## 5.0 ALTERNATIVES TO PROVIDE NEW OR IMPROVED WASTEWATER DISPOSAL FACILITIES

No alternatives are being proposed for the Tier I area of the Township. The Township believes that the only viable method to provide needed wastewater services, consistent with the Township and County Comprehensive Plans, is to provide sewer to areas designated for high density residential development, and to permit OLDS in the remaining low density development areas, where soil conditions allow.

The Tier II area, which includes Bel Air Estates and lots along Valley Road, will require providing some means of sewage treatment other than OLDS. Five options were explored: extending municipal sewer to the site (two different routes); installing a package treatment plant (serving only Bel Air Estates, or serving both Bel Air and Valley Road); and a "community" drainage field. Other options, such as "Best Technical Guidance" repairs (larger individual fields and tanks, holding tanks, etc.) would be interim measures, not long-term solutions.

## 5.1 CONVENTIONAL COLLECTION, CONVEYANCE, TREATMENT, AND DISCHARGE ALTERNATIVES

**5.1.1** The Amity plant is a subregional facility; no expansion of the region served is being considered. The available capacity of the plant must be continually monitored in order to provide adequate treatment and accommodate growth within the regional sewer service area. The facility must be upgraded as demand increases.

### 5.1.2 Extension of existing municipal facilities.

**Tier I.** The Township is proposing a limited expansion (re-rating) of the existing sewage treatment plant, following necessary maintenance and system upgrades to that facility. This re-rating will be adequate to handle the needs of development through the next ten years, based on population projections shown in Section 4, for the Tier I area.

**Tier II.** Five options were considered to serve the "Tier II" area. These are summarized in **TABLE 5-1**, and shown graphically in **FIGURE 5-1**.

**Option 1. Limekiln Interceptor (Extending sewer along Limekiln Road to Bel Air Estates)**

Approximately 6,200 feet of sewer would have to be constructed to reach Bel Air Estates. Estimated cost for this option is $875,420. In addition, there would be a cost for a collection system within Bel Air Estates, estimated at $329,225. Total estimated cost for this option is **$1,204,645**. The estimated cost/EDU is **$19,121,** assuming 63 EDU's. The major advantages to this option are that it is the shortest extension, and the easiest to construct.

# TABLE 5-1

## TIER II SEWER EXTENSION
### COST COMPARISON

| | Option | 1 Limekiln Interceptor | 2 Monocacy Interceptor | 3 Package Plant - Bel Air Estates | 4 Package Plant - Bel Air Estates & Valley Rd | 5 Elevated Sand Mound or Drip Irrigation - Bel Air Estates | |
|---|---|---|---|---|---|---|---|
| | **Length of Sewer Extension (feet)** | 6,200 | 13,300 | NA | NA | NA | |
| **Cost** | Interceptor Cost | 875,420 | 1,141,295 | - | 425,490 | - | |
| | Plant Cost | - | - | 315,770 | 310,655 | 219,700 | |
| | Collection System Cost | 329,225 | 329,225 | 329,225 | 329,225 | 329,225 | |
| | **Total Cost** | **$ 1,204,645** | **$ 1,470,520** | **$ 644,995** | **$ 1,065,370** | **$ 548,925** | |
| **EDU's** | Bel Air Estates | 35 | 35 | 35 | 35 | 35 | |
| | Valley Rd | - | 35 | - | 35 | - | |
| | Other | 28 | 4 | - | - | - | |
| | **Total** | 63 | 74 | 35 | 70 | 35 | |
| | **Cost/EDU** | **$ 19,121** | **$ 19,872** | **$ 18,428** | **$ 15,220** | **$ 15,684** | |
| **Annual O&M for Project** | | $ 1,650 | $ 2,000 | $ 18,000 | $ 24,000 | $ 1,525 | |
| **Annual Sewage Treatment Plant O&M** | **(based on number of additional EDU's)** | $ 12,978 | $ 15,244 | **$ 1,000** | **$ 2,000** | **$ 1,000** | See note |
| **Total O&M** | | **$ 14,628** | **$ 17,244** | **$ 19,000** | **$ 26,000** | **$ 2,525** | |
| **FINANCING** | **Annual Rental Cost/EDU** | | | | | | |
| | Bank/Bond - 10 years @ 4% | $ 35 | $ 43 | $ 22 | $ 33 | $ 14 | |
| | Bank/Bond - 20 years @ 4% | $ 23 | $ 28 | $ 15 | $ 22 | $ 9 | |
| | Bank/Bond - 10 years @ 5% | $ 37 | $ 45 | $ 23 | $ 34 | $ 15 | |
| | Bank/Bond - 20 years @ 5% | $ 24 | $ 25 | $ 16 | $ 24 | $ 14 | |
| | Bank/Bond - 10 years @10% | $ 45 | $ 55 | $ 27 | $ 41 | $ 19 | |
| | Bank/Bond - 20 years @ 10% | $ 34 | $ 34 | $ 21 | $ 32 | $ 14 | |
| | PennVEST - 20 yrs @ 2.427% | $ 20 | $ 25 | $ 14 | $ 20 | $ 8 | |

**Note:** O&M cost for on-site systems assumes that sludge is hauled to Amity Treatment Plant, dried in belt filter press, and landfilled.

