

### III. EXISTING FACILITIES IN THE PLANNING AREA

#### A. Identify and Describe Municipal Sewerage Facilities in the Planning Area

##### 1. Location, Size, and Ownership

The existing treatment plant is located in Amity Township, Berks County, and is owned and operated by the Township of Amity. It is a 2.2 MGD secondary treatment plant. Approximately 75 miles of gravity sewer line, 8 pumping stations and associated force main collect and convey wastewater to the treatment plant. Treated effluent is discharge to the Schuylkill River. The plant operates under NPDES Permit No. PA 0070351 (effective November 16, 2005 and expiring November 30, 2010).

The figure in Appendix A shows the location of the current treatment, collection and conveyance system.

A small number of private facilities, serving single-family residences have NPDES permits, as shown in the following table:

**Table 3-1 NPDES Permits**

<b>Permit #</b>	<b>Name</b>	<b>Type</b>
03410	McQuaite	Ext. Aeration/Sand Filter
03313	Scheifley	Aeration/Sand Filter
04057	Thompson	Septic Tank – Sand Filter
04058	Thompson	Septic Tank – Sand Filter

The plan in Appendix I more clearly defines the existing “Sewer Service Area” for Amity Township.

As referenced above, there are eight (8) pump stations in the Amity Township sewer system. All stations are in good physical condition and operating satisfactorily.

These stations are:

		<u>CAPACITY (MGD)</u>
P.S. 1	Amityville	0.504
P.S. 2	Amity Gardens	2.160
P.S. 3	Route 422 South	2.020
P.S. 4	Monocacy Station	1.613
P.S. 5	Manatawny Creek	0.979
P.S. 6	Cider Mill	0.461
P.S. 7	Rosecliff	0.403
P.S. 8	Sunset Knoll	0.374

NOTE: One (1) new pump station will be added in the near future. This will serve Woods Edge, Phase 6.

## 2. Basic Treatment Process

The existing Amity Township Sewage Treatment Plant is a combined carbonaceous nitrogenous activated sludge process, rated at a capacity of 2.2 MGD. The facility consists of the following major components.

- a. Headworks comminutor and diversion channel.
- b. Equalization basin.
- c. Primary clarifiers.
- d. Oxidation – Nitrification ditch with rotor aeration.
- e. Final clarifiers.
- f. Return sludge pumping station and mechanical building.

- g. Aerobic digesters for waste activated sludge/Anaerobic digesters for primary sludge
- h. Chlorine contact tank and chlorination system.
- i. Post aeration tank.
- j. Outfall manhole and pinch valve.
- k. Flood pump station.
- l. Sludge thickening tanks.
- m. Belt filter press.
- n. Sludge drying beds (reed beds).

A schematic of the plant's basic treatment process is shown on the figure found in Appendix J.

3. Problems With Existing Treatment Plant and/or The Collection and Conveyance System

Currently the wastewater treatment plant is operating satisfactorily and is in good repair. Plant personnel are diligent with facility maintenance and upkeep. The plant superintendent coordinates the purchasing and installation of most replacement equipment as it is needed.

The sewage collection system is in good serviceable condition overall and functions in a satisfactory manner. The Township's sewage treatment plant staff, which also operates the collection and conveyance system, are experienced and able to respond in a timely manner should a problem arise. Township staff perform regular maintenance to manholes, including concrete, patching, and tar coating. The township owns its own cleaning and televising equipment and operates an ongoing program to identify inflow/infiltration sources. Rehabilitation by contractors is followed by the televising work.

The Amity Township sewage collection system consists of approximately 75 miles of gravity sewer line, ranging in size from 8 inches to 30 inches. The original system was built in the mid 1970s to serve a development of several hundred lots known as Amity Gardens.

The portion of the sewage collection system serving Amity Gardens consists of approximately 12 miles of 8 and 10-inch sewer line, predominantly constructed of vitrified clay pipe in five foot sections. This older portion of the sewage system is clay pipe and experiences some infiltration and inflow problems. Internal sewer line video taping projects have revealed defective pipes, cracked pipes, separated joints, deflected joints and protruding lateral connections. Specifications for sewer rehabilitation work have been prepared and as each Phase of the system is televised, each will be repaired externally and internally.

