aeration, final clarification, and ultraviolet disinfection. The treated effluent is discharged to the Little Muddy Creek. The treatment process is depicted in Figure 3-3.

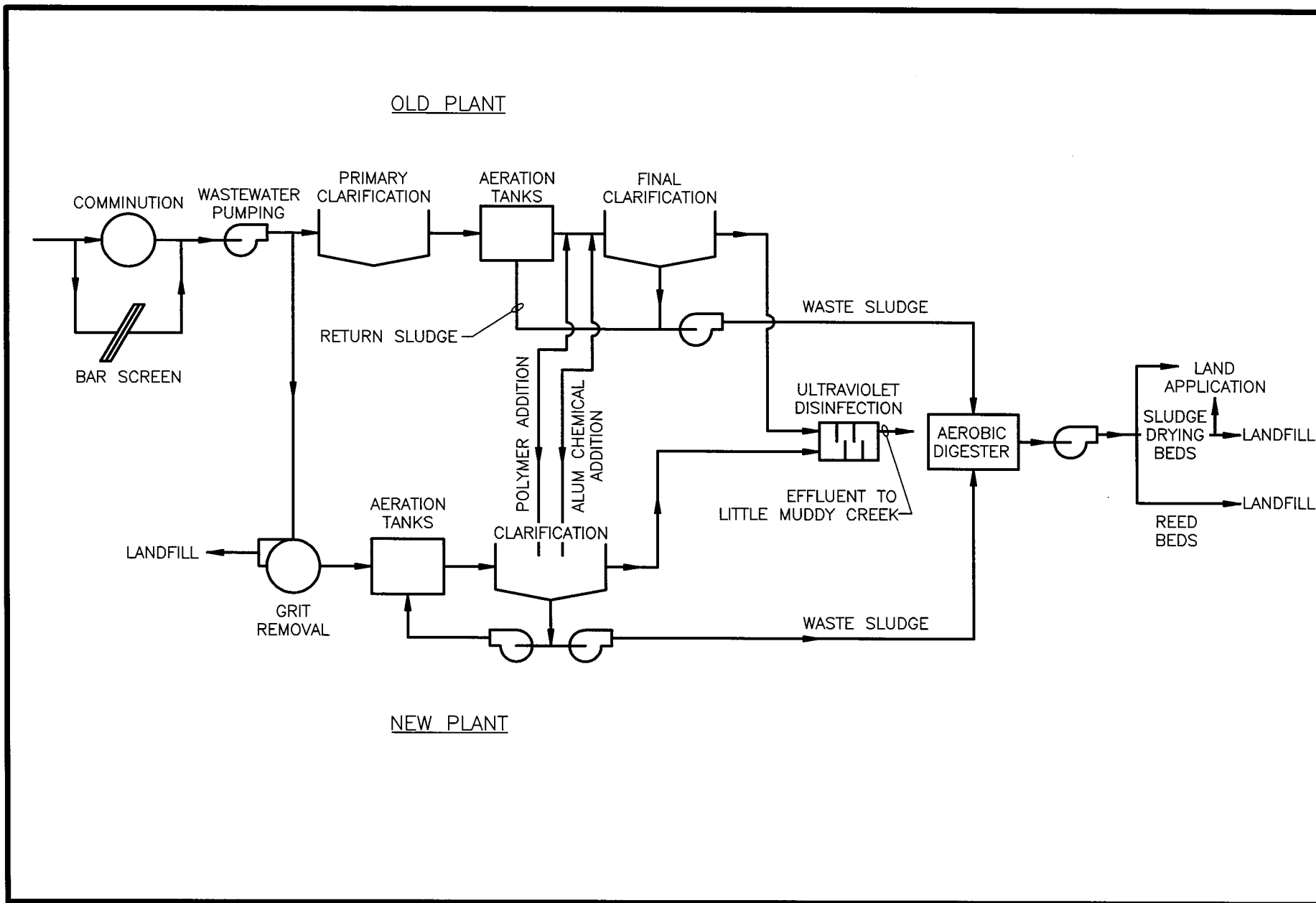
The average daily design flow is 0.6 MGD with a peak hour design flow of 1.6 MGD. The total capacity allocated to East Cocalico is 0.1 MGD. The average daily flow to the plant in 2006 was 0.365 MGD, with 0.048 MGD contributed from East Cocalico Township. The target flowrate for ECTA is 0.076 MGD to maximize utilization of the allotted capacity while remaining within the loading limits of the Adamstown Agreement. The sludge handling processes are described in Section 3.5 of this plan.

#### *West Cocalico Wastewater Treatment Plant*

West Cocalico Township Authority provides sewage treatment services to a small number of properties located in East Cocalico Township. Collection and conveyance are provided through West Cocalico Township Authority's sewer lines. Treatment is provided at the West Cocalico Township Authority's Wastewater Treatment Plant. This extended aeration plant has a capacity of 0.15 MGD and discharges to the Little Cocalico Creek.



East Cocalico Township Act 537 Plan Update  
 Ephrata Regional Wastewater Treatment Facility No. 2  
 Liquid Processing Facility Schematic  
 Figure 3-2



East Cocalico Township Act 537 Plan Update  
Adamstown Wastewater Treatment Plant  
Facility Schematic  
Figure 3-3

### *Locustwood Mobile Home Park*

The privately owned Locustwood Mobile Home Park, which is located in the northernmost part of the Township, has a 10,000 gallon per day (gpd) extended aeration package treatment plant, with an average daily flow of approximately 5,000 gpd. The effluent is discharged to the Little Cocalico Creek.

Table 3-1 presents a summary of the effluent limitations for the plants providing treatment of sewage flows from properties in East Cocalico Township.

There are no small-flow treatment facilities, i.e. single family residence treatment facilities that have been identified in the Township.

## **3.2.2 Collection and Conveyance Systems**

Pumping stations are required where local topography will not permit sewage conveyance by gravity from the collection system to the wastewater treatment plant. Following is a brief description of the pumping stations, gravity sewer lines, and force mains located in East Cocalico Township.

### *Gellman School Road Pumping Station (PS #1)*

This station was constructed in 2002 to replace the previous two pumping stations at the site (PS #1-A and PS #1-E). The station is located along Gehman's School Road on the eastern side of the Township. Flow is pumped through a 12-inch force main and discharges into the Authority's manhole #330 in Muddy Creek Church Road. The design capacity of this station is 1.82 MGD. The average daily flow at this station for 2006 was 0.090 MGD and the maximum monthly average daily flow was 0.126 MGD. The annual inspection of this facility, performed in January 2006, indicated that the station is in excellent condition and operating satisfactorily. The design capacity of the station was based on a 20-year flow projection in the UGA serving the pumping station. The station will have sufficient capacity for the next 15 to 20 years, unless there is a significant change in zoning and proposed development for the area, in which case it would be the responsibility of the developer(s) to fund any necessary improvements to the station.

### *Stevens Pumping Station (PS #2)*

This station was constructed in 1981. The station is located along South Line Road on the western side of the Township, near the intersection of Wabash Road. The station pumps flow through a 4-inch force main to the Authority's manhole #833 in Wabash Road. All flow from this station is directed to the Ephrata WWTF No. 2. The design capacity of this station is 0.288 MGD. The 2006 average daily flow at this station was 0.027 MGD and the maximum monthly average daily flow was 0.034 MGD. The annual inspection of this facility, performed in January 2006, indicated that the station is in good condition and operating satisfactorily.

There are several proposed developments in the Stevens Pumping Station drainage basin. One of the projects is the ECTA Well F Water Treatment Facility, which will discharge an

**Table 3-1****Summary of the Effluent Limitations for Treatment Plants in East Cocalico Township**

<b>Permit Parameter</b>	<b>Permit Limit</b>		
	Ephrata WWTF No. 2	Adamstown WWTP	Locustwood Treatment Plant
Design Flow (MGD)	2.3	0.6	0.01
CBOD5 (mg/L)	25	25	25
Total Suspended Solids (mg/L)	30	30	30
Minimum Dissolved Oxygen (mg/L)	5	5	5
pH	6-9	6-9	6-9
Total Phosphorous (mg/L)	2	2	2
Fecal - Oct-Apr/May-Sept (#1100mL)	200/6100	200/2000	200/2700
Ammonia-Nitrogen - May-Oct/Nov-Apr (mg/L)	4/12	3/9	20
Total Dissolved Solids	1200		
Total Residual Chlorine	0.48		

average daily flow of 0.098 MGD. Once the Water Treatment Facility is online the Stevens Pumping Station will not have sufficient capacity to accommodate the other proposed developments. The Stevens Pumping Station, its surrounding gravity collection system, and downstream receiving lines are evaluated in Sections 5 and 6 of this Plan Update.

#### *North Muddy Creek Road Pumping Station (PS #3)*

The North Muddy Creek Road Pumping Station (previously referred to as the Old Homestead Pumping Station) is located along North Muddy Creek Road in the Old Homestead development. The station pumps flow through a 6-inch force main to the Authority's manhole #327-1 in North Reading Road. All flow from this station is directed to the Ephrata WWTF No. 2. The design capacity of this station is 0.288 MGD. The 2006 average daily flow at this station was 0.022 MGD and the maximum monthly average daily flow was 0.026 MGD. The annual inspection of this facility, performed in January 2006, indicated that this station is in good condition and operating satisfactorily.

The Morganshire development prompted a capacity evaluation of the existing North Muddy Creek Road Pumping Station and force main. The calculations included the areas that were included in the previous Act 537 planning efforts along Smokestown Road, Swartzville Road, and Lakeside Drive, as well as the proposed Morganshire flows. As a result of the evaluation, a section of the force main from the station to the existing 6-inch portion of the force main was upgraded from a 4-inch to a 6-inch line in 2004 to increase the capacity, resulting in a continuous 6-inch force main. With the force main upgrade, the pumping station has sufficient capacity to accommodate the projected growth within the UGA, as well as the Act 537 projects. Any proposed developments not accounted for in the design of the station and the more recent capacity evaluation would be responsible for funding necessary improvements at the station.

#### *Building 264 Pumping Station (PS #4)*

This pumping station was constructed to serve the Albertsons' ACME distribution center on South Muddy Creek Road along the eastern border of the Township, as well as future flows from the contributing area. The design capacity of this station is 0.337 MGD. The 2006 average daily flow at this station was 0.022 MGD and the maximum monthly average daily flow was 0.026 MGD. All flow from this station is currently directed to the Adamstown WWTP. Flow is pumped through a 6-inch force main that is reduced to a 4-inch force main and discharged into the Authority's manhole #612-1 in the gravity line approaching the Adamstown WWTP. Piping was also installed to allow direction of pumped flow to Lehman School Road Pumping Station once the necessary pumping modifications are made by Albertsons. Although the station has not yet been dedicated to the Authority, it is currently being operated by the Authority and is expected to be dedicated to the Authority in 2007. The annual inspection of this facility, performed in January 2006, indicated that this station is in good condition and operating satisfactorily. The station will have sufficient capacity for the next 15 to 20 years, unless there is a significant change in zoning and proposed development for the area, in which case it would be the responsibility of the developer(s) to fund any necessary improvements to the station.

### *Main Gravity Interceptor*

As indicated in Section 1.2 of this Plan, the main ECTA gravity interceptor was projected to have overload conditions in the 1998 Act 537 Plan. This prompted the upgrade of the interceptor in 2001 to a 21-inch line with an average daily design flow of 1.5 MGD and a peak design capacity of 6.0 MGD. The interceptor ties into the Intermunicipal Group (IMG) interceptor, which conveys flow to the Ephrata wastewater treatment facilities.

### *IMG Gravity Interceptor*

The IMG interceptor is jointly owned by the municipalities of the IMG, which are East Cocalico Township, Ephrata Township, Ephrata Borough, and Denver Borough. The upper section of the interceptor, which extends to WWTF No. 2, was upgraded in 2004 to increase the average daily flow capacity to 3.72 MGD, by increasing the line size from 21-inches to 30-inches. This upgrade was planned for 20-year flows and resulted in a peak flow capacity of 9.28 MGD.

## **3.3 On-Lot Disposal Systems**

East Cocalico Township's On-Lot Sewage Facilities Management Ordinance 2003-02 outlines the Township regulations for maintaining existing OLDS, repairing existing OLDS, and installing new OLDS. A copy of the ordinance is included in Appendix B. The purpose of the ordinance is to promote the health and safety of the people of East Cocalico Township through the regulation of OLDS. A permit is required for any repairs or installations of OLDS, including any alterations to the treatment tank, subsurface absorption area, spray field, holding tank, or soil modification. Special permission must be obtained to install a holding tank, and the owner must enter into a Holding Tank Maintenance Agreement with the Township. The Ordinance requires that each septic tank, holding tank, or cesspool be pumped out and inspected by a septic pumper/hauler at least once every three years. The pumper/hauler must be registered with the Township. The Ordinance prohibits the installation of OLDS, whether individual or community, in a floodway as identified by Federal Flood Insurance mapping or within 50-feet of the top of the stream bank, if the floodway has not been mapped.

The East Cocalico Township Holding Tank Maintenance Agreement is included in Appendix C, along with a listing of properties with holding tanks in the Township. Based on Township records, holding tank agreements were entered into with twelve residents. The agreements included a requirement for an annual inspection of the holding tank by the Township SEO or a Township representative. According to the Township's current SEO, the inspections are performed, but there is no documentation of the inspections unless a problem is identified. It is recommended that in the future the SEO provide the Township with a brief holding tank inspection report for each property.

An evaluation of the existing OLDS Management Program in East Cocalico Township is included in Section 5.3 of this Act 537 Plan Update. Guidelines for the use of OLDS in the Township are included in Section 520 of the East Cocalico Township Official Subdivision & Land Development Ordinance of 2003.

Since the adoption of the OLDS Management Program, the first group of Township residents required to have their tanks pumped out and inspected were notified on June 15, 2003. Of the total 177 residents notified, 174 properties or 98 percent have completed their inspection/pump-out or provided proof that such activity had been performed in the last three years. Another 3 properties or 2 percent of the notified residents have not yet responded to the notice. The second group of notices was issued on June 15, 2005 to 339 residents with OLDS.

### **3.3.1 General Description**

Those areas of the Township not served by public sewers utilize some type of underground OLDS for sewage treatment. These systems allow wastewater to be disposed in the ground where naturally occurring bacteria break down solids and the soil filters out impurities before they reach the groundwater. Soil type and geological features play an important role in the determination of OLDS applicability and placement. There are many different types of OLDS, as described in the following paragraphs.

**Septic Tanks with Drain Field** - The sewage enters the septic tank from the house through a pipe connection. The system will generally have two tanks with baffles to help with solids separation. Solids deposit at the bottom of the septic tank by gravity, and liquid flows over the baffle into either the second tank or a separate compartment in the first tank depending on the age and design of the system. Liquid from the second tank enters the drain field piping where it is allowed to percolate into the ground through perforated piping. Malfunctions occur when the solids in the tank build up and overflow the baffles. This allows solids to enter the drain field piping. The piping perforations are generally too small to allow passage of solids and the piping becomes clogged. Liquid waste will back up and eventually overflow the septic tank. This is evidenced by liquid ponding on the ground surface, or sewage backing up into the home. Poor drain field percolation may result in water collecting near the surface instead of seeping into the underlying soil. This condition is evidenced by the growth of green, lush grass over the drain field or water ponding on the surface. Proper maintenance, such as pumping out the septic tanks every three years to avoid solids buildup, should keep septic systems operating efficiently for many years.

**Elevated Sand Mounds** - Elevated sand mounds are usually septic tanks that instead of being connected to a drain field for liquid disposal, have sand mounds. These are found where the soil and geology of the immediate area are not favorable for a drain field. This may be due to poor soil permeability, shallow groundwater table, or highly fractured geology that permits surface water to quickly enter the water table. The mound of sand acts to filter the impurities from the liquid and bacteria in the sand breakdown the impurities. The filtered liquid is allowed to enter the ground or surrounding soil. Malfunctions may occur when the underlying soil cannot accept the volume of water entering the mound and it leaks out the bottom of the mound.

**Cesspools** - Cesspools are underground vaults with perforated walls, which allow liquid waste to percolate from the tank into the surrounding soil. The solids remain in the vault. Malfunctions occur when the wall perforations become blocked with solids or soil. The sewage may backup into the home. Partial blockage of the wall perforations may result in

soil saturation when all the liquid attempts to exit the vault at the same spot. Cesspools require periodic pumping to remove the solids. Cesspools are not an acceptable system for on-lot sewage disposal.

In addition to septic tanks, sand mounds and cesspools, other alternatives are used to provide sewage disposal including the following methods.

**Retaining Tanks** - A retaining tank is a watertight receptacle that receives and holds sewage and facilitates ultimate disposal of that sewage at another site. The most common types of retaining tanks are holding tanks, privies, composting toilets, and chemical toilets. A holding tank is a tank or underground vault that receives sewage from a water carrying system and stores the sewage until it is pumped out. The waste is not permitted to seep out of the tanks. These must be frequently and regularly pumped out to avoid overfilling. This is a temporary sewage disposal solution and is approved on a case-by-case basis. In general, holding tanks are only approved for use when there is a planned replacement by adequate sewerage facilities in accordance with a defined schedule.

A privy is a tank that receives and retains sewage where water under pressure or piped wastewater is not available. In general, a privy is only approved for use if a site meets requirements for ultimate sewage disposal by another OLDS method in the event water under pressure or piped water becomes available to the site in the future. A composting toilet is a device for holding and processing human and organic kitchen waste employing the process of biological degradation through the action of microorganisms to produce a stable, humus-like material. A chemical toilet is a privy that uses chemical treatment in the retaining tank for odor control.

**Borehole Disposal** - This method of sewage disposal consists of holes in the ground either dug or previously existing, in the form of boreholes, abandoned water wells, drywells, ventilation shafts or other subterranean structures, into which sewage is discharged. This is not an acceptable alternative to provide sewage disposal.

**Wildcat Sewers** - Wildcat sewers are collection systems serving more than one dwelling unit that discharge untreated or partially treated sewage to the surface of the ground, storm sewers or other waters of the Commonwealth. This is not an acceptable alternative to provide sewage disposal.

### 3.3.2 OLDS Survey

Through research of records and discussions with Township personnel, it was initially estimated that 1,226 OLDS were presently in use within East Cocalico Township.

Approximately 165 of these properties are planned to be included in future sewer extensions recommended in previous 537 Plan Amendments. Therefore the total number of OLDS used to determine the number of surveys to be performed as part of this Plan Update was 1061. A list of properties utilizing an OLDS, as provided by the Township, is included in Appendix D.

PADEP's guidance document titled "Act 537 Sewage Disposal Needs Identification" provided the direction for the performance of the OLDS survey for this Act 537 Plan Update. Based on requirements of the PADEP to obtain a representative random sampling, a minimum of 15 percent of the total number of OLDS in the Township, or 160 OLDS, were to have field verified surveys performed for this Act 537 Plan Update. After establishing the total number of samples required based on a total of 1,226 OLDS, the Township subsequently revised this number to 1,016. Subtracting the 165 properties already included in previous Plan Amendments, the number of OLDS was reduced to 851. For this total number of OLDS, PADEP guidance requires the number of surveys to be 20 percent of the total, or in this case, 170. A final methodology for arriving at the total number of surveys to be performed as part of this Plan Update would be to use the total number of 1,016 OLDS and the 15 percent survey rate to arrive at 152 surveys. After assessing each of these three methodologies, a target value of 160 OLDS surveys was selected.

A total of 168 door-to-door OLDS surveys were conducted during the month of May 2005. The proposed methodology for selecting the properties to be surveyed was reviewed with PADEP prior to conducting the survey, and PADEP's concurrence was obtained. Weather conditions during the survey were dry, mildly warm, and sunny. The survey was conducted by a representative of CDM accompanied by a representative of East Cocalico Township. Notice of the OLDS survey was sent to all Township residents through the March 2005 newsletter. Copies of the newsletter notice and the survey questionnaire are included in Appendix E.

The results of the OLDS survey were categorized using the following classifications.

Confirmed Malfunction - Confirmed through observation by SEO or other qualified professional, dye testing, "Best Technical Guidance" repairs, seasonally wet absorption areas, system backups, and piped discharges with direct evidence of sewage (i.e. direct observation of soap suds, food residue, solids, odors). Of the 168 surveys performed, 25 systems or 15 percent fell into the confirmed malfunctions category, mostly due to the presence of greywater (laundry and sink water) discharges to the surface or wet absorption areas. PADEP's interpretation is that a property with an existing greywater discharge represents a confirmed malfunction. If this discharge was eliminated and connected into the existing septic system, it would almost certainly cause the system to fail.

Suspected Malfunction - Abnormally green grass in the vicinity of the OLDS, piped discharges without direct evidence of sewage, absorption areas located in known unsuitable soils, cesspools in high-density development areas, and the use of pit privies. Of the 168 surveys performed, 4 systems or 2 percent fell into the suspected malfunction category. These properties displayed abnormally green grass in the absorption area, water ponding and odors around the septic tank but not in the drainfield, or homeowners indicated there was a broken pipe that has not been repaired.

Potential Malfunction - Systems that appear to operate satisfactorily but are one of the following: pre-regulatory system or unlikely to receive a permit under current regulations, repair due to poor site conditions or aging system, systems constructed in known unsuitable soils, septic tank pumping more frequently than once per year, or replacement systems

installed on lots without sufficient space for a future replacement system. Of the 168 surveys performed, 37 systems or 22 percent are potential malfunctions, mostly due to system age or a repair performed on the property. SE0 permitting records began in 1971 in the Township, so any system installed prior to that year falls into this category.

Wildcat Sewer System - Sewage collection system with multiple connections and an unlawful discharge. No wildcat sewer systems were identified during the course of the survey.

Retaining Tank - A holding tank has been used to retain sewage until pumping is required. Of the 168 surveys performed, 3 properties, or 2 percent were identified as utilizing retaining tanks.

Adequate or New System - Survey response indicates adequate site conditions and system or SE0 has issued a new permit. The SE0 records filed with the Township were consulted for the date of initial SE0 septic system permitting. The SE0 records indicate septic system permitting began in 1971. Of the 168 surveys performed, 99 systems or 59 percent were found to be adequate or new systems.

Table 3-2 contained in Appendix F lists the properties surveyed and the major categories of findings resulting from the survey.

Figure 3-4 shows the location of the OLDS surveyed and the survey results.

### **3.3.3 Groundwater Testing**

In conjunction with the OLDS needs evaluation and in accordance with the PADEP guidance document titled "Act 537 Sewage Disposal Needs Identification", a well testing program was performed in the Township concurrent with the OLDS survey. Samples obtained from private wells were tested for total coliforms, e-coli, and nitrate nitrogen to aid in the determination of the extent of these contaminants in the groundwater of the Township. The sample testing was performed by Microbac Laboratories located in Camp Hill, Pennsylvania.

The well testing program was performed according to the guidelines set forth by the PADEP, stating that 15 percent of all private wells in the Township (total number of wells greater than 1,000) were to be sampled. There are a total of 1328 private wells in the Township (not including the 165 properties included in previous Plan Amendments), therefore requiring a total of 200 samples. A total of 202 water samples were collected. The well samples were selected randomly and represent a wide distribution throughout the Township. Figures 3-5 and 3-6 show the location and sample testing results of the private wells. Overall, well contamination does not appear to be a major widespread problem in the Township. If any problems were to be noted, it could be observed that contamination appears to be slightly more concentrated in the northcentral and southern portions of the Township.

Numerous Township residents rely on well water for their drinking water. The quality of the groundwater is a concern for public health. Nitrate in drinking water can have serious and occasionally fatal effects on infants.

Nitrate-nitrogen levels in the water samples ranged from less than 0.5 mg/l to 33.7 mg/l. High nitrate-nitrogen levels, defined as greater than the maximum contaminate level (MCL) of 10 mg/l, were found in 21 well samples or 10 percent. Twenty-four percent of the samples had nitrate levels between 5 and 10 mg/l. Figure 3-5 shows the location and sample testing results for nitrate nitrogen.

Pathogenic organisms, such as bacteria, viruses, protozoa and others, may also be present in drinking water. Because the number of these organisms may be small and they are difficult to isolate and identify, the coliform organism is commonly used as an indicator organism. If coliforms are present in the sample, this is an indication that other pathogenic organisms may also be present. If coliforms are not present, this indicates that the water is free from pathogenic organisms.

Total coliform has an MCL of less than one coliform in 100 ml. The total coliform in the well water samples ranged in number from 0 to over 201 in 100 ml. Total coliforms were found above the MCL in 74 water samples or 37 percent of those wells tested. E-coli, a specific coliform that is entirely of fecal origin, was found in 9 of the samples, or about 12 percent, that tested positive for total coliform. Seven of the samples collected were disinfected samples, treated via UV or chlorination, because samples were not able to be taken prior to the treatment units. Therefore, the possibility exists that the raw water of these wells may have tested positive for total and fecal coliform.

Figure 3-6 shows the location and sample testing results for total coliform and e-coli.

Table 3-3 contained in Appendix G presents a summary of the water sample test results.

### **3.3.4 Nitrate-Nitrogen Planning Implications**

In accordance with Title 25, Chapter 71 requirements of the Pennsylvania Code, PADEP requires Act 537 Plan Updates to address any nitrate-nitrogen groundwater contamination problems that are documented by the well sampling effort. The nitrate-nitrogen level results of the water sample testing were presented in Figure 3-5. As presented in the previous section, the MCL for nitrate-nitrogen is 10 mg/l. Twenty-one of the 202 water samples had nitrate levels that exceeded the MCL. In addition to the number of samples that exceed the MCL, the number of samples with nitrate levels that fall in the 5 to 10 mg/l range also has an impact on the land development planning process. An additional 48 of the 202 water samples had nitrate levels that fell in the 5 to 10 mg/l range.

Figure 3-7 shows <sup>1</sup>/<sub>4</sub> -mile radius circles drawn around sample locations with nitrate levels that fall in the 5 to 10 mg/l range. Any proposed development located within the circles presented on this figure will require completion of a preliminary hydrogeologic study as part of the land development planning process. The East Cocalico Township Subdivision and Land Development Ordinance requires a hydrogeologic study to be performed as part of land development planning "when in the opinion of the Township there is a probable

likelihood that a project will affect, or be affected by, carbonate geologic hazards." To be in accordance with PADEP requirements, the Township will need to amend this Ordinance in the future to include provisions for requiring hydrogeologic studies in areas with high levels of nitrate in the groundwater, as well as in all carbonate geology areas. The Township can interpret and form opinions on the validity of the conclusions drawn in any hydrogeologic report; however, it is ultimately the review of PADEP that will govern decisions concerning development in areas with high nitrate levels.

Figure 3-8 shows <sup>1</sup>/<sub>4</sub>-mile radius circles drawn around sample locations with nitrate levels that exceed 10 mg/l. In accordance with Chapter 71 requirements, any proposed development located within the circles presented on this figure will require the use of denitrification units in any new land development planning. Guidance provided by PADEP indicates that there are currently no approved denitrification units, but that limited options for OLDS may exist that could be used in these areas where nitrate levels exceed 10 mg/l. It is also possible, though unlikely, that additional well samples obtained for a hydrogeologic study may allow for development with OLDS. Overall, development with OLDS is not likely to occur in these areas.

Figure 3-9 was prepared to show the combined effects of nitrate-nitrogen level planning implications in East Cocalico Township. This figure indicates that about half of the area of the Township that is not currently served by public sewer is impacted by these development planning restrictions.

### **3.4 Areas of Concern**

The objective of this section of the Plan Update is to identify any areas of concern, or areas where sewage disposal needs must be addressed, within the area of East Cocalico Township that is not currently served by public sewer. This identification of areas is based upon the background information reviewed in Sections 1 and 2, and the OLDS survey conducted during the course of this Plan Update. The water sampling activity conducted as part of the OLDS survey is intended to identify areas of the Township where high concentrations of nitrates, coliforms and e-coli occur in the groundwater. Areas of special concern can be identified by combining this information with those areas identified as having concentrations of confirmed, suspected and potential OLDS malfunctions.

In addition to consideration of information obtained through the OLDS survey, the records of the East Cocalico Township SEO were reviewed to identify areas of existing problems or needs. Since the beginning of SEO records in the Township in 1971, eight representatives have served as SEO to the Township. The repairs documented by the SEOs include repairs to existing systems, as well as new systems that were installed to serve an existing residence with a failing or outdated OLDS. The documented OLDS repairs in the Township are listed in Table 3-4 located in Appendix H. The SEO repair records were cross-checked with the properties included in the OLDS survey to determine if any of the survey properties were also on the repair listing. In accordance with PADEP guidance, any survey property that was on the repair listing was categorized as a potential malfunction, with the exception of a repair consisting of a system replacement on a lot with sufficient size for another system replacement in the future if required. The repair permits for three properties in the

Township indicated that the repairs made were "Best Technical Guidance" (BTG) repairs. This type of repair is considered by PADEP to be categorized as a confirmed malfunction; therefore, these properties are also shown on the mapping in Figure 3-4.

An evaluation of the mapping results of the OLDS survey and water sampling effort does not obviously indicate any areas of the Township that demonstrate problems of a magnitude that would warrant the consideration of sewer extension alternatives.

Figure 3-4 presents the categorization of the properties included in the OLDS survey into confirmed, suspected and potential malfunctions, retaining tanks and new or adequate systems. The mapping of these results does not indicate any areas that can be concluded to have concentrations of malfunctions. The greatest number of malfunctions appears to be in the north central and northwest areas of the Township where about four confirmed malfunctions may be within about a half mile distance of each other, but even in these cases, the properties are generally large enough (most are in the range of two to 38 acres) to easily accommodate replacement OLDS if necessary.

A similar interpretation of water sample testing results can be made based on the mapping presented in Figures 3-5 and 3-6. Figure 3-5 presents the results of the nitrate testing. A very small area in the south part of the Township along Martin Road and Landis Road and another small area in the north central part of the Township near Martin Drive have three or four properties with high nitrate levels. These areas however, with the exception of two properties, do not correspond with the areas with identified confirmed malfunctions. It is probably more likely that the high nitrate levels can be linked to the agricultural land use in those areas.

Similarly, Figure 3-6 presents the results of the coliform testing. Although there are about five properties within a half mile of each other in the southern part of the Township near the intersection of Red Run Road and E. Church Street with positive results for coliform in the water sample, the OLDS systems in this area were generally categorized as new or adequate and the nitrate levels in this area were low. Water samples from the northeast part of the Township indicated more samples with either coliform or total and fecal coliform present, but are spread across a large area where nitrate levels are low. Properties located in the northwestern part of the Township in the area of White Oak Road also indicated more samples with coliform present, but nitrate levels in this area are not above the MCL and the area does not correspond with the area of greater confirmed malfunctions.

In conclusion, it is very difficult to make the assessment that areas of concern exist within the Township that are of significant enough concentration to warrant the consideration of extension of the sewer system. This conclusion is further supported by the fact that only about 17 percent of the total OLDS surveys were categorized as confirmed or suspected malfunctions. Although an additional 22 percent were included in the potential malfunction category, this classification was mainly as a result of the age of the system, and not related to any observed or reported malfunction of the system. Finally, almost 60 percent of the properties surveyed were categorized as new or adequate systems.

Based on all of the supporting information presented above, it appears that the aggressive implementation of the OLDS Management Program in the Township is the most appropriate means of addressing sewage disposal in those areas of the Township that are not presently served by public sewer. It appears that the areas of the Township that are not served by public sewer, and are experiencing significant problems, are those identified in the past Amendments to the Ephrata Area Act 537 Plan of 1995 as described in Section 1 of this Plan Update. These areas include the Lakeside Drive, Smokestown Road and Pinewood Estates areas of the Township.

### **3.5 Wastewater Sludge and Septage Generation and Disposal**

Wastewater sludge generated at the various treatment facilities in the Township is treated on-site at the Ephrata and Adamstown plants, but taken off-site for disposal. Sludge generated at the Locustwood plant is transported off-site for treatment and disposal. Following is a description of the sludge disposal method utilized by each of the facilities.

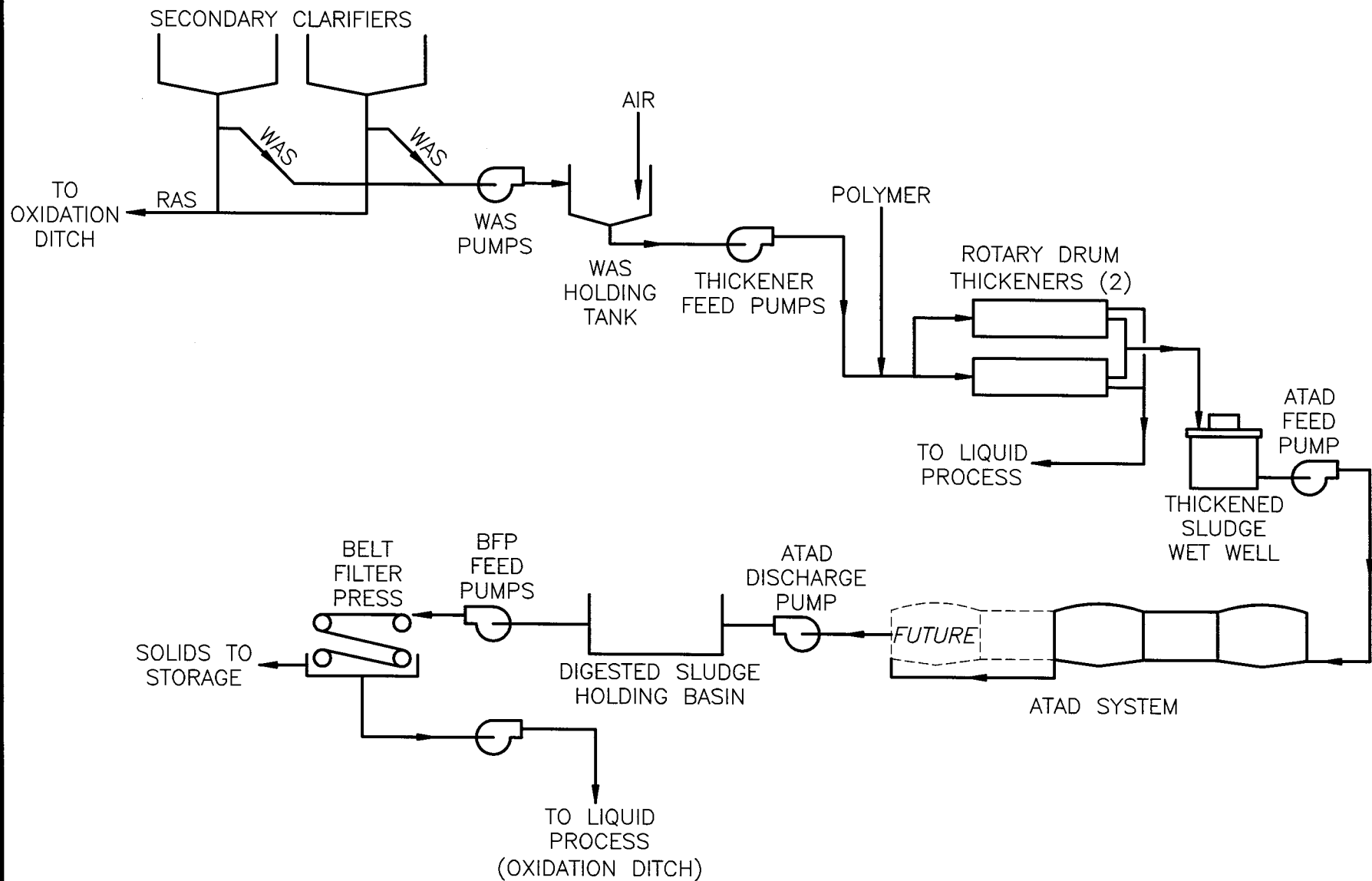
Ephrata WWTF No. 2 utilizes an autothermal thermophillic aerobic digestion system (ATAD) , rotary drum thickening, and a 2-meter belt press for dewatering for sludge processing. The biosolids are then applied to permitted farm fields. Approximately 15.6 dry tons of sludge are removed from the facility each month. Figure 3-10 shows the solids process flow for Ephrata WWTF No. 2.

Adamstown WWTP sludge processing consists of aerobic digestion, which is followed by dewatering in drying beds. Alternatively, the liquid sludge is transported to another wastewater treatment plant for dewatering and lime stabilization prior to disposal, or the liquid sludge may be used directly in land application on farm fields. Ultimately, the sludge is disposed on permitted farm fields or in an approved landfill. A total of 56.93 dry tons of sludge were generated during 2004, with monthly disposal quantities ranging from zero to 20.91 dry tons.

Approximately 1200 gallons of liquid sludge are hauled from the Locustwood Treatment Plant each month. The sludge is land-applied as a liquid or further processed at a treatment plant.

Septage is generated in the numerous OLDS throughout the Township. Private haulers are hired by the homeowners to pump out their individual systems on an as needed basis or every three years as required by the Township. The septage pumped from the OLDS by the private haulers is taken to various PADEP-permitted disposal facilities in the county. The Township has a list of approved haulers, which residents are required to use. Septage haulers must complete a training session provided annually by the Township once every five years and register annually with the Township to be included on the list of approved haulers.

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East Cocalico Township Act 537 Plan Update  
Ephrata Regional Wastewater Treatment Facility No. 2  
Solids Processing Facility Schematic  
Figure 3-10

## Section 4

# Future Growth and Development

### 4.1 Introduction

The potential for future growth and development in East Cocalico Township must be evaluated to project future sewage disposal needs. The key elements involved in flow projection include input from local planners, population predictions and anticipated growth areas.

#### 4.1.1 Future Flow Projections

The East Cocalico Township Authority (ECTA) closely tracks the development planning process in the Township through monthly Development Status Reports. These developments are located within the Urban Growth Area as presented in Figure 2-1.

ECTA recently performed a Water Capacity Allocation Study, for which water usage projections were determined for undeveloped parcels expected to develop within the next 25 years. The projections were developed using the current Township Zoning, and 65% of the total land area was considered in the calculations to account for streets, open space, etc. These projections are directly related to the anticipated sanitary sewer connections. This Study was used to develop sewage flow projections for the next 5, 10, and 20 years. All of the properties are located within the Urban Growth Area, with the exception of Woodcrest Retreat and the properties in the Lakeside Drive/Route 897, Smokestown Road, and Pinewood Estates areas that are slated for public sewer service from previous Act 537 Plan Amendments. It is prudent for Woodcrest Retreat to connect to public sewer; however, the off-site sewage facilities will remain private minimizing the potential for additional growth and to maintain the rural characteristics of the area. In the Stevens Pumping Station drainage area several parcels located within the UGA, which were not included in the Water Capacity Allocation Study, were included in the sanitary sewer flow projections. These parcels were included due to anticipated development in the area, which was identified as part of the Stevens Pumping Station Evaluation. A copy of the evaluation is included in Appendix N.

Sound engineering and planning judgment was used to estimate the time of development for each parcel. Based on the range of housing density within each zoning district, both low and high EDU projections were developed in the Study. For the purpose of this Plan Update an average of the low and high EDU projections was used. The projected connections and flows are presented in Table 4-1.

The current process for requesting sewer service involves an initial capacity request that is submitted to the Authority. If sufficient capacity is available, the Authority notifies the property owner that capacity is available. To reserve the capacity, the property owner must enter into a Reservation Agreement with the Authority and pay the associated tapping fee for each reserved EDU. Prior to connection the property owner will be issued a connection

permit. If connection to the Authority's facilities is not made prior to the second anniversary of the execution of the Reservation Agreement, the reservation of capacity shall lapse.

#### 4.1.2 Wastewater Treatment and Sewer Conveyance Capacity

Future growth and development within East Cocalico Township projects that sewage flows in the year 2027 will be about 2.072 MGD. This exceeds the 1.780 MGD (1.680 MGD in IMG facilities and 0.100 MGD in Adamstown WWTP) capacity needs estimate developed in the 1995 Ephrata Area Act 537 Plan. Based on a projection of 2.072 MGD and 2006 average daily sewage flow of 0.731 MGD, East Cocalico Township will require about 1.341 MGD of capacity in the next 20 years. In 2005 the net available uncommitted capacity in the jointly used IMG facilities was 1.165 MGD which is to be shared by all of the member municipalities on an as needed basis. The IMG tracks this calculation and at some point in the future will need to develop a plan for providing additional treatment capacity to accommodate the growth needs of all the member municipalities. The IMG Sewage Service Agreement has provisions for expanding the sewage service area and increasing conveyance and treatment capacity.

If insufficient conveyance capacity exists for proposed developments in tributary sewer lines, the developers will be responsible for constructing the necessary upgrades. As development continues over the next ten to twenty years and sewage flows approach ultimate allocations and capacities, the Township and Authority may need to address options available for increasing treatment capacity and the main interceptor conveyance capacity.

**Table 4-1****Future Flow Projections**

Year	Projected Cumulative Additional EDUs	Cumulative Additional Flow (MGD)	Total Average Daily Flow (MGD)
Base Year			0.904
2012	1463	0.413	1.317
2017	2527	0.713	1.617
<b>2027</b>	4141	1.168	<b>2.072</b>

**Notes:**

- 1) Projected EDUs based on full buildout of UGA from the ECTA Water Capacity Allocation Study, Act 537 amendment projects, Stevens Pumping Station Evaluation, and the 2006 Chapter 94 Report.
- 2) 1 EDU = 282 gpd (Based on 2.82 people/household & 100 gpcd)
- 3) The base year flow is the peak annual ADF over the last 3 years (2004) to Ephrata and the allocated capacity at the Adamstown plant plus flow from EDUs connected in 2005 and 2006.

### **4.1.3 Population**

East Cocalico Township's historical population figures from the U.S. Bureau of Census and projected future populations from the Lancaster County Planning Commission are shown in Table 4-2. The average growth rate per decade, starting with the 1950's was 26.8 percent. Peak growth occurred in the 1960's with a growth rate of 31.7 percent. The minimum growth rate was in the 1980's at 22.9 percent. According to the 2000 census, the population of East Cocalico Township was 9,954 persons.

The estimated 2004 population for the Township was 10,222 (U.S. Census). The LCPC recently released preliminary population projections for East Cocalico Township in August, 2003. Based on census data, historic birth and death rates, and rates of migration, the Township population is projected to be 11,291 persons in 2010, 12,653 persons in 2020, and 13,961 persons in 2030. These projections reflect an expected decline in the growth rate over the next 25 years. Linear interpolation with the U.S. Census data shows that the 5-year (2012) population would be 11,563, the 10-year (2017) population would be 12,244, and the 20-year (2027) population would be 13,569.

The population projections presented for East Cocalico Township in the Strategic Comprehensive Plan for the Cocalico Region are 11,608 persons in 2010 and 13,262 persons in 2020. Those values were obtained using the average population increase per decade over the last thirty years (1,654 persons). Linear interpolation was used to establish the 5-year, 10-year, and 20-year projections of 11,939, 12,766 and 14,420, respectively.

Alternatively, if the average growth rate per decade (26.8 percent) over the last 50 years is used to project the population from the 2000 Census value of 9,954, the projected populations are significantly higher. The 5-year, 10-year, and 20-year projections are 13,155, 14,918, and 18,916, respectively.

A fourth method of population projection utilizes the new residential EDUs from the future flow projections outlined in Section 4.1.1. An estimate of 2.82 (2000 U.S. Census) persons per household was used to convert EDUs to the number of residents. The 5, 10, and 20-year population projections from this method are 12,317, 14,071, and 16,959, respectively. These projections fall in between the LCPC and Strategic Comprehensive Plan projections and the average growth rate projections.

Table 4-2

## East Cocalico Township Population Data

Year	Lancaster County Planning Commission Population Projections			Strategic Comprehensive Plan for the Cocalico Region Population Projections			Past Average Growth Rate Population Projections			Residential Service Connection Population Projections			
	Total Population (1)	Growth Rate Per Decade	Additional Residents	Total Population (2)	Growth Rate Per Decade	Additional Residents	Total Population (3)	Growth Rate Per Decade	Additional Residents	Total Population (4)	Additional Residential EDUs	Residents per EDU	Additional Residents
1950	3,044												
1960	3,791	24.5%	747										
1970	4,993	31.7%	1,202										
1980	6,354	27.3%	1,361										
1990	7,809	22.9%	1,455										
2000	9,954	27.5%	2,145	9,954			9,954						
2004	10,222	(Estimated by U.S. Bureau of Census)								10,222			
2010	11,291	13.4%	1,337	11,608	16.6%	1,654		26.8%					
2012	<b>11,563</b>			<b>11,939</b>			<b>13,155</b>		3,201	<b>12,317</b>	743	2.82	2,095
2017	<b>12,244</b>			<b>12,766</b>			<b>14,918</b>		1,763	<b>14,071</b>	622		1,754
2020	12,653	12.1%	1,362	13,262	14.2%	1,654							
2027	<b>13,569</b>			<b>14,420</b>			<b>18,916</b>		3,998	<b>16,959</b>	1,024		2,888
2030	13,961	10.3%	1,308										

## Notes:

- 1) 2010, 2020, and 2030 populations are projections from LCPC. 2012, 2017, and 2027 populations are linear interpolations from the LCPC projections.
- 2) 2010 and 2020 populations from the Comprehensive Plan are based on the average population increase over the last 30 years (1,654 per decade). 2012, 2017, and 2027 populations are linear interpolations from those projections.
- 3) Projected populations calculated using the average growth rate per decade over the last 50 years.
- 4) Projected populations calculated using residential EDU projections from section 4.1.1.

