

## 6.0 EVALUATION OF ALTERNATIVES

### 6.1 TECHNICALY FEASIBLE ALTERNATIVES - CONSISTENCY

#### 6.1.1 Clean Streams Law and Clean Water Act

The proposed alternative, the Monocacy Creek Interceptor, will provide sewer connecting to the existing treatment plant. The plant will continue to meet its obligations under the NPDES permit. The two "package plant" options that were explored would discharge into the Monocacy Creek, and would have to meet secondary effluent criteria, as per Appendix 6-4.

#### 6.1.2 Municipal Wasteload Management Plans

The 2002 Chapter 94 report estimates plant loading going forward five years. The estimates provided in the report are shown in the table below. Average hydraulic and organic loading is below the plant's capacity through 2007; however, maximum loading exceeds plant capacity. The proposed re-rate project for the plant is intended to address those problems. The proposed alternatives for correcting the Bel Air Estates malfunctions have either no impact or an insignificant impact on plant capacity.

**Table 6-1 PLANT HYDRAULIC AND ORGANIC LOADING**

	Projected 2007 Loading	Capacity	Excess Capacity	% Difference
Average Annual Hydraulic Loading (gpd)	1,495,212	1,600,000	104,788	6.5%
3-Month Maximum Hydraulic Loading (gpd)	1,987,190	1,600,000	(387,190)	-24.2%
Average Annual Organic Loadings (lbs/day)	2,718	2,670	(48)	9.7%
3-Month Maximum Organic Loading (lbs/day)	4,729	2,670	(2,059)	-77.1%

Source: 2002 Operating Year - Municipal Wasteload Management Report - Chapter 94 Annual Report

#### 6.1.3 Title II - Clean Water Act

There were no plans that could be located that were prepared under Title II of the Clean Water Act. The 1995 Berks County "Sewer and Water Systems Study" did not have any recommendations specific to Amity Township.

#### **6.1.4 Comprehensive Plan Consistency**

The current Amity Township Comprehensive Plan was approved in July 1990, and pre-dates the most recent expansion of the Sewage Treatment Plant. The Comprehensive Plan did reference the previous Act 537 Plan that had been prepared in 1989, and was consistent with the goals of that Plan (the intent of the Township was to have the Act 537 Plan serve as “background analysis and direction for a Future Land Use Plan, Community Facilities Plan (sewage facilities), information regarding physical characteristics, and population characteristics”). It anticipated increasing plant capacity to 1.6 MGD, which was done. Key elements of the Comprehensive Plan relating to development patterns and objectives are detailed in Section 1.2.2.

This Plan calls for the extension of sewer into the southwestern portion of the Township. The purposes of this extension are:

- to eliminate malfunctioning on-lot septic systems in Bel Air Estates and along Valley Road.
- to serve future commercial development along the Route 422 corridor.
- to permit limited residential growth where cluster development is appropriate and densities of 1 dwelling unit per 2 net acres can be achieved.

#### **6.1.5 Antidegradation Requirements**

The projected growth can be met by the existing sewage treatment plant (subject to re-rating following the upgrade and modification project), which meets its NPDES permit requirements (and will continue to meet permit requirements following the completion for that project). Therefore, there are no inconsistencies with anti-degradation requirements of Chapters 93, 95 and 102.

Two of the options studied for the Bel Air Estates/Valley Road area will require construction of a package treatment plant. That plant will have to meet NPDES permit requirements, as per Appendix 6-4.

#### **6.1.6 State Water Plans - Water Resources Planning Act**

The State Water Plan is over 25 years old, and had no specific mention of Amity Township. However, a “Watershed Restoration Action Strategy” (WRAS) was developed for Subbasin 03D, which includes the French Creek and Manatawny Creek watersheds. The Manatawny Creek watershed includes the Monocacy Creek; together, they drain most of Amity Township.

Under "Water Quality Impairment," the WRAS report had the following comments relative to the Manatawny:

Subbasin 03D has little documented impairment but has potential threats to water quality from increasing residential and commercial development and agricultural practices.

Ironstone Creek shows signs of streambank erosion. *Several other tributaries to Manatawny Creek are stressed due to on-lot septic system discharges*, riparian habitat loss, and sediment and nutrient loading. Development pressures are high in the Manatawny Creek watershed, especially around the US 422 corridor.

Manatawny Creek and Pickering Creek watersheds were evaluated under the Department's Unassessed Waters Program in 1999. The French Creek portion of the subbasin was assessed in 1998. *The assessment of Monocacy Creek watershed has not been completed.*

The main stem Manatawny Creek was determined to be unimpaired after the 1999 assessment. Previously, 20.66 miles of Manatawny Creek had been on the Department's 1998 303d List of Impaired Waters as impaired by nutrients, organic enrichment/low dissolved oxygen (DO) from agricultural sources. The 303d listing had been based on a 1980's nutrient survey that stated a potential for diurnal DO violations. *Manatawny Creek was removed from the 303d list in 2000 after the 1999 assessment showed no impairment.* Five unnamed tributaries to Manatawny Creek were determined to be impaired; one due to habitat modification and flow alterations and the others from crop related agricultural activities. Due to the high percentage of agricultural land use in the watershed, the increasing development along major highways, and several impaired tributaries, Manatawny Creek is vulnerable to nonpoint source pollution and should be protected. (Emphasis added)

The report raises no issues that need further consideration in this report. The comment about discharges from on-lot septic systems is not specific enough to identify it as an Amity Township problem. However, if this is in fact the case, the Sewage Management Program and solutions offered for the Tier II area are appropriate responses to address that concern.