There are several disadvantages to this option:

- It would provide sewer along Limekiln Road, in an area zoned Low Density Residential (LDR). The Township's Comprehensive Plan does not support the additional high density growth in this corridor that a sewer line extension would encourage.
- This approach would not serve the Valley Road area.
- A pumping station would be required on Limekiln Road.
- Construction would be along a state road, where restoration costs are higher.

**Option 2. Monocacy Creek Interceptor (Extending sewer along Monocacy Creek streambed)**

A second option explored for this area was extending sewer along the Monocacy Creek basin. Approximately 13,300 feet of sewer would have to be constructed to reach Bel Air Estates and Valley Road.[1] Estimated cost for this option is $1,141,295, plus $329,225 for the Bel Air collection system, for a total of **$1,470,520**. The estimated cost/EDU is **$19,872,** assuming 74 EDU's. The major advantages are that it would be a gravity system, eliminating the need for a pump station, and that it could service the Valley Road area. The primary drawbacks are:

- Obtaining rights-of-way.
- Obtaining permits for required stream crossings.
- Slower construction.
- Requires road boring under US Route 422.

Options 3 and 4 are to build package treatment facilities, and are detailed below in Section 5.3. Option 5, a community on-lot treatment system, is also detailed below in Section 5.4.

### 5.1.3 Continued Use of Municipal Treatment Plant

The design of upgrading and modification of the existing plant is currently underway. The Township has an on-going annual program to reduce inflow and infiltration, which will help reduce hydraulic loading. The Township intends to apply to have the plant's capacity re-rated when the upgrade and modification project is complete. The upgraded plant will have adequate capacity to handle the additional EDU's from Options 1 or 2.

## 5.2 USE OF INDIVIDUAL SEWAGE DISPOSAL SYSTEMS

The use of OLDS are controlled by ordinance (see "On-Lot Sewage Disposal Systems" Ordinance, Appendix 5-1). This will remain the primary option for all Tier I areas outside of the designated growth zone for the sewage system. For the Tier II area, continued use of OLDS is not an acceptable long-term alternative. The Township will require a preliminary hydrogeologic evaluation in areas identified as having nitrate levels above 5 ppm, as shown in **FIGURE 3-8.**

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[1]The proposed extension is to the part of Valley Road that is currently developed. Beyond this point is a large (59.6 acre) tract with a single home. There are four additional homes beyond that lot. At this time is was not judged cost effective to extend the line for those few homes.

## 5.3 USE OF SMALL FLOW OR PACKAGE TREATMENT FACILITIES

**Option 3. Package Plant - Bel Air Estates.**

A package treatment plant was considered as an option to serve the Tier II area. The major advantage to this option over extending conventional sewer is that it would not encourage higher density development along the sewer corridor. The estimated cost for this option is **$644,995**. The estimated cost/EDU is **$18,428**. Approximately 35 homes would be served by the facility.

**Option 4. Package Plant - Bel Air Estates/Valley Road**

The plant could be built initially to serve both areas, or it could be designed to initially serve only Bel Air Estates, and later expanded to include Valley Road. The major difference between this option and Option 3 is the siting of the plant. To serve Valley Road using a gravity collector, the plant would have to be located further downstream. The estimated cost for this option is **$1,065,370**. The estimated cost/EDU is **$15,220**. Approximately 70 homes would be served by the facility.

The primary advantages for the package plant options are:

- Low initial cost.
- Low cost/EDU.
- No right-of-way issues.
- Will not promote growth in the area.

The primary disadvantages are:

- Long-term operating and maintenance.
- Odors and noise associated with on-site plant.

### 5.3.1 Requirements Under §71.64 - Tier II

**Soils Suitability.** The sanitary survey showed a very high incidence of malfunctioning systems (over 90% combined Confirmed, Suspected or Potential malfunctions). The soils map indicates a high water table, and the soils suitability map clearly indicates that this area is unsuitable for OLDS.