## **Section 5**

# **Alternatives to Provide New or Improved Wastewater Disposal Facilities**

### **5.1 Treatment Facility Alternatives**

The projected flows presented in the previous Section of this Plan Update (Table 4-1) indicate that East Cocalico Township may reach the treatment capacity needs estimate of 1.780 mgd developed for the Township in the 1995 Ephrata Area Act 537 Plan within the next 20 years. The capacity needs estimate included treatment capacity at both the Ephrata WWTF No. 2 and the Adamstown WWTP. The projected Township flow is 2.072 mgd in the year 2026.

The development of this projected flow of 2.072 mgd is based on several assumptions including housing density and industrial/commercial wastewater generation. These assumptions could result in differing flow projections, certainly in the range by which the projected flow amount exceeds the capacity needs estimate.

There are three possible scenarios by which the Township could increase their available sewage treatment capacity within the next twenty years, if it proves necessary. Each option is discussed in more detail in Appendix M, which contains a memorandum evaluating the sewage capacity expansion alternatives.

Option 1: Maximum utilization of existing capacity in Ephrata Plants No. 1 and 2 plus participation in an expansion of Plant No. 2 in the future and continuation of diversion of up to 100,000 gallons per day to Adamstown.

Option 2: Maximum utilization of existing capacity in Ephrata Plants No. 1 and 2 plus participation in an expansion of Plant No. 2 in the future and elimination of the diversion to Adamstown.

Option 3: Maximum utilization of existing capacity in Ephrata Plants No. 1 and 2 plus participation in an expansion of the Adamstown WWTP.

The Township should closely monitor the increase in sewage flows over the next 5 to 10 years and be prepared to investigate the options available for increasing treatment capacity in the next 10 to 15 years. It is recommended that all of the IMG municipalities work towards projecting 20 year flows and discuss the prospect of expanding the treatment capacity. IMG Technical Committee members discussed the need to evaluate long term sewage treatment capacity at a recent meeting. If an expansion is warranted, it will most likely be driven by growth within East Cocalico, but at this time it is too early to anticipate when this growth would reach the crucial point requiring expansion, especially considering that the timing will be impacted by other IMG members.

**COM**

## **5.2 Sanitary Sewer System Alternatives**

An evaluation of the results of the OLDS survey and the water sample testing performed in May 2005 as part of this Act 537 Plan Update did not identify any new areas of concern within East Cocalico Township. However, three areas of concern do exist in the Township, which were identified from previous Act 537 Planning efforts. Figure 5-1 shows the location of the identified areas of concern, which are listed as follows:

- Lakeside Area
- Smokestown Road
- Pinewood Area
- Stevens Pumping Station

Although three of these areas were addressed in previous Plan Amendments, as detailed in Section 1.2.3, this Plan Update re-assesses the sanitary sewer system alternatives, schedules, and funding options to address sewage disposal needs within these three areas of concern.

Proposed developments in the Stevens area of the township have the potential to exceed the capacity of the Stevens Pumping Station, gravity collection system, and force main. This Plan Update identifies the projected future flows and proposes alternatives that will be able to accommodate increased flows to the Stevens Pumping Station.

It appears unlikely that the long-term sewage disposal needs of these areas can be met with private OLDS, based upon a combination of factors including lot sizes, soil suitability, geology, topography and age and design of systems. It also does not seem likely that many OLDS repairs or replacements could be accomplished with systems that meet current regulatory requirements. Because the Township previously selected alternatives that provide sanitary sewer service, rather than a community OLDS, this evaluation focuses on sanitary sewer service. The Township does not wish to encourage the use of community OLDS within areas that are slated for growth. Due to a history of problems with maintenance agreements and operation of community systems, the Township would prefer to implement sanitary sewer service alternatives. Therefore, public sewerage alternatives are identified in the subsequent sections for each area of concern.

### **5.2.1 Lakeside Area**

The Lakeside area was first identified as an area of concern in the late 1970s, as a result of complaints received by the Department of Environmental Resources. The Township prepared a Lakeside Estates Area Act 537 Plan Revision, dated July 1980, to address the area. The Plan Revision called for sewer service within five years and considered on-lot facilities as interim solutions. Concurrently, the Township adopted an Official Act 537 Plan prepared in August 1980, which concluded that implementation of a sewer alternative should be the responsibility of the Developer and/or the homeowners. No further action on the implementation of sewer alternatives was taken.

**COM**

The Lakeside area was again identified as an area of concern in the 1995 Act 537 Plan Update based on the results of an OLDS and well water sampling survey. The conclusion of the 1995 Plan Update was that a more detailed follow-up study of the area was necessary. The follow-up OLDS survey conducted in 1998 identified a significant number of malfunctions. The results of this 1998 sampling were included in the initial Act 537 Plan Amendment Special Study: Pinewood, Lakeside, and Smokestown dated April 26, 2000. This Amendment was followed by the Morganshire-Lakeside Smokestown Act 537 Plan Amendment, which was dated December 28, 2001.

Sewer alternatives were identified in the 2001 Plan Amendment. The Lakeside study area initially included the properties on Swartzville Road. Through partial implementation of the 2001 Plan, these properties were connected in a recent sewer extension project. Therefore, the scope of this Plan Update is limited to 11 properties along Lakeside Drive.

*Alternative No. 1 - Low-Pressure Sewer through Private Rights-of-Way*

Prior to the development of plans for the Morganshire development, which is located at the intersection of Swartzville Road and Smokestown Road, the proposed alternative for Lakeside was a low-pressure line along Swartzville Road connecting to the proposed gravity line in Swartzville Road. However, once the plans for the Morganshire development were approved, which included a pumping station, force main, and gravity lines to the southwest of Lakeside Drive, a new alternative was developed that was the only one incorporated in the final December 2001 amendment. This alternative included a low-pressure sewer line from the eastern end of Lakeside Drive along Swartzville Road to the pumping station in the Morganshire development by way of easements across five properties. However, this alignment conflicts with a proposed detention pond for the development, and for this Plan Update the alignment has been revised. The proposed alignment will be located in private easement until it reaches the Morganshire property. Once on the Morganshire property, the line will be within Roan Drive. This is Alternative No. 1 for this evaluation. The total length of low-pressure sewer for this alternative is 2,170 linear feet.

*Alternative No. 2 - Low-Pressure Sewer along Swartzville Road*

Alternative No. 2 is similar to the originally proposed low-pressure line in Swartzville Road, but instead ties into the gravity line in Mustang Trail. Mustang Trail is part of the proposed Morganshire development located across from Mohn's Hill Road. Although the length of sewer line is greater than that required for Alternative No. 1, this alternative allows for more efficient access for maintenance because it is located in the shoulder of Swartzville Road/SR 0897.

This alternative provides service to six existing properties along Swartzville Road, in addition to the Lakeside properties. Laterals are installed for the Swartzville Road properties; however, the property owners are not required to connect to the sanitary sewer system at the time of construction.

In the previous Plan Amendment, a few properties at the base of Mohn's Hill Road off of Swartzville Road were included as a subalternative. It did not appear that this subalternative was included in the implementation schedule. This Plan Update does not include those properties in the Lakeside area. If these properties were required to be connected to public sewer at some point in the future, a connection could be made either to gravity sewer lines in Morganshire or by means of a gravity sewer extension along Swartzville Road.

### **5.2.2 Smokestown Road**

This area includes 38 properties on Smokestown Road from North Muddy Creek Drive to Martzall Road. It was identified as an area of concern in the 1995 Act 537 Plan Update, based on the results of an OLDS and well water sampling survey. As described for the Lakeside area above, a more detailed follow-up study was conducted with OLDS surveys in 1998 and the subsequent 2000 and 2001 Plan Amendments. The Morganshire-Lakeside Smokestown Act 537 Plan Amendment, dated December 28, 2001, listed only one alternative for providing sewer service to the area.

The topography slopes downward along Smokestown Road from North Muddy Creek Drive to Martzall Road. Prior to the plans for the Morganshire development, which has extended sewer service to the intersection of Smokestown Road and North Muddy Creek Drive, the proposed alternatives in the 1995 Plan Update relied on a pumping station and force main to convey flows from Smokestown Road up Hill Road to a gravity line on the southern side of Hill Road. With the extension of public sewer for Morganshire, a more viable alternative for conveyance from the Smokestown Road area is to connect to gravity sewer in Smokestown Road at the intersection with North Muddy Creek Road. There are two options for the collection system along Smokestown Road to reach this connection point, both of which include a pumping station and force main.

#### *Alternative No. 1 – Gravity Sewer, Low-Pressure Sewer, Pumping Station, and Force Main*

This alternative places the pumping station west of White Oak Road along Smokestown Road. Gravity sewer conveys flows from 14 properties to the east of the pumping station. Low-pressure sewer conveys flows from 24 properties to the west of the pumping station to the station. A total of 1,800 linear feet of gravity sewer, 2,660 linear feet of low-pressure sewer, and 3,500 linear feet of force main are required.

#### *Alternative No. 2 – Gravity Sewer, Pumping Station, and Force Main*

For this alternative, gravity sewers convey flows from all properties in this area to a pumping station at the intersection of Smokestown Road and Martzall Road. The pumping station force main pumps flows back to the connection point in the existing gravity sewer. The total length of gravity sewer is 4,460 linear feet, and the length of force main is 6,200 linear feet.

### 5.2.3 Pinewood Area

The Pinewood area was identified as an area of concern in the 1995 Act 537 Plan Update based on the results of an OLDS and well water sampling survey. As described for the Lakeside area above, a more detailed follow-up study was conducted with OLDS surveys in 1998 for the 2000 Plan Amendment. The Pinewood Area Sewage Facilities Plan, dated July 17, 2002, was a follow-up to the 2000 Plan Amendment and evaluated several alternatives for public sewer service to the area.

The Pinewood area contains 59 single family residences, a construction business office, and an East Cocalico Township municipal garage. Initially the Pinewood area only identified the properties on Ridgewood Avenue, Center Avenue, and Pinewood Avenue, but as part of the alternatives analysis for the 2002 Plan Amendment, additional properties in the surrounding area were identified for service. This Plan Update only considers alternatives that provide service for all the properties as identified in the previously selected alternative. This area of concern is near the southeast border of the Township and includes properties located on Ridgewood Avenue, Center Avenue, Pinewood Avenue, South Reamstown Road, Glenwood Drive, and Wabash Road.

There are several possible alternatives for the Pinewood area. Alternatives including a combination of gravity sewers, low-pressure sewers, and force mains are evaluated.

#### *Alternative No. 1 – Gravity Sewer along Coover Run*

Pinewood Avenue, Center Avenue, and Ridgewood Avenue are served via gravity sewer in all of the identified alternatives. Gravity sewers convey flow to South Reamstown Road. The gravity sewer line continues down South Reamstown Road to the southwest with an additional gravity line tying in at the base of Glenwood Drive. The gravity line follows South Reamstown Road past the intersection with Wabash Road until reaching Coover Run. An interceptor follows Coover Run and connects to the IMG Interceptor at Manhole 3. This alternative consists of a total of 8,360 linear feet of gravity sewer, which includes one stream crossing of the Cocalico Creek. There is also the potential for conflicts with the wetlands along Coover Run and a significant amount of land for which private easements must be purchased.

#### *Alternative No. 2 – Gravity Sewer along Wabash Road*

This alternative also serves Pinewood Avenue, Center Avenue, Ridgewood Avenue, South Reamstown Road, and Glenwood Drive via gravity sewer along South Reamstown Road. The primary difference between this alternative and Alternative No. 1 is that the gravity sewer follows Wabash Road to the north. The line connects to the IMG interceptor at Manhole 14. This alternative does not involve a stream crossing, but may involve some wetlands investigation along Cocalico Creek at the connection point to the IMG interceptor. An easement must be obtained from a single property owner from Wabash Road to the IMG interceptor. There is additional pavement restoration, but fewer easement purchase costs

with this alternative. The total length of gravity sewer is 8,500 linear feet. This alternative serves four additional residences along Wabash Road.

*Alternative No. 3 - Gravity Sewer through Agricultural Land*

This alternative is very similar to Alternative No. 2, but it involves a shorter length of sewer in Wabash Road and a longer distance through agricultural land. The total length of sewer is 8,160 linear feet. This alternative requires a stream crossing of the Cocalico Creek. The line connects to the IMG interceptor at Manhole 3. The increased easement length through agricultural land could present additional expenses or conflicts with agricultural preservation.

*Alternative No. 4 - Gravity Sewer and Low-Pressure Sewer*

Alternative No. 4 involves gravity sewers for Pinewood Avenue, Center Avenue, and Ridgewood Avenue, but the gravity line in South Reamstown Road runs to the northeast. A low-pressure sewer provides public sewerage service to the properties west of the Pinewood Avenue and South Reamstown Road intersection, connecting to the gravity line at that intersection. The gravity line along South Reamstown Road cuts through an existing property and crosses under the Cocalico Creek. The line connects to the IMG interceptor at Manhole 29. This involves a minimal length of total construction, but has increased cost and maintenance associated with the grinder pumps for properties served via low-pressure. The total length of gravity sewer is 4,540 linear feet, and the low-pressure line has a length of 2,460 feet.

*Alternative No. 5 - Gravity Sewer and Force Main*

Alternative No. 5 is similar to Alternative No. 4, but utilizes a combination of gravity sewer and a pumping station with a force main to serve the properties on South Reamstown Road to the west of Pinewood Avenue. In comparison with Alternative No. 4, this alternative serves two additional properties on Wabash Road. There is additional property cost associated with this project for the pumping station lot. The length of gravity sewer is 7,640 linear feet. The length of force main is 2,580 linear feet.

## **5.2.4 Stevens Pumping Station**

The Stevens Pumping Station and surrounding area is considered to be an area of concern due to projected developments, which will overload the capacity of the existing station and sanitary sewer system. A detailed evaluation of the pumping station and surrounding area is provided in Appendix N. This section of the Plan Update summarizes the findings.

There are currently 116 EDUs that contribute flows to the Stevens Pumping Station. Figure 1 of Appendix N outlines the drainage basin serving the Stevens Pumping Station. The capacity of the existing Stevens Pumping Station is 200 gpm. The future projected peak hourly flow is 860 gpm, significantly exceeding the capacity of the existing station and force

main. In addition, the projected flows have the potential to surcharge a section of gravity sanitary sewer that conveys flow to the pumping station.

There are two alternatives for increasing the sanitary sewer service capacity of the Stevens Pumping Station.

*Alternative No. 1 – New Pumping Station at the Existing Location*

Alternative No. 1 involves constructing a new pumping station at the existing site and expanding the existing site by approximately 2,000 square feet, as well as increasing the size of the force main. The existing gravity sanitary sewer serving the eastern portion of the Stevens area is expanded from 8-inch to 10-inch diameter, providing the necessary capacity for full buildout.

*Alternative No. 2 – New Pumping Station at Garden Spot Road & Line Road*

Alternative No. 2 is very similar to Alternative No. 1, except for the location of the pumping station. The pumping station is relocated to the lowest point in the Township at the corner of Garden Spot Road and Line Road. This allows a few additional parcels to reach the pumping station by gravity. This alternative also involves the additional length of gravity sanitary sewer and force main to reach the new site.

## **5.3 OLDS Management Program**

OLDS can provide an efficient and viable alternative for sewage disposal if they are constructed and maintained properly. Unfortunately, in many communities, proper installation and maintenance of OLDS has not always occurred. OLDS Management provides a non-structural option to long-term sewage facilities planning that municipalities across Pennsylvania have recently developed to prevent these problems from occurring. A guidance document titled "A Municipal Official's Guide to Managing On Lot Sewage Disposal Systems" was published in 1998 by the Pennsylvania State Association of Township Supervisors. This guidance document can be used to identify management alternatives that may be applicable to a specific community.

Numerous rural and suburban areas of East Cocalico Township are dependent upon OLDS as the only available method of sewage disposal. Therefore, an OLDS Management Program was a key component of the 2002 Act 537 Plan Amendment and is, accordingly, a key component of this Plan Update.

### **5.3.1 Existing OLDS Management Program**

Fueled by previous Act 537 Plan Amendments, East Cocalico Township adopted its OLDS Management Ordinance in 2003, recorded as Ordinance 2003-02. The Ordinance is defined as follows:

An ordinance defining and regulating the installation, construction, alteration, repair, and maintenance of individual and community onlot sewage disposal

systems and holding tanks within East Cocalico Township; requiring permits for and providing for inspections, and prescribing penalties for violation of the Ordinance.

One of the major purposes of the existing OLDS program was to provide additional oversight in the planning, design and construction of OLDS. Another major intent of the existing program was to ensure that OLDS are properly maintained.

The existing OLDS program outlined in Ordinance 2003-02 requires a permit for all OLDS installations and repairs/modifications, including alterations such as the enlargement of tank capacity, absorption fields, spray fields, and soil modification. The Township's Sewage Enforcement Officer is tasked with issuing, denying, and revoking permits. All permits must be consistent with the Official Act 537 Plan of the Township. Depending on the type of OLDS or repair, the SEO requires a minimum of a pre- and post-construction site inspection. Property owners must reserve a suitable alternate area for the installation of a replacement OLDS in the event of failure of their existing system.

The management component of the Ordinance is aimed at promoting OLDS maintenance and identifying malfunctions at an early stage in order to enforce remedies for such problems.

In order to install a holding tank, the property owner must request "special permission" from the Board of Supervisors before applying for a permit. The owner must enter into a contract with a pumper/hauler and provide the Township with receipts for each pump-out. The Township must also complete and retain annual inspection reports for each permitted tank. The owner is also required to enter into a Holding Tank Maintenance Agreement and establish an escrow account with the Township.

Each property owner with an OLDS is required to use, operate and maintain their OLDS within the confines of the Ordinance. Proper operation and use outlined in the Ordinance includes ensuring proper operation of all system components and prohibiting the discharge of specific items, including industrial waste, automobile oil, toxic or hazardous chemicals, and surface or ground water. Each owner must have their OLDS pumped out and inspected at least once every three years, or more frequently if deemed necessary by the Township. Documentation of each pump-out must be provided to the Township.

Property owners may only use pumper/haulers that are registered with the Township. Contractors must attend a training session once every five years and renew their registration annually to operate in the Township. Registered contractors must be licensed by the Commonwealth of Pennsylvania for pumping and hauling activities.

The contractor/inspector must fill out an On-Lot Sewage Facilities Initial Inspection Pumping Report for the first inspection at each property. For subsequent pump-outs, a Regular Inspection & Pumping Report must be completed. Copies of the inspection reports are included in Appendix I. The inspection reports contain general information on the property owner, type of OLDS, and location of the OLDS. In addition, the inspection forms specifically list several conditions of the tank and absorption area that can be key indicators

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of malfunctions or require repair, which the contractor/inspector must observe during the inspection.

The Township or SEO also has the right to require additional maintenance that is deemed necessary, such as cleaning/ unclogging piping, repairing mechanical equipment, and diverting surface water away from the absorption area.

A property owner or pumper/hauler must report an identified malfunction to the Township within three days of discovering the malfunction. Upon notification of a malfunction, the Township will issue a notice of violation to the property owner. The property owner must file an application with the SEO for a repair or replacement system within seven days of the notice of violation. Construction of the repair/replacement system must begin within 30 days of the notice and be completed within 60 days of the notice, unless the Township extends these dates for a specific application.

Subdivisions involving more than ten dwelling units, non-residential developments, and developments with less than ten dwelling units seeking an exemption from planning requirements must complete a sewage facilities planning module application mailer and submit the completed mailer to PADEP.

### **5.3.2 Implementation of Existing OLDS Management Program**

To facilitate the management of the required pump-outs and inspections, the Township has been divided into three districts. Property owners within each district are required to have their OLDS inspected and pumped-out within one year of the issuance of the notice for their district. District 1 was notified in June 2004, District 2 was notified in June 2005, and District 3 will be notified in June 2006.

Property owners have been educated and informed about the implementation and progress of the Ordinance through articles in the quarterly Township newsletter.

The Township has developed a procedure for following up with property owners who do not comply with the requirements of the Ordinance. Approximately seven months from the first notice, follow-up notices were sent to all the property owners in District 1 who had not yet responded. This notice stressed to the property owners that compliance with the Ordinance was mandated by PADEP and failure to comply would be a violation. In June 2005, as the one-year deadline approached, remaining property owners who had still not responded were issued a Final Notice. Non-compliant property owners were then issued letters from the Township solicitor to further address the consequences of non-compliance. The Solicitor's letter stressed that a violation of the Ordinance would result in the Township filing an action before the District Justice and upon conviction of violating the Ordinance, the property owner would be issued a fine of not more than \$1,000 per violation.

The permitting aspect of the Ordinance is managed by the SEO. Permits are filed and recorded at the Township office.

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### **5.3.3 Recommendations for Modifications to the Existing OLDS Management Program**

The existing OLDS Management program contains all of the elements of a successful program to meet the intents of East Cocalico Township and the requirements of PADEP. The program provides an excellent means of assuring proper maintenance of OLDS through the pumping and inspection of systems every three years.

Hydrogeologic study requirements are outlined in the Subdivision and Land Development Ordinance (SALDO). The SALDO currently leaves the decision for requirement of a hydrogeologic study up to the Township based on the potential for encountering or impacting carbonate geology. In addition to this requirement, it is recommended that the SALDO be revised to require hydrogeologic studies for all of the areas within a quarter mile of those properties with nitrate levels between 5 and 10 mg/L, as depicted in Figure 3-7. This modification must be made to remain in compliance with PADEP regulations. The hydrogeologic report requirements outlined in the SALDO include the requirements of the environmental assessment report.

## Section 6

# Evaluation of Alternatives

### 6.1 Consistency Analysis

PADEP guidance documents for the preparation of Act 537 Plan Update Revisions include a requirement for performing a consistency determination between proposed sewage facilities alternatives that are identified as part of the Act 537 Update process and the overall goals and objectives of county, state and federal programs. If this determination is made at the planning stage of municipal projects, it allows for the resolution of potential problems before major resources are committed to the implementation of an alternative that would not be consistent with these overall goals and objectives. For the purpose of this Plan Update, a consistency analysis is performed for each alternative with respect to: plans developed for each municipality under the Clean Streams Law, the Clean Water Act, the Pennsylvania Municipalities Planning Code, the Water Resources Planning Act, the Pennsylvania Prime Agricultural Land Policy, the Pennsylvania Natural Diversity Inventory, and the Pennsylvania Historical and Museum Commission. The following paragraphs address the consistency determinations for the alternatives identified for the three areas of concern.

Applicable plans developed and approved under Sections 4 and 5 of the Pennsylvania Clean Streams Law and Section 208 of the Clean Water Act would include any previously approved Official Sewage Facilities Plans for East Cocalico Township and Comprehensive Water Quality Management Plans (COWAMP). Existing sewage facilities planning for East Cocalico Township has been based on the 1995 Act 537 Plan and the four amendments to that Plan completed during the years 2000 to 2002, as well as the 1998 Adamstown Act 537 Plan. The alternatives under consideration in this current Plan Update are consistent with information contained in the previous sewage planning documents. The COWAMP developed water quality standards and wastewater facilities plans for the Conestoga River Watershed, in which East Cocalico Township is located. In designated growth areas, COWAMP recommended that existing sewerage systems be extended into developing areas where the need exists and that OLDS be utilized outside designated growth areas. Although the alternatives under consideration in this Plan Update are not located within the designated growth area, the previous amendments that have investigated these areas confirmed that public sewer extensions are the only viable alternatives. Future developments in the Stevens area serving the pumping station are primarily located within the designated growth area. Those properties outside of the growth area are only considered to account for the possibility of rezoning during the new pumping station's anticipated service life. Accounting for the possible flows generated outside of the UGA in the capacity of the pumping station does not directly promote growth in those areas.

The 2006 Municipal Wasteload Management Chapter 94 Report for the East Cocalico Township Authority reports no projected hydraulic overloads in any part of the collection and conveyance system. The 2006 Chapter 94 Reports for Adamstown

Borough and Ephrata Borough, which include the treatment facilities that receive East Cocalico Township's sewage flows, did not project hydraulic or organic overloads within the next five years. Therefore, the alternatives involving connection to the East Cocalico Township Authority or Intermunicipal Group sewers are consistent with the information contained in the most recent Chapter 94 Report.

The Strategic Comprehensive Plan for the Cocalico Region that was adopted in December 2003, and was described in Section 1.3.1 of this Plan Update, provides direction for growth and development in East Cocalico Township, as well as other participating municipalities. The public sewer extensions to the Lakeside area, Smokestown Road, and the Pinewood area are all included in the Implementation Schedule for East Cocalico Township. Inclusion of the extensions in the Comprehensive Plan reinforces consistency with local planning, even though the extensions will be outside of the urban growth area. The Stevens Pumping Station replacement was not included in the Comprehensive Plan, because it is fueled by more recent growth in the area.

The consistency of the Plan Update alternatives with the State Water Plans developed under the Water Protection Planning Act and the Pennsylvania Administrative Code was assessed by contacting the PADEP's Division of Water Use Planning. The Division's response was that they do not consider the State Water Plan reports to be sufficiently up to date to render a decision of inconsistency. The Division is, however, in the process of preparing an update to the State Water Plan with a target completion date of March 2008. The update will provide an assessment of the water availability throughout the state; however, there is no analysis or documentation available at this time.

The Plan Update alternatives were evaluated to determine any impact upon prime agricultural land. Alternatives No. 1 and No. 3 for the Pinewood area involve sewer extensions through PA Clean and Green properties. Soil Conservation Service soils mapping for Lancaster County and a listing of prime farmland soils were used to delineate the prime farmland soils. The Pinewood area Alternatives No. 2 and No. 3 and both of the Smokestown alternatives are located in areas that may be partially underlain by prime farmland soils. Based on National Wetland Inventory mapping, the Plan Update alternatives will not encroach on wetlands that have previously been identified and mapped. If a selected alternative is located in an area with potential wetlands conflicts a more detailed assessment will be performed during design and permitting of the project.

The necessary notifications have been made to the Pennsylvania Natural Diversity Inventory (PNDI) and the Pennsylvania Historical and Museum Commission (PHMC). Copies of the notifications and the responses are included in Appendix J. The PNDI response indicates that special concern species or resources are located in the vicinity of the proposed projects; however, impact is considered to be unlikely and no further coordination is required. The PHMC response indicates that there is a high probability that significant archaeological sites are located in the identified areas, and a Phase I archaeological survey of the project area is required to locate potentially significant

archaeological resources. There are no historic buildings or structures located in the identified areas, but if historic resources are discovered in these areas, the Township must notify the Bureau of Historic Preservation.

All of the Plan Update alternatives propose the use of existing permitted sewage treatment facilities for ultimate treatment of the additional sewage flows and discharge of treated effluent. Therefore, all of the alternatives are consistent with applicable water quality standards, effluent limitations and other regulatory requirements.

## **6.2 Present Worth Analysis of Sanitary Sewer System Alternatives**

### **6.2.1 Lakeside Area**

Section 5 of this Plan Update identified two alternatives to provide public sewer service to the Lakeside area. In this section of the Plan, capital design and construction cost estimates are developed for each alternative, along with operating cost estimates and a present worth evaluation and comparison of the alternatives. The alternative with the lowest present worth cost is recommended as the preferred alternative for implementation by the Township.

Capital design and construction cost estimates for the Lakeside alternatives are included in Tables 6-1 and 6-2. A description of the cost development for each alternative is presented in the following paragraphs.

Table 6-1 develops the cost estimate for Alternative No. 1, a low-pressure sewer system serving Lakeside Drive and conveying the sewage through easements and tying into the proposed gravity sewer in the Morganshire development. The major components of the cost in Table 6-1 are the low-pressure sewer line, the grinder pumps, and Township road restoration. Twenty-five percent is added to the construction cost estimate to account for costs including survey, engineering and other indirect project related costs, and a 25 percent contingency is added to arrive at the total estimated project construction cost.

Similarly, Table 6-2 develops the cost estimate for Alternative No. 2, a low-pressure sewer system serving Lakeside Drive and conveying sewage along the shoulder of Swartzville Road/SR 0897 to a gravity manhole in Mustang Trail. Six additional laterals are included for future connections along Swartzville Road. The longer length of sewer along Swartzville Road, and the PENNDOT shoulder pavement restoration result in a higher cost for this alternative.

The next step in the financial analysis is the development of operations and maintenance cost estimates for each of the alternatives. The Lakeside alternatives involve grinder pump operation and maintenance costs. Pipeline maintenance cost is based upon actual East Cocalico Township Authority costs per foot for the existing sewer system. The operations and maintenance cost estimates for the two alternatives are included in Table 6-3.

A present worth cost analysis is then performed to determine the total costs (capital and operating) of a specific alternative over its intended life cycle. The determination of total present worth costs allows an equal comparison of the various alternatives to identify the most cost-effective alternative. The uniform present value cost, which is the value of a recurring amount over a set future period, was determined for the operation and maintenance costs for each alternative. The Federal Register has established a discount rate of 5.125 percent for 2006. The discount rate and the number of years of operation are used in a formula to calculate a uniform present value factor. The discount rate of 5.125 percent and 20 years of operation yield a factor of 12.34. This factor is multiplied by the estimated operation and maintenance costs in the first full year of operation to result in the uniform present value cost, or present worth.

The present worth of the annual operation and maintenance costs is combined with the initial capital design and construction cost to determine the total present worth of each alternative. A cost for assumed grinder pump replacement over the 20-year period has also been included in the total present worth cost, using an assumption that 25 percent of the pumps will be replaced during that time period. The addition of all of these cost components results in a total lifetime cost for each alternative. These costs can then be divided by the total number of new EDUs that will be provided with sewer service to arrive at the cost per EDU. These total present worth costs on a dollar per EDU basis can be compared to identify the most cost-effective alternative for a particular sewer service area. The present worth cost analysis for the Lakeside area alternatives is presented in Table 6-3. The alternative resulting in the least cost per EDU is Alternative No. 1, the construction of a low-pressure sewer system conveying flows through easements to the Morganshire pumping station. However, the costs per EDU for the two alternatives are not significantly different, and other considerations such as ease of future access to the sewer line are taken into consideration. The Authority selects Alternative No. 2 as the recommended alternative because it will eliminate the potential difficulty associated with obtaining private easements and provides the capability to serve the additional existing residences along Swartzville Road. Figure 6-1 presents the proposed layout of the sewerage facilities for Alternative No.2.

### Table 6-1

[illegible]

### Table 6-2

Lakeside Area Alternative No. 2 - Low Pressure Sewer along Swartzville Road					
Capital Design & Construction Cost Estimate					
Item No.	Item	Quantity	Unit	Unit Price	Unit Cost
1	2" SDR-21 PVC Low-Pressure Sewer	2,600	LF	\$65	\$169,000
2	Grinder Pumps (high head)	11	EA	\$9,400	\$103,400
3	1.5" Low-Pressure Laterals	17	EA	\$1,000	\$17,000
4	Township Road Restoration	512	SY	\$50	\$25,600
5	PENNDOT Road Restoration	778'	SY	\$60	\$46,680
<b>Construction Sub-Total</b>					
					<b>\$361,680</b>
Other Project Related Costs (Survey, Engineering, etc.) @ 25%		25	%	\$361,680	\$90,420
Contingencies		25	%	\$361,680	\$90,420
<b>PROJECT TOTAL COST</b>					<b>\$543,000</b>

**TABLE 6-3**  
**PRESENT WORTH EVALUATION OF LAKESIDE AREA ALTERNATIVES**

**Lakeside Alternative No. 1**

Cost Category	Dollars Per Year
---------------	------------------

Grinder Pumps: Maintenance	\$1,100
Energy	\$200
Pipeline: Maintenance	\$977
Total	\$2,277

assumed each homeowner will spend \$2000 for repairs over 20 years  
 assumed 11 2-HP pumps running 0.2 hrs/day @ \$0.10/kW-hr  
 based on \$0.40/linear foot of pipeline

Present Worth for 20-year Operation Cost:	\$29,000
Grinder Pump Replacement Cost:	\$6,400
Design & Construction Cost:	<u>\$455,000</u>
Total Lifetime Cost:	\$490,400
Cost per EDU:	\$44,582

assumed 25% of pumps being replaced @ \$2,300/pump

**Lakeside Alternative No. 2**

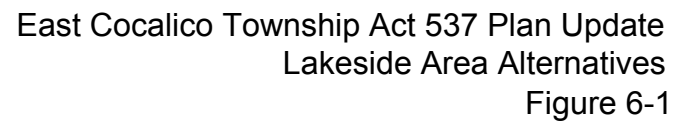
Cost Category	Dollars Per Year
---------------	------------------

Grinder Pumps: Maintenance	\$1,100
Energy	\$200
Pipeline: Maintenance	\$1,033
Total	\$2,333

assumed each homeowner will spend \$2000 for repairs over 20 years  
 assumed 11 2-HP pumps running 0.2 hrs/day @ \$0.10/kW-hr  
 based on \$0.40/linear foot of pipeline

Present Worth for 20-year Operation Cost:	\$29,000
Grinder Pump Replacement Cost:	\$6,400
Design & Construction Cost:	<u>\$543,000</u>
Total Lifetime Cost:	\$578,400
Cost per EDU:	\$52,582

assumed 25% of pumps being replaced @ \$2,300/pump



## 6.2.2 Smokestown Road

Section 5 of this Plan Update identified two alternatives to provide public sewer service to homes along Smokestown Road. Capital design and construction cost estimates for the two alternatives are included in Tables 6-4 and 6-5.

Table 6-4 develops the cost estimate for Alternative No. 1, consisting of gravity sewers, low-pressure sewers, a pumping station, and force main. Gravity sewers convey flows to the west to the pumping station, while low-pressure sewers convey flows to the east to the centrally located pumping station. The force main conveys flows to the east, discharging into the existing gravity sewer in Smokestown Road. Significant components of the cost estimate include the pumping station, gravity sewers, low-pressure sewers, grinder pumps, and force main. PENNDOT pavement restoration also comprises a significant portion of the estimate. The pavement restoration item does not include mill and overlay of Smokestown Road, but does include shoulder restoration for the force main, low-pressure line, gravity line, and lateral crossings for the residences.

Table 6-5 develops the cost estimate for Alternative No. 2, which is a modification of the first alternative. It eliminates the low-pressure line and grinder pumps and extends gravity sewers and the force main to the westernmost side of the project area. It also relocates the pumping station to the westernmost side of the project area. Although the grinder pumps were eliminated, the increased length of pavement restoration, gravity sewer, and force main result in a higher total cost for this alternative. The pumping station cost was also increased slightly to account for the greater head due to the location of the station.

The operations and maintenance cost analysis for these alternatives includes costs for the pumping station, grinder pumps, and the pipeline. The pumping station labor cost is based on one half-hour per weekday per pumping station at a labor rate of \$25 per hour. The cost for maintenance is based on costs for similarly sized pumping stations. The cost for energy assumes two 15 horsepower pumps for Alternative No. 1 and two 20 horsepower pumps for Alternative No. 2 operating one hour per day and an energy cost of \$0.10 per kilowatt-hour. Other expenses are for miscellaneous costs associated with operation of the pumping station. Pipeline maintenance was calculated as described above for the Lakeside alternatives.

The operations and maintenance cost estimates and the present worth evaluation for the two alternatives is presented in Table 6-6. Assumptions used to develop the cost estimates and the present worth evaluation are the same as those described in the alternatives evaluation for the Lakeside area. The alternative resulting in the least cost per EDU is Alternative No. 1, consisting of low-pressure sewers, gravity sewers, a pumping station, and force main. This alternative is therefore recommended as the preferred method of providing sewer service to Smokestown Road. Figure 6-2 presents the proposed layout of the sewerage facilities for this alternative.

### Table 6-4

[illegible]

### Table 6-5

[illegible]

**TABLE 6-6**  
**PRESENT WORTH EVALUATION OF SMOKESTOWN ROAD ALTERNATIVES**

**Smokestown Alternative No. 1**

<u>Cost Category</u>	<u>Dollars Per Year</u>	
Pumping Station: Labor	\$3,250	assumed 0.5 hour/weekday/pumping station @ \$25/hr
Maintenance	\$5,000	
Energy	\$900	assumed 2 15-HP pumps running 1 hr/day @ \$0.10/kW-hr
Other Expenses	\$1,000	
Grinder Pumps: Maintenance	\$2,400	assumed each homeowner will spend \$2000 for repairs over 20 years
Energy	\$ 300	assumed 24 2-HP pumps running 0.2 hrs/day @ \$0.10/kW-hr
Pipeline: Maintenance	\$3,162	based on \$0.40/linear foot of pipeline
Total	\$16,012	
Present Worth for 20-year Operation Cost:	\$198,000	
Grinder Pump Replacement Cost:	\$13,800	assumed 25% of pumps being replaced @ \$2,300/pump
Pump Replacement Cost	\$40,000	assumed replacement pump cost of \$20,000 each
Design & Construction Cost:	<u>\$2,500,000</u>	
Total Lifetime Cost:	\$2,751,800	
Cost per EDU:	\$72,416	

**Smokestown Alternative No. 2**

<u>Cost Category</u>	<u>Dollars Per Year</u>	
Pumping Station: Labor	\$3,250	assumed 0.5 hour/weekday/pumping station @ \$25/hr
Maintenance	\$5,000	
Energy	\$1,100	assumed 2 20-HP pumps running 1 hr/day @ \$0.10/kW-hr
Other Expenses	\$1,000	
Pipeline: Maintenance	<u>\$4,218</u>	based on \$0.40/linear foot of pipeline
Total	\$14,568	
Present Worth for 20-year Operation Cost:	\$180,000	
Pump Replacement Cost	\$40,000	assumed replacement pump cost of \$20,000 each
Design & Construction Cost:	<u>\$3,026,000</u>	
Total Lifetime Cost:	\$3,246,000	
Cost per EDU:	\$85,421	

### 6.2.3 Pinewood Area

Section 5 of this Plan Update identified five alternatives to provide public sewer service to the Pinewood area of East Cocalico Township. Capital design and construction cost estimates for the five alternatives are included in Tables 6-7 through 6-11.

The capital design and construction cost estimate for Alternative No. 1 is presented in Table 6-7. The gravity sewer line is the most significant portion of the cost with a moderate amount of pavement restoration assumed to be in the shoulder. This alternative also requires a stream crossing. Each of the Pinewood area alternatives includes a meter pit, since they all tie directly into the IMG interceptor.

Table 6-8 develops the capital design and construction cost estimate for Alternative No. 2. This alternative has a slightly longer length of gravity sewer and an increased amount of pavement restoration, but does not involve a stream crossing.

The capital design and construction cost estimate for Alternative No. 3 is presented in Table 6-9. Of the three gravity alternatives, this alternative has the least length of sewer line required. With additional easement length through agricultural land, pavement restoration is minimized.

Table 6-10 develops the capital design and construction cost estimate for Alternative No. 4. This alternative provides low-pressure sewer service for 25 of the properties to the west of Pinewood Avenue and minimizes the overall length of pipe installed and pavement restoration.

Table 6-11 develops the capital design and construction cost estimate for Alternative No. 5. This alternative is similar to Alternative No. 4, but replaces the low-pressure sewer line with a gravity line, pumping station, and force main. These items significantly increase the cost for this alternative.

Project related costs and contingencies are based on the same assumptions as the previous alternatives.

The operations and maintenance cost estimates and the present worth evaluation are presented in Table 6-12. The pumping station energy costs for Alternative No. 5 were developed assuming two 10 horsepower pumps operate for two hours per day with an energy cost of \$0.10 per kilowatt-hour.

The three gravity alternatives have similar total costs, with Alternative No. 2 being the most financially feasible of the three. Alternative No. 4 has the lowest overall cost. Alternative No. 2 is a viable alternative because it utilizes all gravity lines, limits the amount of line within an easement, and avoids potential conflicts that may occur with a stream crossing. This alternative will also not burden homeowners with the costs of purchasing, operating, and maintaining a grinder pump. Therefore, it may be beneficial to carry both alternatives forward to the conceptual design phase of the project. The Authority could then make a final alternative selection at that time. Figure 6-3 presents the proposed layout of the sewerage facilities for Alternatives No. 2 and No. 4.

### Table 6-7

[illegible]

### Table 6-8

[illegible]

### Table 6-9

[illegible]

### Table 6-10

Pinewood Area Alternative 4 - Gravity Sewer and Low-Pressure Sewer					
Capital Design & Construction Cost Estimate					
Item No.	Item	Quantity	Unit	Unit Price	Unit Cost
1	8 SDR-35 PVC Gravity Sewer	4,540	LF	\$150	\$681,000
2	6" SDR-35 PVC Gravity Sewer Laterals	37	EA	\$1,500	\$55,500
3	2" SDR-21 PVC Low-Pressure Sewer	2,460	LF	\$65	\$159,900
4	Grinder Pumps	25	EA	\$9,300	\$232,500
5	1.5" Low-Pressure Laterals	25	EA	\$1,000	\$25,000
6	River Crossing	80	LF	\$825	\$66,000
7	Township Road Restoration	3,349	SY	\$50	\$167,450
8	Easement Restoration	324	SY	\$10	\$3,240
9	Easements	700	LF	\$10	\$7,000
10	Meter Pit	1	EA	\$50,000	\$50,000
<b>Construction Sub-Total</b>					<b>\$1,447,590</b>
Other Project Related Costs (Survey, Engineering, etc.) @ 25%					\$361,898
Contingencies					\$361,898
<b>PROJECT TOTAL COST</b>					<b>\$2,171,000</b>

**Table 6-11**[illegible]

**TABLE 6-12**  
**PRESENT WORTH EVALUATION OF PINWOOD AREA ALTERNATIVES**

**Pinewood Alternative No. 1**

<u>Cost Category</u>		<u>Dollars Per Year</u>	
Pipeline:	Maintenance	\$3,321	based on \$0.40/linear foot of pipeline
Total		\$3,321	
Present Worth for 20-year Operation Cost:		\$41,000	
Design & Construction Cost:		\$2,472,000	
Total Lifetime Cost:		\$2,513,000	
Cost per EDU:		\$41,197	

**Pinewood Alternative No. 2**

<u>Cost Category</u>		<u>Dollars Per Year</u>	
Pipeline:	Maintenance	\$3,376	based on \$0.40/linear foot of pipeline
Total		\$3,376	
Present Worth for 20-year Operation Cost:		\$42,000	
Design & Construction Cost:		\$2,412,000	
Total Lifetime Cost:		\$2,454,000	
Cost per EDU:		\$37,754	

**Pinewood Alternative No. 3**

<u>Cost Category</u>		<u>Dollars Per Year</u>	
Pipeline:	Maintenance	\$3,241	based on \$0.40/linear foot of pipeline
Total		\$3,241	
Present Worth for 20-year Operation Cost:		\$40,000	
Design & Construction Cost:		\$2,497,000	
Total Lifetime Cost:		\$2,537,000	
Cost per EDU:		\$40,919	

**Pinewood Alternative No. 4**

<u>Cost Category</u>		<u>Dollars Per Year</u>	
Grinder Pumps:	Maintenance	\$2,500	assumed each homeowner will spend \$2000 for repairs over 20 years assumed 25 2-HP pumps running 0.2 hrs/day @ \$0.10/kW-hr based on \$0.40/linear foot of pipeline
	Energy	\$300	
Pipeline:	Maintenance	\$2,780	
Total		\$5,580	
Present Worth for 20-year Operation Cost:		\$69,000	
Grinder Pump Replacement Cost:		\$14,400	assumed 25% of pumps being replaced @ \$2,300/pump
Design & Construction Cost:		\$2,171,000	
Total Lifetime Cost:		\$2,254,400	
Cost per EDU:		\$36,361	

**Pinewood Alternative No. 5**

<u>Cost Category</u>		<u>Dollars Per Year</u>	
Pumping Station:	Labor	\$3,250	assumed 0.5 hour/weekday/pumping station @ \$25/hr
	Maintenance	\$5,000	
	Energy	\$1,100	assumed 2 10-HP pumps running 2 hrs/day (4. \$0.10/kW-hr
	Other Expenses	\$1,000	
Pipeline:	Maintenance	\$4,059	based on \$0.40/linear foot of pipeline
Total		\$14,409	
Present Worth for 20-year Operation Cost:		\$178,000	
Pump Replacement Cost		\$40,000	assumed replacement pump cost of \$20,000 each
Design & Construction Cost:		\$3,310,000	
Total Lifetime Cost:		\$3,528,000	
Cost per EDU:		\$55,125	

## 6.2.4 Stevens Pumping Station

Section 5 of this Plan Update identified two alternatives to increase the capacity of the Stevens Pumping Station. Capital design and construction cost estimates for the two alternatives are included in Tables 3 and 4 in Appendix N.

The cost estimates for the two alternatives are very similar. The primary difference is the additional expense required to construct the additional gravity sanitary sewer and force main to the pumping station site for Alternative No. 2. Project related costs and contingencies are based on the same assumptions as the previous alternatives.

A present worth analysis was not performed for the Stevens Pumping Station alternatives, because the results for each alternative would be the same. The two alternatives do not present significantly different operating conditions, but rather focus on two unique pumping station sites.