The Township has purchased a televising truck and equipment to implement a system-wide infiltration/inflow remediation program to reduce peak flows.

A computerized hydraulic model of the sewer system has been developed. The model was built to evaluate the capacities of the sewer lines and determine the effects of proposed development and infiltration/inflow repair work.

The hydraulic model identified areas of the sewer system that are at or near capacity. These areas will be the first to be addressed under the Township's inflow and infiltration program.

4. Ongoing Upgrade or Expansion of Treatment Facilities

No expansion or upgrades were completed at the Township's Wastewater Treatment Plant in 2008. The Township completed a wastewater treatment plant expansion project and a rerating of permitted capacity in 2004. As part of this Act 537 Planning process, the Township contacted the neighboring municipalities to address their flow needs. Please see Section IV of this Plan for details associated with these needs. This Plan will ultimately examine the necessity of a plant expansion based on the Township's and the neighboring municipal needs.

5. Description of Operations and Maintenance Requirements

**Collection/Conveyance System Maintenance and Repair in 2008:**

- There were no main or sewer lateral stoppages cleared in 2008.
- Main sewers were flushed and cleaned prior to televising the Phase II area.

The 2008 Sewer Rehabilitation Program included vitrified clay pipe sewers located in Aspen Court, Glenwood Drive, Griffith Drive South, Lake Drive, Magnolia Court, Russel Avenue, Willowwood Court, the right-of-way perpendicular to Lake Drive and the right-of-way parallel to Russel Avenue. 35 manhole sections were found to require repairs. The following repairs were made by two contractors as follows:

**Wexcon**

- Four excavations and pipe replacements were made.
- One wye connection was replaced.

- 1275 feet of 8” VCP was replaced using 10” PVC sewer pipe. The replacement started from the end of the concrete bridge on Lake Drive between MH 63 and MH 64 and from MH 64 to MH 77 and continuing on the right-of-way perpendicular to Lake Drive.

### **Utility Services Group**

- 1700 feet of 8” VCP sewers were cleaned and televised.
- 340 joints were air-tested and 40 joints were grouted.
- 5 laterals were televised and 5 laterals were grouted.
- Sectional liners were installed in 2, 3 and 5-foot lengths restoring broken pipe structural integrity at 25 locations.

There are eight pumping stations in the Amity Township sewerage system. All of the stations are in good physical condition and are operating satisfactorily.

- All eight pumping stations had their generators serviced including oil changes by Township maintenance people.
- At each station, pumps are checked, tested and lubricated by township personnel.
- Pumping Station No. 2 is being upgraded;
  - The old influent line was plugged and abandoned. A new influent line directs flow to the concrete wetwell.
  - An older pumping station wetwell was demolished and the new wetwell is being equipped with a second high capacity pump. The capacity is unchanged.
  - A manhole with screening equipment was built prior to the wetwell so screenings can be removed before pumping.

During 2008 the Township sewer inspection equipment was used to clean and televise sewers in the Phase II area.

During 2008 Phase II of the sewer rehabilitation continued. The Township prepared DVD video recordings, photographs and individual manhole section reports. Using the recordings and reports ARRO prepared specifications for bidding repairs of the Phase II area. The rehabilitation work is scheduled for Spring 2009 and included the following:

- Root treatment of eleven main sewer manhole sections and ten laterals.
- Cleaning of 2,000 feet of 8" main sewers and installation of fourteen 2', 3' and 5' sectional liners.
- Air testing and grouting of eleven joints.
- Cleaning, televising and grouting 34 leaking laterals.
- There are two manhole sections that are recommended to be replaced.

The Phase II area encompasses Pennsylvania Avenue, Monocacy Road, Monocacy Creek Road, Hillview Road, Galahad Lane, Main Street Alley, Main Street, Limekiln Road, Route 422 West, Route 422 East, Thalia Lane, Hilty's Lane, and Pumping Station No. 4 Driveway.

### **Wexcon**

The 2009 Sewer Rehabilitation Program was awarded to two contractors in May 2009.

- Replacement of 10' long section of 8" sewer main.
- Replacement of 1 wye connection.
- Replacement of two sections of 8" sewer main totaling 234' of line.