**Preliminary Hydrogeologic Evaluation.** Not applicable, as treated sewage effluent would be discharged into Monocacy Creek

**Operation of Facility**. This option proposes municipal ownership and operation of the facility.

**Density of Development.** There are no similar facilities in Amity Township. The proposed facility would provide sewage disposal for up to 35 of the 46 lots on Valley Road,[2] and about

[2] Because of the proposed location, there are four properties on Valley Road located below where the plant would be situated, and could not be connected without installing a gravity collection system and pump station. The proposed "Monocacy Interceptor" sewer line would not be able to serve these properties either.

35 in Bel Air Estates. Lots in this area are generally small; 18 of the 46 on Valley Road were less than 1 acre; 10 are greater than 2 acres.

**Evaluation of Alternatives.** There are no technical barriers to the installation of a package treatment plant. The plant would have to meet NPDES and Clean Water Act regulations, and obtain necessary environmental permits. The plant would be operated by the current sewage treatment plant operators.

## 5.4 USE OF COMMUNITY LAND DISPOSAL ALTERNATIVES

This option explored the use of a community disposal system. It would consist of a collection system (same as all of the other options), and a community drainage field. That field could be either one or more elevated sand mounds, or a drip irrigation system.

**Option 5.** The sand mound option requires an area where soils are reasonably suitable for on-lot disposal. Many of the soils are either alluvial (Bowmansville) or have fragipan layers that limit percolation through the soil (Readington silt loam, Croton silt loam). The areas of Penn shaly soil are the best choice for an on-lot system. Using conservative percolation rates, a 40,000 square foot sand mound would be required. Costs for collection from the home sites remain the same as for the package system and sewer options. The total cost is estimated to be **$548,925**, or **$15,684/EDU** (assuming 35 EDU's). This option is contingent on successful percolation tests in the field; none have been done at this time. An alternative to a sand mound is a drip irrigation system. Costs are roughly the same as for a sand mound. Should a community on-site system be chosen as the preferred alternative, both sand mound and drip systems will be evaluated.

The major drawback of this option is control over ownership and maintenance of the community portion of the system. Of the 35 home sites, 14 are owned by the mobile home park operator, and the community system would have to be located on the operator's property. Agreements for maintenance, sharing of costs, etc. would have to be reached between the park operator and the 20 lot owners. In addition, this option would not have the potential for serving the Valley Road area. Given these drawbacks and the questionable soil suitability, this option does not appear to be feasible.

## 5.5 USE OF RETAINING TANKS

The 1989 plan identified three locations with holding tanks. These properties have since been connected to sewer. The Township is not aware of any other holding tanks. New holding tanks would be subject to the Township "Holding Tank" Ordinance (**Appendix 1-1**).

Holding tanks are not a viable option for the Tier II area as a long-term solution. Installing individual holding tanks would be prohibitively expensive, and given the mixed ownership in the mobile home park, difficult to monitor. Installing a central holding tank would still require a collection system. At that point, connecting the collection system using any of the other options would be preferable to a holding tank, other than as an interim measure.

## 5.6 SEWAGE MANAGEMENT PROGRAM

A Township on-lot management program involves the institution of increased local government controls, particularly concerning the operation and maintenance of on-lot subsurface disposal systems. DEP's manual lists the following functions of such a program:

- Actively identify malfunctions;
- Take enforcement action to abate nuisances;
- Provide technical assistance to correct malfunctions;
- Update old systems to present disposal technology;
- Require property owners to pump septage from septic tanks;
- Conduct operation inspections;
- Require financial assurances of system operation and maintenance.

Currently the Township's Sewage Enforcement Officers (SEO's) have responsibility for identifying malfunctions, taking enforcement actions, and providing technical assistance. The remaining elements would have to be incorporated into a program.

Any area of the Township not already served by sewer (or not intended to be served by sewer), would comprise the management area. That management area includes most of the areas zoned Rural Conservation (RC) and some portions of the Low Density Residential (LDR) zone. A copy of a municipal ordinance implementing a Sewage Management Program is included in **Appendix 5-2.**

As part of the implementation of the Sewage Management Program, the Township will provide through mailings and other sources homeowner information to explain how the program works, and their responsibilities for maintaining the system.

### 5.6.1 Municipal ownership or control over operation and maintenance of individual OLDS

Municipal ownership is not an option currently being considered.

### 5.6.2 Required inspection of OLDS

The required interval for inspections, and the designation of inspectors, will be set by ordinance as part of the Sewage Management Program.

### 5.6.3 Required maintenance of OLDS

The Township will require periodic pumping and inspection of septic systems, and require documentation to that effect, as part of a Sewage Management Program. The required interval for pumping, and specific documentation requirements, will be set by ordinance.

### 5.6.4 Repair, replacement and upgrading of malfunctioning OLDS

As is currently practiced in Amity Township, the Sewage Enforcement Officers will be responsible for identifying malfunctioning systems, and issuing permits for repair, replacement or upgrading of those systems.