Alternative No. 1 is the recommended alternative because, in addition to lower cost, it has several other advantages associated with its location on the existing pumping station site. The existing 4-inch force main will be able to be utilized for the initial design conditions, which will postpone the expansion of the force main until necessary for future development. At which time, the respective developer will be responsible for the force main upgrade. By utilizing the existing site there will be minimal earth disturbance for construction. Gravity sewer and force main extensions are not necessary to reach the site. Further details on the selected alternative, including figures, are included in Appendix N.

## 6.3 Analysis of Funding Methods

The implementation of the recommended alternatives identified in this Plan Update will require substantial funding by the East Cocalico Township Authority (ECTA). In terms of possible funding alternatives, a commercial bank loan could be obtained by ECTA. The standard maximum length of loan is 20 years and the anticipated interest rate is dependent on the source of funds for the bank. A standard commercial loan at the current rates would be in the range of 4.75 to 5.0 percent. The application process for the loan requires financial statements for the past two to three years, a breakdown of project costs, the Authority's financial status, and a brief description of the project.

ECTA also possesses the ability to issue revenue bonds that are secured by the projected revenue of the Authority's system. The normal term for a bond issue is 20 to 30 years. The interest rate on the bonds is dependent upon the Authority's rating by bond insurers, a Township Guarantee and the ability of the Authority to obtain bond insurance. A current 30 year bond issue could be obtained at about 5.0 percent. The process of issuing a bond would take about three months and is typically started soon after the final design is complete. During this time period, the Authority would begin with an initial meeting with the bond brokers and the Authority's Bond Counsel. The Authority would be required to provide engineering and planning studies/evaluations, historical summaries and financial statements. Meetings with bond insurers and a report for prospective bond buyers would also be required.

ECTA can apply for low interest loans or grants through the Pennsylvania Infrastructure Investment Authority (PENNVEST). The project's costs could be fully financed by a PENNVEST loan upon approval. PENNVEST loan interest rates are typically lower than both commercial loans and bond issues and are based upon the median income of the service area. Grants are also available but are limited to \$250,000. These supplemental grants are available to prevent excessively high user fees for water and wastewater systems. Most PENNVEST loans have a term of 20 years. The application process involves the submittal of forms describing the applicant, the proposed project, final construction plans and specifications, and financial and legal information of the Authority. Also requested are the annual reports submitted to the Commonwealth of Pennsylvania, financial statements, current and proposed user rate schedules, a map of the service area and location of the proposed project. Applications are reviewed three times per year at the PENNVEST board meetings. Planning consultation meetings with the Authority, PENNVEST and PADEP are required. The project's plans and specifications are submitted to the U.S. Environmental Protection Agency for a technical review. The current PENNVEST interest rates for Lancaster County are 2.556 percent for years 1 through 5, and 3.195 percent for years 6 through 20. The average interest rate over the 20-year period is 3.0 percent. For the purpose of this Plan Update, it has been assumed that the sewer extension projects will not be funded through PENNVEST loans. To qualify for PENNVEST funding, an overall PENNVEST rating must be prepared, including a rating in the Public Health and Safety category. Without a rating in this category or with a low rating in this category, the overall PENNVEST rating will be low which could lessen the likelihood of obtaining a funding offer. In order for a rating to be prepared in the Public Health and Safety category, the Plan Update must show that the percentage sampling requirements have been met for a particular sewer service area (in terms of the number of OLDS surveys performed and water samples tested). In order to meet these percentage sampling requirements for the project areas in this Plan Update, additional "Tier 2" sampling would be required.

In the Public Health and Safety category, projects are assigned points for various criteria, such as Community Environment and Aesthetics (based on the number of confirmed malfunctions in the project area) and Domestic Water Supply Rating (based on the number of private wells with fecal coliform in the project area). Based upon the results of the OLDS survey and water sample testing performed for this Plan Update, a judgment has been made that even if additional "Tier 2" sampling is performed, it is not likely that the project areas will be assigned enough points, and therefore receive a sufficiently high rating, to qualify for PENNVEST funding. This conclusion can be re-evaluated, however, at the beginning of project implementation for each area of concern.

Community Development Block Grants from the federal block grant program of the Department of Housing and Urban Development (HUD) may be available to ECTA. These funds are limited to \$250,000 per project, or for larger projects, \$250,000 per phase of the project. Although these grants would not be sufficient to meet the total needs of the Authority for the projects under consideration, they could help to reduce the ultimate costs to the customers of the system. Eligibility is based on census data and income surveys of the specific project area. Fifty-one percent of the total number of

persons in the households must fall in the low to moderate income category. Income surveys are completed as a cooperative effort between the Township and the Lancaster County Redevelopment Authority.

Based on this preliminary review of the various methods of funding available to ECTA, a bond issue or bank loan at 5 percent for a 30 year term appears to be the preferable option. These assumptions are used in the financial analyses performed for the alternatives in the following sections. ECTA should also investigate the availability of Community Development Block Grants and the eligibility of specific project areas within the Township to obtain these funds. Subsequent to adoption of this Plan Update by the Township and the prioritization of the various projects, the Township would work with the County Redevelopment Authority to undertake income surveys of the specific project areas.

## **6.4 Financial Feasibility and Implementation of Sanitary Sewer System Alternatives**

### **6.4.1 OLDS Comparative Cost Analysis**

Prior to evaluating the financial feasibility of sewer alternatives for the areas of concern, an average cost per household for the continued use of OLDS is developed for comparative purposes. Numerous assumptions are made in order to develop a cost for the use of OLDS in the long term. For the purpose of this study, the following assumptions are used:

A replacement OLDS consists of a sand mound system, because it is not known if the soils and background nitrate levels support the use of a conventional septic tank and drainfield system. Due to lot size constraints, it is unlikely in some cases that regulatory OLDS repairs would be possible. But for the purpose of this evaluation, it is assumed that a replacement OLDS using a sand mound could be constructed on each property.

The cost of an average residential sand mound system is in the range of \$10,000 to \$14,000. The lower end of the range is used for the purpose of this analysis since it is possible that some systems may remain functional with repairs only, as opposed to complete replacement.

- The OLDS system remains in service for at least 30 years (the period over which the costs are amortized for the sewer alternatives).
- Every homeowner incurs a replacement cost of at least \$10,000 (in today's dollars) over the next 30 year period to continue to use an OLDS.
- Construction costs increase at the same rate as the cost of borrowing money.
- Systems are pumped out every three years at a cost of \$200.

Energy costs to operate the pump are comparable to those developed for grinder pumps in Section 6.3.

Based on the above assumptions, the average annual cost per homeowner for the continued use of OLDS is about \$750. This cost can be compared to the costs per customer developed in the following sections for the sewer extension alternatives.

### **6.4.2 Lakeside Area**

The capital design and construction cost for the selected alternative (Alternative No. 2) is \$543,000. If an assumption is made that the tapping fees from the new customers are applied towards the cost of the project, the income from 11 tapping fees at the present rate of \$2,064.87 per EDU is \$22,714. The total tapping fee is \$3,130, but \$1,065.13 is paid directly to Ephrata Borough for the treatment capacity. In this example, the remaining cost to finance is \$520,286. If the project is funded by a bond issue at an interest rate of five percent for a 30-year period, the annual debt service is \$33,851. If only the new customers of the sewer system in Lakeside incur this cost, it is equivalent to \$3,077 per customer, for debt service alone. Obviously, this is not a financially feasible alternative. Another alternative is to share the cost among all of the sewer system users.

In the 2001 Morganshire-Lakeside Smokestown Act 537 Plan Amendment, extension of public sewer service to the Lakeside area was scheduled for implementation in 2009-2010 based on a projected completion date for the Morganshire sewer facilities. For the purpose of this Plan Update it is proposed that the alternative to provide public sewer service be placed in the five-year planning period. Design would begin in 2010 with construction starting in 2011, and the service connections would be completed in 2012. However, the timing of this project is dependent upon the ability of the Authority to secure funding without a major impact to user fees.

### **6.4.3 Smokestown Road**

The capital design and construction cost for the recommended alternative (Alternative No. 1) is \$2,500,000. If an assumption is made that the tapping fees from the new customers are applied towards the cost of the project, the income from 38 tapping fees at the present rate of \$2,064.87 per EDU is \$78,465. If the total remaining cost to finance is \$2,421,535, and the interest rate is 5 percent for a 30-year period, the annual debt service is \$157,549. If only the new customers of the sewer system along Smokestown Road incur this cost, it is equivalent to \$4,146 per customer, for debt service alone. Alternatively, the debt service could be shared among all sewer system users.

Extension of public sewer service to Smokestown Road was scheduled for construction in 2014 with design and financing starting in 2013 in the implementation schedule for the 2001 Morganshire-Lakeside Smokestown Act 537 Plan Amendment. For the purpose of this Plan Update, it is proposed that the alternative to provide public sewer service be placed in the ten year planning period for implementation, with a slightly modified schedule. In order to allow adequate time for construction, design will begin in 2012 with construction starting in 2013. Connection of service lines will occur in 2015.

However, the timing of this project is dependent upon the ability of the Authority to secure funding without a major impact to user fees.

#### **6.4.4 Pinewood Area**

The capital design and construction cost for the most cost-effective alternative (Alternative No. 4) is \$2,171,000. Tapping fee income from the 62 new customers at the present rate of \$2,064.87 per EDU is \$128,022. If the total remaining cost to finance is \$2,042,978, and the interest rate is 5 percent for a 30-year period, the annual debt service is \$139,920. If only the new customers of the sewer system in the Pinewood area incur this cost, it is equivalent to \$2,144 per customer, for debt service alone. A similar analysis for Alternative No. 2, with a capital design and construction cost of \$2,412,000, results in an increase of \$2,280 per EDU each year for customers in the Pinewood area. Alternatively, the debt service could be shared among all of the sewer system customers.

Extension of public sewer service to the Pinewood area was scheduled for design in 2012 and construction in 2014 in the 2002 Pinewood Area Sewage Facilities Plan. The Pinewood area remains in the ten-year planning period in this Plan Update. However, in order to stagger the ramifications of undertaking such high-capital projects with so few new sewer users, it is recommended that the schedule be revised to provide for design and construction beginning in 2015, with final service connections in 2017. However, the timing of this project is dependent upon the ability of the Authority to secure funding without a major impact to user fees.

#### **6.4.5 Stevens Pumping Station**

The funding situation for the Stevens Pumping Station differs from the other alternatives, because the Stevens alternative is prompted by growth in the area. The Authority will ultimately only be responsible for a portion of the pumping station cost, while private developers will cover the remaining cost of the station and all of the force main and gravity sewer costs. A discussion of the cost distribution for the Stevens Pumping Station is provided in Appendix N.

## Section 7

# Institutional Evaluation

### 7.1 Introduction

The East Cocalico Township Authority (ECTA) provides wastewater conveyance services to portions of East Cocalico Township. The Authority's facilities consist of gravity sewers ranging in size from 8 inches through 24 inches, force mains ranging in size from 4 inches through 12 inches, and low-pressure lines ranging in size from 2 to 2.5 inches. The total length of sewer lines in the ECTA system is approximately 242,500 linear feet

The Authority's wastewater conveyance system includes four pumping stations with design pumping capacities up to 1,264 gallons per minute. Three of the stations are currently owned by the Authority. These pumping stations are the Gehman School Road Pumping Station (PS #1), Stevens Road Pumping Station (PS #2), and the North Muddy Creek Road Pumping Station (PS #3). The ACME Building 264 Pumping Station (PS #4) is currently owned by Albertson's, Inc. but is being operated by the Authority. It is expected to be dedicated to the Authority sometime in 2006.

The wastewater from the Authority service area is treated at two wastewater treatment facilities: the Ephrata Wastewater Treatment Facility (WWTF) No. 2 and the Adamstown Wastewater Treatment Plant (WWTP). The Adamstown WWTP receives flow from PS #4 and the Rose Hill development under an agreement with the Authority that flows will not exceed 100,000 gallons per day. The Ephrata WWTF No. 2 receives flow from PS #1, 2, 3 and all other gravity flow lines in the Authority's service area.

#### 7.1.1 Financial and Debt Status

The East Cocalico Township Authority adopted its current operating budget on February 10, 2005. The budget includes all anticipated income and expenditures for the current fiscal year that runs from March 1, 2005 through February 28, 2006. The projected income includes sewer revenue, tapping and other fees, and interest earnings. The projected expenditures include operating and administrative expenses and debt service payments. The budget anticipates a positive cash flow with income exceeding expenses. The Authority's Auditor performs an annual audit of the Authority's financial records. The Authority has always received a clean audit in conformance with generally accepted accounting principles. A copy of the Authority's Operating Budget for FY 2007/2008 is included in Appendix K.

The only outstanding debt of the Authority consists of a Guaranteed Sewer Revenue Bond. The Series of 2002 Bond is in the amount of \$3,580,000. Proceeds from the sale of bonds were used for the financing of ongoing sewer system capital improvement projects and the refinancing of previous Authority debt. The closing documents for the bond included a certificate prepared by the Authority's consulting engineer that included the opinion that estimated sewer rentals, together with other available revenue, would be sufficient to meet the financial obligations of the bond and Authority operating expenses. A copy of the

annual payment schedule for the bond is included in Appendix L.

### **7.1.2 Operating and Administrative Resources**

The East Cocalico Township Authority is an operating authority that employs its own operating and administrative staff. Currently, the operating staff includes a system superintendent, an assistant superintendent, and two system operators. There is one vacancy for a third system operator. The two system superintendents and one of the system operators hold valid PADEP certifications for the operation of wastewater collection systems. All of the operating staff positions are full-time. Although not frequently required, the Township road crew is available to assist the Authority staff in the event of a severe emergency. The administrative staff includes three full-time employees who share all administrative duties including reception, billing, bookkeeping, permitting, and other duties as assigned by the Authority and Authority Manager. The East Cocalico Township Manager also serves as the manager of the East Cocalico Township Authority.

Approximately one-quarter of the manager's time is devoted to the East Cocalico sewer system. It should be noted that the East Cocalico Township Authority owns and operates both the East Cocalico sewer system and the East Cocalico water system. Approximately one-half of the time of all operating and administrative staff is devoted to the sewer system and one-half to the water system.

The Authority maintains separate office space in the East Cocalico Township Office Building located at 102 Hill Road, Denver, PA. The office space is rented from East Cocalico Township. The current rental fee is \$900 per month which is split equally between water and sewer. The Authority maintains regular office hours between 8:00AM and 4:30PM weekdays. The Authority owns its own maintenance facility located on Ridge Avenue in Reamstown, PA. The maintenance facility consists of a 30 x 60-foot four-bay garage and a 28 x 40-foot three-bay garage with attached office and lunch room space. Authority equipment includes four pick-up service trucks, one backhoe, one dump truck, hand tools, safety equipment, and a lateral camera. The Authority also maintains a complete supply of operating supplies and critical spare parts. The Authority also has a working relationship with Jet Vac Services, Inc., Mechanicsburg, PA who provides the Authority with sewer cleaning and televising services on a routine and emergency basis.

### **7.1.3 Legal Authority**

The East Cocalico Township Authority is a municipality authority incorporated pursuant to an ordinance of the Board of Supervisors of East Cocalico Township, Lancaster County under provisions of the Municipality Authorities Act of 1945, as amended, now Chapter 56 of Title 53, Pennsylvania Consolidated Statutes, of the Commonwealth of Pennsylvania. A Certificate of Incorporation was issued by the Secretary of the Commonwealth of Pennsylvania on February 21, 1957. The Authority is granted statutory powers under the provisions of the Act. The Authorities Act provides that authorities incorporated thereunder may sue and be sued; may enter into leases and other contracts; may acquire property by any lawful means, including the exercise of the power of eminent domain; may hold, operate, and maintain properties; may issue bonds and secure their payment by a pledge of general or special revenues; and may charge and collect rates, fees, and other charges for

the use of their facilities. The Authority is permitted by the Authorities Act to acquire, hold, construct, finance, improve, maintain and operate, own or lease sewers, sewer systems or parts thereof, and sewage treatment works, including works for treating and disposing of industrial wastes.

The Authority presently owns and operates the East Cocalico sewer system, as described above. The governing body of the Authority is comprised of a board of nine members who are appointed by the Board of Supervisors of the Township to serve for five-year terms. The terms of the members of the Authority are staggered, with at least one member's term expiring each year.

## **7.2 Implementation of Selected Alternatives**

### **7.2.1 Institutional Alternative**

This East Cocalico Township Act 537 Plan Update recommends the implementation of a series of alternatives to address the projected sewage needs of the municipality. Most of the recommended alternatives can be implemented with the existing institutional structure currently in place in the Township. The East Cocalico Township Authority has the power to raise the necessary capital to fund projects that are deemed to be financially viable and are approved by the Township Board of Supervisors. The East Cocalico Township Board of Supervisors currently has in place the necessary ordinances to mandate connection to sewerage facilities constructed by the Authority. No additional municipal agencies or organizations are necessary to finance, administer, or implement any sewer extension projects to the existing East Cocalico sewer system.

This Plan Update also recommends the continuation of the implementation of the current OLDS Management program for East Cocalico Township. No new organizations or administrative entities will be required to accomplish this objective.

### **7.2.2 Administrative and Legal Activities**

As stated in the previous section, no new authorities or agencies will be required for implementation of the recommended alternatives. The construction of sewer extensions to the existing East Cocalico sewer system can be accomplished by the East Cocalico Township Authority in cooperation with the East Cocalico Township Board of Supervisors. Sewage generated as a result of the proposed sewer extension projects will be transported for treatment at either Ephrata Plant No. 2 or the Adamstown WWTP. Since intermunicipal agreements are currently in place with both Ephrata and Adamstown and no other municipalities or authorities will be involved in these projects, no new intermunicipal agreements are required. All required ordinances, regulations, and standards are currently in place. Required sewer easements for the sewer extensions will be obtained by the Authority through negotiated purchase or, if necessary, by eminent domain.

The implementation of the proposed revisions to the Township's Subdivision and Land Development Ordinance to define the requirements for a preliminary hydrogeologic investigation for new development as part of the planning process will require the

adoption of a modified ordinance by the East Cocalico Board of Supervisors.

### **7.2.3 Intermunicipal Agreements**

As stated above in the Introduction, the Authority currently has intermunicipal agreements in place with both the Boroughs of Ephrata and Adamstown for the treatment and disposal of sewage generated within East Cocalico Township. Originally, all sewage from the Township was transported to the Borough of Ephrata. In the mid-1990's, due to potentially overloaded conditions at the existing Ephrata treatment facility, the Authority entered into an agreement with the Borough of Adamstown for the diversion of a portion of the existing and future sewage flow from a designated portion of the Township to the Adamstown WWTP. Based on a review of the two intermunicipal agreements performed in conjunction with this Act 537 Plan Update, it was determined that continuation of the discharge of sewage to both Ephrata and Adamstown may not be in the best future interests of the Authority. Due to the configuration of the East Cocalico sewer system, it would not be feasible to eliminate the discharge to Ephrata. However, it may be feasible for the Authority, at some time in the future, to eliminate the discharge to Adamstown. A much more detailed analysis of this situation is presented in a memorandum to the East Cocalico Township Authority dated January 23, 2006. The memorandum is included in Appendix M.

### **7.2.4 Implementation Schedule**

A detailed schedule for the implementation of the recommended alternatives is presented in Section 8 of this Plan Update. This schedule includes all of the significant milestones associated with each alternative including milestones associated with planning, design, permitting, construction, and operation. The schedule also includes significant milestone dates associated with the implementation of the institutional requirements as outlined in this section.

## **Section 8**

# **Justification for Selected Technical and Institutional Alternatives**

### **8.1 Introduction**

This section of the Plan Update identifies the selected technical and institutional alternatives that best meet the present and future wastewater needs of East Cocalico Township. Alternative selection was based on wastewater disposal needs, cost-effectiveness, available management and administrative systems, ability to meet growth projections and environmental soundness.

### **8.2 Technical and Institutional Alternatives**

The selected alternative for the Lakeside area is the construction of a low-pressure sewer system along Swartzville Road, directing flow to the proposed sewer system in the Morganshire development. The properties along Smokestown Road are proposed to be serviced by public sewer consisting of a gravity sewer line, a low-pressure sewer line, a pumping station, and a force main connecting into the existing gravity sewer in Smokestown Road. Public sewer service is proposed for extension to the Pinewood area through either a gravity sewer line or a combination of a gravity sewer line and a low-pressure sewer line that would connect to the IMG interceptor. The capacity of the Stevens Pumping Station will be increased by constructing a new pumping station at the existing site and expanding the force main and gravity collection lines, as prompted by additional development.

The recommended alternatives can be implemented with the existing institutional structure currently in place in the Township. The construction of sewer extensions to the existing East Cocalico sewer system can be accomplished by the East Cocalico Township Authority in cooperation with the East Cocalico Township Board of Supervisors. All required ordinances, regulations and standards are currently in place. The Board of Supervisors will need to adopt a revision to the current Subdivision and Land Development Ordinance to address the requirements of a preliminary hydrogeologic investigation for new development as part of the land development planning process.

### **8.3 Capital Financing Plan**

The recommended capital financing plan selected as the preferable option in Section 6 of this Plan Update is the use of a bond issue or a bank loan, supplemented if possible with Community Development Block Grants.

### **8.4 Implementation Schedule**

Act 537 Plan Adoption activities are listed below. After approval of this Act 537 Plan Update by East Cocalico Township, the East Cocalico Township Authority and PADEP, it is

anticipated that the implementation plan for the selected alternatives will follow as outlined below.

### 8.4.1 Act 537 Plan Adoption Activities

<u>Activity</u>	<u>Milestone</u>
Submission of Draft Act 537 Plan Update to East Cocalico Township	April 2007
Initiate 30-Day Act 537 Public Notification and Comment Period	May 2007
Completion of Act 537 Public Notification and Comment Period	June 2007
Receipt of Public Comments	June 2007
Respond to Comments and Completion of Act 537 Plan Update	June 2007
Adoption of Act 537 Plan Update by East Cocalico Township	July 2007
Submission of Act 537 Plan Update to PADEP	July 2007
Receipt of PADEP Comments	August 2007
Submission of Revised Act 537 Plan Update to PADEP	September 2007
Final Approval of Act 537 Plan Update by PADEP	September 2007
Submission of PADEP Planning Assistance Grant Reimbursement Application	One Month after Plan Approval

### 8.4.2 Expansion of Sewer Service Area to Existing Areas of Concern

The timing for these capital projects is contingent upon the availability of funds that will not significantly impact system user fees.

<u>Activity</u>	<u>Milestone</u>
<i>Stevens Pumping Station</i>	<i>Two Years after Plan Approval</i>
Design and Permitting of Pumping Station	1 Month - 8 Months after Plan Approval
Construction of Pumping Station	9 Months - 18 Months after Plan Approval
Construction of New Force Main and Gravity Sanitary Sewer	Development Driven

<u>Activity</u>	<u>Milestone</u>
<i>Sewer Service to Lakeside Area</i>	<i>Five Years after Plan Approval</i>
Obtain Project Financing Including Investigation of CDBG Eligibility	38 Months after Plan Approval
Design and Permitting of Sewer Facilities	44 Months - 50 Months after Plan Approval
Construction of Sewer Facilities	50 Months - 54 Months after Plan Approval
Issuance of Connection Notices	54 Months after Plan Approval
Connection to Sewer Facilities	60 Months after Plan Approval
<i>Sewer Service to Smokestown Road</i>	<i>Eight Years after Plan Approval</i>
Obtain Project Financing Including Investigation of CDBG Eligibility	60 Months after Plan Approval
Design and Permitting of Sewer Facilities	66 Months - 78 Months after Plan Approval
Construction of Sewer Facilities	78 Months - 90 Months after Plan Approval
Issuance of Connection Notices	90 Months after Plan Approval
Connection to Sewer Facilities	96 Months after Plan Approval
<i>Sewer Service to Pinewood Area</i>	<i>Ten Years after Plan Approval</i>
Obtain Project Financing Including Investigation of CDBG Eligibility	94 Months after Plan Approval
Design and Permitting of Sewer Facilities	100 Months - 106 Months after Plan Approval
Construction of Sewer Facilities	106 Months - 114 Months after Plan Approval
Issuance of Connection Notices	114 Months after Plan Approval
Connection to Sewer Facilities	120 Months after Plan Approval

### 8.4.3 Additional Ordinances

Activity

Milestone

Revision to Subdivision and Land  
Development Planning Ordinance  
(as outlined in Section 5.3.3)

One Month after Plan Approval

Advertise and Adopt Revision to Ordinance

Two Months after Plan Approval

Begin Implementation of Revised Ordinance

Three Months after Plan  
Approval

Table 2-1

## Soil Types - East Cocalico Township

Soil Symbol	Soil Name	Slope	Prime Farmland	Depth to Bedrock (in)	OLDS Suitability	Limitations to OLDS	Limitations to Development
AbB	Abottstown silt loam	3-8%	No	>40	Subsurface System (>60")/Elevated Sand Mound	Severe: wetness, percs slowly	Severe: wetness, frost action
AsB	Abottstown extremely stony silt loam	3-8%	No	>40	Subsurface System (>60")/Elevated Sand Mound	Severe: wetness, percs slowly	Severe: wetness, frost action
Bo	Bowmansville silt loam	0-3%	No	>60	Subsurface System	Severe: flooding, wetness, percs slowly	Severe: wetness, frost action, flooding, cut banks cave
BrC	Brecknock gravelly silt loam	8-15%	No	40-60	Elevated Sand Mound (<12%)/Unsuitable	Moderate: depth to rock, percs slowly, slope	Moderate: depth to rock, frost action; Severe: slope
BsC	Brecknock very stony silt loam	8-25%	No	40-60	Elevated Sand Mound (<12%)/Unsuitable	Severe: wetness, slope	Severe: slope
BuA	Bucks silt loam	0-3%	Yes	>40	Elevated Sand Mound	Severe: percs slowly	Moderate: shrink-swell, frost action, low strength
BuB	Bucks silt loam	3-8%	Yes	>40	Elevated Sand Mound	Severe: percs slowly	Moderate: shrink-swell, frost action, low strength, slope
BuC	Bucks silt loam	8-15%	No	>40	Elevated Sand Mound/Unsuitable	Severe: percs slowly	Moderate: shrink-swell, frost action, low strength, slope; Severe: slope
BuD	Bucks silt loam	15-25%	No	>40	Subsurface System (>60")/Unsuitable	Severe: percs slowly, slope	Severe: slope
BxC	Bucks very stony silt loam	8-25%	No	>40	Subsurface System (>60")/Elevated Sand Mound	Severe: slope	Moderate: slope, shrink/swell, frost action, low strength, slope; Severe: slope
CkA	Clarksburg silt loam	0-5%	Yes	>60	Subsurface System	Severe: wetness, percs slowly	Moderate: wetness, shrink/swell, large stones, frost action, low strength; Severe: slope
DbA	Duffield silt loam	0-3%	Yes	>48	Subsurface System (>60")/Elevated Sand Mound	Moderate: depth to rock	Moderate: shrink/swell; Severe: low strength
DbB	Duffield silt loam	3-8%	Yes	>40	Subsurface System (>60")/Elevated Sand Mound	Moderate: depth to rock	Moderate: shrink/swell, slope; Severe: low strength

Table 2-1

## Soil Types - East Cocalico Township

Soil Symbol	Soil Name	Slope	Prime Farmland	Depth to Bedrock (in)	OLDS Suitability	Limitations to OLDS	Limitations to Development
EcA	Elk silt loam	0-3%	Yes	>60	Subsurface System	Moderate: percs slowly	Severe: low strength
EcB	Elk silt loam	3-8%	Yes	>60	Subsurface System	Moderate: percs slowly	Moderate: slope; Severe: low strength
HaB	Hagerstown silt loam	3-8%	Yes	>40	Subsurface System (>60")/Elevated Sand Mound (<12%)/Unsuitable	Moderate: depth to rock, percs slowly	Moderate: shrink/swell, depth to rock, slope, too clayey, too much stone; Severe: low strength
HbC	Hagerstown silty clay loam	8-15%	No	>40	Subsurface System (>60")/Elevated Sand Mound	Moderate: depth to rock, percs slowly, slope	Moderate: depth to rock, shrink/swell, too clayey, slope, large stones; Severe: slope, low strength
HbD	Hagerstown silty clay loam	15-30%	No	>40	Subsurface System (>60" & <25%)/Unsuitable	Severe: slope	Severe: slope, low strength
He	Hagerstown urban land complex	0-15%	No	>40	Unsuitable	Moderate: depth to rock, percs slowly	Moderate: depth to rock, too clayey, shrink/swell, slope, large stones; Severe: low strength
Hg	Holly silt loam	0-3%	No	>60	Subsurface System	Severe: flooding, wetness, percs slowly	Severe: cut banks cave, wetness, flooding, frost action
LaB	Lansdale silt loam	3-8%	Yes	40-60	Elevated Sand Mound	Moderate: depth to rock, percs slowly	Moderate: slope, frost action
Lg	Linden silt loam	0-3%	Yes	>60	Subsurface System	Severe: flooding, wetness, poor filter	Moderate: flooding, wetness; Severe: flooding
Ln	Lindside silt loam	0-3%	Yes	>60	Subsurface System	Severe: flooding, wetness	Severe: flooding wetness
Qu	Pitts quarry	NA	NA	NA	Unsuitable	NA	NA
RaB	Readington silt loam	3-10%	No	40-60	Elevated Sand Mound	Severe: wetness, percs slowly	Moderate: wetness, slope, low strength, frost action; Severe: wetness
RbB	Readington extremely stony silt loam	3-8%	No	40-60	Elevated Sand Mound	Severe: wetness, percs slowly	Moderate: wetness, slope, low strength, frost action, small stones, large stones

Table 2-1

## Soil Types - East Cocalico Township

Soil Symbol	Soil Name	Slope	Prime Farmland	Depth to Bedrock (in)	OLDS Suitability	Limitations to OLDS	Limitations to Development
Rd	Rowland silt loam	0-3%	Yes	>60	Subsurface System	Severe: flooding, wetness, percs slowly	Moderate: flooding, wetness; Severe: cut banks cave, flooding, wetness, frost action
UaB	Ungers loam	3-8%	Yes	40-60	Elevated Sand Mound	Moderate: depth to rock, percs slowly	Moderate: slope, frost action
UaC	Ungers loam	8-15%	No	40-60	Elevated Sand Mound (<12%)/Unsuitable	Moderate: depth to rock, percs slowly, slope	Moderate: slope, frost action; Severe: slope
UaD	Ungers loam	15-25 %	No	40-60	Unsuitable	Severe: slope	Severe: slope
UbB	Ungers extremely stony loam	3-8%	No	40-60	Elevated Sand Mound	Moderate: depth to rock, percs slowly	Moderate: slope, frost action, large stones
UbD	Ungers extremely stony loam	8-25%	No	40-60	Elevated Sand Mound (<12%)/Unsuitable	Severe: slope	Severe: slope
UbE	Ungers extremely stony loam	25-50%	No	40-60	Unsuitable	Severe: slope	Severe: slope
Uc	Urban land	NA	NA	NA	Unsuitable	NA	NA
Ud	Udorthents loamy	0-25%	No	NA		NA	NA
W	Water	NA	NA	NA	Unsuitable	NA	NA

EAST COCALICO TOWNSHIP

Lancaster County, Pennsylvania

ORDINANCE NO. 2003-02

AN ORDINANCE DEFINING AND REGULATING THE INSTALLATION, CONSTRUCTION, ALTERATION, REPAIR, AND MAINTENANCE OF INDIVIDUAL AND COMMUNITY ONLOT SEWAGE DISPOSAL SYSTEMS AND HOLDING TANKS WITHIN EAST COCALICO TOWNSHIP; REQUIRING PERMITS FOR AND PROVIDING FOR INSPECTIONS, AND PRESCRIBING PENALTIES FOR VIOLATION OF THE ORDINANCE.

ENACTED AND ORDAINED by the Supervisors of East Cocalico Township as follows:

DECLARATION OF PURPOSE

The purpose of this Ordinance is to promote the health and safety of the people of East Cocalico Township through the regulation of onlot sewage disposal systems.

OBJECTIVES

It is the objective of the Township to provide through this Ordinance adequate and safe methods of onlot sewage disposal, and to minimize the potential for the contamination of groundwater or surface water by any existing or future onlot sewage disposal system.

SECTION 1.0 - DEFINITIONS

- 1.1 - With the exception of those words and terms defined in Section 1.2 of this Ordinance, all words and terms used in this Ordinance shall be defined in accordance with Section 71.1 of Chapter 71, Section 72.1 of Chapter 72, Section 73.1 of Chapter 73 of the Department's Regulations.
- 1.2 - The following words and terms, when used in this Ordinance, shall have the following meanings:
  - a. Absorption Area - A component of an individual or community sewage system where liquid from a treatment tank seeps into the soil; it consists of an aggregate-filled area containing piping for the distribution of

liquid and the soil or sand/soil combination located beneath the aggregate.

1. Primary Absorption Area - This absorption area which is initially permitted and installed for the proposed use.
  2. Alternate Absorption Area - A tested area which is reserved for possible future installation of an absorption area, if the primary absorption area is clogged or otherwise is malfunctioning.
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- b. Act - The Pennsylvania Sewage Facilities Act (35 P. §§750.1-750.20).
  - c. Board of Supervisors - The Board of Supervisors of East Cocalico Township, Lancaster County, Pennsylvania.
  - d. Chapter 71 of the Department's Regulations - Title 25, Pennsylvania Code, Chapter 71, "Administration of Sewage Facilities Planning Program".
  - e. Chapter 72 of the Department's Regulations - Title 25, Pennsylvania Code, Chapter 72, "Administration of Sewage Facilities Permitting Program".
  - f. Chapter 73 of the Department's Regulations - Title 25, Pennsylvania Code, Chapter 73, "Standards for Sewage Disposal
  - g. Community Sewage System - A sewage facility, whether publicly or privately owned, for the collection of sewage from two or more lots, or two or more equivalent dwelling units and the

treatment or disposal; or both, of the sewage on one or more of the lots or at any other site.

- h. Department - The Department of Environmental Protection of the Commonwealth of Pennsylvania.
- i. Holding Tank - Means a watertight tank, whether permanent or temporary, which receives and retains sewage conveyed by a water carrying system and is designed and constructed to facilitate the ultimate disposal of the sewage at another site.

Improved Property - Shall mean any property within the Township upon which there is erected a structure intended for continuous or periodic habitation, occupancy or use by human being or animals, and from which structure sewage shall or may be discharged.
- k. Individual Sewage System - A system of piping, tanks or other facilities serving a single lot and collecting and disposing of sewage in whole or in part into the soil or into any waters of the Commonwealth of Pennsylvania or by means of conveyance to another site for final disposal.
- 1. Official Plan - A Comprehensive Plan for the provision of adequate sewage systems adopted by the Township, and submitted to, and approved by the Department as provided by the Act and Chapter 71 of the Department's Regulations.
- m. Owner - Shall mean any person vested with ownership, legal or equitable, sole or partial, of any property located in the Township.

n. Person - An individual, association, public or private corporation for profit or not-for-profit, partnership, firm, trust, estate, department, board, bureau or agency of the United States, Commonwealth, political subdivision, municipality, district, authority or another legal entity which is recognized by law as the subject of rights and duties. The term includes the members of an association, partnership or firm and the officers of a local agency or municipal, public or private corporation for profit or not-for-profit.

o. Pumper/Hauler - Any person who engages in cleaning any or all components of a community or individual onlot system and evacuates and transports the septage cleaned therefrom, whether for a fee or free of charge.

ID Sewage - A substance that contains the waste products or excrement or other discharge from the bodies of human beings or animals and any noxious or deleterious substances being harmful or inimical to the public health, or to animal or aquatic life, or to the use of water for domestic water supply or for recreation.

This term includes any substance which constitutes pollution under the Clean Streams Law.

q. Sewage Enforcement Officer - An official of the local agency who reviews permit applications and sewage facilities planning modules, issues permits as authorized by the act and conducts investigations and inspections that are

necessary to implement the Act and the regulations thereunder.

- r. Soil Modification - A process by which small diameter pellets of plastic or a similar material are injected into the soil in the vicinity of the absorption area of an onlot sewage disposal system. The process is intended to fracture the soil and improve porosity of the soil. The Township does not make any claim or representation that such "Soil Modification" will improve soil porosity or soil permeability.
- s. Township - Shall mean East Cocalico Township, Lancaster County, Pennsylvania.

#### SECTION 2.0 - DESIGNATION OF SEWAGE ENFORCEMENT OFFICER

- 2.1 - The Board of Supervisors shall annually appoint one or more Sewage Enforcement Officers and an Alternate Sewage Enforcement Officer (If only one [1] primary Sewage Enforcement Officer is appointed) as its Sewage Enforcement Officer(s) to carry out the duties specified in this Ordinance. Such officer shall serve until he or she resigns, is dismissed by the Board of Supervisors, or has his or her certification suspended or removed by the Department.
- 2.2 - In January of each year the Board of Supervisors shall submit the name and address of its Sewage Enforcement Officer(s) to the Department. The Board of Supervisors shall notify the Department within thirty (30) days of any change in the information referred to in this subsection.

#### SECTION 3.0 - CONDUCT OF SEWAGE ENFORCEMENT OFFICERS

- 3.1 - All Sewage Enforcement Officers shall abide by the Standards of Conduct specified in Chapter

72 of the Department's Regulations. Violation of any of these standards shall be grounds for dismissal by the Supervisors.

#### SECTION 4.0 - GENERAL REQUIREMENTS

- 4.1 - The installation of any treatment tank, subsurface absorption area, spray field, or any holding tank constitutes either the installation of an individual or a community sewage system and requires a permit prior to beginning the installation of the system or beginning the construction, installation or occupancy of any building or buildings for which such a system will be installed.

The installation of an individual or community sewage system shall include any repairs to, the alteration, replacement, or enlargement of any treatment tank, subsurface absorption area, spray field, or holding tank. A permit shall be required for all these activities regardless of the acreage of the tract on which the ,individual or community sewage system is to be installed or repaired.

- 4.2 - "Soil Modification" is hereby deemed to constitute the alteration of an onlot sewage disposal system, and shall only be undertaken pursuant to a permit issued by the Sewage Enforcement Officer.
- 4.3 - The Board of Supervisors will issue, deny, and revoke permits only by and through its Sewage Enforcement Officer(s).
- 4.4 - If construction or installation of an individual or community sewage system and of any building or structure for which such system is to be installed has not commenced within three (3) years after the issuance of a permit for such system, the said permit shall expire.

A new permit shall be obtained prior to the commencement of said construction or installation.

- 4.5 - Construction of a new sewage system for a newly occupied building will be known as a "new sewage system" for the purposes of this Ordinance. The alteration, enlargement, augmentation, modification, repair, or replacement of an existing onlot sewage disposal system for a structure which is occupied at the time of the application for permit issuance shall be known as a "repair sewage system" for the purposes of this Ordinance.
- 4.6 - The site investigations and procedures for permit issuance shall follow the standards in Chapters 71, 72, and 73 of the Department's "Rules and Regulations" and this Ordinance.
- 4.7 - The design and installation of an individual or community sewage system, or part thereof, shall be done in conformance with the standards in Chapter 73 of the Department's "Rules and Regulations" and this Ordinance.
- 4.8 - Application for permits for new sewage systems which are not consistent with the Official Plan of the Township shall not be approved.
- 4.9 - No individual or community system shall be installed in an area identified by completed Federal Flood Insurance mapping as a floodway or where completed flood mapping is not available, a floodway extends fifty feet (50') from the top of the stream bank as determined by the local agency. This paragraph is not applicable to spray fields.

- 4.10 - The minimum isolation distances described in Department Regulations shall be the same as indicated in those Regulations.

SECTION 5.0 - APPLICATION AND TESTING PROCEDURES AND PERMIT ISSUANCE

- 5.1 - Application for a permit shall be made by the property owner, equitable owner, or an authorized agent of the owner or equitable owner to the Sewage Enforcement Officer prior to the commencement of construction, alteration or repair of individual or community sewage system, or the construction of expansion of any building for which such a system is to be installed or used.

- 5.2 - The application shall contain the following:

- a. The information found on the Application Form 3640-FM-WQ 0290, current revision, prescribed by the Department.
- b. Such further information as may be required by the Sewage Enforcement Officer to insure that the proposed action complies with the regulations promulgated by the Department.
- c. Application Fee.

Application forms may be obtained from the Sewage Enforcement Officer or Township office.

- 5.3 - a. When the Sewage Enforcement Officer has determined that an initial application is incomplete or that it is unable to verify the information contained in an application, the Sewage Enforcement Officer shall notify the applicant in writing within seven (7) days of receipt

of the application. The notice shall include the reasons why the application is not acceptable. When the required information is received, the Sewage Enforcement Officer shall act upon the application within fifteen (15) days.

- b. Failure of the Sewage Enforcement Officer to act on an application does not constitute permit approval. If the Sewage Enforcement Officer does not act upon an application within seven (7) days of receipt, or within fifteen (15) days of receipt of supplemental information under Subsection (a), the applicant may request a hearing before the Board of Supervisors.

#### 5.4 - New Sewage Systems

For new systems, the application and review process consists of the following four stages:

- a. Preliminary stage
- b. Site evaluation stage
- c. System design stage
- d. Final inspection stage

5.4.1 - In the preliminary stage, the applicant obtains an Application Form 3640-FM-WQ0290, current revision, from the Sewage Enforcement Officer, completes Part I and signs Part IV of the form and submits it along with the appropriate permit fee to the Sewage Enforcement Officer. The Sewage Enforcement Officer reviews Part I and an on-site evaluation is scheduled at a mutually agreed time.

5.4.2 -In the site evaluation stage, the Sewage Enforcement Officer observes the soil test pits, conducts or observes percolation

tests and slope measurements, and completes Part IV of the application. Unless otherwise instructed by the Sewage Enforcement Officer, it shall be the responsibility of the applicant to prepare the site for inspection, including the digging and proper preparation of the percolation test holes as specified in Chapter 73 of the Department's Regulations, the digging of a soil test pit at least seven feet (7') deep, any general clearing of the site necessary to make slope measurements, conducting soil and percolation tests, and providing water for the percolation test. A passing soil and percolation test shall be provided for the primary absorption area and the alternate absorption areas. After the site evaluation stage, the applicant will be notified if the site is suitable or receive a letter of permit denial if it is not.

5.4.3 - The system design stage involves the completion of Parts II and III of the application form by the applicant. All application information and designs must be provided in a neat and legible manner. Drawings must be drawn to scale and must be prepared by a State Registered Surveyor, Licensed Engineer, or a State Certified Sewage Enforcement Officer but not one that is appointed as the Township Sewage Enforcement Officer and the Drawing must show the following:

- a. All information required under Parts II and III of the application;
- b. All test pits and percolation tests (pass or fail) conducted on the lot;
- c. Alternate absorption area location;

- d. Location and width of all right-of-way, easements, building restriction lines, including any limitations on their use;
- e. Existing and proposed contours at two-foot (2') intervals and spot elevations for the following:
  - 1. First floor elevation of any structure.
  - 2. Elevation at each corner and high point of the proposed absorption area. In addition, if an elevated sand mound system is required, the existing grades at each corner of the proposed toe of berm must be shown.
  - 3. Elevation of existing grade at the proposed pump tank or lift station if required.
- f. Show how stormwater will be diverted around the sewage system area;
- g. The primary and alternate absorption areas and those areas must be staked in the field and protected from disturbance with snow fence, safety fence or other adequate means, prior to permit issuance;
- h. Two (2) intervisible permanent reference points that must be established in the field and shown on the Sewage Disposal System Design Plan. The dimensions to the proposed corner of the primary area from the two (2) intervisible points must also be shown on the Design Plan; and

- i. A Plan Note requiring the top of the well casing for the individual water supply be extended a minimum of one foot (1') above finished grade.

5.4.4 -When the Sewage Enforcement Officer has determined that the application is complete and meets the requirements of Chapters 71, 72, and 73 of the Department's Regulations and this Ordinance and has field verified the requirements of Section 5.4.3 (g) and (h) of this Ordinance, a permit shall be issued.

5.4.5 - Permits shall be issued or denied by the Sewage Enforcement Officer, in writing, within seven (7) days after receiving a completed application for permit, except as stated in Section 5.3. Permits may be denied at any stage during the application and review process. Reasons for denial shall be stated in a letter.

#### 5.5 - Repair Sewage Systems

For repair sewage systems, the application and review process consists of the following four (4) stages:

- a. Preliminary stage
- b. Site evaluation stage
- c. System design stage
- d. Final inspection state

5.5.1 - In the preliminary stage, the applicant obtains an Application Form 3640-FM-WQ0290, current revision, from the Sewage Enforcement Officer or Township office, completes Part I and signs Part IV of the

form and submits it along with the appropriate permit fee to the Sewage Enforcement Officer. The Sewage Enforcement Officer reviews Part I and an on-site evaluation is scheduled at a mutually agreed time.

- 5.5.2 -In the site evaluation stage, the Sewage Enforcement Officer will observe the soil test pits, the percolation test and slope measurements. Percolation tests shall be performed, when a repair absorption area is necessary and the procedure will follow the procedure outlined in Section 5.4.2. However, soil test pits and percolation tests shall not be required for an additional "alternate absorption area".

If the application for system repair only includes a request for "Soil Modification", the Sewage Enforcement Officer will provide a site evaluation, but no soil testing will be required.