Operations and maintenance of the collection/conveyance system is carried out by municipal public works personnel. Township treatment plant personnel do inspect the contributing municipalities meter stations on a periodic basis. Treatment plant personnel also assist in maintaining the Township pump stations. Pumping Station No. 4 had one pump rebuilt.

### **Tri-State Grouting**

- Cleaning, televising, testing and grouting of 2,320' of sewer mains.
- Inspection, testing and grouting of 34 laterals.
- Installation of 14 sectional liners.
- Repairs of 3 manholes.

### **Wastewater Treatment Plant**

The mechanical equipment is inspected daily. The following maintenance and improvements were made during 2008.

- All flow meters were recalibrated.
- All settling tanks were drained, cleaned, and inspected. Repairs and painting were done as needed.
- Brush was cut and removed from the inside and outside of the dike.
- Plant generators were serviced.
- All equipment bearings were lubricated as scheduled.
- All gear box oil changes were made as scheduled.
- The oxidation ditch rotating mechanical aerators were repaired as follows:
  - Three aerators' gear boxes were replaced.
  - Two aerators motors were replaced.
- Two return activated sludge pumps were rebuilt.



- A 60' x 80' pole barn was constructed. Presently the building houses all the trucks including the Vactor flushing truck and the televising truck. The plan is to also use the building as a maintenance garage.

## 6. Ultimate Disposal

The Amity Township wastewater treatment plant has an NPDES permit number of PA0070351 and is permitted to discharge 2.2 MGD of treated effluent to the Schuylkill River.

During 2008, 711,600 gallons of aerobically digested sludge were applied to the reed drying beds. There were 137.2 dry tons of dewatered sludge hauled to Pioneer Crossing Landfill in Birdsboro, PA for disposal.

## B. Needs Identification

The sewered area of Amity Township is delineated. The needs assessment survey focused on the area outside of the sewered area. The Amity Township Board of Supervisors mailed a letter to all residents who were identified as not having sewer (based on sewer bills). The letter informed residents that the Township's engineering consultant, representing the Township, would be conducting a door-to-door survey.

The engineering consultant's Sewage Enforcement Officers interviewed residents. They interviewed 127 Amity Township residents, and obtained 125 drinking water samples, representing the required Tier I 20% of the sample population (see APPENDIX K for a discussion of survey methodology). Survey results are summarized in APPENDIX L. Residents who were surveyed were also asked to allow the engineering consultant to take a water sample for testing. Samples were tested for the presence of coliform, fecal coliform, and nitrate-nitrogen contamination. Results are summarized in APPENDIX M.

In addition, a Tier II sample was done for the area known as Bel Air Estates, which preliminary studies identified as a “critical area” (the Tier II surveys were part of the 127 Tier I samples). Bel Air Estates is a privately owned mobile home park, with 34 home sites.

- The mobile home park operator owns 14 of the sites. Those 14 sites are served by 6 community wells. All 6 wells tested negative for coliform bacterial, and had nitrate levels below 5 ppm.
- The remaining 20 lots are in private ownership. Six of these properties were surveyed. All 6 tested negative for coliform bacterial. Two of the wells had nitrate levels greater than 5 ppm, but less than 10 ppm.
- During the initial survey, and in subsequent follow-ups, 25 of the OLDS were assessed, with the following results:

Confirmed Malfunctions	15	60%
Suspected Malfunctions	1	4%
Potential Malfunctions	7	28%
No Malfunctions	2	8%

Overall, 92% of the systems examined had confirmed, suspected or potential malfunctions.

See the Table found in APPENDIX O.

#### 1. **Types of Systems in Use**

Virtually all systems identified in the survey had modern septic systems for sewage disposal, characterized by a septic tank, and some form of drain field (most commonly an in-ground bed, in-ground trench, or elevated sand mound).

Graywater disposal closely followed the sewage disposal method, although there were a small number of properties that had “pipe to ditch” (5), “pipe to surface” (5), or “other” (4) disposal systems.