### 5.6.5 Establishment of joint municipal programs

Amity Township's sewage treatment plant is a subregional facility, and agreements already exist with Union, Douglass and Earl Townships; no additional agreements are required at this time.

### 5.6.6 Requirements for bonding, escrow accounts, management agencies

Amity Township has provisions in its "Spray Irrigation and Stream Discharge Systems" ordinance to require a maintenance agreement with the permit holder, along with sufficient funds in escrow to assure the long-term functioning of the system. There are no similar requirements in the other sewage-related ordinances.

## 5.7 NON-STRUCTURAL COMPREHENSIVE PLANNING ALTERNATIVES

### 5.7.1 Modifications of existing comprehensive plans

Elements of the comprehensive plans at both County and Township level are fully discussed in Section 1.2 and 4.3.2. No modifications are needed to achieve the goals of this plan.

### 5.7.2 Local comprehensive plan

Amity Township's Comprehensive Plan is detailed in Section 1.2.2. No modifications are needed to achieve the goals of this plan.

### 5.7.3 Subdivision regulations

Amity Township's Subdivision and Land Development Ordinance (SALDO) is discussed in Section 1.2.2. No modifications are needed to achieve the goals of this plan. The Zoning Ordinance is detailed in Section 4.2.1.

### 5.7.4 Evaluation of existing local agency programs and need for technical or administrative training

The study did not identify any deficiencies in the operation of the sewage treatment plant. Plant personnel attend 230 hours of annual training, and receive necessary certifications.

## 5.8 NO-ACTION ALTERNATIVE - SHORT-TERM AND LONG-TERM EFFECTS

### 5.8.1 Water Quality/Public Health

Besides the Tier II area, no major problem areas were identified during the drinking water and sanitary surveys. Only six out of 127 tested wells were found to have fecal coliform contamination, and they were distributed throughout the Township. About half of the OLDS were identified as malfunctioning (Confirmed - 27, Suspected - 5, Potential - 29, No Malfunction - 66), but they were not clustered so as to identify an area requiring action. With a "no action" approach, exclusive of the Tier II area, there would be no sewage management program, which would increase the likelihood of undetected malfunctions.

The Tier II area showed a better than 90% (68% - Confirmed, 4%-Suspected, 28% - Potential) OLDS malfunction rate in Bel Air Estates. However, the wells that were tested did not show any coliform contamination or high levels of nitrates. A "no action" approach would assure the continuing malfunctions, which could create health concerns for the residents, and potentially impact the Limekiln Creek.

For the portions of the Township served by sewer (or within the sewer service area), a "no action" approach would have a negative impact by limiting the expansion (through re-rating of capacity) of the sewage treatment plant. That would encourage residential growth using OLDS. Even with the best systems, there is a greater potential for ground water contamination from a large number of OLDS than from a central treatment plant. For the area of the Township not served by sewer, "no action" would mean not implementing a sewage management program (see Section 5.6). In the long run, this would likely result in a greater number of malfunctions, and the possibility of greater ground water contamination.

### 5.8.2 Growth Potential

Amity Township has experienced one of the highest rates of growth in Berks County over the past decade (see Section 4.3.1). All remaining sewer capacity has been allocated through 2006. A "no action" approach would essentially prevent any significant additional residential development, with the exception of large-lot developments with OLDS.

### 5.8.3 Community economic conditions

The rapid growth of the past decade has stressed Amity Township's infrastructure, and the Township sees a need to expand its tax base beyond the residential sector. The Township has a small industrial base, currently concentrated in two areas (along the southern portion of Route 662, and south of Route 422). The Township would like to expand that base, which is not possible at this time due to lack of sewer capacity and potential sites with available sewer service. A "no action" approach would negatively impact the possibility of growing the local economy.

### 5.8.4 Recreational opportunities

This section applies primarily to the impact on high quality waterways used for recreational purposes. The small creeks running through Amity Township, the Monocacy and Manatawny[3] and their tributaries, have very limited recreational use. The Schuylkill River has some limited recreational use as well (primarily canoeing and "tubing"). A "no action" alternative would have no appreciable impact on the recreational values of any of these watercourses.

[3] The Manatawny is a trout stocking stream, and has recreational value for fishing.

### 5.8.5 Drinking water sources

All drinking water in Amity Township comes from underground sources, either from private on-site wells, or from Pennsylvania-American Water Company, which obtains its water from wells. The City of Pottstown, several miles downstream from the sewage treatment plant, obtains its drinking water from the Schuylkill River. A "no action" plan would result in some minor degradation of ground water over time, and probably have no measurable impact on the Schuylkill River as a drinking water source.

### 5.8.6 Other environmental concerns

No other environmental concerns were identified during this study.