- 5.5.3 -The system design stage involves the completion of Parts II and III of the application form by the applicant. The system design shall be the responsibility of the applicant and shall follow the procedure outline in Section 5.4.3.

- 5.5.4 -When the Sewage Enforcement Officer has determined that the application is complete, a permit shall be issued or denied.

- 5.5.5 - Permits shall be issued or denied by the Sewage Enforcement Officer, in writing, within seven (7) days after receiving a completed application for permit, except as shown in Section 5.3. Permits may be denied at any stage during the application

and review process. Reasons for denial shall be stated in a letter.

5.5.6 -If, during the site evaluation, the Sewage Enforcement Officer observes a system malfunction, an application for "Soil Modification" shall be denied. The applicant must undertake a system repair to correct the malfunction. "Soil Modification" shall not be approved as a means to correct a malfunction.

## 5.6 - Inspections

5.6.1 - Prior to any earth disturbance for the installation of the permitted onlot sewage disposal system, the applicant and/or contractor for the applicant must contact the Sewage Enforcement Officer to arrange for a preconstruction meeting at the site.

5.6.2 - For the final inspection stage, the applicant shall notify the Sewage Enforcement Officer when the installation is complete and ready for inspection or reinspection.

5 6 3 -The Sewage Enforcement Officer may require additional inspections prior to the final inspection for those installations he or she believes may be difficult to install per the permitted design. In those cases where additional inspection is required, the Sewage Enforcement Officer shall outline the required interim inspection on the permit under "Additional Conditions".

5.6.4 -No part of any installation shall be covered, nor in the case of new systems shall the building for which it is intended to be occupied until it is inspected and given final written approval

by the Sewage Enforcement Officer, except that the applicant may cover the installation in absence of written approval or disapproval at the expiration of seventy-two (72) hours, excepting weekends and holidays, from the date the Sewage Enforcement Officer receives the notice to inspect. The Sewage Enforcement Officer may, by order, require an installation to be uncovered at the expense of the applicant, if the installation was covered contrary to the provisions of this section.

5.6.5 -Elevated Sand Mounds, Elevated Sand Trenches and Subsurface Sand Filters; separate inspections are required as follows:

- a. First inspection upon completion of scarification or excavation of the system site.
- b. Second inspection upon completion of placement of sand.
- c. Third inspection upon completion of all piping and permanent installation of pump and alarm.
- d. Final inspection upon final cover of the absorption area and grading around the absorption area to divert stormwater.

5.6.6 -At grade onlot sewage disposal systems. Inspections a, (b) upon completion of placement of stone, (c), and d above are required for at-grade onlot sewage disposal system; all other onlot sewage disposal methods shall be inspected at key stages of construction which shall be determined by the Sewage Enforcement Office at the time of permit issuance.

## SECTION 6.0 - HOLDING TANKS

- 6.1 - It is necessary for the protection, benefit, and preservation of the health, safety, and welfare of the inhabitants of the Township to properly use and maintain all existing and new holding tanks designed to receive and retain sewage whether from residential or commercial uses.
- 6.2 - The applicant for the installation and use of a holding tank shall provide a request to the Board of Supervisors for "special permission" for the utilization of the holding tank prior to applying for the permit to install the holding tank and an application fee. This request for "special permission" should be supported by whatever information the applicant deems important to allow the Board of Supervisors to grant permission for a holding tank.
- 6.3 - Upon review of the request for "special permission", the Township Board of Supervisors shall determine whether or not the request satisfies the following criteria:
  - a. Compatible with the Township Act 537 Official Sewage Facilities Plan and the limitations of the Pennsylvania Code Title 25.
  - b. Qualify for the standards of "retaining tanks" or "holding tanks" as described in Pennsylvania Code Title 25, Chapter .73.61 and 73.62.
  - c. Comply with the other provisions of this section of this Ordinance.

#### 6.4 - Exclusive of Rights and Privileges

- a. The collection and transportation of all sewage from any improved property utilizing a holding tank shall be done solely by or under the direction and control of the Board of Supervisors, and the disposal thereof shall be made only at such site or sites as may be approved by the Department. The owner shall be required to furnish to the Township a written contract entered into between the owner and the pumper/hauler, whereby the pumper/hauler agrees to receive and dispose of the sewage at site or sites acceptable to the Township and not to cancel or terminate the contract, except upon at least ninety (90) days written notice to the Township of intention to terminate.
- b. The Township will receive, review, and retain pumping receipts from permitted holding tanks.
- c. The Township will complete and retain annual inspection reports for each permitted tank.

#### 6.5 - Duties of Improved Property Owner - The owner of an improved property that utilizes a holding tank shall:

- a. Maintain the holding tank in conformance with this or any Ordinance of this Township, the provisions of any applicable law.
- b. Enter into a Holding Tank Maintenance Agreement with the Township upon the form acceptable to the Board of Supervisors.

- c. Establish an escrow with the Township as a guarantee for performance of maintenance, in an amount established by Resolution.
- d. Maintain the holding tank cover at least three (3) inches above existing ground level and grade the property around the cover with a slope away from the cover so no stormwater runoff enters the holding tank.
- e. Maintain the holding tank cover that is "vandal-proof" and "child-proof".
- f. Permit the Board of Supervisors or their agent to inspect holding tanks on an annual basis.

Section 7.0 USE, OPERATION AND MAINTENANCE OF ONLOT SEWAGE DISPOSAL SYSTEM

7.1 - Basic operation and maintenance - All persons who own a lot upon which an onlot sewage disposal system is installed and all persons owning a building served by an onlot sewage disposal system shall properly operate and maintain such systems. Proper use and operation and maintenance of an onlot sewage disposal system shall include at a minimum:

7.1.1 - Prohibit the discharge of any of the following substances into an onlot disposal system:

- Industrial waste.
- Automobile oil and other nondomestic oil.
- Toxic or hazardous substances or chemicals, including but not limited to pesticides, disinfectants, acids,

paints, paint thinners, herbicides, gasoline, and other solvents.

- Clean surface or ground water, including water from roof or cellar drains, springs, basement sump pumps, and french drains.

7.1.2 -Maintain all system components in a functional and operational condition, including all:

- Electrical and mechanical components
- Chemical feed systems
- Collection and conveyance piping
- Pressure piping
- Treatment tanks, including septic tanks
- Baffles
- Flow splitter or distribution boxes
- Distribution piping
- Absorption piping
- Alarms
- Flow recorders
- Disinfection equipment
- Safety facilities
- Ground surface contours and other means or storm runoff diversion

7.1.3 -Provide periodic pumping and system inspection as follows:

a. The septic tank and/or treatment tank, or pump tank shall be inspected and pumped by a qualified pumper/hauler registered with the Township on the following schedule:

1. Properties located in East Cocalico Township District 1: within one (1) year of effective date of this Ordinance.
2. Properties located in East Cocalico Township District 2: within two (2) years of effective date of this Ordinance.
3. Properties located in East Cocalico Township District 3: within three (3) years of effective date of this Ordinance.
4. Thereafter, that person shall have the septic tank and/or treatment tank, pump tank, cesspool, or dry well pumped at least once every three (3) years.

b. Receipts from the pumper/hauler shall be submitted to the Township.

c. The Township may delay that owner's initial required pumping to conform to the general three-year frequency requirement, if the owner provides a receipt or other written evidence showing that their tank had been pumped within three (3) years of the first-year anniversary of the effective date of this Ordinance.

- d. The Township may allow an extension or up to two (2) years to the pump-out period when the owner can demonstrate to the Township that their onlot disposal system can operate properly for this additional period of time. This extension is not automatically renewed, and the owner must individually apply for each extension requested. Such a request must be made no sooner than six (6) months prior to the date when the next required pumping is to be completed. The request must be in writing with all supporting documents attached. The Township, in making its determination, shall take into account the information submitted by the applicant, any sewerage permit issued for the installation or rehabilitation of the system and supporting documentation, reports on the inspection and maintenance of the system and other relevant information, and may conduct an on-site inspection. The applicant shall bear the cost of any inspection, surface or subsurface, and soil or wastes sampling conducted for the purposes of evaluating the request. The applicant shall receive a decision within sixty (60) days of accumulation of all necessary information by the Township, but the application for a time extension shall be automatically denied if not approval is granted within the sixty (60) days.
- e. The required pumping frequency may be increased at the discretion of the Township if the septic and/or

treatment tank, cesspool, or dry well is undersized, or whenever an inspection reveals that the septic and/or treatment tank is filled with solids in excess of one-third (1/3) the liquid depth of the tank, or with scum in excess of one-third (1/3) the liquid depth of the tank, whichever shall require the more frequent removal, if the hydraulic load on the system increases significantly above average, if a garbage grinder is used in the building, if the system malfunctions, or for other good cause shown.

f. Each time a septic tank and/or treatment tank is pumped out, the pumper/hauler, shall provide to the Township and to the owner of the subsurface waste disposal system a signed pumper/hauler report. Report forms shall be provided by the Township. The pumper/hauler report shall contain, at a minimum, the following information:

1. Date of pumping
2. Name and address of the system owner
3. Address of the tank's location, if different from the owner's address
4. Description and diagram of the location of the tank, including the location of any markers, risers, and access hatches and size of the tank with distance to the fixed landmark

5. The date the existing system was installed
6. Last date of pump out
7. List of other maintenance performed
8. Any indication of system malfunction observed
9. Amount of septage or other solid or semisolid material removed
10. Verification that the baffles have been inspected and are found to be in good working condition.
11. Verification that ground surface contours and other measures consistent with Chapter 73 (relative to standards for onlot sewage treatment facilities) to divert stormwater away from treatment facilities and absorption areas are being maintained and that these facilities are protected from physical damage.
12. List of recommendations
13. The Department of Environmental Protection Permit Number destination of the septage (name of the treatment facility)
14. Pumper/hauler truck operator's signature and pumper/hauler business owner's signature

- g. Inspections can be provided by the pumper/hauler truck operator.
  - h. The pumper/hauler report and receipt must be submitted to the Township's business office within thirty (30) days of the date of pumping.
1. Any owner served by an alternative system or onlot sewage disposal system which onlot sewage disposal contains an aerobic treatment tank shall follow the operation and maintenance recommendations of the equipment manufacturer. A copy of the manufacturer's recommendations and a copy of the system Service Agreement recommended by the manufacturer shall be submitted to the Township within six (6) months of the effective date of this Ordinance. Thereafter, service receipts shall be submitted to the Township at the intervals specified by the manufacturer's recommendations. In no case, however, may the service or pumping intervals exceed those required for septic tanks.

## 7.2 - Additional Maintenance

The Township and/or the Sewage Enforcement Officer may require additional maintenance activity, including, but not necessarily limited to, cleaning and unclogging of piping, servicing and the repair of mechanical equipment, leveling of distribution boxes, tanks, and lines, removal of obstruction roots or trees, the diversion of surface water away from the disposal area, etc. The determination of the requirement for the additional maintenance shall be based upon a need as

identified by the Township Sewage Enforcement Officer. Repair permits issued by the Sewage Enforcement Officer must be secured for these activities.

7.3 - Reporting of Malfunctioning Onlot Sewage Disposal Systems: Any person who owns a lot upon which an onlot sewage disposal system is installed, any person who resides or operates a business upon a lot which an onlot sewage disposal system is installed, and any pumper/hauler pumping, inspecting, or otherwise maintaining an onlot sewage disposal system shall report any malfunctioning of such system or component of, to the Township, such report shall be made as soon as possible, but in no case, later than three (3) days after discovery of the malfunction.

7.4 - System Malfunctions and Requirements for Rehabilitation

7.4.1 - No person shall operate and maintain an onlot sewage disposal system in such a manner that it malfunctions. All liquid wastes, including kitchen and laundry wastes and water softener backwash, shall be discharged to a treatment tank. No sewage system shall discharge untreated or partially treated sewage to the surface of the ground or into the waters of the Commonwealth of Pennsylvania unless a permit to discharge has been obtained from the Department.

7.4.2 - The Township shall issue a written notice of violation to any person who is the owner of a property in the Township which is found to be served by a malfunctioning onlot sewage disposal system and/or which is discharging raw or partially treated sewage without a permit.

- 7.4.3 - Within seven (7) days of notification by the Township that a malfunction has been identified, the owner shall make an application to the Sewage Enforcement Officer for a permit to repair or replace the malfunctioning system. Within thirty (30) days of initial notification by the Township, construction of the permitted repair or replacement shall commence. Within sixty (60) days of the original notification by the Township, the construction shall be completed unless seasonal or unique conditions mandate a longer period, in which case, the Township shall set an extended completion date.
- 7.4.4 - The Sewage Enforcement Officer shall have the authority to require the repair of any malfunction by the following methods: cleaning, repair or replacement of components of the existing system, adding capacity or otherwise altering or replacing the system's treatment tank, expanding the existing disposal area, replacing the existing disposal area, replacing a gravity distribution system with a pressurized system, or other alternatives as appropriate for the specific site.
- 7.4.5 - In lieu of or in combination with the remedies described in Subsection 7.4.4, the Sewage Enforcement Officer may require the installation of water conservation equipment and the institution of water conservation practices in structures served. Water-using devices and appliances in the structure may be required to be retrofitted with water-saving appurtenances or they may be required to be replaced by water-conserving devices and appliances. Wastewater generation in the structure may

also be reduced by requiring changes in water usage patterns in the structure served. The use of laundry facilities may be limited to one (1) load per day or may be prohibited altogether, etc.

7.4.6 - In the event that the rehabilitation measures described in this section are not feasible or do not prove effective, the Township may require the owner to apply for a permit to construct a holding tank. Upon receipt of said permit, the owner shall complete construction of the system within thirty (30) days.

7.4.7 - Should none of the remedies described above prove totally effective in eliminating the malfunction of an existing onlot sewage disposal system, the owner is not absolved of responsibility for that malfunction. The Township may require whatever action is necessary, as described in the Act, to lessen, mitigate, or eliminate the malfunction.

#### 7.5 - Registration of Pumper/Haulers and Disposal of Septage

7.5.1 -All pumper/haulers operating within the Township shall be registered with the Township and shall comply with all reporting requirements established by the Township.

7.5.2 -All septage originating within the Township shall be disposed of at sites or facilities approved by the Department.

7.5.3 -All pumper/haulers operating within the Township shall operate in a manner consistent with this Ordinance and provisions of the Pennsylvania Solid Waste Management Act (Act 97 of 1980, 35 P.S.

§§6018.101 through 6018.1003), and regulations adopted pursuant to such Act.

7.5.4 -If any pumper/hauler shall have been convicted on two (2) occasions of any violation of this Ordinance, or for violating the conditions of its State permit or of any State or Local law governing its operation, the Board of Supervisors shall have the power to suspend said pumper/hauler from operating within the Township for a period of not less than six (6) months or more than two (2) years for each violation, as determined by the Township.

#### 7.6 - Discontinuance of Individual Sewage System

7.6.1 -Upon the discontinuance of the use of any tank for sewage disposal purposes, whether by mandatory or voluntary connection to a public sewage system or abandonment for any other reason, the owner thereof shall have the tank pumped and flushed by a pumper/hauler and, at the owner's option, either physically removed from the premises or filled with soil and/or crushed stone.

7.6.2 -When the owner elects to have the tank filled with stone as permitted by Subsection 7.6.1 above, said tank may then be used for the discharge of stormwater, sump pump discharge, or other effluent not qualifying for discharge into the public sewage system, provided that said discharge is otherwise permitted by applicable law.

#### SECTION 8.0 - ADMINISTRATION; RECORD; APPLICATION AND PERMIT FEES

8.1 - The Board of Supervisors may, from time-to-

time, adopt a fee schedule by Resolution for applications, soil testing permits, registration of pumper/haulers and/or other Township administrative costs that may be incurred as a result of this Ordinance.

8.2 - All fees paid under this section shall be made payable to the Township.

8.3 - The Board of Supervisors shall establish all administrative procedures necessary to properly carry out the provisions of this Ordinance.

8.4 - All permits, records, reports, files, and other written material relating to the installation, operation and maintenance, pumping, inspections, and malfunction of onlot sewage disposal systems shall become the property of the Township.

#### SECTION 9.0 - REVOCATIONS OF PERMITS

9.1 - A permit for the installation of a treatment tank, subsurface absorption area, spray field, or holding tank shall be revoked by the Sewage Enforcement Officer at any time for any one or more of the following reasons, which shall be incorporated into the Notice of Revocation:

- a. When any change which has occurred in the physical conditions of any lands which will materially affect the operation of an individual or community sewage disposal system covered by any permit issued by the Sewage Enforcement Officer under the provisions of Chapter 72 of the Department's Regulations; or
- b. When one or more tests, material to the issuance of the permit, has not been properly conducted; or

- c. When information material to the issuance of permit has been falsified; or
- d. When the original decision of the Sewage Enforcement Officer otherwise failed to conform with the provisions of the Act and the Department's Regulations; or
- e. When the permittee has violated the provisions of the Act or Chapters 71, 72, or 73 of the Department's Regulations; or
- f. When the inspection reveals that the installation of the system, water supply location, or (the underlying soil or geologic conditions differ from those stated in the application.

9.2 - The notice of revocation of a permit shall be in writing to the permit holder and shall include the reasons for revocation, notice of the permit holder's opportunity to request a hearing before the Township within ten (10) days of receipt of the revocation notice, and notice that no further construction or use of either the sewage system or the structure for which it is intended may take place until a new permit is issued or the revocation is reversed by the Township.

9.3 - If a permit holder fails to file a written request for a hearing under this chapter within ten (10) days after receipt of revocation, revocation shall be final.

#### SECTION 10.0 - REVIEW OF REVOCATIONS AND DENIALS

10.1 - The Township Board of Supervisors shall hold a hearing for denials or revocations within thirty (30) days after receipt of a written request for a hearing. Hearing requests shall state concisely all reasons for the appeal. The Department shall be notified of the hearing

by the Township at least three (3) days prior to the hearing date. This notification shall include a statement of the reasons for the appeal.

10.2 - Hearings under this section and a subsequent appeal shall be conducted under 2 PA.C.C. §§ 551-555 (relating to the Local Agency Law). The local agency shall defend its action during the course of a subsequent appeal.

10.3 - The Attorney General and the Department shall be notified in writing by the appellant of an appeal challenging the constitutionality of the act or the validity of this part.

#### SECTION 11.0 - WAIVER OF LIABILITY

Although this Ordinance is intended to provide guidelines for the proper installation and maintenance of onlot sewage disposal systems, nothing contained herein should be interpreted as a guarantee to the applicants, or owners, or system users that systems installed under the provisions of this Ordinance will function as intended. Uncontrollable variables such as soil characteristics, actual water usage, misuse of the system, and material or construction inadequacies, may cause a system malfunction, even though the requirements of the Department and this Ordinance are reasonably followed.

#### SECTION 12.0 - NUISANCES AND PENALTIES

12.1 Any discharge of sewage to the surface of the ground shall constitute a nuisance. Upon written notice from the Sewage Enforcement Officer, the property owner shall be required to repair the sewage system to eliminate such nuisance. The repair shall be satisfactorily completed within thirty (30) days of the

receipt of the notice. Each day subsequent to the original notice period that the identified nuisance continues, shall be a separate violation of this Ordinance, and shall be subject to either or all of the remedies described in Section 12.2, Section 12.3, and Section 12.4 of this Ordinance.

12.2 - Any person who violates any of the provisions of this Ordinance, shall, upon conviction thereof, in a summary proceeding under PA Rules of Criminal Procedure be sentenced to pay a fine of not more than one thousand dollars (\$1,000.00) per violation and costs of prosecution, and in default of the payment of the fine and costs so imposed, said person may be imprisoned to the extent allowed by law for the punishment of summary offenses.

12.3 - In addition to proceeding under any other remedy available or in equity for a violation of any provision of this Ordinance or upon notice to any person violating Section 12.1 of this Ordinance, in the manner described in Section 12.1 to abate or eliminate the nuisance, and upon failure of such person to so abate or eliminate the nuisance, in the time period described in Section 12.1, the Township may take such steps as are necessary to abate or eliminate the nuisance and charge said person violating said Section with all costs thereof, together with a collection fee of ten percent (10%), or file an Action of Assumpsit, without the filing of a claim, with the Prothonotary of Lancaster County for all the costs thereof together with a collection fee of ten percent (10%).

12.4 - In addition to proceeding under any other remedy available or in equity for a violation of any provision of this Ordinance, the Township may institute proceedings in any Court

of Equity having jurisdiction to abate any violation of this Ordinance.

SECTION 13.0 - REQUIREMENTS FOR OFFICIAL SEWER PLAN, REVISION, EXEMPTIONS, AND EXCEPTIONS (FOR SUBDIVISIONS AND LAND DEVELOPMENTS)

- 13.1 - Testing shall be conducted in accordance with the requirements of Section 5.0 of this Ordinance for each proposed lot and/or all proposed uses in all Subdivisions and Land Developments proposing onlot sewage disposal as part of the Official Plan revision, exemption, or exception to the planning process.
- 13.2 - For nonresidential uses and subdivisions involving more than ten (10) residential lots or equivalent dwelling units or applying for an exemption from planning, the developer shall contact the Department via sewage facilities planning module application mailer, (D.E.P. post card) which may be obtained from the Sewage Enforcement Officer.
- 13.3 - Prior to initiating testing, the developer shall provide a Sketch Plan showing test locations, and shall have the locations staked at the site with a designation corresponding with that on the plan. Any additional testing shall be marked in the same manner.
- 13.4 - The developer shall pay the required fees or deposits for testing review, as may be established by Resolution of the Board of Supervisors.
- 13.5 - Plans must be provided as supporting documentation to a request for approval of an Official Plan revision, exemption or exception, and these plans shall show all data required by the Department and shall show among other things:

- a. Proposed and existing building structures (to approximate sale);
- b. Location of soil probes and percolation tests, whether passing or failing;
- c. Proposed or existing water supplies or wells;
- d. Location of all existing and proposed street and right-of-way lines and easements;
- e. Existing and proposed lot lines;
- f. Existing or "planned" wells and/or onlot absorption areas on all properties adjacent to the Subdivision or Land Development within one hundred feet (100') of the property line.
- g. Any floodplain or wetland area;
- h. Existing and proposed onlot absorption areas (both primary and alternate locations).

13.6 - The plans shall show primary and alternate absorption areas sufficient to illustrate that such systems can be placed while maintaining required isolation distances.

13.7 - The applicant requesting that the Township consider an Official Plan revision, exemption, or exception, shall be responsible for completion of the appropriate components of the Department Planning Module for Land Development or exemption requests and for providing the required testing, supporting plans, and other data. The Module or exemption request will be reviewed and approved or denied in accordance with the procedures specified in Chapter 71 of the Department's Regulations.

#### SECTION 14.0 - SEVERABILITY

14.1 - If any sentence, clause or section, or part of this Ordinance is for any reason found to be unconstitutional, illegal, or invalid, such unconstitutionality, illegality or invalidity shall be limited to that specific sentence, clause, or section or part of this Ordinance. It is hereby declared as the intent of the Township that this Ordinance would have been adopted had such unconstitutional, illegal, or invalid sentence, clause, section, or part thereof not been included herein.

#### SECTION 15.0 - REPEALER

15.1 - All Ordinances or parts of Ordinances inconsistent herewith are hereby repealed, also specifically, the following Ordinances are repealed:

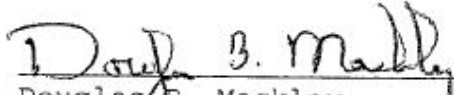
1. Ordinance 25, dated March 6, 1968
2. Ordinance 70, dated March 7, 1977
3. Ordinance 72, dated September 20, 1978
4. Ordinance 86-12, dated October 1, 1986
5. Ordinance 92-5, dated May 20, 1992
6. Ordinance 99-2, dated March 3, 1999

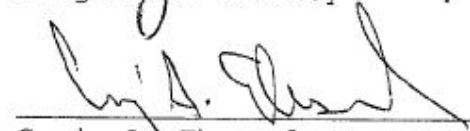
#### SECTION 16.0 - EFFECTIVE DATE

16.1 - This Ordinance shall be effective five (5) days from the date hereof.

ENACTED AND ORDAINED this 6<sup>th</sup> day of August, 2003.

EAST COCALICO TOWNSHIP

  
\_\_\_\_\_  
Douglas B. Mackley

  
\_\_\_\_\_  
Craig A. Ebersole

  
\_\_\_\_\_  
Clyde S. Kulp

**HOLDING TANK MAINTENANCE AGREEMENT**

**BY AND BETWEEN** East Cocalico Township (hereinafter referred to as "**TOWNSHIP**"), 100 Hill Road, Denver, Lancaster County, Pennsylvania, and \_\_\_\_\_

\_\_\_\_\_ with an address of \_\_\_\_\_

(hereinafter referred to as "**APPLICANT**").

**BACKGROUND**

**APPLICANT** has applied to **TOWNSHIP** for a permit under the Sewage Facilities Act and regulations to install, maintain, operate and use a holding tank for sewage collection at Property it owns at \_\_\_\_\_

\_\_\_\_\_, East Cocalico Township. The request is necessitated by the fact that **APPLICANT** \_\_\_\_\_

\_\_\_\_\_  
(provide legal basis for permitting holding tank)

\_\_\_\_\_  
In order to not deprive **APPLICANT** of use of his or her property, **TOWNSHIP** is willing to issue **APPLICANT** a holding tank permit, subject to Pennsylvania Department of Environmental Resources (hereinafter referred to as "**DER**") approval, upon the terms and conditions hereinafter set forth.

**NOW, THEREFORE,** in consideration of the mutual promises and covenants herein contained and intending to be legally bound hereby do agree as follows:

1. The holding tank permit and the Approval Plan revision must be approved by **DER** and the **TOWNSHIP** Sewage Enforcement Officer.

2. The holding tank installed must meet the design standards set forth in applicable regulations (See 25 Pa. Code Section 71.63 as amended) and shall be approved as to conformance with said standards and installation on the site by the Township Sewage Enforcement Officer.

3. (a) **APPLICANT** shall either deposit in escrow with **TOWNSHIP** or deliver to **TOWNSHIP** an Irrevocable Letter of Credit in a form acceptable to the **TOWNSHIP** Solicitor, in the sum of

---

Dollars (\$\_\_\_\_\_) as security for proper maintenance of the holding tank and collection and disposal of its contents.

**TOWNSHIP** shall have the right, without prior notice to **APPLICANT**, to draw upon said escrow to maintain the tank or empty its contents any time if in its sole opinion such action is necessary.

(b) **TOWNSHIP** shall have the right upon thirty (30) days written notice to demand the escrow be increased to such additional amount as it deems necessary to provide sufficient security for the proper maintenance of the holding tank.

(c) In the event **TOWNSHIP** shall ever draw upon the escrow, **APPLICANT** shall, upon ten (10) days written notice, provide **TOWNSHIP** with funds as are necessary to restore the escrow to such amount as shall then be in effect.

(d) The **TOWNSHIP** may waive escrow for a non-residential/non-commercial use that is without running water that uses a privy with a concrete vault, providing that within thirty (30) days of the close of school each year, the user will cause the privy/vault to be pumped and forward certification to the **TOWNSHIP**.

4. **APPLICANT** has procured and shall maintain continuously in effect a contract for the collection and disposal of the holding tank contents with a **DER** approved holding tank hauler. A copy of the contract is attached to this Agreement.

5. In the event **APPLICANT** shall be in violation of any of the provisions of this Agreement, he shall within five (5) days written notice from **TOWNSHIP** cease all use of the holding tank until such violation has been abated to the **TOWNSHIP'S** satisfaction.

6. Nothing in this Agreement shall be construed to waive or be in conflict with any provisions of the Sewage Facilities Act, its implementing regulations or other applicable laws but shall be construed to impose additional consistent requirements.

7. This Agreement shall be binding upon the parties, their heirs, successors and assigns and is intended to be recorded to give notice to future owners of the property of the conditions upon use of the holding tank there located.

**DATED** this \_\_\_\_\_ day of \_\_\_\_\_

**EAST COCALICO TOWNSHIP**

\_\_\_\_\_  
Douglas B. Mackley

\_\_\_\_\_  
Elwood V Schwartz

\_\_\_\_\_  
Clyde S. Kulp

**APPLICANT**

\_\_\_\_\_  
\_\_\_\_\_

**COMMONWEALTH OF PENNSYLVANIA**

) SS :

**COUNTY OF LANCASTER**

On this, the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, before  
me, \_\_\_\_\_ the undersigned officer,  
personally appeared \_\_\_\_\_

\_\_\_\_\_ known to me (or satisfactorily proven)  
to be the person(s) whose name(s) is/are subscribed to the within  
instrument and acknowledged that he executed the same for the  
purposes therein contained.

IN WITNESS WHEREOF, 1 have hereunder set my hand and  
notarial seal.

\_\_\_\_\_  
Notary Public

## HOLDING TANKS

Matthew Harlan  
582 Smokestown Road  
Denver, PA 17517

Ronald Bair & Shiloh  
5 Lakeside Drive  
Reinholds, PA 17569

Stephen Reeser  
Shady Grove Campground  
264 W Swartzville Road  
Reinholds, PA 17569

? was James Horning  
714 Smokestown Road  
Denver, PA 17517

Lloyd Fox  
1335 Landis Road  
Ephrata, PA 17522

Eugene Stauffer  
335 Church Street  
Stevens, PA 17578

Redman Homes Inc.  
101 Garden Spot Road  
Ephrata, PA 17522

Esther Weaver  
1330 Pieffer Hill Road  
Stevens, PA 17578

Robert Martin  
328 W. Swartzville Road  
Reinholds, PA 17569

Charles Messner  
1781 Kramer Mill Road  
Denver, PA 17517

Ray Weaver  
13 Lakeside Drive  
Reinholds, PA 17569

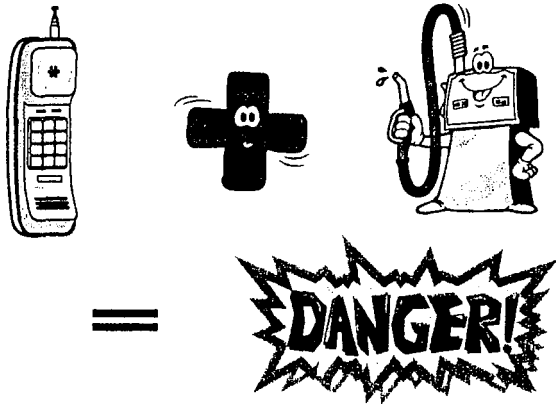
Richard Lorah  
9 Lakeside Drive  
Reinholds, PA 17569

# EAST COCALICO TOWNSHIP NEWSLETTER

Vol. 14

Lancaster County, PA

March 2005



Accidental fires while pumping fuel have been on the increase. The Shell Oil Company recently issued a warning after three incidents in which mobile phones (cell phones) ignited fumes during fueling operations. In the first case, the phone was placed on the car's trunk lid during fueling; it rang and the ensuing fire destroyed the car and the gasoline pump. In the second, an individual suffered burns to the thigh and groin as fumes ignited when the phone, which was in their pocket, rang while they were fueling their car. Mobile phones that light up or ring release enough energy to provide a spark for ignition. Mobile phones should not be used, or should be turned off, around materials that generate flammable or explosive fumes or dust.

Static electricity causes fires at gas pumps. Here are rules for safe refueling:

- Turn off engine
- Don't smoke
- Don't use your cell phone - leave it inside the vehicle. Turn it off.
- Don't re-enter your vehicle during fueling.

If you absolutely have to get into your vehicle while the gas is pumping, make sure when you get out you close the door, touching the metal before you ever pull the nozzle out. This way the static from your body will be discharged before you ever remove the nozzle.

Please pass this information to your family and friends, especially those who may have children with them while pumping gas. If this were to happen to them, they may not be able to get the children out in time.

## NOTICE TO EAST COCALICO TOWNSHIP RESIDENTS WITH ON-LOT SEWAGE DISPOSAL SYSTEMS

East Cocalico Township has contracted with the consulting engineering firm of Camp Dresser & McKee Inc. (CDM) of Lancaster to update the Township's Act 537 Sewage Facilities Plan. The current approved plans are the Ephrata Area Plan of March 1995 and the East Cocalico Township-Adamstown Joint Plan of July 1998. The Township has recently updated its Comprehensive Plan and now desires to update the Act 537 Plan accordingly. The main purposes of the Act 537 Plan are: to protect the health, welfare and safety of the citizens in the municipality, to prevent future sewage disposal problems and to provide protection for groundwater and surface waters of the Commonwealth.

One of the major tasks to be performed in the preparation of an Act 537 Plan update is the identification of sewage disposal needs. This task is performed in accordance with PADEP guidance by conducting a door-to-door survey of properties in the Township with on-lot sewage disposal systems. During Spring 2005, a representative of CDM and a representative of the Township will be performing the survey. The survey team will randomly select properties and request that the property owner provide verbal information in response to questions concerning their sewage system (type, age, condition, etc.). The survey team will also request the property owner's permission to visually inspect the property. Finally, if the property's water supply is obtained from a private well, a well water sample will be taken for analysis. Testing results of well water samples will be shared with the property owners at no cost.

The Township Supervisors ask for your cooperation with the survey team if your property is randomly selected for participation in the survey. The survey team will carry identification and the survey should take no more than about 30 minutes. If you are interested in volunteering your property for the survey, please contact the Township Office at 336-1720 prior to April 15, 2005.

DOOR TO DOOR  
NEEDS SURVEY

Munic.: \_\_\_\_\_ Co.: \_\_\_\_\_ Study Area: \_\_\_\_\_ Date: \_\_\_\_\_  
General weather conditions: \_\_\_\_\_

A survey is being conducted to determine if there are any sewage problems in this area. This is a general survey and the results are intended to be used in evaluating the need for community wide solutions.

NAME: \_\_\_\_\_ STREET \_\_\_\_\_ CITY \_\_\_\_\_  
ZIP \_\_\_\_\_ PHONE # \_\_\_\_\_ OWNER OR RENTER? NUMBER OF RESIDENTS \_\_\_\_\_  
What kind of water system do you have? WELL? SPRING? CISTERN? PUBLIC? OTHER?  
If you have a well: Is it Dug or DRILLED? HOW DEEP \_\_\_\_\_ ft. CASED? Y / N  
How far is the well or spring from the drain field \_\_\_\_\_ ft. Is well UP / DOWNHILL  
Do you treat your water? Y / N How? CL/UV DISINFECTION, SOFTENER, ION, OTHER \_\_\_\_\_  
Was the water ever tested? Y / N When? \_\_\_\_\_  
Any contamination? Y / N What (TC, FC, N, etc.) \_\_\_\_\_

How large is your lot? \_\_\_\_\_ No. of dwelling units? \_\_\_\_\_  
One or more sewage systems? \_\_\_\_\_ COMMERCIAL / RESIDENTIAL?

What kind of sewage system do you have? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	THIGROUND BED	COMMUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STREAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER _____		

Where does your laundry and/or sink water go? ? (CIRCLE ALL THAT APPLY)

SEPTIC TANK	INGROUND BED	CONVEIUNITY SEWER
CESSPOOL	INGROUND TRENCH	STORM SEWER
OLD WELL	ELEVATED SAND MOUND	PIPE TO DITCH
HOLDING TANK	SEEPAGE PIT	PIPE TO STREAM
PRIVY	BORE HOLE	PIPE TO SURFACE
OTHER _____		

How old is your system? \_\_\_\_\_ Was it permitted? Y / N When? \_\_\_\_\_

Have you ever noticed any of the following near your septic system?

GREEN LUSH GRASS	WETNESS OR SPONGY AREAS	ODORS
WATER PONDING OR SURFACING	SYSTEM OVERFLOW	
SLUGGISH DRAINS	WASTEWATER BACKING INTO THE HOME	
OTHER _____		

If you noticed any of the above, are they seasonal or year-round? \_\_\_\_\_

Have you ever had your system pumped out? Y / N How often? \_\_\_\_\_ Last time? \_\_\_\_\_

If it was pumped, was it inspected for cracks or broken baffles? Y / N What part? \_\_\_\_\_

Has the system ever been repaired? Y / N When? \_\_\_\_\_ By permit? Y / N What part? \_\_\_\_\_

TANK: REPAIRED/REPLACED LINE: REPAIRED/REPLACED DRAINFIELD: REPAIRED/REPLACED

COMMENTS: \_\_\_\_\_

DO I/WE HAVE YOUR PERMISSION TO CONFIRM THIS INFORMATION BY LOOKING AROUND? Y / N

**Table 3-3**

**Summary of Water Sampling**

[illegible]

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/l) (2)	Water Test Total CoNorms (coV100 ml) (3)	Water Test E Coli (coV100m1) (3)
28	70	BRIAR LANE	W	Drilled	200	V	200		N			N				5		0.8	<1	<1
29	136	MARTIN DRIVE	W	Drilled	145	Y	100	Level	N			N				0.5		12	5	<1
30	125	MARTIN DRIVE	W	Drilled		Y	200		N			Y		N		0.5		12	1	<1
31	110	MARTIN DRIVE																13	<1	<1
32	828	W SWARTZVILLE RD	W	Drilled	62	Y	120	Down	N			N				1		4.3	<1	<1
33	760	W SWARTZVILLE RD	W	Drilled	250	Y	250		N			V	2003	N		50		3.3	8	<1
34	230	HOLTZMAN RD	W	Drilled	100	Y	200	Up	N			V		N		23.69		4	<1	<1
35	895	W SWARTZVILLE RD	W	Drilled	shallow	Y	50	Level	N			Y	1985	NO3		0.25		13	<1	<1
36	1015	W SWARTZVILLE RD	W				50	Up	N			N				0.75		0.9	<1	<1
37	616	W SWARTZVILLE RD	S				100	Down	N			Y		FC		10	Don't drink water	4.2	34	<1
38	90	MOHNS HILL RD	W	Drilled		Y	100	Level	N			N				9		2.1	10	<1
39	45	MOHNS HILL RD	S				200	Level	N			Y		N		9		2.2	<1	<1
40	220	MOHNS HILL RD	W	Drilled		V			N			N				2.5		1.2		<1
41	240	MOHNS HILL RD	W	Drilled	140	Y	150	Up	N			N	2004	N		2.25		1.3	<1	<1
42	281	MOHNS HILL RD	W	Drilled	200	Y	200	Up	RO			Y	2003	N		2		1.3	19	<1
43	330	MOHNS HILL RD	W	Drilled	200	Y	125	Down	Filter			Y	2003	N		2.5	Treated sample	1.7	<1	<1
44	335	MOHNS HILL RD	W	Drilled	200	Y	105	Down	N			Y		Y		2.65		1.5	29	21
45	16	ADAMSTOWN RD	W	Drilled		Y	100	Level	Filter			Y	2005	N		1		5	145	<1
46	9	ADAMSTOWN RD	W	Drilled	200	Y	150	Up	Filter			Y	1991	N		1.5		5.2	<1	<1
47	94	ADAMSTOWN RD	W	Drilled		Y	150		Softener	Neutralizer		N		N		6.8		6.6	41	32
48	100	ADAMSTOWN RD	W	Drilled	200	V	150					Y	2000	N		1		3.8	<1	<1
49	185	BON VIEW DRIVE	W	Drilled	75	Y	100	Up	Softener			Y	2004	NO3		3		< 0.5	9	<1
50	195	BON VIEW DRIVE	W	Drilled	196		75	Up	Softener			V				1.5		<0.5	<1	<1
51	203	BON VIEW DRIVE	W	Drilled	90	V			Softener	Filter		Y		N		0.75		< 0.5	<	<1
52	169	BON VIEW DRIVE	W	Drilled	200	V	>200	Up	N			Y		N		2		2.2	>201	<1
53	789	REINHOLDS RD							N									7.9	>201	<1
54	770	REINHOLDS RD	W				50		N			N				0.4		5.7	<1	<1

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/1) (2)	Water Test Total Coliforms (col/100 ml) (3)	Water Test E Coli (col/100ml) (3)
55	732	REINHOLDS RD	W	Drilled	160	Y			N			Y		FC		0.75	In the past, prior to	< 0.5	<1	<1
56	553	REINHOLDS RD	W	Drilled		Y	100	Level	Softener			Y		Y		11		4.2	<1	<1
57	1048	SMOKESTOWN RD	W	Drilled	<100	Y	50	Up	N							10.7		3.9	15	<1
58	525	REINHOLDS RD	W	Drilled		Y	100	Up	N			N				5.5		4.7	<1	<1
59	504	REINHOLDS RD	W	Drilled	shallow	Y	50	Up	N			N				0.75		2.7	22	<1
60	446	REINHOLDS RD	W	Drilled	120	Y			N			Y		N				1	<1	<1
61	365	REINHOLDS RD	W	Drilled	160	Y	50-100		N			Y				0.95		6.6	<1	<1
62	359	REINHOLDS RD	W	Drilled	90	Y	150	Up	N			N				1		5.6	<1	<1
63	352	REINHOLDS RD	W	Drilled	120	Y			N			V		N		1		9.5	6	<1
64	305	REINHOLDS RD	W				50		N			N				0.5		5.1	1	<1
65	230	REINHOLDS RD	W	Drilled	120	Y			N			N				0.7		5.9	<1	<1
66	211	REINHOLDS RD								N								7.9	<1	<1
67	48	ADAMSTOWN RD	W	Drilled		Y	100	Down	N							26	Don't drink water	6.5	<1	<1
69	180	ADAMSTOWN RD	W	Drilled	99	V	90	Up	N			N				5		1.8	<1	<1
70	128	ADAMSTOWN RD	W	Drilled		Y	100	Up	Softener	Filter		Y	2000	N		5		1.4	1	<1
71	126	ADAMSTOWN RD								N								5.3	1	<1
72	280	HILL RD	W	Drilled		Y	>100	Up	UV			Y		N		1	Disinfected sample	2.8	2	<1
73	306	HILL RD	W	Drilled		Y	130-140	Up	UV			Y				1	Disinfected sample	1.9	<1	<1
74	75	SLEEPY HOLLOW CIR	W	Drilled	235	V	150	Up	N			Y	2001	N		2.99		1.6	<1	
75	380	HILL RD	W	Drilled			60	Up	N			N				6.5		2.4	2	<1
76	354	HILL RD	W						N			N						2.2	<1	<1
77	358	HILL RD	W						N			N						3	<1	<1
78	408	HILL RD	W	Drilled	140	Y			Softener									1.3	<1	<1
79	211	MOUNTAIN VIEW CIR	W	Drilled		Y	150-200		N			Y	1995	N		2		4.3	<1	<1
80	451	HILL RD	W	Drilled		Y	150-200	Up	Softener	Neutralizer		Y		N		2.5		4.5	<1	<1
81	521	HILL RD	W	Drilled		Y	>100	Up	N			Y	1997	N		1.75		1	<1	<1
82	531	HILL RD	W						N									2.7	<1	<1

**Table 3-3**

**Summary of Water Sampling**

[illegible]

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/l) (2)	Water Test Total Coliforms (col/100 ml) (3)	Water Test E Coli (col/100ml) (3)
110	241	REINHOLDS RD																8	0	0
<b>III</b>	96	HICKORY LANE	W	Drilled	350	Y	150		RO			V		N		1		5.7	0	0
112	78	HICKORY LANE	W	Milled		Y			Y			N				1.1		4.7	0	0
113	59	HICKORY LANE																5.7	0	0
114	985	SMOKESTOWN RD	W				75	Down	N			N				>1		4.2	14	PRESENT
115	756	REINHOLDS RD	W	Drilled	200	Y	150	Down	Neutralizer	Softener		Y		N		0.7	Treated sample	2	0	0
116	805	REINHOLDS RD	W	Drilled	100	Y			N			Y		N		1.75		4.3	0	0
117	690	REINHOLDS RD	W	Dug	shallow		250	Down	Filter			Y		N			Treated sample	<0.5	2	0
118	680	REINHOLDS RD	W	Drilled	< 100	Y		Up	Softener			Y		N		1.4		2.9	0	0
119	590	REINHOLDS RD							Softener	Filter								5.8	67	0
120	963	SMOKESTOWN RD	W	Drilled		Y	200	Down	N			N				2.8		2.8	0	0
121	55	SLEEPY HOLLOW CIR							Softener								Treated sample	1.5	0	0
122	43	SLEEPY HOLLOW CIR	W	Drilled	180	Y			Filter			Y		N		2		2.4	0	0
123	830	STONE HILL RD	W	Dug	30		150	Down	N			N				12		4.1	>201	<1
124	43	S MUDDY CREEK RD	W	Drilled		V	250	Up	N			N				2		9.8	<1	<1
125	681	S MUDDY CREEK RD	W	Drilled			300	Level	N			N				1		7.5	160	<1
126	678	S MUDDY CREEK RD	S															3.3	130	<1
127	1550	KRAMER MILL RD	W	Drilled	180	Y	150	Down	N			N				75		5.6	<t	<1
128	1558	KRAMER MILL RD	W	Drilled			200	Level	UV			N				1		3.2	<1	<1
129	1620	KRAMER MILL RD	W	Drilled	40		150	Up	N			N				0.75		5.8	<1	<1
130	1815	KRAMER MILL RD	W	Drilled			150	Up	N			N				1		3.8	1	<1
131	1601	PEIFFER HILL RD	W	Drilled			150	Level	N			Y				1		112	<1	<1
132	1361	PEIFFER HILL RD	W	Drilled	160	Y	200	Up	N			Y				3		3	8	<1
133	241	LAUSCH RD	W	Drilled	600	Y	150	Up	N			Y	2005	N		5.9		<0.5	1	<1
134	285	LAUSCH RD	W	Drilled	150	Y	150		UV			Y	2004	N		4.9		4.7	<1	<1
135	1512	PEIFFER HILL RD	W	Drilled	125	Y	125		N			Y	2003	N		2		6.9	<1	<1
136	1465	PEIFFER HILL RD	W	Drilled		Y	150	Up	N			V		N		1		7	<1	<1