The average age of an ODLs was 23 years. A high percentage (80+%) of those surveyed had their septic systems pumped. Some had it done on a regular schedule, while others had it done on an “as needed” basis. Many respondents were unable to identify when their system was last pumped, but for those who responded, the average frequency was 3.2 years.

## **2. Sanitary Survey**

The Sanitary Survey included a visual inspection of on-lot sewage disposal systems by Sewage Enforcement Officers (SEO’s). The SEO’s also interviewed the resident and completed a questionnaire (See APPENDIX N). Results of the Sanitary Survey are shown graphically in APPENDIX P.

## **3. Comparison of ODLs with Systems Appropriate for Soil, Geologic and Topographic Conditions**

Overall, 48% of the properties surveyed had properly functioning ODLs. Twenty-four percent (24%) had “confirmed” malfunctions, 4% “suspected”; and 25% “potential” malfunctions. The “potential” malfunctions were generally based either on the age of the system (installed before permitting) or distance from well (less than 100 feet). Those numbers are somewhat skewed by the inclusion of the “Tier II” samples. Without the Tier II samples, the results are: 57% properly functioning; 16% “confirmed”; 4% “suspected”, and 23% “potential.”

The incidence of problems is scattered; with the exception of the Tier II area, the malfunctions seem to be randomly distributed across the Township. Malfunctions

seemed to be caused as much by the age, design or maintenance of the system as by the soil, geologic or topographic factors.

The Tier II area consists of various sized lots located in a mobile home park. The property is bordered by the Limekiln Creek, a tributary of the Monocacy Creek. The OLDS on the sites owned by the mobile home park were well maintained; there was less control over the lots in private ownership, although 4 of 6 had their systems pumped and inspected. Despite those efforts, 75% of the systems tested were “confirmed” malfunctions, and another 17% were “potential” malfunctions. The problems in this area are:

- Soils are hydric, or in the 100-year flood plan
- The Soil Capacity map shows “severe limitations” due to flooding and high water table
- Small lots (many under an acre)

#### 4. **Water Supply Survey**

Results of the survey are shown graphically in APPENDIX Q. As expected from the geological and soils maps, there were elevated nitrate levels in the northern portion of the Township, where the soils are predominately limestone derived. There were numerous wells with coliform bacteria contamination, but only six with fecal coliform. There was no pattern to the coliform bacteria contamination; much of the non-fecal contamination can be attributed to poor well head protection by the property owner.

To comply with DEP regulations, Title 25, Section 71.62(c)(2)(iii), APPENDIX Q shows a ¼ mile circle around all wells with nitrate levels greater than 5 ppm. Developments requesting on-lot sewage disposal that are within those circles will be required to conduct preliminary hydrogeologic studies prior to plan approval.

Requests for exemptions from sewage facilities planning, as per Section 71.51(b)(1)(ii) will not be permitted. Exceptions to the requirement to revise the official plan for new land development will not be permitted, as per Section 71.55(b).

#### **5. Individual and Small Volume Community On-lot Systems**

At this time, Amity Township's involvement in regulating individual and community systems is limited to participating in the permitting process, and having the Sewage Enforcement Officer (SEO) respond to complaints (at this time, there are no community systems). The Township adopted and implemented a septage management plan/ordinance which assures that systems are regularly inspected and pumped.

#### **C. Wastewater Sludge and Septage Generation, Transport and Disposal Methods**

##### **1. Location of Sources of Wastewater Sludge and Septage**

Amity Township currently accepts a limited amount of septage from individual septic tanks. Septage is hauled to the plant in tank trucks, and discharged into the aerated equalization basin, and then sent to the treatment plant in a regulated flow. The previous upgrades to the plant's headworks included grit and rag removal equipment to better enable the plant to accept increased amounts of septage, including septage collected as part of the On-Lot Sewage Management Plan.

Amity Township stopped accepting trucked-in leachate from landfills in 2005 due to problems with effluent total dissolved solids concentration from the leachate treatment.

2. **Quantities of Sludges and Septages Generated**

Sewage sludge generated by the Plant is dried at the plant, and hauled by truck to the Pioneer Crossing Landfill for disposal. Approximately 146 tons of sludge was generated in 2009.

3. **Present Disposal Methods, Locations, Capacities and Transportation Methods**

See Section III.C.2.