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/l) (2)	Water Test Total Coliforms (col/100 ml) (3)	Water Test E Coll (col/100m1) (3)
137	1337	PEIFFER HILL RD	W				125	Up	N			N		N		1.5		2.1	<1	<1
138	1274	PEIFFER HILL RD	W															3.3	<1	<1
139	354	CHESTNUT HILL RD	W					Up	N			Y	2005	N		1		13.3	1	<1
140	345	CHESTNUT HILL RD	W	Drilled			150		N			Y		N		4		2.6	<1	<1
141	195	CHESTNUT HILL RD	W	Drilled		Y	80		N			Y		N		14		4	74	<1
142	60	MILLER RD	W	Drilled			150	Up	UV	RO		Y	2003	bacteria	nitrites	0.5		27.6	10	<1
143	990	S RIDGE RD	W	Dug			100	Up	Filter			Y		N		0.75		4.9		
144	890	S RIDGE RD	W					Up	N			Y	2003	N		0.75		6.4	11	5
145	680	S RIDGE RD	W	Drilled			150	Up	UV			Y	2003	N		2.7	Disinfected sample	2.8	<1	<1
146	640	S RIDGE RD	W	Drilled	100	Y	110	Up	N			Y	2003	N		5		2.3	<1	<1
147	530	S RIDGE RD	W				125		Filter			Y		N		4		3.6	<1	<1
148	500	S RIDGE RD	W															5.4	<1	<1
149	78	WEAVER RD	W	Drilled	140	Y	100		Softener			Y		N		4		33.7	<1	<1
150	84	WEAVER RD																7.7	43	<1
151	171	STEVENS RD	W	Drilled	92	Y	50	Level	CL	Softener		Y	N			60	Disinfected sample	10.3	<1	<1
152	292	E CHURCH ST	W				150	Up	Filter			N				1		3.3	<1	<1
153	359	E CHURCH ST	W				75-100	Up	N			N				3		2.1	<1	<1
154	377	E CHURCH ST	W	Drilled		Y	150	Up	UV	Softener		Y	1999	N		13		3.5	14	<1
155	390	E CHURCH ST	W				80		N			Y	1991	N		8.9		2.5	18	<1
156	436	E CHURCH ST							N									8.4	<1	<1
157	451	E CHURCH ST	W				120	Down	Filter			N				1		11	160	<1
158	448	E CHURCH ST							UV									9.4	<1	<1
159	471	E CHURCH ST	W	Drilled			150		N			Y	2004	N		21		10	<1	<1
160	5	MARTIN RD	W				200		UV	Softener	Filter	V	2001	N		13		21.3	10	22
161	1335	LANDIS RD	W						Filter			N				1.25		25.2	<1	<1
162	166	NAPIERVILLE RD	W				110		Softener			N				1.19		1.9	<1	<1
163	180	NAPIERVILLE RD							CL	Softener	Filter							5	<1	<1

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/l) (2)	Water Test Total Coliforms (col/100 ml) (3)	Water Test E Coli (col/100ml) (3)
164	1276	LANDIS RD	W	Drilled	60	Y	125	Up	N			Y	2004	N		39		19	<1	<1
165	1339	RED RUN RD	W	Drilled	200	Y	150		N			Y	1999			11		3.5	1	0
166	1332	RED RUN RD	W	Drilled		Y	50	Up	Filter			Y	2000	Y		0.5		5.4	0	0
167	1329	RED RUN RD	W	Drilled	188	Y	125	Level	UV			Y	2001	bacteria		1		10.8	22	0
168	1272	RED RUN RD	W	Drilled	180	Y	150	Up	N			Y	1975	N		1.17		6.2	2	0
169	1240	RED RUN RD	W	Drilled					N	N	N							6.2	0	0
170	229	NAPIERVILLE RD	W	Drilled	175	Y	150	Down	Softener			Y	1999	N		14		<0.5	0	0
171	414	FRYSVILLE RD	W	Drilled		Y	100	Down	Softener			Y	1993	N		2		12.9	0	0
172	41	NAPIERVILLE RD	W	Drilled		Y	200		Softener			Y	2001	N		1.5	Don't drink water	6.6	0	0
173	490	HAHNSTOWN RD	W	Drilled		V	125		N			Y	2004	N		50		<0.5	0	0
174	450	HAHNSTOWN RD	W	Drilled		Y	200		UV	Softener	Filter	Y	2004	NO3				17.9	31	0
175	410	HAHNSTOWN RD	W	Dug	27	N	150	Up	UV			Y				16		12.3	0	0
176	350	HAHNSTOWN RD	W	Drilled		I'			Filter			Y		N				2.9	0	0
177	305	HAHNSTOWN RD	W	Drilled		Y	75		Filter			Y	2003	bacteria		28		0.5	0	0
178	1168	STEFFY RD	W	Drilled					N			N				2		4.8	3	0
179	120	WOODCREST LANE	W	Drilled		Y			Softener	RO		Y	2005	N		4.25		3.7	0	0
180	170	WOODCREST LANE	W	Drilled		I'			N			N						1.4	0	0
181	77	WOODCREST DRIVE	W	Drilled	very deep	Y			UV	Softener	Filter	Y		E-coli		0.5	Disinfected sample	3.8	0	0
182	682	RIDGE AVE	W	Drilled			200	Up	N			Y	1995	N		1.5		2.7	12	0
183	1182	RIDGE AVE	W	Drilled	80	Y	200	UP	N			Y		N		7.3		7.8	0	0
184	1130	RIDGE AVE	W	Drilled	30	Y	130	Up	RO	Softener		Y	1992			3		3.8	>201	0
185	1035	RIDGE AVE	W	Drilled	200	V	150	Up	N			Y		N		4		1.9	0	0
186	940	RIDGE AVE																0.7	0	0
187	902	RIDGE AVE	W	Drilled	80-100		125	Down	Y			Y	1998	N		1		2.8	5	0
188	790	RIDGE AVE	W						UV	Softener								4.7	0	0
189	776	RIDGE AVE	W	Drilled	150	Y			N			N				1.3		1.3	0	0
190	706	RIDGE AVE	W		150		130	Up	Y			Y	2	N		1.5		0.8	0	0

Table 3-3

## Summary of Water Sampling

Sample Number (1)	Street Number	Street	Well or Spring	Dug or Drilled	Depth (ft)	Cased	Distance from Drainfield (ft)	Uphill, Downhill, Level	Water Treatment 1	Water Treatment 2	Water Treatment 3	Water Test	Date Test	Contamination 1	Contamination 2	Property Size (acres)	Comments (3)	Water Test Nitrates (mg/l) (2)	Water Test Total Coliforms (col/100 ml) (3)	Water Test E Coli (col/100ml) (3)
191	187	WABASH RD	W		130		200		UV	Softener		Y				15		0.8	1	0
192	187	S REAMSTOWN RD	S				125	Up	N			Y		N		63		12.6	83	1
193	264	S REAMSTOWN RD	W	Drilled	130	Y	150		Y			Y	2000	N		60		8	0	0
194	425	MOHNS HILL RD																0.9	0	0
195	27	GARDEN SPOT RD	W	Drilled	200	Y	200	Level	Softener			Y		N		3		19.8	<7	<1
196	171	EBERSOLE RD	W	Drilled	165	Y	100	Up	N			Y		N		0.5		7.6	<1	<1
197	30	EBERSOLE RD	W	Drilled					Softener									<0.5	<1	<1
198	300	GLENWOOD DRIVE	W	Drilled	400		150	Up	CL & UV							88		3.9	<1	<1
199	31	CHESTNUT HILL RD	W	Drilled			100	Up	Y							1		3.9	<1	
200	32	CHESTNUT HILL RD	W	Drilled	120	Y	75		N			N				1.5		3.1	<1	<1
201	136	CHESTNUT HILL RD	W	Drilled		Y	50		N			N				0.75		2.4	<1	<1
202	531	W SWARTZVILLE RD	W	Drilled		Y			N			V		N		2		2.2	8	<1
203	495	W SWARTZVILLE RD	W	Dolled					N									2.6	<1	<1

## Notes:

- 1) Sample number corresponds with survey number in Table 3-2 for properties that participated in both the survey and sampling. There were a total of 202 water samples.
- 2) Color coding corresponds to Figure 3-5.
- 3) Color coding corresponds to Figure 3-6.

Table 3-4

## Documented OLDS Repairs

Year	Street No.	Street	Comments	Owner
1989		272 @ Turnpike		Pepperidge Farms
1996	24	Adamstown Rd		
2004	520	Adamstown Rd		
1997	224	Black Horse Rd		
1990	485	Black Horse Rd		
2000	624	Black Horse Rd		
1983		Black Horse Rd		Raymond Eager
1989		Black Horse Rd		Ronald Martin
1998	185	Bon View Dr		
1997	207	Bon View Dr		
1976		Brunners Grove Rd		Harold High
2002	145	Chesnut Hill Rd	BTG Repair	
2002	300	Chesnut Hill Rd		
1997	319	Chesnut Rd & S. Church St		
1976		Chesnut Rd & S. Church St		Emanuel Brubaker
1994	335	Church St		
1997	5	Dennis Dr		
1976		Denver R. 1		Dalton Weaver
1975		Denver Rd		Samuel Wanner
1992	835	Dogwood Dr.		
1991	990	Dogwood Dr.		
1998	133	E. Church St		
1998	377	E. Church St		
1993	419	E. Church St		
1999	436	E. Church St		
1976		E. Church St		Ezra Horst
1990		E. Church St		Edwin Gehman
1986	430	E. Main St.		
1998		Exit 21 PA Turnpike		
2003	5	Faust Dr		
1987		Faust Dr		Gary Frees
1975		Frys Rd		Morton Fry
1976		Frys Rd		Morton Fry
1989	27	Garden Spot Rd		
1995	101	Garden Spot Rd		
1996	161	Garden Spot Rd		
1975		Gehman Rd		Daniel Gehman
1989		Gehmans School Rd		Eli Martin
1996	300	Glenwood Dr		
1994	500	Glenwood Dr		
2001	119	Hahnstown Rd		
2002	350	Hahnstown Rd		
2002	378	Hahnstown Rd		
1991	384	Hahnstown Rd		
2002	388	Hahnstown Rd		
1997	410	Hahnstown Rd		
1991	450	Hahnstown Rd		
1990	535	Hahnstown Rd		
1999	548	Hahnstown Rd		
2002	548	Hahnstown Rd		
2002	549	Hahnstown Rd		
1993	292	Hill Rd		
1997	336	Hill Rd		
1996	405	Hill Rd		
1991		Hill Rd		Paul Martin
1996		Hill Rd		Alton Ziemers

Table 3-4

## Documented OLDS Repairs

Year	Street No.	Street	Comments	Owner
1997	225	Holtzmann Rd		
1990	309	Holtzmann Rd		
1993	309	Holtzmann Rd		
1994	429	Holtzmann Rd		
1976		Holtzmann Rd		James Wike
1978		Holtzmann Rd		James Wike
1977	1620	Kramer Mill Rd		Allen Sensenig
1992	1640	Kramer Mill Rd		
1993		Kramer Mill Rd		Oberholtzer/VWhitesell
2000	13	Lakeside Dr		
1982		Lakeside Dr		Richard Lorah
1982		Lakeside Dr		Michael Bartzel
1993	1335	Landis Rd		
1975		Landis Rd		Lester Martin
1975		Landis Rd & Naiperville Rd		Robert Emerick
1992	239	Lausch Rd		
1992	241	Lausch Rd		
1997	285	Lausch Rd		
1995	245	Line Rd		
1978		Line Rd		Cocalico Euip.
2000	33	Long Ave		
1989		Long Lane		Weyerhauser
1982		Main St. - Stevens		Lloyd Zeiset
1982		Miller Rd		David Hoover
1992		Miller Rd		Chester Burkholder
1995		Miller Rd		David Hoover
1977		Mobile Home Park, Reinholds		James Wike
2003	88	Mohns Hill Rd		
1976		Mohns Hill Rd		William Strohl
1983		Mohns Hill Rd		Richard Greiner
1986		Mohns Hill Rd		Barry Ruffner
1975		Muddy Creek Rd		Menno Stoltzfus
1976		Muddy Creek Rd		Martin Zimmerman
1981		Muddy Creek Rd		Stanford Seed
1993	505	N. Muddy Creek Rd		
2000	514	N. Muddy Creek Rd		
2001	745	N. Reading Rd		
1997	1512	N. Reading Rd		
2003	2160	N. Reading Rd		
1990	20	N. Ridge Rd		
1991	490	N. Ridge Rd		
2002	100	Napierville Rd		
2002	161	Napierville Rd		
2000	180	Napierville Rd		
1976		Napierville Rd		Lester Bowman
1977		Napierville Rd		Luke Weaver
1982		Napierville Rd		Rueben Zimmerman
1990	31	Oak Ln		
2003	1512	Peiffer Hill Rd		
2001	1622	Peiffer Hill Rd		
1992	210	Pfautz Hill Rd		
1994	317	Pfautz Hill Rd		
1994	426	Pfautz Hill Rd		
2002	5	Pinewood Ave		
1994	27	Pinewood Ave		
1988		Pinewood Ave		Richard Bernarduci

Table 3-4

## Documented OLDS Repairs

Year	Street No.	Street	Comments	Owner
1989		Pinewood Ave		Dale Edwards
1986		Rd. 2 Reinholds		Howard Horst
1979		Rd.1 Ephrata		Hess Bros.
1979		Rd.1 Old Reading Rd		Charles Bock
1984		Rd.1 Stevens		David Zimmerman
1986		Rd.4 Denver		Earl Nussbaum
2000	1305	Red Run Rd		
1990	1318	Red Run Rd		
1996	1329	Red Run Rd		
2004	1372	Red Run Rd		
1971		Red Run Rd		Willis Fox
1981		Red Run Rd		Kenneth Eshleman
1996	225	Reinholds Rd		
1991	285	Reinholds Rd		
1997	327	Reinholds Rd		
2003	445	Reinholds Rd		
1992	690	Reinholds Rd		
1992	741	Reinholds Rd		
1993	756	Reinholds Rd		
1997	782	Reinholds Rd		
1997	835	Reinholds Rd		
1976		Reinholds Rd		Stephen Stoltzfus
1988		Reinholds Rd		Debra Woodland
1994	682	Ridge Ave		
1990	746	Ridge Ave		
1989	902	Ridge Ave		Kenneth Koser
1988		Ridge Ave		Bill Wingenroth
1972		Ridge Rd & Rt. 897		Clarence Weaver
1990	1	Ridgewood Ave		
1975		Rt. 897		Betty Trievel
1977		Rt. 897		Carl Weaver
1989		Rt. 897		Kerry Moyer
1977		Rt. 897 & Black Horse Rd		Cocalico Euip.
1990		Rt. 897 & Mohns Hill Rd		Sam Gehman
1975		S. Church St		Paul Landis
1988		S. Main St Reinholds		Floyd Royer
1990	680	S. Muddy Creek Rd		
1995	681	S. Muddy Creek Rd		
2002	295	S. Reamstown Rd	BTG Repair	
1995	300	S. Reamstown Rd		
2002	316	S. Reamstown Rd		
1990	347	S. Reamstown Rd		
1998	352	S. Reamstown Rd		
1990	380	S. Ridge Rd		
2002	380	S. Ridge Rd		
1998	690	S. Ridge Rd		
1987		S. Ridge Rd		John Gallagher
1994	43	Sleepy Hollow Cir		
2002	495	Smokestown Rd		
2004	714	Smokestown Rd		
2002	758	Smokestown Rd		
1995	844	Smokestown Rd		
1990	985	Smokestown Rd		Susan Walmer
1979		Smokestown Rd		Michael Beaver
1975		Smokestown Rd		Harry Cooper
1975		Smokestown Rd & White Oak Rd		Aaron Groff

Table 3-4

## Documented OLDS Repairs

Year	Street No.	Street	Comments	Owner
1994	1120	Steffy Rd		
1974		Steffy Rd		Richard Steffy
2004	210	Stevens Rd		
<b>1995</b>	830	Stone hill Rd		
Year	Street No.	Street		Last Name
1994	266	Vera Cruz Rd		
1990		Vera Cruz Rd		Jeff Wenrich
1999	49	Vinemont		
2001	109	W. Church St		
1992	94	W. Swartzville Rd		
1993	264	W. Swartzville Rd		
2001	268	W. Swartzville Rd	BTG Repair	
<b>1990</b>	276	W. Swartzville Rd		
2002	284	W. Swartzville Rd		
1993	328	W. Swartzville Rd		
1999	385	W. Swartzville Rd		
1996	530	W. Swartzville Rd		
1998	565	W. Swartzville Rd		
1996	616	W. Swartzville Rd		
1992	631	W. Swartzville Rd		
1990	1081	W. Swartzville Rd		
1995	1162	W. Swartzville Rd		
1991	1175	W. Swartzville Rd		
2000	1180	W. Swartzville Rd		
1991	1200	W. Swartzville Rd		
1997	1229	W. Swartzville Rd		
2002	1256	W. Swartzville Rd		
1994	187	Wabash Rd		
1996	187	Wabash Rd		
<b>1998</b>	84	Weaver Rd		
1981		Weaver Rd		Ryder Truck Rental
1981		White Oak Rd		Bruce Schmack
1997	10	Winding Way		
2001	55	Woodcrest Dr		
1989		Woodcrest Ln		Woodcrest Personal Care

# ONLOT SEWAGE FACILITIES - INITIAL INSPECTION PUMPING REPORT

EAST COCALICO TOWNSHIP  
LANCASTER COUNTY  
100 HILL RD., DENVER, PA 17517  
PHONE (717) 336-1720; FAX (717) 336-1724

TAX ACCOUNT NO. \_\_\_\_\_

DATE: \_\_\_\_\_

**TO BE COMPLETED BY A QUALIFIED INSPECTOR AND A PUMPER/HAULER REGISTERED WITH EAST COCALICO TOWNSHIP**

1. Property Owner: \_\_\_\_\_  
Property Address: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
(if different) \_\_\_\_\_  
G.I.S. Coordinate of System: \_\_\_\_\_ (N)  
(if available) \_\_\_\_\_ (E)

3. Date System Installed: \_\_\_\_\_  
(if not known - approximate \_\_\_\_\_)

5. Date of this Inspection and Pumping \_\_\_\_\_  
and Gallons Pumping \_\_\_\_\_  
and Disposal Site No. \_\_\_\_\_

7. Description of Existing System (Also provide Plot Plan):

Treatment Tank

Type \_\_\_\_\_ (i.e., septic aerobic, etc.) \_\_\_\_\_  
Size \_\_\_\_\_ Gallons \_\_\_\_\_  
Material of Construction: \_\_\_\_\_

Absorption Area

Type \_\_\_\_\_ (i.e., inground, sand mound, etc) \_\_\_\_\_  
Size \_\_\_\_\_

Note: If pumps or Special Systems - Describe:

\_\_\_\_\_  
\_\_\_\_\_

10. Condition of Other Facilities - Describe: \_\_\_\_\_

2. Land Use:

\_\_\_\_\_ Single Family Detached: Number of Bedrooms \_\_\_\_\_  
\_\_\_\_\_ Multiple Families: Number of Dwellings \_\_\_\_\_  
\_\_\_\_\_ Nonresidential: Estimated Gallons/Day \_\_\_\_\_  
Explain Nonresidential Use (if any) \_\_\_\_\_  
\_\_\_\_\_

4. Date System was Last Pumped: \_\_\_\_\_

Provide copy of receipt if done in 2001, 2002, or 2003

6. Date System was Last Repaired: \_\_\_\_\_  
Brief Description of Repair: \_\_\_\_\_  
\_\_\_\_\_

8. Condition of Tank	YES	NO
a. Cover Broken	_____	_____
b. Walls Cracked	_____	_____
c. Inlet Baffle Broken	_____	_____
d. Outlet Baffle Broken	_____	_____
9. Condition of Absorption Area		
a. Water on Surface	_____	_____
b. Odors	_____	_____
c. Lush Vegetation	_____	_____
d. Animal Intrusion	_____	_____
e. Surface Runoff directed onto drainfield	_____	_____

Inspector:

Pumper/Hauler:

Name Printed

SEO # or PSMA #

Name Printed

Company Name Printed

Name Signed

Date

Name Signed

Date

Return completed form to East Cocalico Township within thirty (30) days of inspection and pumping. Thank you!

NOTICE: COMPLETION OF THIS REPORT IS REQUIRED BY EAST COCALICO TOWNSHIP FOR INFORMATION PURPOSES ONLY AND THIS REPORT SHALL NOT BE DEEMED TO BE ANY TYPE OF CERTIFICATION OF CONDITIONS AS MAY BE REQUESTED OR REQUIRED BY ANY PROPERTY OWNER, PROSPECTIVE PROPERTY OWNER, OR LENDING INSTITUTE.

# ONLOT SEWAGE FACILITIES - INITIAL INSPECTION PUMPING REPORT

EAST COCALICO TOWNSHIP  
LANCASTER COUNTY  
100 HILL RD., DENVER, PA 17517  
PHONE (717) 336-1720; FAX (717) 336-1724

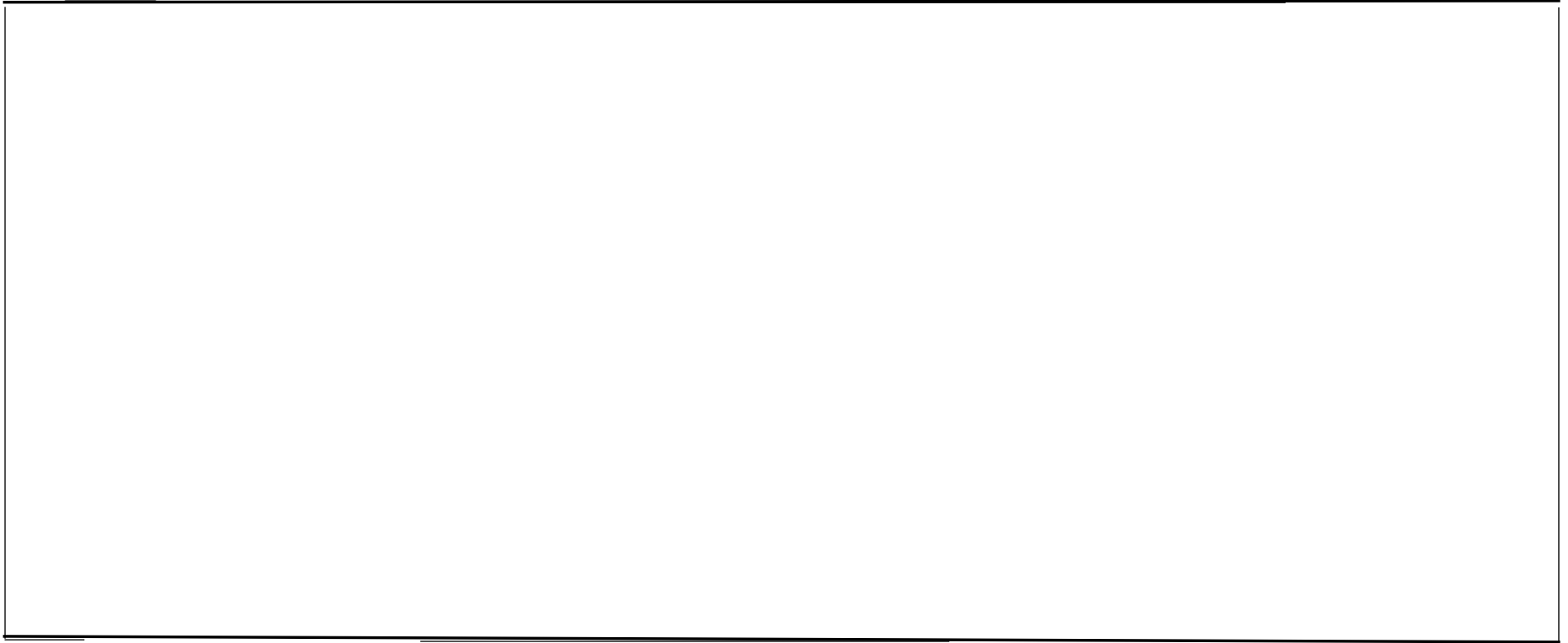
TAX ACCOUNT NO, \_\_\_\_\_

DATE \_\_\_\_\_

***TO BE COMPLETED BY A QUALIFIED INSPECTOR AND A PUMPER/HAULER REGISTERED WITH EAST COCALICO TOWNSHIP***

## PLOT PLAN

PLEASE PROVIDE THE REQUESTED INFORMATION ON THIS PLAN OR A SEPARATE PLAN OF THE PROPERTY. IF AVAILABLE.  
SHOW: BUILDING, TANKS, DRAINFIELD, WELL, DIRECTION OF SLOPE, POOL, GARAGE, ETC.



STREET

Return completed form to East Cocalico Township within thirty (30) days of inspection of pumping. Thank you.

NOTICE: COMPLETION OF THIS REPORT IN EAST COCALICO TOWNSHIP FOR INFORMATION PURPOSES ONLY AND THE REPORT SHALL NOT BE DEEMED TO BE ANY TYPE OF CERTIFICATION OF CONDITIONS AS MAY BE REQUESTED BY ANY PROPERTY OWNER, PROSPECTIVE PROPERTY OWNER, OR LENDING INSTITUTE.

# ONLOT SEWAGE FACILITIES - REGULAR INSPECTION & PUMPING REPORT

EAST COCALICO TOWNSHIP  
LANCASTER COUNTY  
100 HILL RD., DENVER, PA 17517  
PHONE (717) 336-1720; FAX (717) 336-1724

TAX ACCOUNT NO. \_\_\_\_\_

DATE \_\_\_\_\_

*TO BE COMPLETED BY A PUMPER/HAULER REGISTERED WITH EAST COCALICO TOWNSHIP FOR SECOND AND SUBSEQUENT INSPECTIONS AND PUMPINGS AND FOR HOLDING TANKS.*

1. Property Owner: _____	3. Condition of Tank	YES	NO
Property Address: _____	a. Cover Broken	_____	_____
_____	b. Walls Cracked	_____	_____
Mailing Address: _____	c. Inlet Baffle Broken	_____	_____
(if different) _____	d. Outlet Baffle Broken	_____	_____
G.I.S. Coordinate of System _____ (N)	4. Condition of Absorption Area		
(if available) _____ (E)	a. Water on Surface	_____	_____
2. Date of this Inspection and Pumping _____	b. Odors	_____	_____
and Gallons Pumping _____	c. Lush Vegetation	_____	_____
and Disposal Site No. _____	d. Animal Intrusion	_____	_____
	e. Surface Runoff directed onto Drainfield	_____	_____

5. Condition of Other Facilities - Describe: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Signatures

Pumper/Hauler

\_\_\_\_\_  
Name Printed

\_\_\_\_\_  
Company Name Printed

\_\_\_\_\_  
Name Signed

\_\_\_\_\_  
Date

Return completed form to East Cocalico Township within thirty (30) days of inspection of pumping. Thank you.

NOTICE: COMPLETION OF THIS REPORT IN EAST COCLAICO TOWNSHIP FOR INFORMATION PURPOSES ONLY AND THE REPORT SHALL NOT BE DEEMED TO BE ANY TYPE OF CERTIFICATION OF CONDITIONS AS MAY BE REQUESTED .BY ANY PROPERTY OWNER, PROSPECTIVE PROPERTY OWNER, OR LENDING INSTITUTE.



# EAST COCALICO TOWNSHIP AUTHORITY

## 2007-2008 SEWER RECEIPTS AND EXPENSE BUDGET



	2004-2005 ACTUAL	2005-2006 ACTUAL	2006-2007 BUDGET	2006-2007 6-MONTHS AUDIT	2006-2007 YEAR-END PROJECTION	2007-2008 BUDGET	PERCENT CHANGE
<b>OPERATING RECEIPTS</b>							
401000 SEWER RENTS	1,480,464	1,638,960	1,751,666	834,751	1,670,000	1,842,000	10.3%
403000 CAPACITY RESERVE CHARGES	12,828	13,944	12,300	4,682	9,500	10,000	5.3%
408000 INTEREST ON LATE PAYMENTS							
409000 PENALTIES FOR LATE PAYMENTS	12,179	16,778	13,500	10,220	20,500	20,000	-2.4%
410000 SURCHARGE	5,255	0	0	0	0	0	--
413000 INSPECTION FEES	928	918	1,300	322	700	700	0.0%
414000 ADMINISTRATIVE REVIEW FEES	1,839	413	500	525	1,100	1,200	9.1%
415000 CONNECTION FEES		62,912		1,615	200		--
417000 SEWER TREATMENT REBATE-ACT339	0	0	0	0	0	0	--
418000 MISCELLANEOUS	1,482	1,276	1,500	363	1,200	1,500	25.0%
423000 MATERIAL SALES	410	2,150	2,500	0	16,500	16,500	0.0%
424000 LEGAL FEES	5,928	12,479	13,000	0	5,000	5,000	0.0%
425000 ENGINEERING FEES	51,992	22,904	30,300	0	19,000	20,000	5.3%
426000 PERMIT & LICENSES	9,091	0			15	0	--
428000 SUB-CONTRACTOR		73	100	0	100	100	0.0%
429000 LABOR SALES	433	783	1,000	0	2,500	2,500	0.0%
<b>TOTAL OPERATING RECEIPTS</b>	<b>1,582,829</b>	<b>1,773,590</b>	<b>1,827,566</b>	<b>852,478</b>	<b>1,746,315</b>	<b>1,919,500</b>	<b>9.9%</b>
<b>OPERATING &amp; MAINTENANCE EXPENSE</b>							
500000 SALARIES AND WAGES-SUPERVISION	49,811	56,436	57,038	28,646	58,394	60,262	3.2%
501000 SALARIES AND WAGES-OTHER	59,490	53,769	62,488	29,980	61,113	63,069	3.2%
502000 PAYROLL TAXES-FICA	12,146	12,263	13,604	7,333	13,943	15,294	9.7%
503000 PA UNEMPLOYMENT TAX	0	1,607	0		1,500	0	--
504000 WORKER'S COMPENSATION INSURANCE	6,136	9,217	7,261	3,498	6,996	7,220	3.2%
505000 INSURANCE	12,496	14,504	13,300	5,345	13,000	13,500	3.6%
506000 EMPLOYEE GROUP INSURANCE	27,238	33,753	35,000	18,052	36,104	39,500	9.4%
507000 MAINTENANCE-STRUCTURES	146	12	1,000	0	100	1,000	900.0%
508000 MAINTENANCE-TREATMENT FACILITIES	3,051	16,167	8,500	1,526	7,000	9,000	28.6%
509000 MAINTENANCE-LINES	20,914	48,106	40,000	8,378	24,000	75,000	212.5%
510000 RENT EQUIPMENT	0	0	1,000		100	1,000	900.0%
511000 CONTRACT SERVICES	580	1,653	1,230	123	500	325	-35.0%
512000 ELECTRIC	16,571	14,737	18,000	7,938	16,000	16,500	3.1%
514000 SEWER TREATMENT	608,156	553,365	560,812	327,474	654,948	640,000	-2.3%
515000 LAB TESTING FEES	2,659	1,554	3,000	504	1,500	1,500	0.0%
516000 CHEMICALS	0	0	0	0	0	0	--
517000 PROPERTY TAXES	0	0	0		0	0	--
518000 PENSION	4,121	5,956	5,544	3,351	6,702	6,916	3.2%
519000 RADIO	0	105	100	0	150	150	0.0%
521000 TELEMETERING MAINTENANCE/REPAIRS	0	2,015	100	0	0	1,000	--
522000 TELEMETERING LINES	2,350	2,738	3,200	1,332	2,500	2,800	7.7%
523000 AUTO ALLOWANCE	24	36	150	61	100	150	50.0%
524000 SURCHARGE COSTS	0	0					--
525000 REPAIRS TO EQUIPMENT	5,402	347	2,500	0	100	100	0.0%
526000 DEPRECIATION	410,224	422,391	439,500	217,591	435,132	447,000	2.7%
527000 DEPRECIATION-OFFSET							--
528000 DEBT SERVICE - EPHRATA							--
563000 PURCHASES-OTHER MATERIALS	5,275	0	2,500	0	15,500	2,500	-83.9%
564000 LEGAL COSTS	6,994	13,945	12,000	0	12,000	12,000	0.0%
565000 ENGINEERING COSTS	42,429	23,441	30,000	0	19,000	20,000	5.3%
569000 INVENTORY ADJUSTMENTS	9,348	(2,519)	0	0	(4,000)	0	--
530000 OTHER OPERATING EXPENSES	2,616	4,008	2,500	599	1,500	3,000	100.0%
<b>TOTAL OPERATING &amp; MAINTENANCE</b>	<b>1,308,677</b>	<b>1,289,626</b>	<b>1,420,327</b>	<b>661,781</b>	<b>1,384,032</b>	<b>1,438,786</b>	<b>4.0%</b>
<b>TRANSPORTATION EXPENSES</b>							
551000 GASOLINE AND MOTOR OIL	1,816	2,733	2,500	1,486	3,000	2,500	-16.7%
552000 REPAIRS AND SERVICE	1,327	1,763	2,500	1,265	2,400	3,000	25.0%
553000 TIRES AND TUBES	26	294	500	190	300	600	100.0%
555000 INSURANCE	2,054	2,315	2,500	1,127	2,254	2,500	10.9%
558000 DEPRECIATION	1,843	1,731	2,457	579	1,158	2,700	133.2%
<b>TOTAL TRANSPORTATION EXPENSES</b>	<b>7,066</b>	<b>3,835</b>	<b>10,457</b>	<b>4,647</b>	<b>9,112</b>	<b>11,300</b>	<b>24.0%</b>
<b>GENERAL &amp; ADMINISTRATION EXPENSES</b>							
601000 MANAGEMENT SERVICES	22,938	24,551	25,129	12,508	25,497	26,313	3.2%
602000 SALARIES AND WAGES-CLERICAL	46,168	50,821	50,522	27,854	54,779	67,842	23.8%
603000 PAYROLL TAXES	0	0	150		250	250	0.0%
605000 INSURANCE (ERRORS & OMISSIONS)	3,079	2,621	3,200	1,148	3,105	3,200	3.1%
607000 BILLING AND COLLECTION EXPENSE (SUPPL)	0	0	100	0	0	100	--
608000 ENGINEERING FEES	96,248	103,489	91,000	31,443	86,000	89,500	4.1%
609000 LEGAL FEES	27,818	25,782	20,000	10,006	18,000	18,000	0.0%
610000 AUDIT FEES	9,839	10,670	11,750	9,290	11,500	11,750	2.2%
611000 TRUSTEE FEE	2,119	2,337	4,500	2,250	3,000	4,500	50.0%
612000 OFFICERS EXPENSE	4,500	4,500	5,000	2,500	5,000	5,000	0.0%
613000 POSTAGE AND OFFICE SUPPLIES	4,717	6,101	4,500	2,862	5,600	5,700	1.8%
614000 DUES AND SUBSCRIPTIONS	1,365	1,071	400	191	400	400	0.0%
615000 ADVERTISING	1,907	2,216	1,500	146	1,500	1,500	0.0%
616000 MAINTENANCE AND REPAIRS	1,549	206	500	376	850	500	-41.2%
617000 SEMINARS & TRAINING		831	1,600	174	200	1,750	775.0%
618000 TELEPHONE	4,598	3,914	5,500	2,594	5,600	5,700	1.8%
619000 RENT BUILDING	4,900	5,850	5,400	2,250	5,400	5,400	0.0%
620000 AUTO ALLOWANCE	51	80	100	90	150	100	-33.3%
623000 DEPRECIATION	1,991	1,186	3,538	694	1,331	1,400	5.2%
624000 UNCOLLECTABLE ACCOUNTS		11,600			400		--
625000 OTHER GENERAL EXPENSE	2,159	1,585	2,000	473	1,200	1,800	50.0%
627000 AMORTIZATION OF COMPUTER SOFTWARE	578	795	717	432	864	652	-24.5%
628000 COMPUTER TRAINING	303	0	300	0	0	2,000	--
629000 COMPUTER SUPPORT	2,506	4,887	3,000	1,223	2,450	3,000	22.4%
<b>TOTAL GENERAL &amp; ADMIN EXPENSE</b>	<b>239,333</b>	<b>265,093</b>	<b>240,506</b>	<b>108,504</b>	<b>233,076</b>	<b>256,357</b>	<b>10.0%</b>
<b>TOTAL OPERATING DISBURSEMENTS</b>	<b>1,555,076</b>	<b>1,563,555</b>	<b>1,671,290</b>	<b>774,932</b>	<b>1,626,220</b>	<b>1,706,443</b>	<b>4.9%</b>



# EAST COCALICO TOWNSHIP AUTHORITY

## 2007-2008 SEWER RECEIPTS AND EXPENSE BUDGET



	2004-2005 ACTUAL	2005-2006 ACTUAL	2006-2007 BUDGET	2006-2007 6-MONTHS AUDIT PROJECTION	2006-2007 YEAR-END AUDIT PROJECTION	2007-2008 BUDGET	PERCENT CHANGE
EXCESS OF OPERATING RECEIPTS OVER OPERATING DISBURSEMENTS	27,753	210,035	155,276	77,546	120,095	213,057	774%
OTHER RECEIPTS							
701000 EARNED INTEREST	14,661	40,243	42,000	34,087	68,174	67,000	-1.7%
703000 OTHER RECEIPTS	0	1,518	0	0	0	3	
TOTAL OTHER INCOME	14,661	41,861	42,000	34,087	68,174	67,000	-1.7%
OTHER DISBURSEMENTS							
802000 INTEREST	147,176	143,727	140,725	70,363	140,726	136,218	-3.2%
803000 AMORTIZATION COSTS	7,674	7,587	7,485	3,742	7,484	7,368	-1.5%
TOTAL OTHER EXPENSES	154,650	151,314	148,210	74,105	148,210	143,586	-11%
806000 GAIN (LOSS) ON SALE OF ASSETS				0	0		
NET INCOME (LOSS) BEFORE EX-	(112,436)	100,582	50,066	37,528	40,059	136,471	240.7%
EXTRAORDINARY ITEMS							
LOSS FROM EARLY RETIREMENT OF DEBT							
NET INCOME (LOSS)	(112,436)	100,582	50,056	37,528	40,059	136,471	240.7%
MISCELLANEOUS CASH TRANSACTIONS							
PRINCIPAL	(125,000)	(130,000)	(135,000)	(135,000)	(135,000)	(140,000)	3.7%
OTHER	(452,709)	(574,053)	(473,100)	(275,098)	(323,525)	(230,605)	-28.7%
411000 TAPPING FEES	230,270	230,270	128,030	63,366	70,000	45,430	-35.1%
NON-CASH TRANSACTIONS (DEPRECIATION)	422,310	433,690	453,697	223,038	446,019	459,120	2.9%
CASH GAIN (LOSS)	(37,565)	60,479	23,693	(86,166)	97,553	270,416	1772%
Accrual based budget							

### Rate Analysis

Income	(112,436)	100,582	50,066	37,528	40,059	136,471	240.7%
Interest Expense	147,176	143,727	140,725	70,363	140,726	136,218	-3.2%
Tabbing Fees	230,270	230,270	128,030	63,366	227,000	45,430	-600%
Cash Available for Debt Service Payment	265,010	474,579	318,821	171,257	407,785	318,119	-22.0%
Principal & Interest Payment	272,176	273,727	275,725	205,363	275,726	276,218	0.2%
Required 15% reserve over Debt Service	40,826	41,059	41,359	30,804	41,359	41,433	0.2%
Revenue Excess (Shortage)	(47,992)	159,793	1,738	(64,910)	90,700	468	-99.5%
Percent rate increase required	NONE	NONE	5.3%	7.8%	NONE	NONE	
Amount of rate increase required	NONE	NONE	0.50	0.00	NONE	0.90	
Current Rate	7.15	7.15	9.45		3.10	9.95	
Recommended New Rate	7.15	7.15	9.95		9.10	10.75	
Rate \$ Increase in Sewer Rents	0	0	0.50			0.80	
Rate % Increase in Sewer Rents			5.3%			8.0%	



# EAST COCALICO TOWNSHIP AUTHORITY

## 2007-2008 SEWER RECEIPTS AND EXPENSE BUDGET



	1st. QUARTER	2nd. QUARTER	3rd QUARTER	4th QUARTER	TOTAL YEAR
OPERATING RECEIPTS					
401000 SEWER RENTS	423,660	497,340	497,340	423,660	1,842,000
403000 CAPACITY RESERVE CHARGES	2,300	2,700	2,700	2,300	10,000
408000 INTEREST ON LATE PAYMENTS	0	0	0	0	0
409000 PENALTIES FOR LATE PAYMENTS	5,000	5,900	5,000	4,800	20,000
410000 SURCHARGE	0	0	0	0	0
413000 INSPECTION FEES	175	175	175	175	700
414000 ADMINISTRATIVE REVIEW FEES	300	300	300	300	1,200
415000 CONNECTION FEES	0	0	0	0	0
417000 SEWER TREATMENT REBATE-ACT339	0	0	0	0	0
418000 MISCELLANEOUS	375	375	375	375	1,500
423000 MATERIAL SALES	4,125	4,125	4,125	4,125	16,500
424000 LEGAL FEES	1,250	1,250	1,250	1,250	5,000
425000 ENGINEERING FEES	5,000	5,000	5,000	5,000	20,000
426000 PERMIT & LICENSES	0	0	0	0	0
428000 SUB-CONTRACTOR	25	25	25	25	100
429000 LABOR SALES	625	625	625	625	2,500
TOTAL OPERATING RECEIPTS	442,835	517,115	516,915	442,635	1,919,500
OPERATING & MAINTENANCE EXPENSE					
500000 SALARIES AND WAGES-SUPERVISION	15,066	15,066	15,066	15,066	60,262
501000 SALARIES AND WAGES-OTHER	15,767	15,767	15,767	15,767	63,069
502000 PAYROLL TAXES-FICA	3,823	3,823	3,823	3,823	15,294
503000 PA UNEMPLOYMENT TAX	0	0	0	0	0
504000 WORKER'S COMPENSATION INSURANCE	7,220	0	0	0	7,220
505000 INSURANCE	3,375	3,375	3,375	3,375	13,500
506000 EMPLOYEE GROUP INSURANCE	9,875	9,875	9,875	9,875	39,500
507000 MAINTENANCE-STRUCTURES	250	250	250	250	1,000
508000 MAINTENANCE-TREATMENT FACILITIES	2,250	2,250	2,250	2,250	9,000
509000 MAINTENANCE-LINES	18,750	18,750	18,750	18,750	75,000
510000 RENT EQUIPMENT	250	250	250	250	1,000
511000 CONTRACT SERVICES	81	81	81	81	325
512000 ELECTRIC	4,125	4,125	4,125	4,125	16,500
514000 SEWER TREATMENT	147,200	172,800	172,800	147,200	640,000
515000 LAB TESTING FEES	375	375	375	375	1,500
516000 CHEMICALS	0	0	0	0	0
517000 PROPERTY TAXES	0	0	0	0	0
518000 PENSION	1,729	1,729	1,729	1,729	6,916
519000 RADIO	38	38	38	38	150
521000 TELEMETERING MAINTENANCE/REPAIRS	250	250	250	250	1,000
522000 TELEMETERING LINES	700	700	700	700	2,800
523000 AUTO ALLOWANCE	38	38	38	38	150
524000 SURCHARGE COSTS	0	0	0	0	0
525000 REPAIRS TO EQUIPMENT	25	25	25	25	100
526000 DEPRECIATION	111,750	111,750	111,750	111,750	447,000
527000 DEPRECIATION-OFFSET	0	0	0	0	0
528000 DEBT SERVICE - EPHRATA	0	0	0	0	0
563000 PURCHASES-OTHER MATERIALS	625	625	625	625	2,500
564000 LEGAL COSTS	3,000	3,000	3,000	3,000	12,000
565000 ENGINEERING COSTS	5,000	5,000	5,000	5,000	20,000
569000 INVENTORY ADJUSTMENTS	0	0	0	0	0
530000 OTHER OPERATING EXPENSES	750	750	750	750	3,000
TOTAL OPERATING & MAINTENANCE	352,311	370,692	370,692	345,092	1,438,786
TRANSPORTATION EXPENSES					
551000 GASOLINE AND MOTOR OIL	625	625	625	625	2,500
552000 REPAIRS AND SERVICE	750	750	750	750	3,000
553000 TIRES AND TUBES	150	150	150	150	600
555000 INSURANCE	625	625	625	625	2,500
558000 DEPRECIATION	675	675	675	675	2,700
TOTAL TRANSPORTATION EXPENSES	2,825	2,825	2,825	2,825	11,300



# EAST COCALICO TOWNSHIP AUTHORITY

## 2007-2008 SEWER RECEIPTS AND EXPENSE BUDGET



	1st.	2nd.	3rd	4th	TOTAL
	QUARTER	QUARTER	QUARTER	QUARTER	YEAR
GENERAL & ADMINISTRATION EXPENSES					
601000 MANAGEMENT SERVICES	6,578	6,578	6,578	6,578	26,313
602000 SALARIES AND WAGES-CLERICAL	16,961	16,961	16,961	16,961	67,842
603000 PAYROLL TAXES	250	0	0	0	250
605000 INSURANCE (ERRORS & OMISSIONS)	800	800	800	800	3,200
607000 BILLING AND COLLECTION EXPENSE (SUPPLIE	25	25	25	25	100
608000 ENGINEERING FEES	22,375	22,375	22,375	22,375	89,500
609000 LEGAL FEES	4,500	4,500	4,500	4,500	18,000
610000 AUDIT FEES	2,938	2,938	2,938	2,938	11,750
611000 TRUSTEE FEE	1,125	1,125	1,125	1,125	4,500
612000 OFFICERS EXPENSE	1,250	1,250	1,250	1,250	5,000
613000 POSTAGE AND OFFICE SUPPLIES	1,425	1,425	1,425	1,425	5,700
614000 DUES AND SUBSCRIPTIONS	100	100	100	100	400
615000 ADVERTISING	375	375	375	375	1,500
616000 MAINTENANCE AND REPAIRS	125	125	125	125	500
617000 SEMINARS & TRAINING	438	438	438	438	1,750
618000 TELEPHONE	1,425	1,425	1,425	1,425	5,700
619000 RENT BUILDING	1,350	1,350	1,350	1,350	5,400
620000 AUTO ALLOWANCE	25	25	25	25	100
623000 DEPRECIATION	350	350	350	350	1,400
624000 UNCOLLECTABLE ACCOUNTS	0	0	0	0	0
625000 OTHER GENERAL EXPENSE	450	450	450	450	1,800
627000 AMORTIZATION OF COMPUTER SOFTWARE	163	163	163	163	652
628000 COMPUTER TRAINING	500	500	500	500	2,000
629000 COMPUTER SUPPORT	750	750	750	750	3,000
TOTAL GENERAL & ADMIN EXPENSE	64,277	64,027	64,027	64,027	256,357
TOTAL OPERATING DISBURSEMENTS	419,413	437,543	437,543	411,943	1,706,443
EXCESS OF OPERATING RECEIPTS OVER OPERATING DISBURSEMENTS	23,422	79,572	79,372	30,692	213,057
OTHER RECEIPTS					
701000 EARNED INTEREST	16,750	16,750	16,750	16,750	67,000
703000 OTHER RECEIPTS	0	0	0	0	0
411000 TAPPING FEES	11,358	11,812	11,358	10,903	45,430
TOTAL OTHER INCOME	28,108	28,562	28,108	27,653	112,430
OTHER DISBURSEMENTS					
802000 INTEREST	0	68,109	0	68,109	136,218
PRINCIPAL PAYMENT	0	140,000	0	0	140,000
803000 AMORTIZATION OF BONDS ISSUE COSTS	1,842	1,842	1,842	1,842	7,368
DEBT SERVICE RESERVE(NON CASH)	10,358	10,358	10,358	10,358	41,433
TOTAL OTHER EXPENSES & RESERVE	12,200	220,309	12,200	80,309	325,018
INCOME (LOSS) AFTER NON-CASH EXPENSES	39,329	(112,176)	95,279	(21,964)	468
ACCUMULATIVE INCOME	39,329	(72,846)	22,432	468	
NON-CASH EXPENSES	114,780	114,780	114,780	114,780	459,120
INCOME BEFORE NON-CASH EXPENSES	154,109	2,604	210,059	92,81	459,588
ACCUMULATIVE INCOME (LOSS) WITH RESERVE	154,109	156,714	366,772	459,588	



# East Cocalico Township Authority Proposed 2007/2008 Sewer Budget Cash Flow



			2007-2008 Budget	2008-2009 Forecast	2009-2010 Forecast	2010-2011 Forecast	2011-2012 Forecast
Estimated Non Restricted Cash on Hand 3/1			1,450,000	1,720,416	1,166,116	1,385,866	1,158,116
Net Income (Loss) from operations			136,471	105,000	105,000	105,000	105,000
Add Back Non-Cash Items (Depreciation & Amortization)			459,120	465,000	470,000	475,000	480,000
Tapping Fees Income	0	2,065.00 Reassessment	45,430	61,950	206,500	196,000	196,000
Bond Issue / Major Development							
Total Inflows			641,021	631,950	781,500	776,000	781,000
Cash Available			2,091,021	2,352,366	1,947,616	2,161,866	1,939,116
Cash Applications:							
Principal Payment			140,000	145,000	150,000	155,000	160,000
Projects:							
Sewer Rehabilitation				300,000		300,000	
Adamstown Diversion Structure and Bypass Sewer	10,000		80,000				
Rights of Way	45,000		45,000	45,000			
As Built Plans	19,000		19,000	19,000			
Pump Station #2 Upgrade - Comminutor & Enclosure	41,000		41,000	656,000	266,000		
Sewer Telemetry					90,000		
Lakeside Act 537 Project					52,000	530,000	
GrindGog SLS #3			14,500				
Ventilating Blower			2,000				
Electric Hoist/Catch Tray (SLS #1)			3,500				
	Total Cost	Sewer %					
Misc. Hand Tools	1,500	50.0%	750				
Traffic Control Signs	1,500	50.0%	750				
Misc. Power Tools	2,500	50.0%	1,250				
#2 Chipping Hammer	400	50.0%	200				
Extension Ladder	250	50.0%	125				
Abbrasive Blasting Helmet	1,500	50.0%	750				
Copier	4,610	50.0%	2,305				
Asphalt Zipper	7,500	50.0%	3,750	3,750	3,750	3,750	3,750
P/U Truck Replacement	30,000	50.0%	15,000	17,500		15,000	
Printer	1,450	50.0%	725				
Total Projects			115,000	230,605	1,041,250	411,750	848,750
Ending Cash Available				1,720,416	1,166,116	1,385,866	1,158,116
							1,775,366



EAST COCALICO TOWNSHIP AUTHORITY  
2007/2008 SEWER DIVISION BUDGET  
DEBT SERVICE REQUIREMENTS



**2002 REVENUE BONDS**

<b>YEAR</b>	<b>PRINCIPAL</b>	<b>INTEREST</b>	<b>BALANCE</b>	<b>TOTAL PAYMENT</b>
2002		95,042	3,760,000	95,042
2003	125,000	150,364	3,635,000	275,364
2004	125,000	147,895	3,510,000	272,895
2005	130,000	144,638	3,380,000	274,638
2006	135,000	140,725	3,245,000	275,725
2007	140,000	136,218	3,105,000	276,218
2008	145,000	131,156	2,960,000	276,156
2009	150,000	125,623	2,810,000	275,623
2010	155,000	119,635	2,655,000	274,635
2011	160,000	113,255	2,495,000	273,255
2012	165,000	106,551	2,330,000	271,551
2013	175,000	99,365	2,155,000	274,365
2014	180,000	91,643	1,975,000	271,643
2015	190,000	83,360	1,785,000	273,360
2016	200,000	74,388	1,585,000	274,388
2017	205,000	64,869	1,380,000	269,869
2018	215,000	54,625	1,165,000	269,625
2019	230,000	43,500	935,000	273,500
2020	240,000	31,750	695,000	271,750
2021	250,000	19,500	445,000	269,500
2022	265,000	6,625	180,000	271,625
	3,580,000	1,980,725		5,560,725

## **Memorandum**

*To: East Cocalico Township Authority*

*From: Russell N. MacNair, P. E.*

*Date: January 23, 2006*

*Subject: Adamstown Agreement Analysis*

In conjunction with the preparation of the East Cocalico Township Act 537 Plan Update, I have reviewed all of the documents which, in my opinion, have a direct or indirect bearing on the Authority's current situation regarding the Adamstown Partnership Agreement. I have summarized the relevant portions of each document to provide a background for the Authority's current position and the basis for the identification and evaluation of alternative sewage treatment scenarios. I have also included a list of recommendations that may be used by the Authority in the development of a possible implementation plan.

### Background

The original East Cocalico Township Authority sewer system was constructed in 1968 with initial connections made in 1969. At that time, an agreement was entered into with the Borough of Ephrata, whereby, the Borough agreed to accept all sewage generated within East Cocalico Township for treatment at the Ephrata Sewage Treatment Plant (Plant No. 1). The Borough also entered into similar agreements to provide sewer service to other neighboring municipalities including Akron Borough, Denver Borough, and portions of Clay Township and Ephrata Township. By the mid-1990's, it became apparent that additional sewage treatment capacity would be required to meet the future development needs of the municipal partners in the sewage treatment plant. As a result of a projected imminent overload condition at the plant, the PADEP mandated that a regional Act 537 Plan be prepared to develop alternatives to address the problem. As an accommodation to the Borough of Ephrata and the other participating municipalities, East Cocalico agreed to pursue the diversion of a portion of its existing and future sewage flow to the Borough of Adamstown Sewage Treatment Plant.

### Ephrata Area Regional Act 537 Plan

The Ephrata Area Wastewater Treatment and Collection System Act 537 Official Wastewater Facilities Plan was completed in March 1995. This was a Regional Act 537 Plan prepared jointly by Akron, Denver, and Ephrata Boroughs and Clay, East Cocalico, and Ephrata Townships. The Plan recommended that the Ephrata Area decentralize wastewater treatment with three treatment plants. The selected alternative provided for the construction of a new wastewater treatment facility (Plant No. 2) to serve Denver Borough, East Cocalico Township and portions of Ephrata Borough and Ephrata Township. This plant was constructed in 1997. The total wastewater flow projection for East Cocalico, as presented in the Plan, is 1,780,000 gallons per day for the design year of 2014. The Plan also states that, of this total, 100,000 gallons per day of wastewater flow from East Cocalico is to be directed to the Adamstown Wastewater Treatment Plant. Therefore, for planning purposes, the net wastewater capacity of 1,680,000 gallons per day is used for East Cocalico throughout the Plan. The Plan also recommended further study of several areas in East Cocalico Township to determine the most appropriate means of sewage disposal. The areas identified for study included the Hahnstown Area, Lakeside Drive, Pinewood Estates, and Smokestown Road. The Township pursued further investigation in these areas and developed separate Plan Amendments for each area with the exception of Hahnstown.

### IMG Sewage Service Agreement

The Ephrata Area Wastewater Treatment and Collection System Act 537 Plan provided for the creation of an advisory committee called the Intermunicipal Group (IMG) to oversee the administration and operation of the regional wastewater conveyance and treatment facilities (Plant Nos. 1 and 2). All of the participants of the Regional Act 537 Plan, with the exception of Akron Borough and Clay Township, became members of the IMG. The IMG Sewage Service Agreement became effective as of November 1, 1995. There are several sections of the IMG Agreement that are relevant to the Authority's agreement with Adamstown and future capacity considerations.

Section 3.04 of the Agreement states that all parties give up their individual right to "reserved capacity", with the exception of Akron Borough's capacity at Plant No. 1. Therefore, existing reserve capacity is available to all parties on an as-needed basis. This provision may be very significant to the Authority in light of the anticipated growth in East Cocalico Township. Section 4.04 of the Agreement addresses the process whereby a party to the Agreement may request additional capacity above what may currently be available in the IMG's existing facilities. Depending upon the current capacity requirements of the other members of the IMG, the expansion project could either be funded jointly by the parties or individually by a single party needing additional capacity.

The issue of the diversion of sewage from East Cocalico to Adamstown is addressed specifically in Section 6.02 of the IMG Agreement. The Agreement allows East Cocalico to divert a total of 0.400 MGD, from a designated service area within the Township, to Adamstown. East Cocalico was allowed to divert the first 0.100 million gallons per day (MGD) to Adamstown with no penalty. For diverted flow between 0.100 MGD and 0.400 MGD, the Agreement requires payment of a Diversion Charge, which represents the proportionate amount of the total annual capital cost allocable to Plant No. 2. This charge is to be paid until such time that Plant No. 2 reaches its ultimate design capacity (2.30 MGD).

Under the terms of the Adamstown Partnership Agreement, East Cocalico initially diverted approximately 76,000 gallons per day to Adamstown. As provided in the IMG Agreement, East Cocalico was "credited" capacity tapping fee payments for future connections to Ephrata up to the EDU equivalent of 76,000 gallons per day. The understanding contemplated by the Agreement was that if East Cocalico diverted additional existing flows to Adamstown (up to 0.100 MGD), they would receive additional tapping fee credits, but if the diverted flows were decreased below 76,000 gallons per day, then East Cocalico would, in turn, make up the difference in capacity tapping fees to Ephrata. In reality, between 1996 and 2005, the actual flows diverted ranged from a high of about 90,000 gallons per day to a low of about 25,000 gallons per day. In May 2005, the East Cocalico Township Authority reached an understanding with Ephrata, whereby the Authority agreed to maintain a diversion flow of 76,000 gallons per day, and, as of January 1, 2005, pay the Borough capacity tapping fees for all new connections in East Cocalico, regardless of whether or not the connections were located within the Ephrata or Adamstown service areas.

#### Adamstown Partnership Agreement

Pursuant to the decision to divert excess sewage flow from East Cocalico to the Adamstown Sewage Treatment Plant, East Cocalico entered into a Sewer Service and Partnership Agreement with Adamstown in 1995. The Agreement provided for the diversion of up to 100,000 gallons per day of sewage from East Cocalico to the Adamstown Sewage Treatment Plant. The current design capacity of the Adamstown Sewage Treatment Plant was 600,000 gallons per day, and the Agreement referenced the possible expansion of the facility to meet the future needs of both municipalities up to a maximum design capacity of 1,200,000 gallons per day. The initial purchase cost for the East Cocalico capacity was based on a proportional amount (100,000/600,000) of the present value of the treatment facilities and one-half of the present value of the common facilities. Additional provisions of the Agreement required East Cocalico to pay its proportional share of any future plant upgrades and 100 percent of the cost of any future solids handling facilities. Future expansion of the treatment plant was to be paid for by the municipality requiring the additional treatment capacity or proportionally if both municipalities required additional capacity. The Agreement also includes a reimbursement provision, whereby Adamstown may buy back capacity from East Cocalico

based upon the initial buy-in calculation. There is no provision in the Agreement for East Cocalico to initiate a divestiture of its capacity in the treatment plant.

#### Adamstown Borough/East Cocalico Township Act 537 Plan

In 1998 Adamstown Borough and East Cocalico Township completed an Act 537 Plan. This Plan covered only the Adamstown watershed portion of East Cocalico Township. The alternative selected included upgrades to ECTA's main interceptor and Gehman School Road Pumping Station and diversion of East Cocalico flow away from Adamstown Borough. Several of the tasks in the recommended alternative have been completed, including upgrading the upper and lower sections of the ECTA main interceptor to convey higher flows to Ephrata WWTF No. 2, and constructing a new Gehman School Road Pumping Station. Additional items that were identified, but have not yet been completed, include the construction of a bypass to direct flows away from the Adamstown WWTP. This project is currently being designed and should be in place by late summer 2006. The selected alternative also contemplated the phased diversion of all ECTA flows back to Ephrata WWTF No. 2 during the four year period following completion of the plan to accommodate anticipated sewage capacity requirements of Adamstown Borough. The plan recognized that this schedule could be extended beyond the initial four year period, particularly if the Borough was able to successfully reduce infiltration/inflow. However, it was estimated that by no later than 2016, the Adamstown WWTP would not have adequate capacity for treatment of any ECTA flows.

#### Amendment to Adamstown Partnership Agreement

Adamstown and East Cocalico executed an amendment to the Adamstown Partnership Agreement with an effective date of January 1, 2005. The amendment included changes in the way the operation and maintenance costs associated with the Adamstown WWTP were shared between Adamstown and East Cocalico. The amendment also revised the method by which surcharges for certain higher strength waste characteristics were calculated and penalties assessed. This amendment had no effect on the capacity and diversion issues addressed in the Adamstown Partnership Agreement or the IMG Sewage Service Agreement.

#### East Cocalico Township Act 537 Plan Update

East Cocalico Township is currently in the process of preparing an Act 537 Plan Update to the Ephrata Area Regional Act 537 Plan prepared in 1995. As part of the Plan Update, the Township is reviewing its future sewage capacity requirements through 2026. The Township has determined that a total sewage treatment capacity of 1.860 MGD will be required by 2026. This is based on a current base average daily sewage flow of 0.934 MGD and a projected future sewage capacity requirement of 0.926 MGD for the next 20 years. The current base average daily flow is comprised of 0.858 MGD discharged to Ephrata and 0.076 MGD

discharged to Adamstown. The future capacity requirement of 0.926 MGD is comprised of 0.123 MGD of committed capacity and 0.803 MGD of uncommitted capacity. The total capacity requirement of 1.860 MGD compares to the 1.780 MGD total capacity requirement included for East Cocalico Township in the 1995 Regional Act 537 Plan.

Should the Township elect to maintain its current diversion of 76,000 gallons per day to Adamstown, the entire future capacity requirement of 0.926 MGD will need to be obtained from Ephrata. However, should the Township elect to eliminate the diversion of any sewage flow to Adamstown in the future, a total additional capacity of 1.002 MGD will need to be obtained from Ephrata. At the present time, the total uncommitted IMG capacity at both Ephrata treatment plants is only 1.165 MGD. This capacity is comprised of 0.668 MGD at Plant No. 2 and 0.497 MGD at Plant No. 1. Since the total uncommitted IMG capacity is available to all members of the IMG, it is quite possible that additional capacity will need to be provided. The additional capacity for East Cocalico could either be provided through an expansion of the IMG facilities or utilization of additional capacity at Adamstown. Alternatively, should one or more of the IMG members not require the capacity as projected in the 1995 Ephrata Area Regional Act 537 Plan, it is possible that the Authority's total treatment capacity requirements, including flow currently being diverted to Adamstown, could be accommodated by a combination of Ephrata Plant Nos. 1 and 2.

#### Evaluation of Alternatives

As indicated in the previous section, assuming that the other members of the IMG will not be in a position to relinquish future sewage treatment capacity requirements, East Cocalico will need additional treatment capacity prior to 2026. The following options for obtaining the required additional treatment capacity can be considered:

##### *Options:*

1. Maximum utilization of existing capacity in Ephrata Plant Nos. 1 and 2 plus participation in an expansion of Plant No. 2 in the future and continuation of diversion of up to 100,000 gallons per day to Adamstown.
2. Maximum utilization of existing capacity in Ephrata Plant Nos. 1 and 2 plus participation in an expansion of Plant No. 2 in the future and elimination of the diversion to Adamstown.
3. Maximum utilization of existing capacity in Ephrata Plants No. 1 and 2 plus participation in an expansion of the Adamstown WWTP.

The underlying decision to be made by the Authority is whether to remain a customer of both Ephrata and Adamstown, or to discontinue utilization of either of the options involving

Adamstown facilities. In addition to sewage treatment capacity considerations, both the Ephrata and Adamstown sewage treatment facilities will need to deal with the recent nutrient limitation issues resulting from PADEP commitments to the Chesapeake Bay Program. The fact that Ephrata Plant No. 2 is currently designed for the removal of nutrients should result in a lower cost per gallon to achieve continued compliance with more stringent discharge requirements at this facility than at the Adamstown WWTP. However, as a member of the IMG, the Authority will also be required to participate in the upgrade of Plant No. 1 for nutrient removal. Continued utilization of both Ephrata and Adamstown treatment facilities will mean that the Authority will be participating in the cost of upgrading three separate sewage treatment facilities.

### Recommendations

The performance of a detailed evaluation of all of the available options will be a challenging task. The number of unknown factors, relating particularly to the nutrient issue, will make the development of construction costs estimates, lifecycle operating cost estimates, and the performance of a present worth analysis very difficult. In addition, there are a number of factors to be evaluated that cannot be expressed purely by cost alone since they deal with the interpretation of existing agreements and decisions by other municipal bodies. Therefore, the Authority will need to decide what level of analysis is necessary and appropriate to make its decision regarding the future of the Adamstown Agreement. With that in mind, we have listed the following recommendations as possible tasks to be pursued.

1. Develop a list of specific parameters and assumptions, based on the issues presented above, should the Authority wish to perform a cost comparison analysis.
2. Perform a present worth analysis for the selected parameters to compare certain costs associated with the three options.
3. Identify the non-technical issues related to the possible termination of the Adamstown Agreement, such as the potential legal ramifications.
4. Begin discussions with Adamstown to explore the issues related to termination of the Adamstown Agreement.
5. Meet with IMG members to discuss long-term sewage treatment capacity requirements.
6. Meet with Ephrata Borough to discuss the issues relating to the possible expansion of Plant No. 2.

7. Explore the possibility of re-rating Plant No. 2 to obtain additional available capacity. This option may not be viable in light of the recent PADEP nutrient reduction initiative.
8. Investigate the impact of the recent nutrient reduction requirements in terms of potential upgrading requirements for all three sewage treatment plants. This will be a difficult task considering the uncertainty regarding the PADEP nutrient reduction strategy and the recent nine month moratorium placed on nutrient reduction regulations.
9. Summarize the results of the present worth analysis and non-cost issues to rank the three options presented above.
10. Select the preferred option for implementation.
11. Develop a timetable for the required steps leading to termination of the Adamstown Agreement.

CDM is available to discuss this matter in greater detail with the Authority and is prepared to assist the Authority in the implementation of any aspect of the program outlined above.

cc: East Cocalico Township Supervisors  
Shirk Reist

# Memorandum

*To: East Cocalico Township Supervisors  
East Cocalico Township Authority*

*From: CDM*

*Date: April 13, 2007*

*Subject: Stevens Pumping Station Evaluation*

## Introduction

Proposed development in the Authority's Stevens Pumping Station area prompted CDM to evaluate the capacity of the station as part of the Township's Act 537 Plan Update. This evaluation involved delineating the drainage area and preparing flow projections to determine the necessary capacity of the pumping station. The capacity of the existing gravity collection system, force main, and receiving gravity sewer were also analyzed. Two alternatives were developed to handle the future flows. The results of this evaluation, including necessary improvements, cost estimates, and a proposed schedule, are presented in this memorandum.

## Drainage Area Delineation

CDM prepared flow projections for the Stevens Pumping Station based on the drainage area for the pumping station. Figure 1 depicts the drainage area for Stevens Pumping Station, the Urban Growth Area (UGA) and Village Growth Area (VGA), and zoning for the parcels. The existing pumping station and sanitary sewer conveyance facilities are also shown. In addition to the parcels located in East Cocalico, neighboring parcels in West Cocalico are included on the map.

The numbered parcels are areas on which development is anticipated. In addition to undeveloped lands, parcels with an area greater than one acre and an existing residence were included as potential developments. The parcels can be broken down into four categories:

- Parcels inside the UGA/VGA and within the drainage area
- Parcels outside of the UGA/VGA but within the drainage area
- Parcels in West Cocalico Township and within the drainage area

- Parcels just outside of the drainage area but in close proximity to the Stevens Pumping Station

To ensure adequate capacity at the Stevens Pumping Station in the future, parcels outside of the UGA were considered to account for possible rezoning. These parcels are currently zoned as Rural Residential.

## **Flow Projections**

Table 1 identifies each of the numbered parcels and lists the acreage for each parcel. In some cases a parcel is divided among two zoning districts, and the respective areas are listed as 9a and 9b, for example. For several parcels, a portion is located within the UGA and the remainder is located outside of the UGA. The number of equivalent dwelling units (EDUs) for each parcel was estimated utilizing the maximum housing densities for that zoning district. The developable area for each parcel, excluding streets, etc., was assumed to be 65 percent of the total area. For several parcels that have development plans, the proposed EDUs provided by the developer were utilized. Parcels with Agricultural zoning were assumed to develop based on Mixed Residential densities to be consistent with the approach taken in the Water Capacity Allocation Study.

The number of EDUs for each development density was multiplied by the current EDU allocation of 282 gallons per day (gpd)/EDU to develop average daily flow (ADF) projections. The value of 282 gpd/EDU was developed based on 100 gallons per capita per day (gpcd) multiplied by 2.82 people per household. Peak hourly flow (PHF) projections were calculated by multiplying each ADF by a peaking factor of 4. Industrial flows were developed based on an assumption of 700 gpd/acre. There are currently 116 existing EDUs generating flow to the pumping station. The resulting ADF is 382,500 gpd and a PHF of 1,236,200 gpd.

## **Gravity Sanitary Sewer Conveyance Capacity**

A hydraulic model of the existing sanitary sewer system was used to analyze the gravity collection system that drains to the pumping station. The flow projections from each parcel were applied to the furthest point upstream of the existing gravity sewer system in the vicinity of the parcel. In cases where the topography may allow for gravity connection to two different branches of the existing system depending on how the parcel is developed, the flow from that parcel was applied at both possible locations. This approach was used for parcels 6, 7, and 9a.

The hydraulic capacity of the downstream gravity sewer located in Wabash , which receives the Stevens Pumping Station discharge, was also analyzed. The proposed pumping station maximum design flow of 860 gallons per minute (gpm) was utilized for this analysis. The receiving gravity line discharges directly into the IMG interceptor.

The results of the gravity system analysis are included in Table 2. A large portion of the existing gravity collection system has adequate capacity to accommodate the projected future flows. Approximately 2,100 linear feet of existing 8-inch pipe will need to be replaced with 10-inch pipe. These sections of gravity sewer are highlighted in Figure 2. The capacity of a 10-inch line at a minimum slope of 0.40 percent is 895,560 gpd. The downstream receiving gravity line in Wabash Road has adequate capacity.

Extensions to the existing gravity system to accommodate parcels that are farther upstream in the Stevens Pumping Station drainage basin will be the developers' responsibility. These extensions were not considered in this analysis or included in the cost estimate.

## **Pumping Station & Force Main Capacity**

The design capacity (PHF) of the existing Stevens Pumping Station is 288,000 gpd or 200 gpm. Because the future flows are not anticipated to reach the maximum for another 15 to 20 years or more, the station will be sized to initially provide a flow rate of 430 gpm with the ability to easily expand to 860 gpm in the future.

Under the initial flow projection, the pumping station will operate at 430 gpm and 57 feet of total dynamic head (TDH). The operating conditions for the future flow condition are 860 gpm and 73 feet TDH. The existing pumps would not be able to operate at either of these conditions.

The memorandum included in Attachment A outlines the existing equipment at the pumping station. The existing equipment will need to be replaced to accommodate the increased flows. The current pumping station enclosure and comminutor have been slated to be replaced. The proposed new pumps will be able to handle larger solids, so this evaluation will not include installing a new comminutor at the new pumping station. Rather than attempt to salvage the existing station it would be beneficial to construct a new larger station while the existing station remains operational during construction.

The wet well, force main, and generator will be sized to handle the future flow condition. The pumps could be sized for the initial flow rate, and then be replaced to accommodate the future flow rate. The existing 4-inch force main could be used for the initial flow condition to offset the initial cost of construction. Once the future flow condition is reached the force main will need to be upgraded along with the pumps.

Alternatively, depending on the pumps selected, it would be possible to utilize the same pumps for both flow scenarios with different impeller sizes. Another option would be to install the pumps with motors sized for the future conditions, but operate under the initial condition with belts and sheaves.

The Authority's standard specifications call for suction lift pumping stations, if feasible. The necessary suction lift at the pumping station would require a below ground station. The other alternative is to construct a submersible pumping station. At this point both options are considered to be possible alternatives, and selection of the ultimate option will depend on the Authority's preference at the time of design. The ECTA Sewer Committee currently recommends designing a submersible station, because constructing a suction lift station with the pumps at an intermediate level would increase construction costs.

The station will be a duplex pumping station, designed to operate with one pump running at a time. The station will have a flow meter. All controls, the transfer switch, and the generator will be housed within the pumping station building. The existing 4-inch force main will be upgraded to an 8-inch force main for the future flow condition, but the existing 4-inch force main will be acceptable for the initial design conditions.

## **Electrical Evaluation**

The station currently has 3-phase power, and the utility service is 480 volts (V). The primary service of the future station will be connected to a 200 amp (A), 480 V main service disconnect (enclosed breaker). The service disconnect switch will feed a 200 A, 480 V main distribution panel through a 200 A automatic transfer switch. The main distribution panel will supply power for the pumps, the pump control panel, and building services. A 15 kilovolt ampere (kVA), 480/120-208 V transformer will feed a 60 A, 30 circuit building service panel board.

The existing generator will not be able to support the power requirements of the new pumping station. A new standby power generator will be required to provide emergency power to start and run one pump, the comminutor, and the building service loads. The size of the generator will be dependent on the type of controls utilized for the pumps. If variable frequency drives (VFDs) are used, the generator will be sized at 60 kilowatts (kW). If across the line starters are used, the generator will be sized at 125 kW. The generator will be equipped with an integral breaker, control and monitoring station, and a sub-base fuel tank with capacity to allow 24 hours of continuous operation. Additional equipment will be provided for automatic power transfer upon power failure and return. The generator and electrical controls will be housed in a building.

## **Pumping Station Site Location & Conceptual Layout**

There are two possible locations for the new pumping station. Alternative No. 1 involves constructing the station at the existing pumping station site. Alternative No. 2 would relocate the pumping station to the corner of Line and Garden Spot Road. If the pumping station is relocated, it would be able to receive the flows from parcels 16, 17, and 18 by gravity. The ECTA Sewer Committee recommends utilizing the existing pumping station site and acquiring any additional land from the neighboring property, which is owned by James and Marian Oberholtzer.

The conceptual level layout for the pumping station is shown in Figure 3. The existing station is shown with the improvements for the new pumping station.

## **Cost Estimate**

A conceptual level cost estimate was developed for each alternative. The cost estimates are presented in Tables 3 and 4 for Alternatives 1 and 2, respectively. The cost estimates were developed based on current bid prices and estimates from comparable projects and vendor quotes.

Both alternatives will require the acquisition of land for the pumping station. Alternative 2 is more expensive than Alternative 1 mainly due to the additional length of force main and gravity sewer required to relocate the pumping station.

## **Project Schedule**

The existing station and gravity collection system has adequate capacity to accommodate the Authority's Well F Water Treatment Plant, which requires 98,000 gpd of sewer capacity. The new pumping station does not need to be completed prior to bringing the Water Treatment Plant online.

The schedule for this project will be driven by the proposed developments that will be contributing to the increased flow and the approval of the Act 537 Plan. Two large developments are in the pre-planning stages and have been in communication with the Authority. To ensure that the Authority is able to provide adequate time and planning, the schedule is rather aggressive. If the timing of the proposed development projects waivers, the schedule can be shifted farther into the future. The proposed schedule is outlined below:

Survey:	October 2007
Design/Permitting:	November 2007 to May 2008
Bidding & Award:	June 2008 to July 2008
Construction:	August 2008 to March 2009

The pumping station construction must be completed up front, but the force main expansion and gravity line replacement will not be necessary until greater flows are expected. The force main will need to be replaced once the initial flow condition is exceeded and larger pumps must be installed for the future condition. Depending on the location and timing of new developments, the gravity line replacement work could be delayed until the existing 8-inch gravity sewer capacity is fully utilized. This needs to be monitored and planned for accordingly.

## **Project Cost Distribution**

To continue efficient operation, excluding the private developments, the existing pumping station would have to be upgraded. This would involve replacing the pumps, comminutor, and pumping station enclosure. Therefore, private developers should be responsible for the portion of the new pumping station required to accommodate the increase in flow from 200 gpm to 860 gpm. Following this approach, the Authority's share of the pumping station costs for Alternative No. 1 would be 23 percent ( $200/860$ ) of \$1,080,000 (\$720,000 plus 25 percent of other project related costs plus 25 percent contingency) or \$251,000.

The gravity sewer line and force main will need to be expanded solely for new development. Therefore, all costs associated with these projects should be funded by developers.

Table 5 summarizes the recommended ultimate cost distribution. The Authority will cover the cost of constructing the new pumping station. This cost will be incorporated in the tapping fee, and the Authority will be reimbursed over time with tapping fees.

Table 1: Stevens Pumping Station Flow Projections

Parcel ID	Owner/Development	Zoning	Acreage	EDUs			Average Daily Flow (gpd)			Peak Hourly Flow (gpd)		
				Min. Density	Ave. Density	Max. Density	Min. Density	Ave. Density	Max. Density	Min. Density	Ave. Density	Max. Density
EXISTING DEVELOPMENT			85.4	116	116	116	32,712	32,712	32,712	130,848	130,848	130,848
INSIDE URBAN GROWTH AREA												
1	ECTANVell F	Suburban Residential	6	348	348	348	98,000	98,000	98,000	98,000	98,000	98,000
2	Wabash Landing	Suburban Residential	22	236	236	236	66,552	66,552	66,552	266,208	266,208	266,208
3	Walter, Fred & Margaret	Suburban Residential	4.4	2	7	11	564	1,974	3,102	2,256	7,896	12,408
5	Kilrain, Thomas	Suburban Residential	1.5	0	2	3	0	564	846	0	2,256	3,384
6	Bauman, Harold & Jeanette	Traditional Residential	2.3	8	11	13	2,256	3,102	3,666	9,024	12,408	14,664
7	Youndt & Martin	Traditional Residential	1.6	6	8	9	1,692	2,256	2,538	6,768	9,024	10,152
8	Harper, Ronald & Melodie	Traditional Residential	1.7	6	8	9	1,692	2,256	2,538	6,768	9,024	10,152
9a	Graybill, Arthur	Suburban Residential	18.8	12	30	48	3,384	8,460	13,536	13,536	33,840	54,144
10a	Zimmerman, Roy W	Suburban Residential	1.1	0	1	2	0	282	564	0	1,128	2,256
11a	Zimmerman, Roy	Suburban Residential	1.6	1	3	4	282	846	1,128	1,128	3,384	4,512
12	Martin, Dennis	Suburban Residential	0.8	0	1	2	0	282	564	0	1,128	2,256
13	Graybill, Arthur	Suburban Residential	2.0	1	3	5	282	846	1,410	1,128	3,384	5,640
20	Brubaker, Ray & Martha Jane	Suburban Residential	2.2	1	3	5	282	846	1,410	1,128	3,384	5,640
21a	Cherry Place Properties	Suburban Residential	1.6	1	3	4	282	846	1,128	1,128	3,384	4,512
21b	Cherry Place Properties	Light Industrial	3.4	5	5	5	1,410	1,410	1,410	5,640	5,640	5,640
23	Reamstown Church of God	Suburban Residential	13.7	10	25	40	2,820	7,050	11,280	11,280	28,200	45,120
SUBTOTAL			84.6	637	694	744	179,000	196,000	210,000	424,000	488,000	545,000
CUMULATIVE SUBTOTAL			170.0	753	810	860	212,000	229,000	243,000	555,000	619,000	676,000
WEST COCALICO TWP												
4	Scheetz, Terry	West Cocalico - VGA	7.3	23	30	37	6,486	8,460	10,434	25,944	33,840	41,736
19	Stevens Court	West Cocalico	58.6	41	41	41	11,562	11,562	11,562	46,248	46,248	46,248
22	Scheetz, Terry	West Cocalico	5.2	40	40	40	11,280	11,280	11,280	45,120	45,120	45,120
SUBTOTAL			71.1	104	111	118	29,000	31,000	33,000	117,000	125,000	133,000
CUMULATIVE SUBTOTAL			241.1	857	921	978	241,000	260,000	276,000	672,000	744,000	809,000
EAST COCALICO TWP PROPERTIES UNABLE TO BE SERVED BY GRAVITY												
16a	Weaver, Joseph & Eunice	Light Industrial	16.4	26	26	26	7,332	7,332	7,332	29,328	29,328	29,328
16b	Weaver, Joseph & Eunice	Agricultural (Mix Res)	21.3	13	27	41	3,666	7,614	11,562	14,664	30,456	46,248
SUBTOTAL			37.7	39	53	67	11,000	15,000	19,000	44,000	60,000	76,000
CUMULATIVE SUBTOTAL			278.8	896	974	1,045	252,000	275,000	295,000	716,000	804,000	885,000
WEST COCALICO TWP PROPERTY UNABLE TO BE SERVED BY GRAVITY												
18	Overholtzer, James & Marian	West Cocalico - Ag	83.3	54	108	162	15,228	30,456	45,684	60,912	121,824	182,736
CUMULATIVE SUBTOTAL			362.1	950	1,082	1,207	267,000	305,000	341,000	777,000	926,000	1,068,000
OUTSIDE URBAN GROWTH AREA & UNABLE TO BE SERVED BY GRAVITY												
17	Overholtzer, James & Marian	Agricultural (Mix Res)	20.3	13	26	39	3,666	7,332	10,998	14,664	29,328	43,992
CUMULATIVE SUBTOTAL			382.3	963	1,108	1,246	271,000	312,000	352,000	792,000	955,000	1,112,000
OUTSIDE URBAN GROWTH AREA												
9b	Graybill, Arthur	Rural Residential	36.0	23	23	23	6,486	6,486	6,486	25,944	25,944	25,944
10b	Zimmerman, Roy	Rural Residential	12.8	8	8	8	2,256	2,256	2,256	9,024	9,024	9,024
11b	Zimmerman, Roy	Rural Residential	56.4	36	36	36	10,152	10,152	10,152	40,608	40,608	40,608
14	Zimmerman, David	Rural Residential	6.6	4	4	4	1,128	1,128	1,128	4,512	4,512	4,512
15	Hoover, Warren	Rural Residential	61.9	40	40	40	11,280	11,280	11,280	45,120	45,120	45,120
SUBTOTAL			173.7	111	111	111	31,000	31,000	31,000	125,000	125,000	125,000
TOTAL			556.0	1,074	1,219	1,357	302,000	343,000	383,000	917,000	1,080,000	1,237,000

Table 2  
Existing Gravity Sanitary Sewer Capacity

Label	Design Capacity (gpd)	Total Flow (gpd)	Excess Design Capacity (gpd)	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Length (ft)	Section Size
Upstream Collection System										
P-812	780,975	130,900	650,075	MH 812	389.75	MH 811	387.05	0.0100	270.00	8 inch
P-811	1,234,830	130,900	1,103,930	MH 811	387.05	MH 810	385.00	0.0250	82.00	8 inch
P-810	1,352,688	130,900	1,221,788	MH 810	385.00	MH 809	382.00	0.0300	100.00	8 inch
P-809	493,932	135,300	358,632	MH 809	380.60	MH 808	379.20	0.0040	350.00	8 inch
P-808	493,932	143,000	350,932	MH 808	379.20	MH 807	377.80	0.0040	350.00	8 inch
P-807	493,932	148,500	345,432	MH 807	377.80	MH 806	376.60	0.0040	300.00	8 inch
P-806	493,932	165,000	328,932	MH 806	376.60	MH 805	375.00	0.0040	400.00	8 inch
P-805	493,932	286,000	207,932	MH 805	375.00	MH 804	373.40	0.0040	400.00	8 inch
P-804	493,932	290,400	203,532	MH 804	373.40	MH-803	372.74	0.0040	165.00	8 inch
P-803	493,932	298,100	195,832	MH-803	372.74	MH 802	371.14	0.0040	400.00	8 inch
P-802	740,898	298,100	442,798	MH 802	371.14	MH 801	368.80	0.0090	260.00	8 inch
P-801	1,155,078	315,700	839,378	MH 801	368.80	MH 800-1	361.10	0.0219	352.00	8 inch
P-800-1	490,672	315,700	174,972	MH 800-1	361.10	MH 800	360.80	0.0039	76.00	8 inch
P-805-2	778,098	0	778,098	MH-805-2	378.85	MH-805-1	377.50	0.0099	136.00	8 inch
P-805-1	617,415	0	617,415	MH-805-1	377.50	MH 805	375.00	0.0063	400.00	8 inch
P-820-6	780,975	147,400	633,575	MH 820-6	380.97	MH 820-5	379.87	0.0100	110.00	8 inch
P-800-5	891,120	150,700	740,420	MH 820-5	379.87	MH 820-4	376.55	0.0130	255.00	8 inch
P-820-4	780,975	150,700	630,275	MH 820-4	376.55	MH 820	374.50	0.0100	205.00	8 inch
P-820	493,352	414,700	78,652	MH 820	374.50	MH 820-1	373.65	0.0040	213.00	8 inch
P-820-1	494,849	539,100	-44,251	MH 820-1	373.28	MH 818	372.20	0.0040	269.00	8 inch
P-818	527,577	539,100	-11,523	MH 818	370.86	MH 817	369.71	0.0046	252.00	8 inch
P-817	780,975	539,100	241,875	MH 817	369.25	MH 816	368.60	0.0100	65.00	8 inch
P-816	493,932	605,100	-111,168	MH 816	368.10	MH 815	367.04	0.0040	265.00	8 inch
P-815	491,218	611,700	-120,482	MH 815	367.04	MH 814	366.04	0.0040	252.77	8 inch
P-814	493,932	619,400	-125,468	MH 814	366.04	MH 813	364.48	0.0040	390.00	8 inch
P-813	496,498	674,400	-177,902	MH 813	364.48	MH 800-2	363.51	0.0040	240.00	8 inch
P-800-2	494,370	674,400	-180,030	MH 800-2	363.51	MH 800-A	362.38	0.0040	282.00	8 inch
P-800-A	493,932	674,400	-180,468	MH 800-A	362.38	MH 800	362.02	0.0040	90.00	8 inch
P-800	2,302,575	1,284,900	1,017,675	MH 800	354.50	VW-2	354.00	0.0100	50.00	12 inch

Table 2  
Existing Gravity Sanitary Sewer Capacity

Label	Design Capacity (gpd)	Total Flow (gpd)	Excess Design Capacity (gpd)	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Length (ft)	Section Size
Upstream Collection System cont'd										
P-820-3	1,694,314	9,900	1,684,414	MH-820-3	382.00	MH-820-2	378.47	0.0471	75.00	8 inch
P-820-2	1,185,326	9,900	1,175,426	MH-820-2	378.47	MH 820-1	375.89	0.0230	112.00	8 inch
P-813-6	497,475	14,300	483,175	MH-813-6	367.65	MR 813	366.10	0.0041	382.00	8 inch
P-813-4	2,014,451	18,700	1,995,751	MH-813-4	398.00	MH-813-3	388.02	0.0665	150.00	8 inch
P-813-3	1,222,142	30,800	1,191,342	MH-813-3	388.02	MH-813-2	382.51	0.0245	225.00	8 inch
P-813-2	1,237,913	30,800	1,207,113	MH-813-2	382.51	MH-813-1	380.50	0.0251	80.00	8 inch
P-813-1	1,294,364	30,800	1,263,564	MH-813-1	380.50	MH 813	371.71	0.0275	320.00	8 inch
							Length to be expanded:			2106
Downstream Receiving System										
P-833	3,336,749	1,300,854	2,035,894	MH 833	400.00	MH 832	395.17	0.0210	230.00	12 inch
P-832	1,456,276	1,300,854	155,422	MH 832	394.15	MH 831	393.63	0.0040	130.00	12 inch
P-831	1,456,276	1,300,854	155,422	MH 831	393.63	MH 830	392.31	0.0040	330.00	12 inch
P-830	4,662,360	1,300,854	3,361,505	MH 830	392.31	MH 829	376.32	0.0410	390.00	12 inch
P-829	2,122,869	1,300,854	822,015	MH 829	376.32	MR 828	372.92	0.0085	400.00	12 inch
P-828	2,122,869	1,300,854	822,015	MH 828	372.92	MH 827	369.52	0.0085	400.00	12 inch
P-827	1,456,276	1,355,854	100,422	MH 827	369.52	MH 826	368.44	0.0040	270.00	12 inch
P-826	2,123,927	1,355,854	768,073	MH 826	365.75	MH 825	363.24	0.0085	295.00	12 inch
P-825	2,302,575	1,361,354	941,221	MH 825	359.75	MH 824	359.30	0.0100	45.00	12 inch
P-824	4,398,025	1,361,354	3,036,670	MH 824	359.30	MR 823	354.01	0.0365	145.00	12 inch
P-823	2,291,425	1,361,354	930,070	MH 823	354.01	MH 822	351.96	0.0099	207.00	12 inch
P-822	1,581,415	1,361,354	220,061	MH 822	351.96	0-821	351.71	0.0047	53.00	12 inch

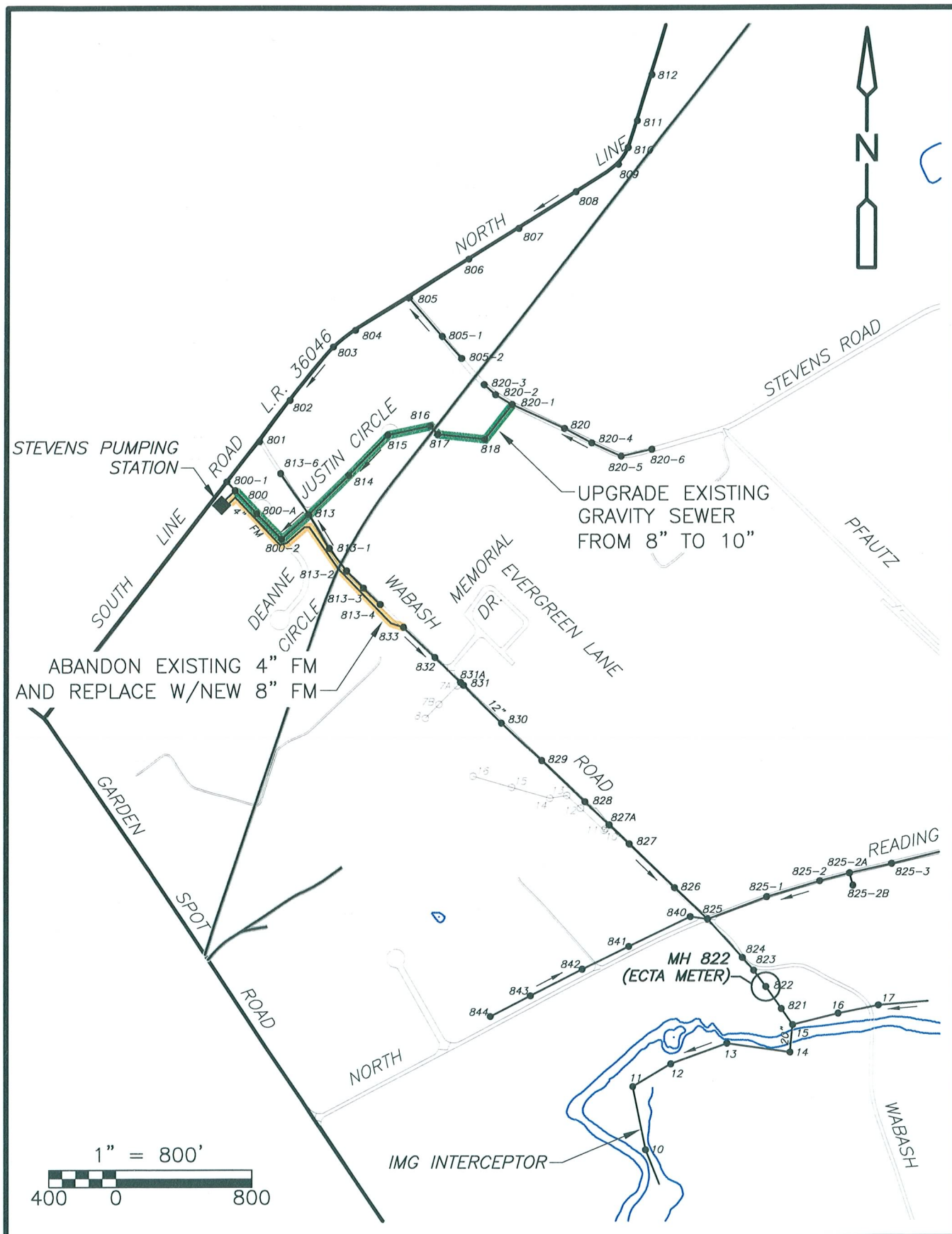


Figure No. 2  
Stevens Pumping Station  
Upstream Gravity Sewer & Force Main Improvements

### Table 3

[illegible]

### Table 4

[illegible]

Table 5  
Stevens Pumping Station Ultimate Cost Distribution

	Total	ECTA	Stevens Court	Wabash Landing	All Other Developments
Proposed Flow (gpm)	860	200	32	185	443
Pumping Station	\$ 1,080,000	\$ 251,000	\$ 40,000	\$ 232,000	\$ 557,000
Force Main	\$ 313,000	\$ -	\$ 15,000	\$ 88,000	\$ 210,000
Gravity Sewer	\$ 531,000	\$ -	\$ -	\$ -	\$ 531,000
Total	\$ 1,924,000	\$ 251,000	\$ 55,000	\$ 320,000	\$ 1,298,000

Notes:

- 1) The costs for the gravity sewer would be paid by developers contributing flows that would overload the existing 8-inch gravity sewer.
- 2) Not all developments within the Stevens Pumping Station drainage area are tributary to the section of the gravity system that must be expanded to support full buildout.

## **Attachment A**

## **Memorandum**

**To:** *Project File*

**From:** *Rachel Kirkham*

**Date:** *November 10, 2006*

**Subject:** *Stevens Road Pumping Station Site Visit*

R. Henne and R. Kirkham (CDM) met with L. Sweigart (ECTA) at the Stevens Road Pumping Station to obtain information on the existing facility. The findings are summarized below.

- Power Supply: 3 phase
- Pumps: Seamans Allis, Gorman Rupp T3 (3" impeller), 1745 rpm, 230/460 V, 60 Hz, 10 hp, 25.6/12.8 amp, class B insulation
- Pump Control Panel: 240 V, 3 phase, 60 Hz, 95 amp
- Autodialer: Raco Verbatum series VSS
- Comminutor: Chicago Pump, 230/460 V
- Generator: Maxi-Power generator set, manufacturer - Leonard Martin Co., Lebanon PA, serviced by - Martin Machinery, Ephrata PA, 717-738-0300, serial # B532-82, model # JDL-50-D3, 50 kW, 151 amp, 62.5 kVA, 120/240V, 60 cycles, 1800 rpm, engine BHP = 80
- Transfer Switch: ASCO auto transfer switch, catalog # 300326061C, serial # 828656001, 260 amp
- Transfer Switch Circuit Breaker: Square D, 100 amp, catalog # FAL32100 series 2
- Utility Pole: PP&L 44407, 532427
- Public water is available at the existing station, but would not be at the possible relocation site at the corner of Wabash Rd and Garden Spot Rd.

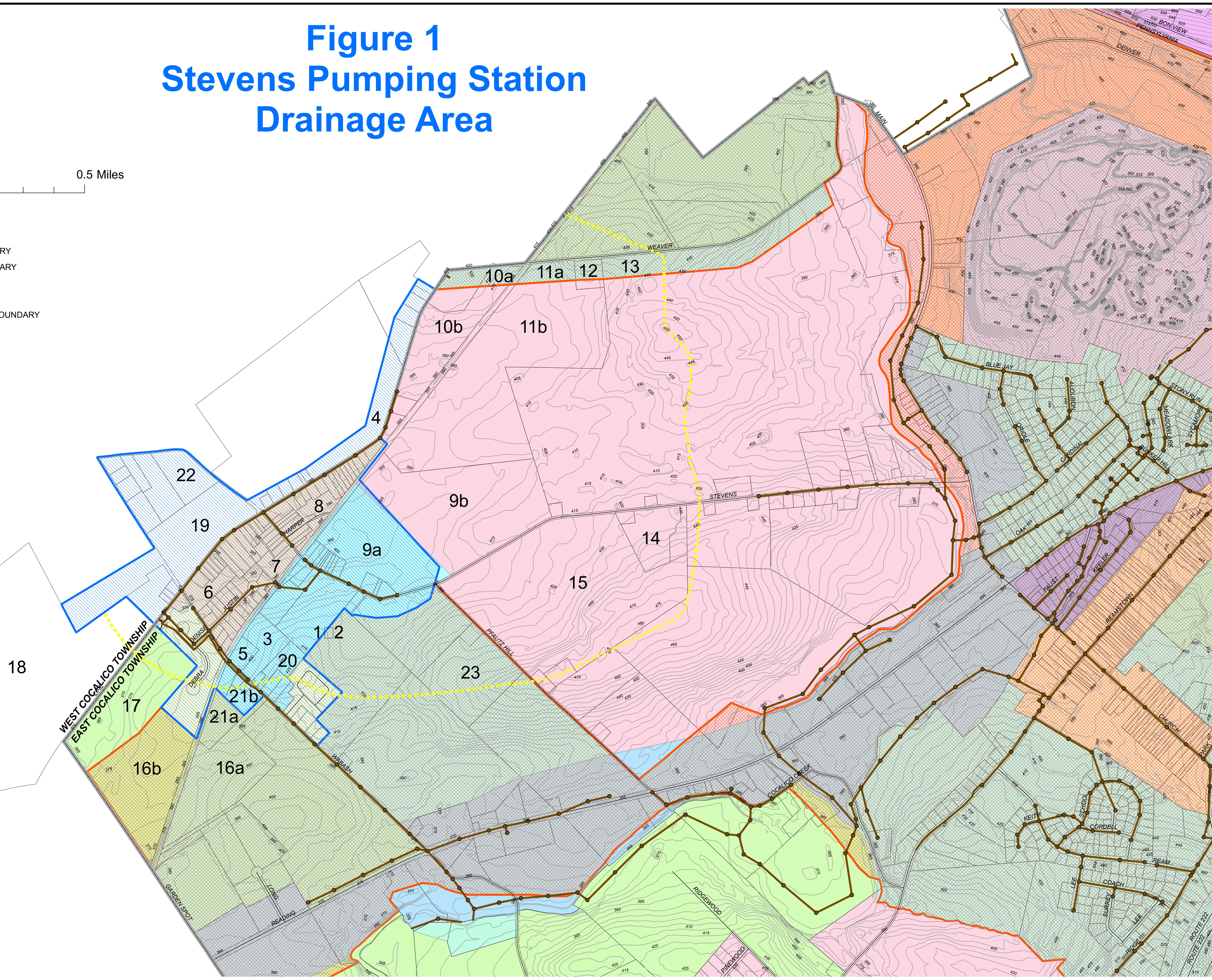
Project File  
November 10, 2006  
Page 2

- Parcel dimensions: 90' wide (road frontage), 99' deep on N side of station (S side of station is deeper)

Figure 1  
Stevens Pumping Station  
Drainage Area



- Legend**
- URBAN GROWTH AREA BOUNDARY
  - VILLAGE GROWTH AREA BOUNDARY
  - EXISTING SANITARY SEWER
  - STEVENS PUMPING STATION
  - STEVENS PS DRAINAGE AREA BOUNDARY
- ZONING**
- AGRICULTURAL
  - CONSERVATION
  - GENERAL COMMERCIAL
  - HEAVY INDUSTRIAL
  - HIGH DENSITY RESIDENTIAL
  - LIGHT INDUSTRIAL
  - MIXED RESIDENTIAL
  - MOBILE HOME PARK
  - PLANNED COMMERCIAL
  - QUARRY
  - RURAL RESIDENTIAL
  - SUBURBAN RESIDENTIAL
  - TRADITIONAL RESIDENTIAL



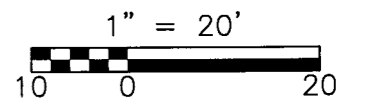
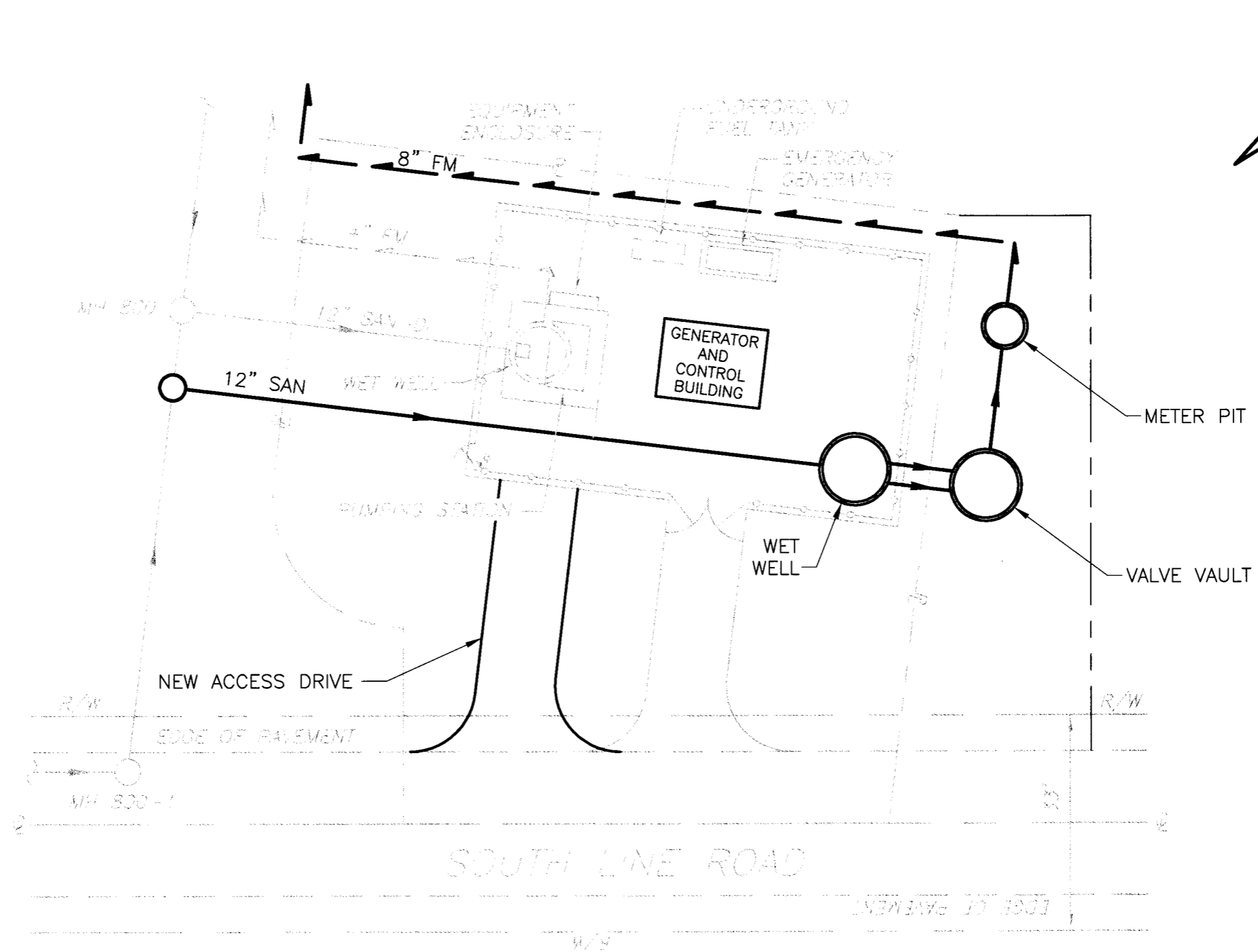
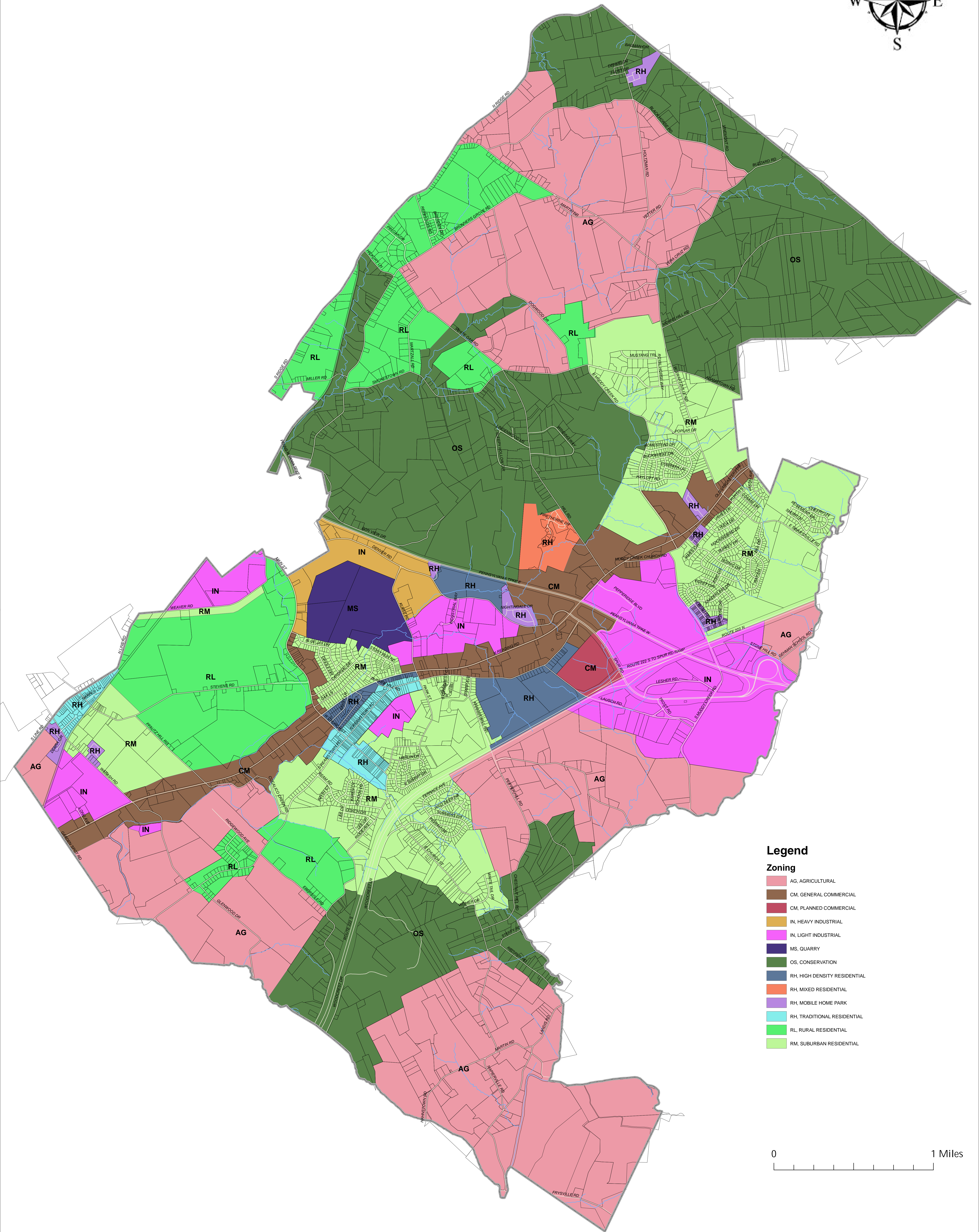


Figure No. 3  
Stevens Pumping Station  
Conceptual Site Plan

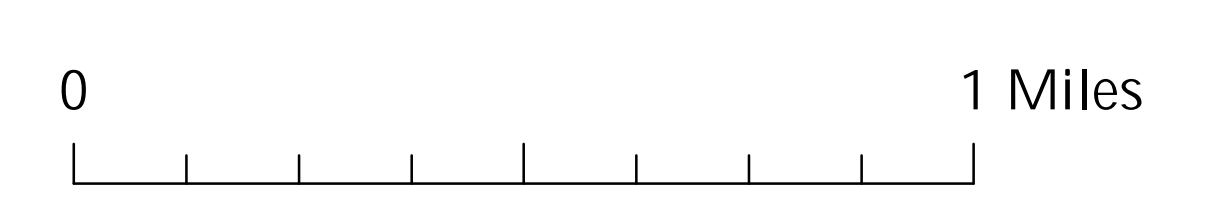
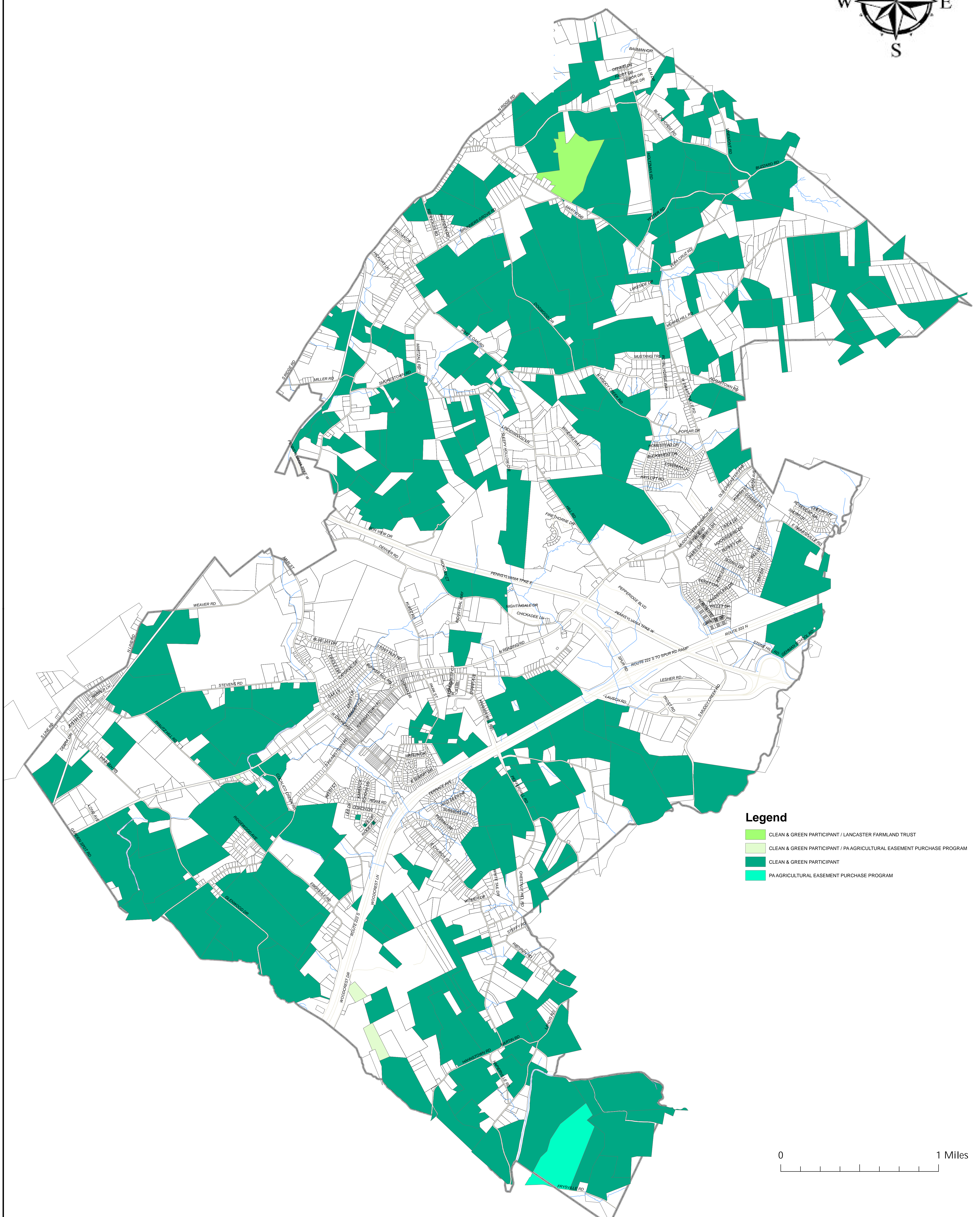
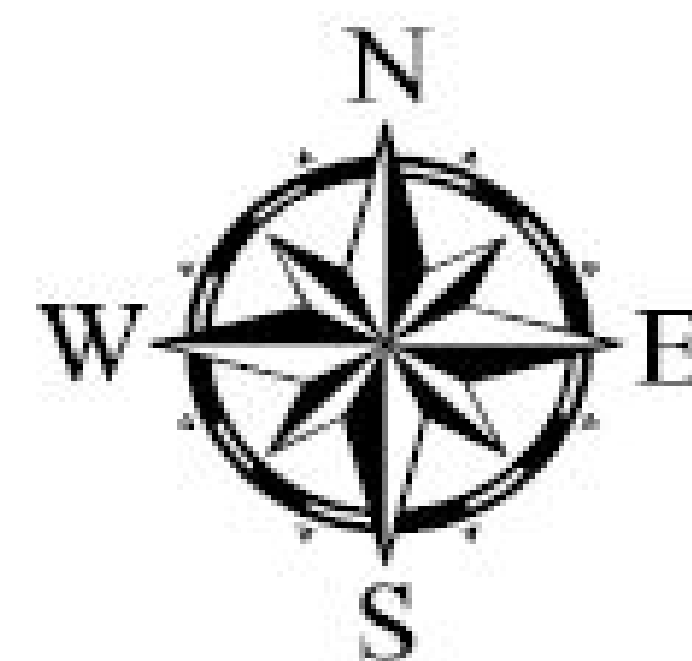


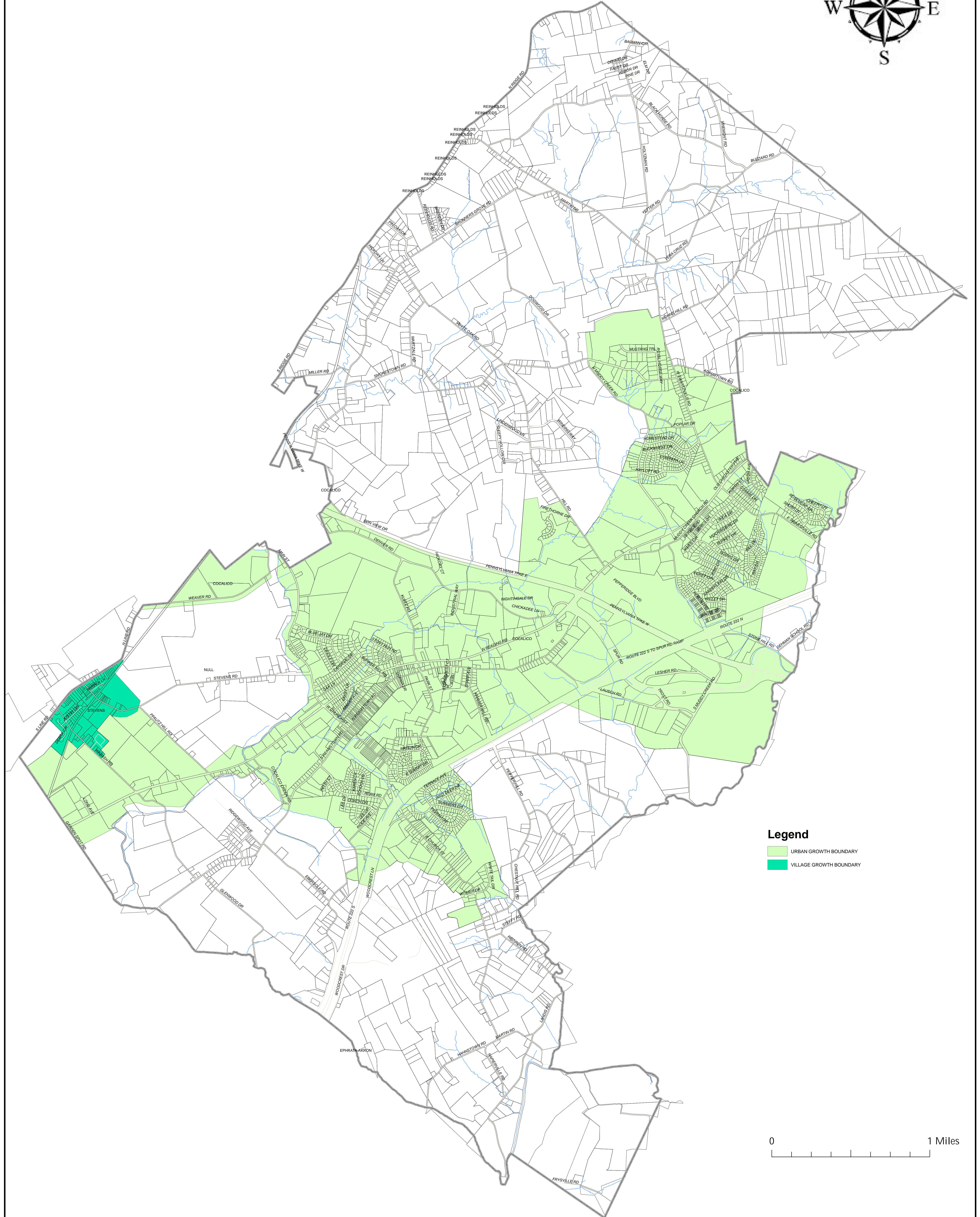
### Legend

#### Zoning

- AG, AGRICULTURAL
- CM, GENERAL COMMERCIAL
- CM, PLANNED COMMERCIAL
- IN, HEAVY INDUSTRIAL
- IN, LIGHT INDUSTRIAL
- MS, QUARRY
- OS, CONSERVATION
- RH, HIGH DENSITY RESIDENTIAL
- RH, MIXED RESIDENTIAL
- RH, MOBILE HOME PARK
- RH, TRADITIONAL RESIDENTIAL
- RL, RURAL RESIDENTIAL
- RM, SUBURBAN RESIDENTIAL

0 1 Miles

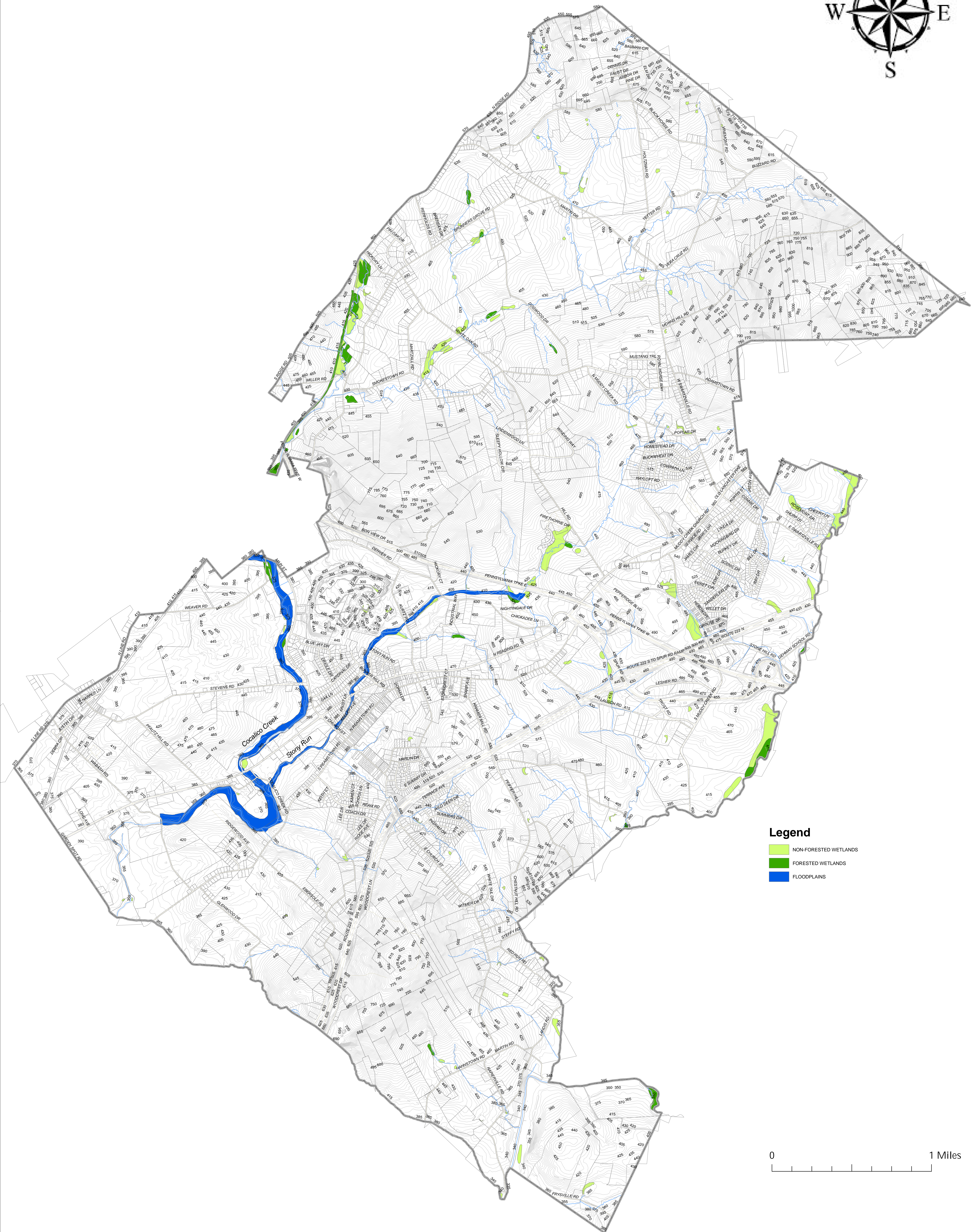




**Legend**

- URBAN GROWTH BOUNDARY
- VILLAGE GROWTH BOUNDARY

0 1 Miles

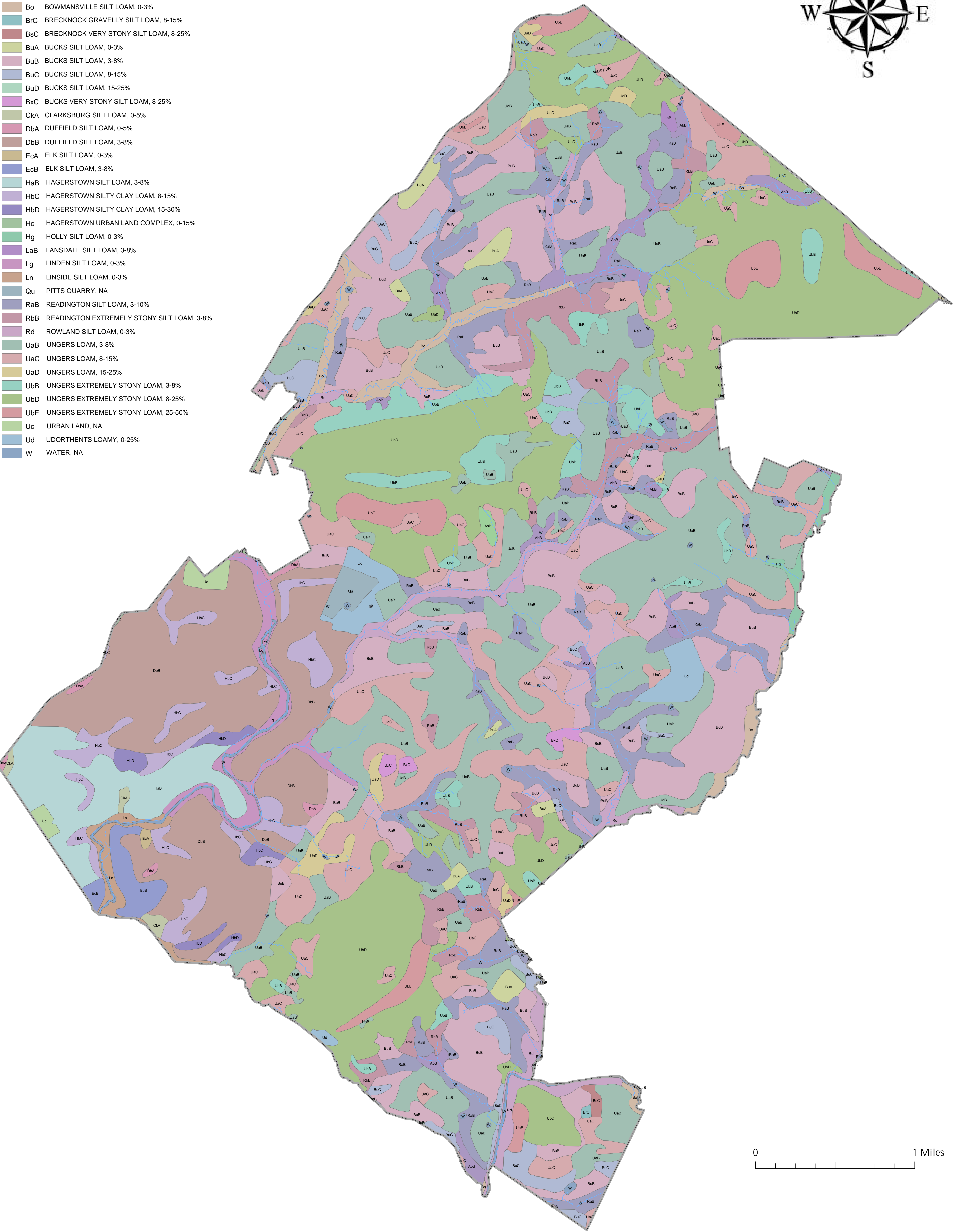


East Cocalico Township Act 537 Plan Update  
TOPOGRAPHY, FLOODPLAINS, AND WETLANDS  
Figure 2-2

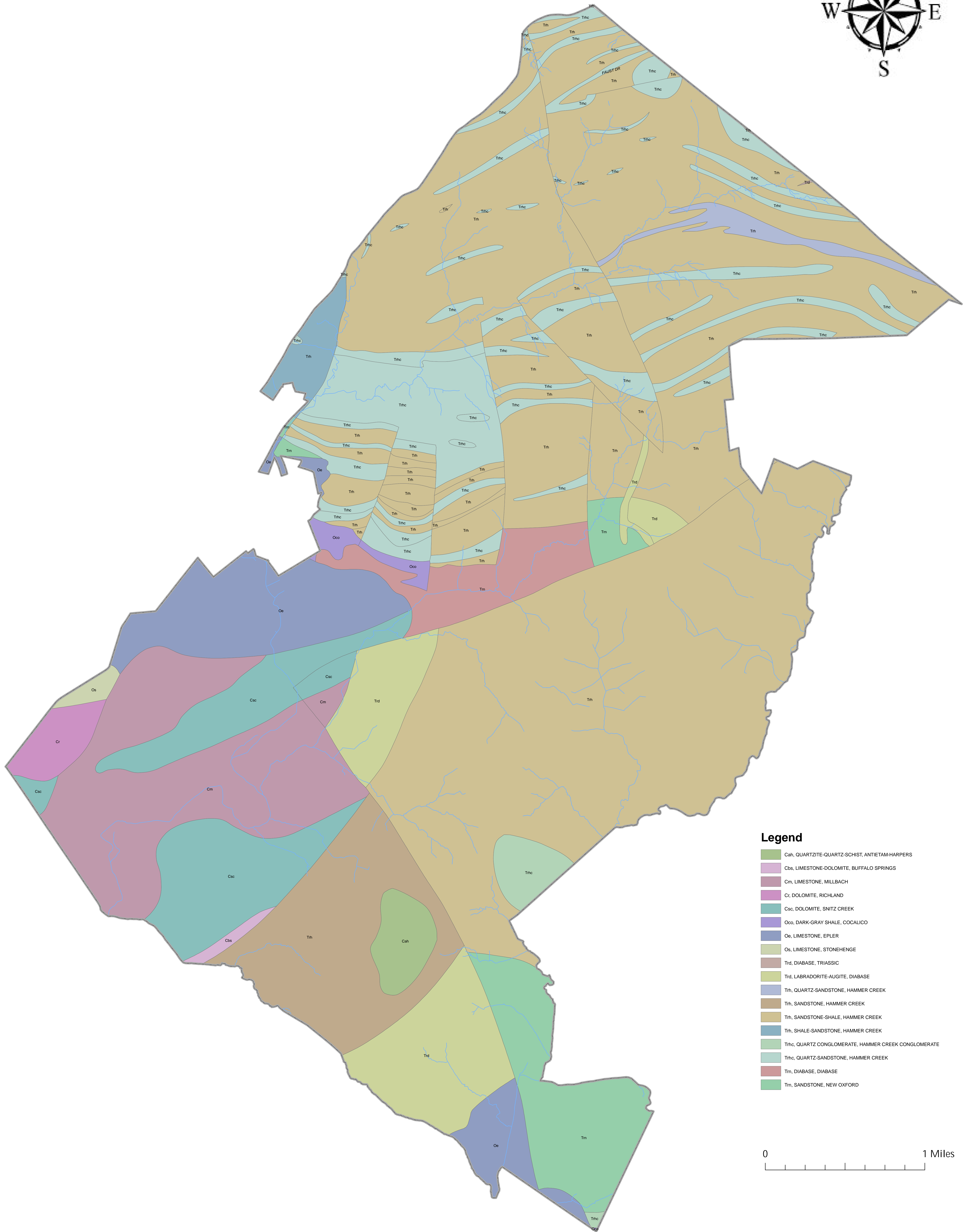
Legend

SOILS

- AbB ABBOTTSTOWN SILT LOAM, 3-8%
- AsB ABBOTTSTOWN EXTREMELY STONY SILT LOAM, 3-8%
- Bo BOWMANSVILLE SILT LOAM, 0-3%
- BrC BRECKNOCK GRAVELLY SILT LOAM, 8-15%
- BsC BRECKNOCK VERY STONY SILT LOAM, 8-25%
- BuA BUCKS SILT LOAM, 0-3%
- BuB BUCKS SILT LOAM, 3-8%
- BuC BUCKS SILT LOAM, 8-15%
- BuD BUCKS SILT LOAM, 15-25%
- BxC BUCKS VERY STONY SILT LOAM, 8-25%
- CkA CLARKSBURG SILT LOAM, 0-5%
- DbA DUFFIELD SILT LOAM, 0-5%
- DbB DUFFIELD SILT LOAM, 3-8%
- EcA ELK SILT LOAM, 0-3%
- EcB ELK SILT LOAM, 3-8%
- HaB HAGERSTOWN SILT LOAM, 3-8%
- HbC HAGERSTOWN SILTY CLAY LOAM, 8-15%
- HbD HAGERSTOWN SILTY CLAY LOAM, 15-30%
- Hc HAGERSTOWN URBAN LAND COMPLEX, 0-15%
- Hg HOLLY SILT LOAM, 0-3%
- LaB LANSDALE SILT LOAM, 3-8%
- Lg LINDEN SILT LOAM, 0-3%
- Ln LINSIDE SILT LOAM, 0-3%
- Qu PITTS QUARRY, NA
- RaB READINGTON SILT LOAM, 3-10%
- RbB READINGTON EXTREMELY STONY SILT LOAM, 3-8%
- Rd ROWLAND SILT LOAM, 0-3%
- UaB UNGERS LOAM, 3-8%
- UaC UNGERS LOAM, 8-15%
- UaD UNGERS LOAM, 15-25%
- UbB UNGERS EXTREMELY STONY LOAM, 3-8%
- UbD UNGERS EXTREMELY STONY LOAM, 8-25%
- UbE UNGERS EXTREMELY STONY LOAM, 25-50%
- Uc URBAN LAND, NA
- Ud UDORTHERTS LOAMY, 0-25%
- W WATER, NA



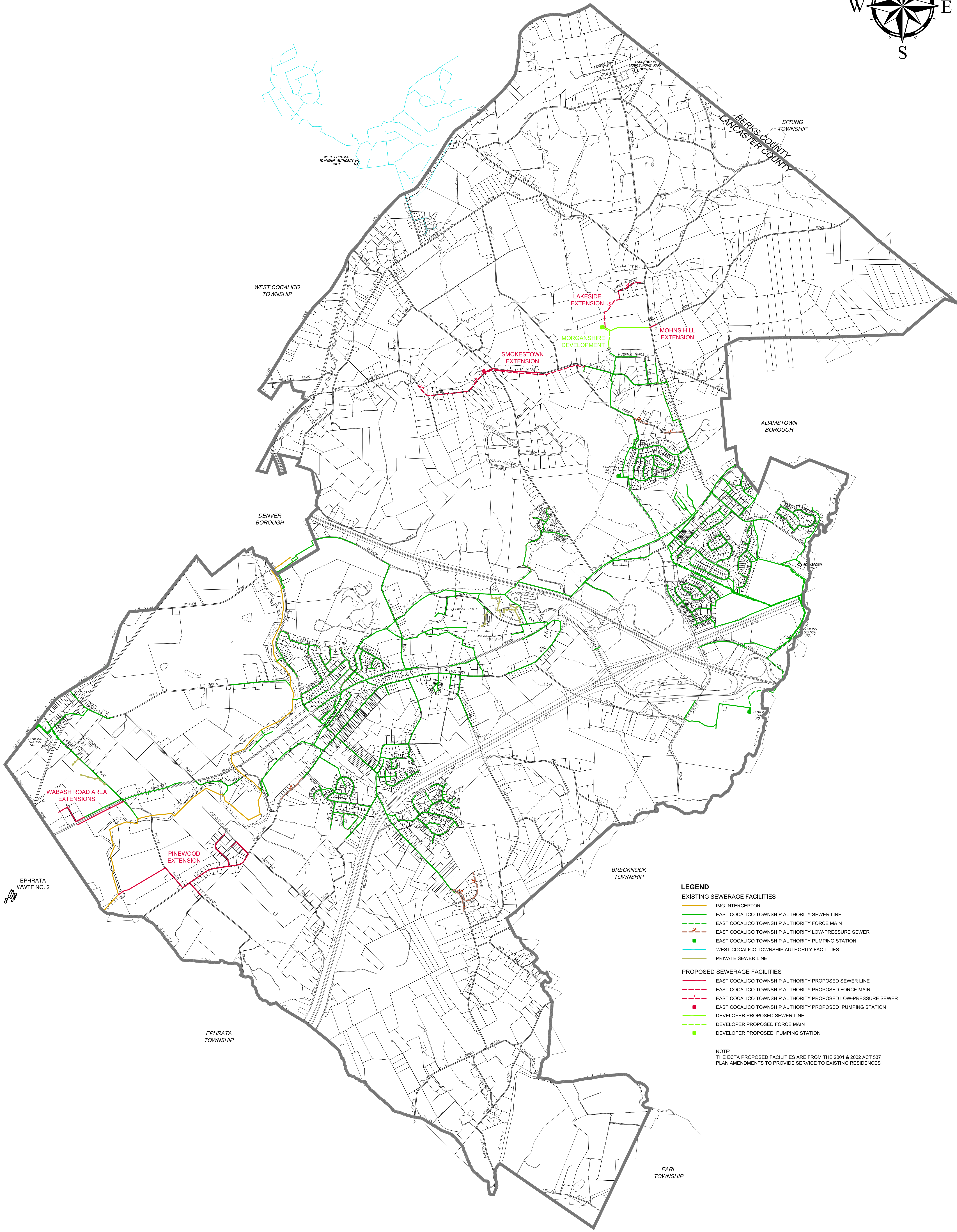
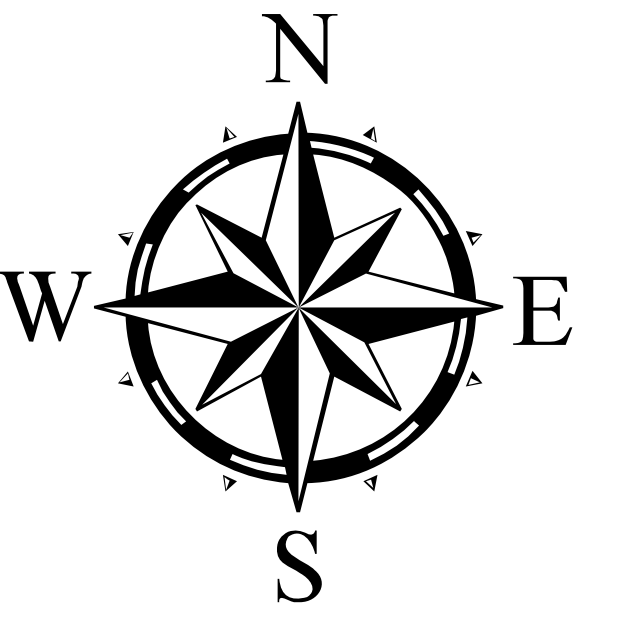
0 1 Miles



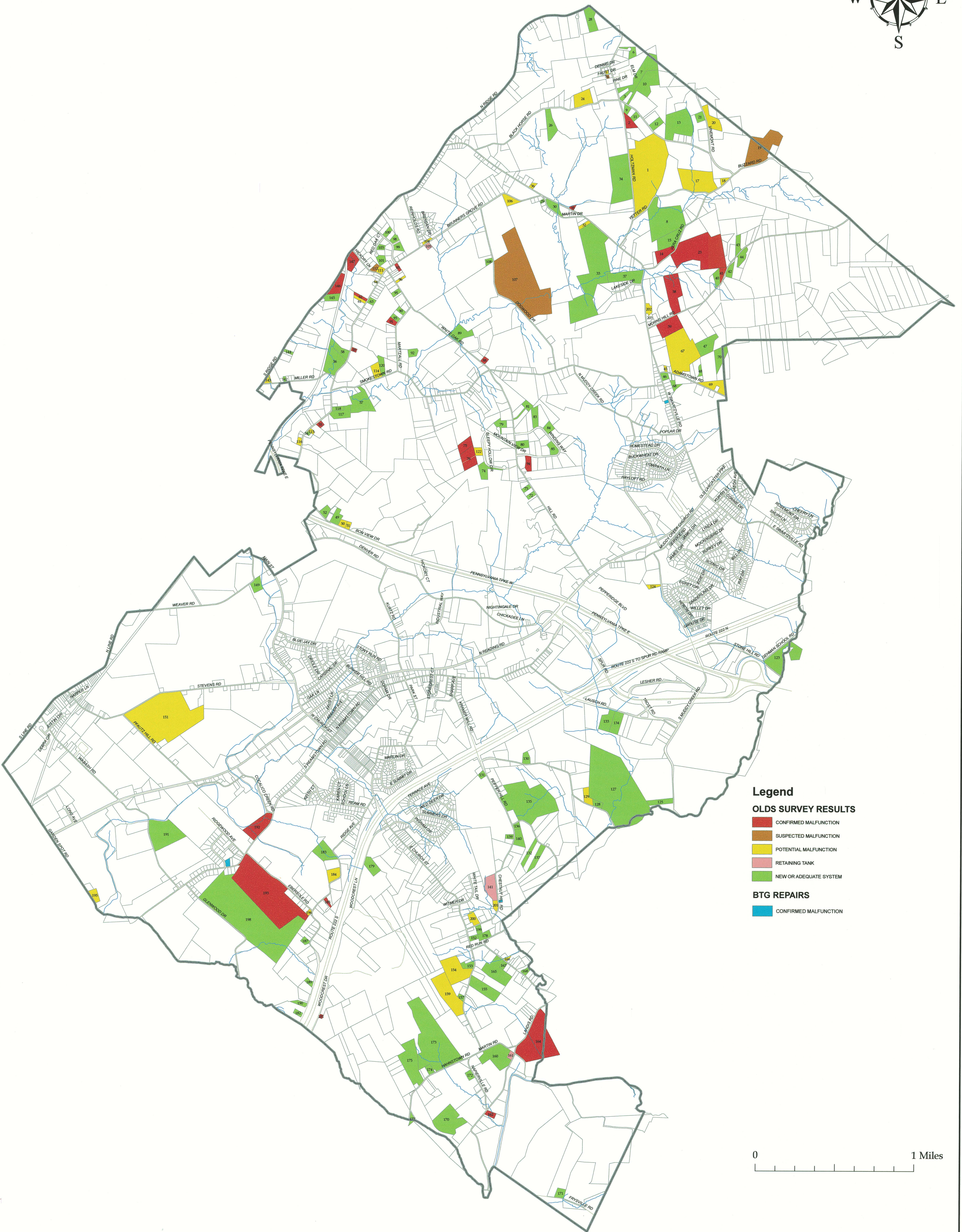
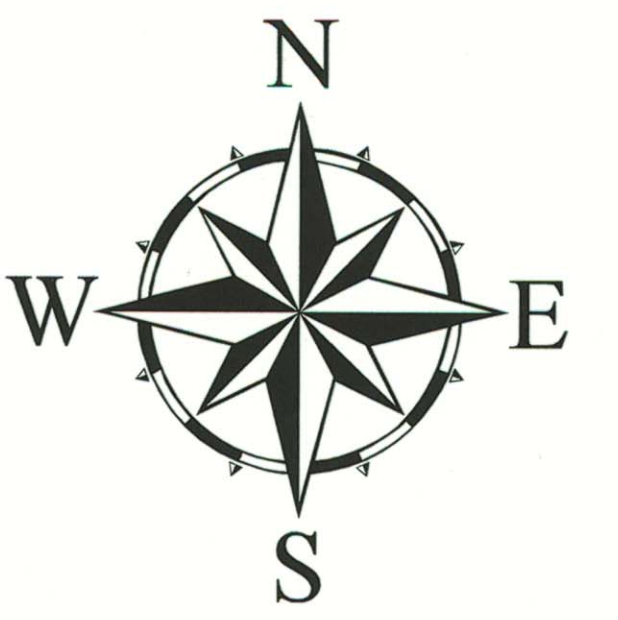
**Legend**

- Cah, QUARTZITE-QUARTZ-SCHIST, ANTIETAM-HARPERS
- Cbs, LIMESTONE-DOLOMITE, BUFFALO SPRINGS
- Cm, LIMESTONE, MILLBACH
- Cr, DOLOMITE, RICHLAND
- Csc, DOLOMITE, SNITZ CREEK
- Oco, DARK-GRAY SHALE, COCALICO
- Oe, LIMESTONE, EPLER
- Os, LIMESTONE, STONEHENG
- Trd, DIABASE, TRIASSIC
- Trd, LABRADORITE-AUGITE, DIABASE
- Tth, QUARTZ-SANDSTONE, HAMMER CREEK
- Tth, SANDSTONE, HAMMER CREEK
- Tth, SANDSTONE-SHALE, HAMMER CREEK
- Tth, SHALE-SANDSTONE, HAMMER CREEK
- Tthc, QUARTZ CONGLOMERATE, HAMMER CREEK CONGLOMERATE
- Tthc, QUARTZ-SANDSTONE, HAMMER CREEK
- Tm, DIABASE, DIABASE
- Tm, SANDSTONE, NEW OXFORD

0 1 Miles

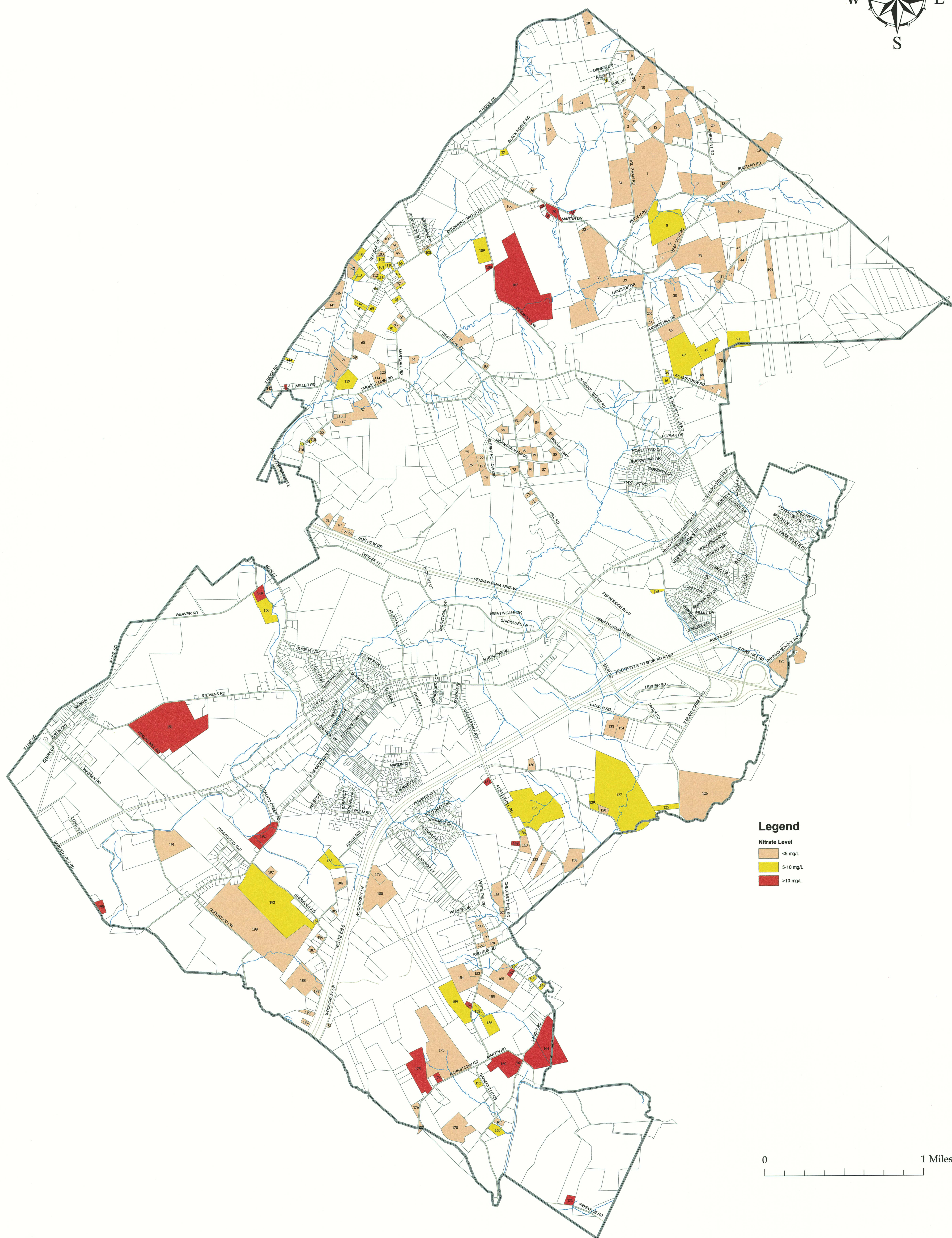
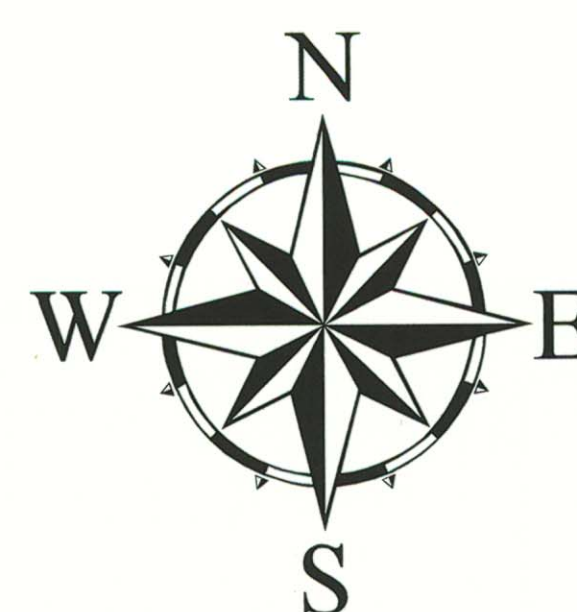


East Cocalico Township Act 537 Plan Update  
SEWER INDEX  
Figure 3-1

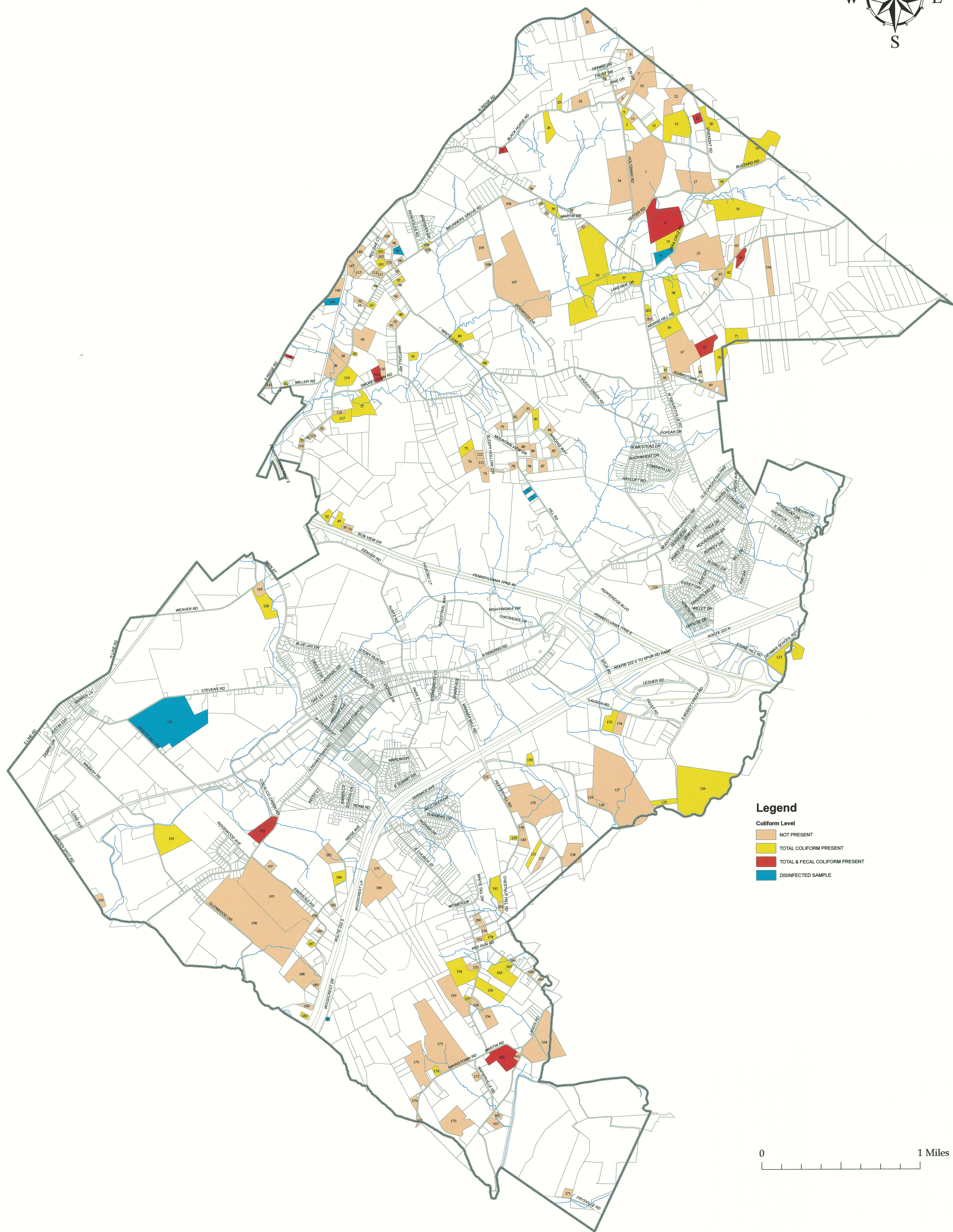


- Legend**
- OLDS SURVEY RESULTS**
- CONFIRMED MALFUNCTION
  - SUSPECTED MALFUNCTION
  - POTENTIAL MALFUNCTION
  - RETAINING TANK
  - NEW OR ADEQUATE SYSTEM
- BTG REPAIRS**
- CONFIRMED MALFUNCTION





0 1 Miles



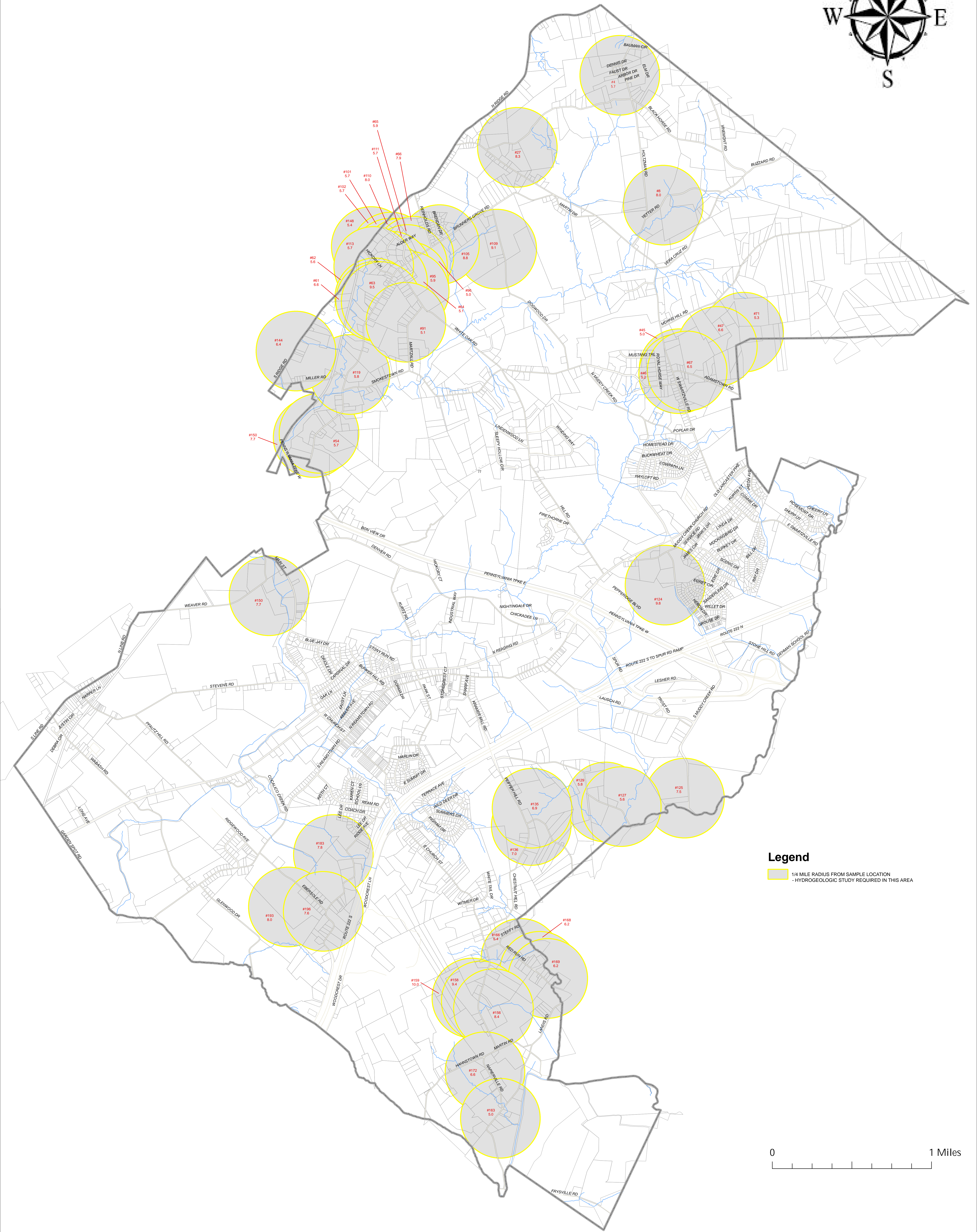
East Cocalico Township Act 537 Plan Update  
WATER SAMPLE TESTING RESULTS - NITRATES  
Figure 3-5



**Coliform Level**

	NOT PRESENT
	TOTAL COLIFORM PRESENT
	TOTAL & FECAL COLIFORM PRESENT
	DISINFECTED SAMPLE

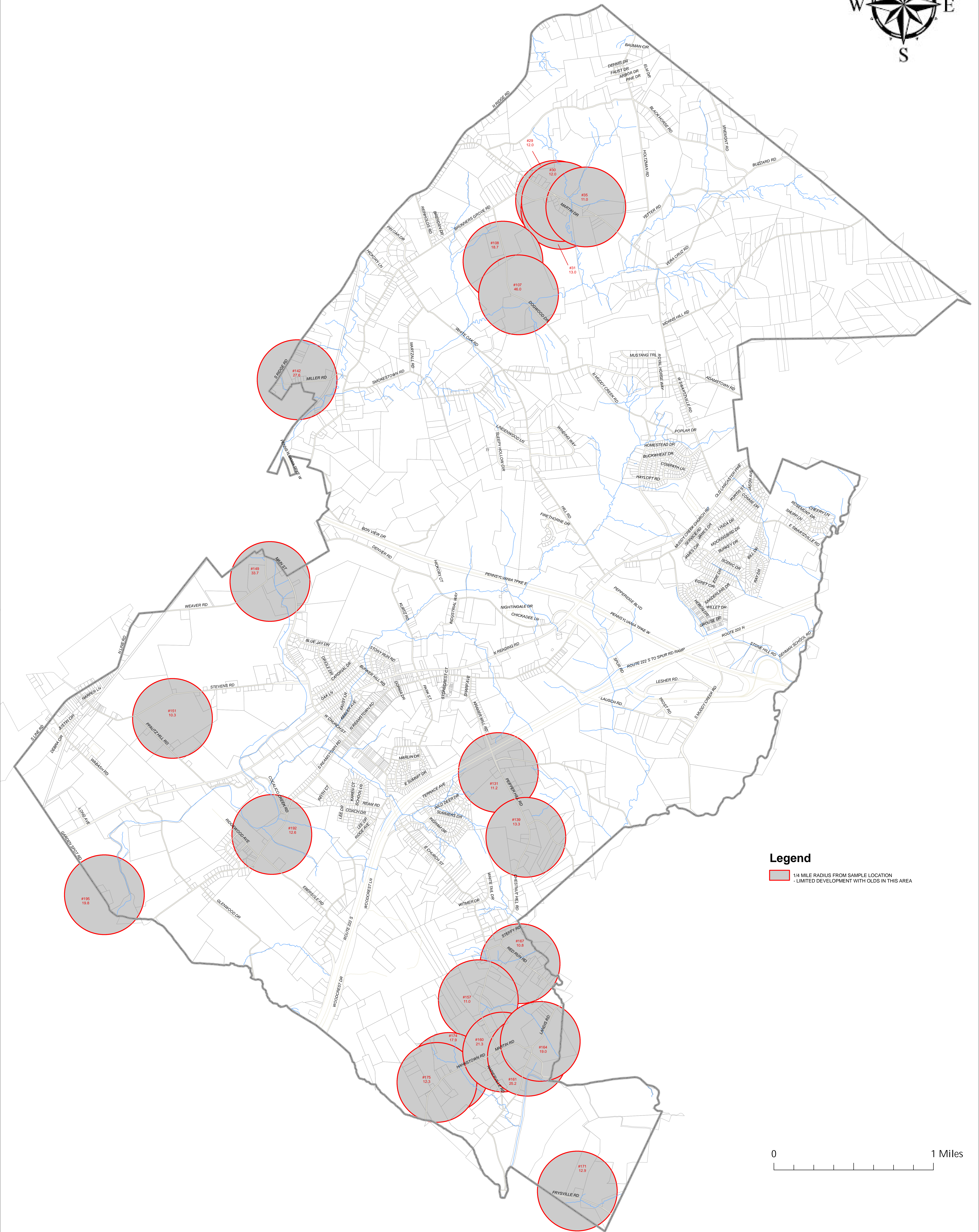
0 1 Miles



**Legend**

- 1/4 MILE RADIUS FROM SAMPLE LOCATION
- HYDROGEOLOGIC STUDY REQUIRED IN THIS AREA

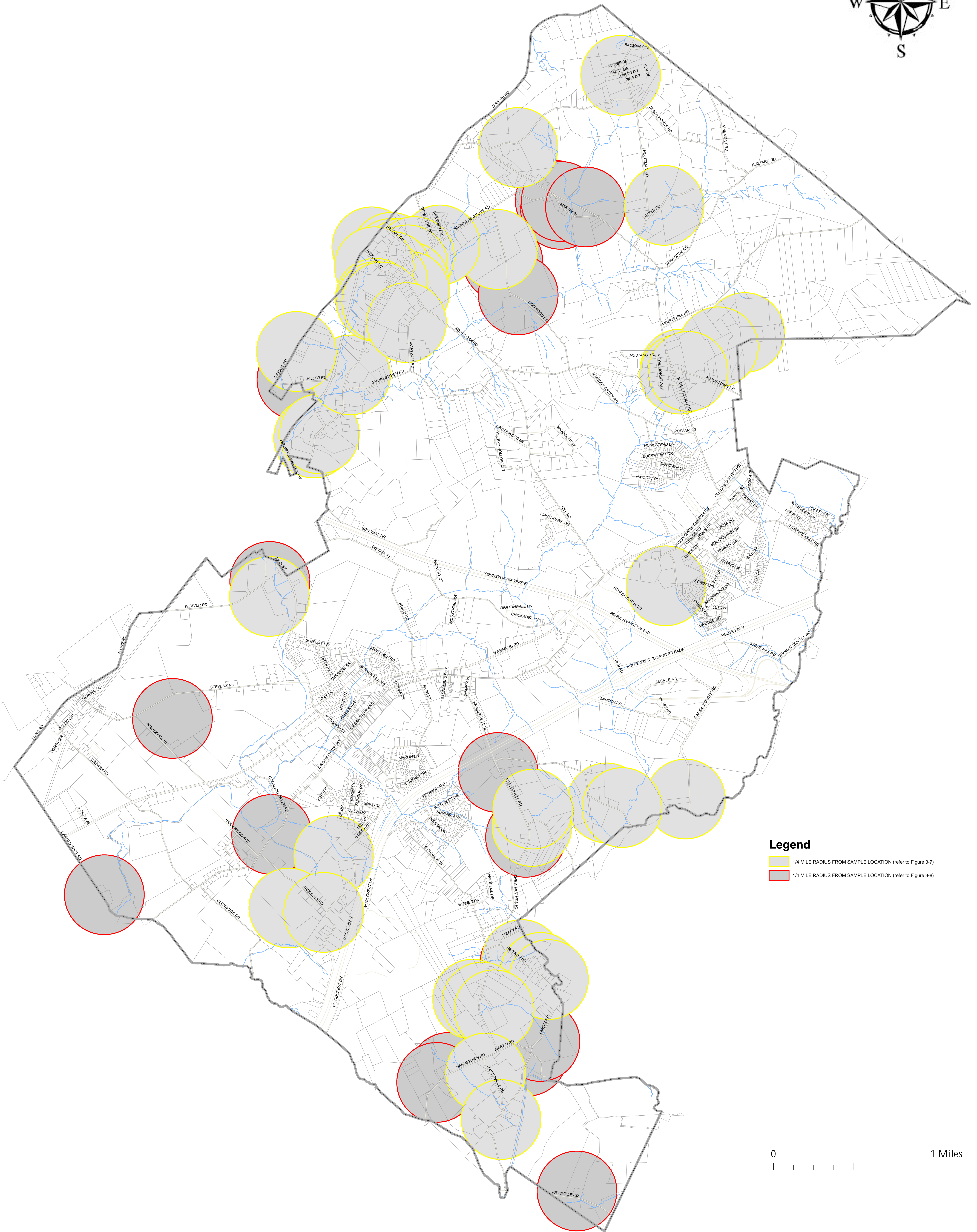
0 1 Miles



**Legend**

- 1/4 MILE RADIUS FROM SAMPLE LOCATION
- LIMITED DEVELOPMENT WITH OLDS IN THIS AREA

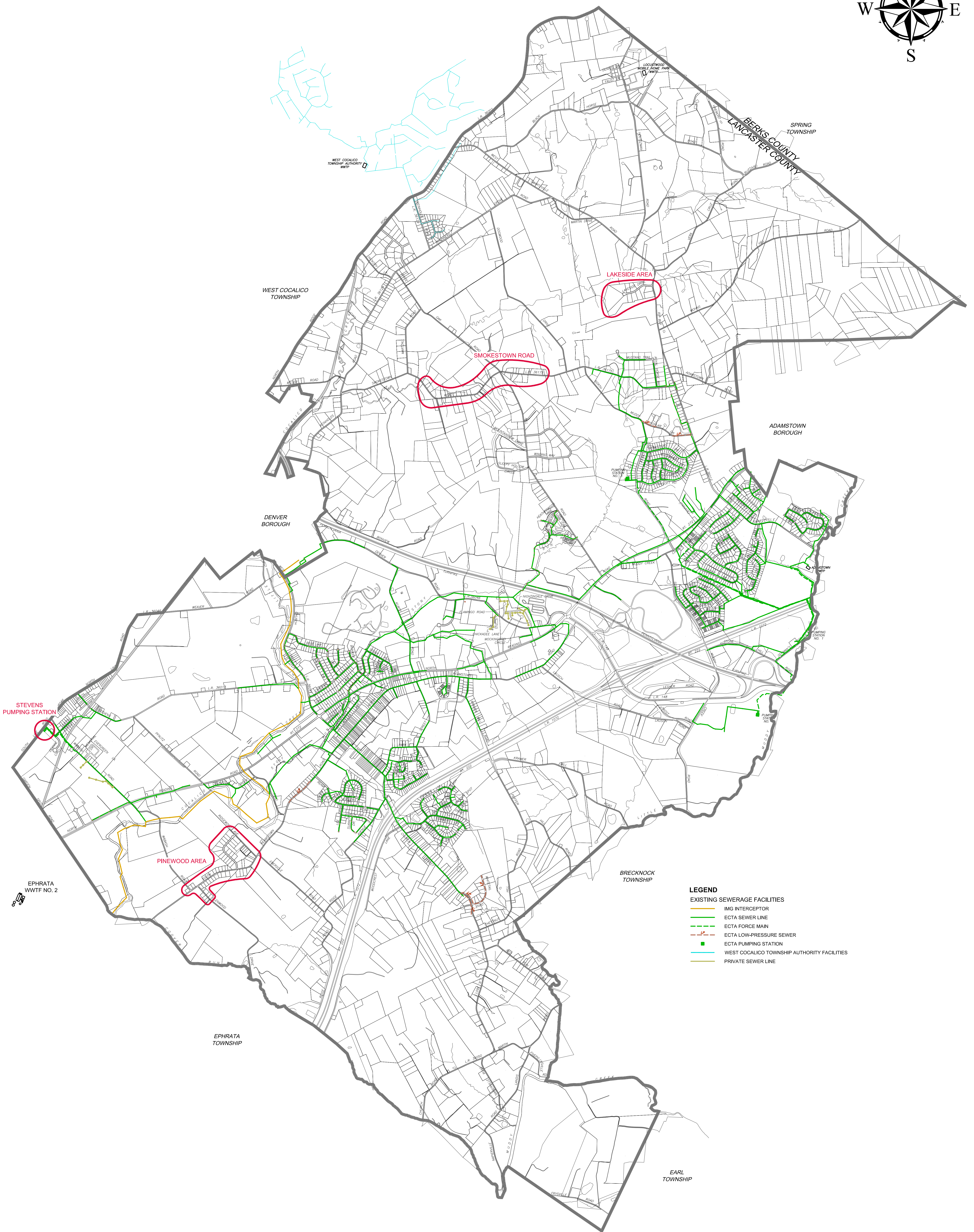
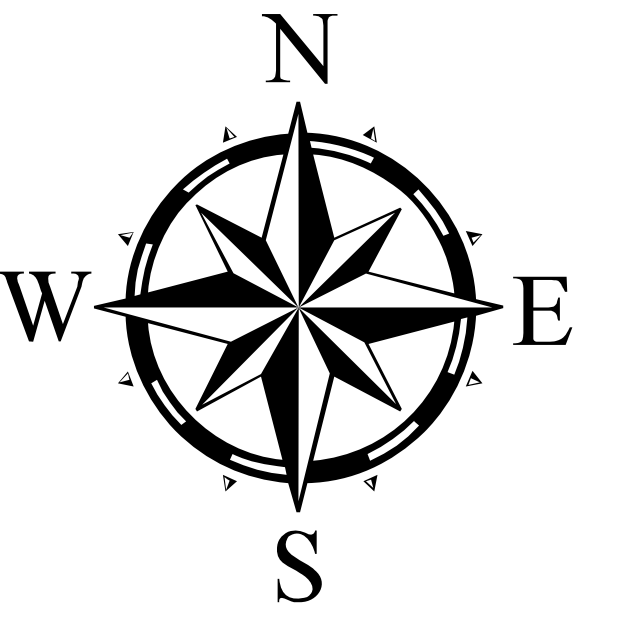
0 1 Miles



 1/4 MILE RADIUS FROM SAMPLE LOCATION (refer to Figure 3-7)

 1/4 MILE RADIUS FROM SAMPLE LOCATION (refer to Figure 3-8)

0 1 Miles

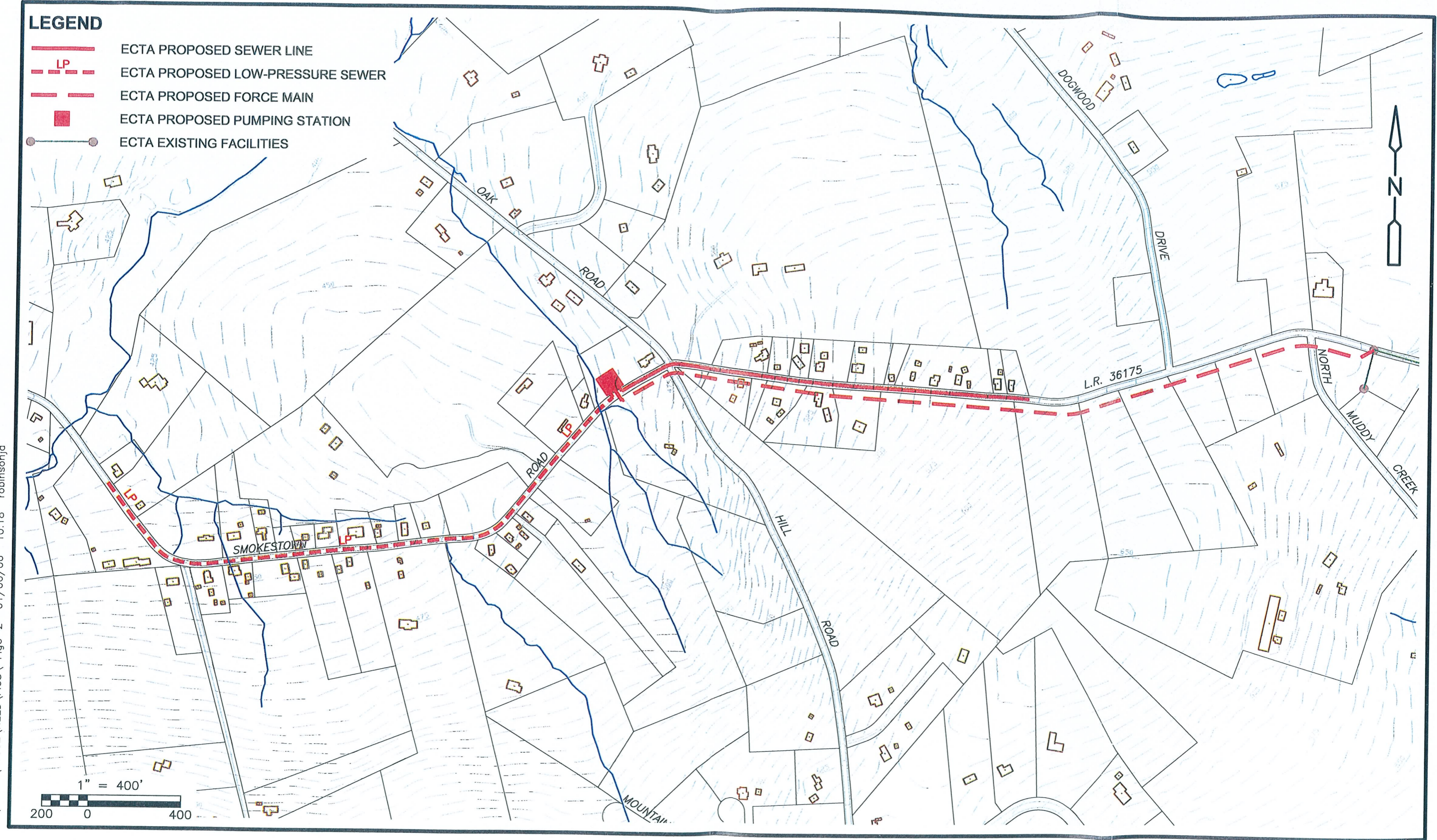


- LEGEND**
- EXISTING SEWERAGE FACILITIES
- IMG INTERCEPTOR
  - ECTA SEWER LINE
  - ECTA FORCE MAIN
  - ECTA LOW-PRESSURE SEWER
  - ECTA PUMPING STATION
  - WEST COCALICO TOWNSHIP AUTHORITY FACILITIES
  - PRIVATE SEWER LINE

East Cocalico Township Act 537 Plan Update  
IDENTIFIED PROBLEM AREAS  
Figure 5-1

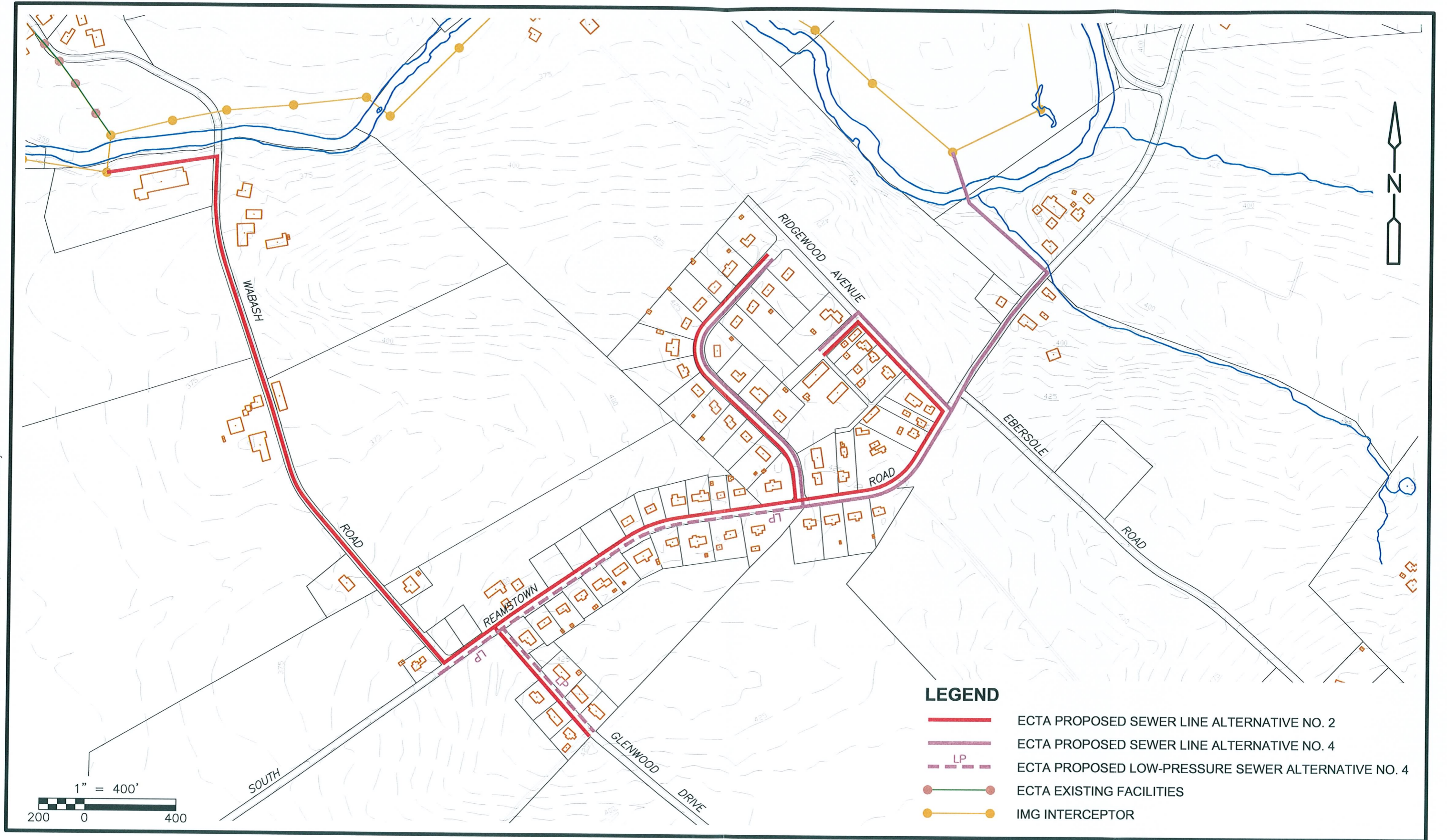


s:\32689\45352\NEED\FIGS\ Fig6-2 01/06/06 10:18 robinsonjd



East Cocalico Township Act 537 Plan Update  
Smokestown Road Alternative No. 1  
Figure 6-2

S:\32689\45352\NEED\FIGS\Fig6-3 01/06/06 10:27 robinsonjd



**EAST COCALICO TOWNSHIP AUTHORITY**  
**Bond Amortization Schedule**  
**Sewer Revenue Bonds - Series of 2002**  
**Semiannual Debt Service**

Dated: April 15, 2002  
Principal Due: June 1, as shown below

Interest Payable: June 1 and December 1  
First Interest Payment: June 1, 2002

<u>Date</u>	<u>Principal</u>	<u>Coupon</u>	<u>Interest</u>	<u>Debt Service</u>	<u>Fiscal Total</u>
6/1/02			19,344.92	19,344.92	19,344.92
12/1/02			75,697.50	75,697.50	
6/1/03	\$ 125,000	1.65%	75,697.50	200,697.50	276,395.00
12/1/03			74,666.25	74,666.25	
6/1/04	125,000	2.30	74,666.25	199,666.25	274,332.50
12/1/04			73,228.75	73,228.75	
6/1/05	130,000	2.80	73,228.75	203,228.75	276,457.50
12/1/05			71,408.75	71,408.75	
6/1/06	135,000	3.10	71,408.75	206,408.75	277,817.50
12/1/06			69,316.25	69,316.25	
6/1/07	140,000	3.45	69,316.25	209,316.25	278,632.50
12/1/07			66,901.25	66,901.25	
6/1/08	145,000	3.65	66,901.25	211,901.25	278,802.50
12/1/08			64,255.00	64,255.00	
6/1/09	150,000	3.85	64,255.00	214,255.00	278,510.00
12/1/09			61,367.50	61,367.50	
6/1/10	155,000	4.00	61,367.50	216,367.50	277,735.00
12/1/10			58,267.50	58,267.50	
6/1/11	160,000	4.10	58,267.50	218,267.50	276,535.00
12/1/11			54,987.50	54,987.50	
6/1/12	165,000	4.15	54,987.50	219,987.50	274,975.00
12/1/12			51,563.75	51,563.75	
6/1/13	175,000	4.30	51,563.75	226,563.75	278,127.50
12/1/13			47,801.25	47,801.25	
6/1/14	180,000	4.40	47,801.25	227,801.25	275,602.50
12/1/14			43,841.25	43,841.25	
6/1/15	190,000	4.45	43,841.25	233,841.25	277,682.50
12/1/15			39,518.75	39,518.75	
6/1/16	200,000	4.65	39,518.75	239,518.75	279,037.50
12/1/16			34,868.75	34,868.75	
6/1/17	205,000	4.75	34,868.75	239,868.75	274,737.50
12/1/17			30,000.00	30,000.00	
6/1/18	215,000	5.00	30,000.00	245,000.00	275,000.00
12/1/18			24,625.00	24,625.00	
6/1/19	230,000	5.00	24,625.00	254,625.00	279,250.00
12/1/19			18,875.00	18,875.00	
6/1/20	240,000	5.00	18,875.00	258,875.00	277,750.00
12/1/20			12,875.00	12,875.00	
6/1/21	250,000	5.00	12,875.00	262,875.00	275,750.00
12/1/21			6,625.00	6,625.00	
6/1/22	265,000	5.00	6,625.00	271,625.00	278,250.00
<b>TOTAL</b>	<b>\$3,580,000</b>		<b>\$1,980,724.92</b>	<b>\$5,560,724.92</b>	<b>\$5,560,724.91</b>