#### **6.1.7 Pennsylvania Prime Agricultural Land Policy**

Prime Agricultural Soils are shown in **FIGURE 2-4** in Section 2. When the Township developed its 1990 Comprehensive Plan, about 63% of the Township was woodland, farmland and general undeveloped open space. Some of the earlier development in the Township occurred on Prime Agricultural Land due to the ease of development and proximity to major highways, and this pre-dates much of the Township's land use regulation. Current zoning attempts to preserve the remaining Prime Agricultural Land (Section 4.2.1), and local farmers are participating in preservation programs such as "Clean and Green" and Agricultural Conservation Easements (See Section 2.2.1).

### **6.1.8 County Stormwater Management Plans**

There are no approved Act 167 Stormwater Management Plans for the Monocacy Creek, Manatawny Creek or Schuylkill River watersheds.<sup>1</sup> The Monocacy Creek is not an Act 167 Plan Watershed; it is a sub-shed of the Schuylkill River. A Schuylkill River (Berks County section) Phase I study is underway. The projected Phase II Plan completion date is December 2004.

### **6.1.9 Wetland Encroachments**

See Section 2.7, and Figures 2.2 and 2.3.

### **6.1.10 Protection of Rare, Endangered or Threatened Species - PNDI**

There were no rare, endangered or threatened species that would be impacted by any of the proposed options. Correspondence to this effect can be found in **APPENDIX 6-1**. The following agencies were contacted and asked to review plans:

- PNDI
- US Fish & Wildlife Service
- Pennsylvania Fish and Boat Commission
- Pennsylvania Game Commission

### **6.1.11 Historical and Archaeological Resource Protection**

There were no historical or archaeological sites that would be impacted by any of the proposed alternatives. Correspondence to this effect can be found in Appendix 6-2.

## **6.2 RESOLUTION OF INCONSISTENCIES**

The Berks County Planning Commission reviewed the proposed plan, and has endorsed it. A copy of their letter is included in Appendix 0-1.

## **6.3 EVALUATION OF ALTERNATIVES**

### **6.3.1 Water Quality Standards**

Amity Township will meet all applicable water quality standards (NPDES). When the upgrades and modifications are made to the existing treatment plant, the Township will submit the necessary documentation to PADEP for a modification to the existing permit.

Options 1 and 2 for the Tier II area (extension of existing sewer) do not present any water quality issues (the additional EDU's represent less than 2% of the plant load).

Options 3 and 4, which call for construction of a package treatment plant, will require obtaining an NPDES permit for discharge into the Monocacy Creek (see Appendix 6-4).

---

<sup>1</sup>PADEP, "DEP Approved Stormwater Management Plans," last updated Aug. 7, 2002.

### **6.3.2 Effluent Limitations**

Amity Township will submit an application to the appropriate agencies to increase the capacity of the existing plant, while meeting the effluent standards of the NPDES permit. The addition of sewage from the Tier II area under either Option 1 or 2 is not significant.

For Options 3 or 4, the NPDES permit will dictate any effluent limitations. DEP has provided preliminary discharge criteria, shown in Appendix 6-4.

Option 5 would not discharge any effluent to streams or rivers.

### **6.3.3 Technical, Legislative and Legal Requirements**

No technical or legislative requirements were identified. Amity Township will meet all legal requirements as part of the NPDES permit process for any of the proposed options.

## **6.4 COST ESTIMATES**

**Appendix 6-5** shows different funding scenarios for each of the options discussed in Section 5. All options involve new construction (sewer extensions, collection and/or package treatment plants, community systems).

Basic assumptions used in the calculations are:

- All eligible EDU's would connect to sewer. The current tapping fee is \$3,920, and all units connecting would pay this fee.
- Based on the 2003 budget for the Township Treatment Plant, and 3,999 EDU's,<sup>2</sup> the Operations and Maintenance (O&M) cost is \$206/EDU. For comparison, this figure was used in all calculations.
- O&M costs for each alternative are included in the analysis. For the sewer options, costs are minimal, and include periodic inspections, right-of-way maintenance, and electricity for the Limekiln Interceptor pumping station. Costs for the package plant options include electricity costs, chemicals, periodic sludge pumping, and part-time staffing.

Cost estimates were done for each of the five alternatives, and estimates for O&M costs (on a per EDU basis) were added to the construction costs. The analysis calculated:

- Total Annual Cost/EDU
- Annual Rental Cost Increase/EDU (for the entire Township). This is the marginal effect of the option on the entire system cost.

---

<sup>2</sup>2002 Chapter 94 Annual Report, estimated Year 2003 EDU's

## **6.5 ANALYSIS OF FUNDING METHODS**

The Township explored three financing options: bank loan; municipal bond; and PENNVEST financing. The analyses for the bank loan and municipal bond use 10 years and 20 years for the term of the loan. Current rates are about 4%. Calculations were done at 5% and 10% as well to assess sensitivity to rate changes. For PENNVEST, the analysis was done using the current rates for Berks County, and assuming a 20-year loan term.

PENNVEST rates are currently very attractive. However, PENNVEST funding limits choices to the lowest cost alternative (or second lowest if it is within 10% of the lowest cost alternative). Because the Township has chosen an option that does not meet the PENNVEST criteria, they will rely on the bank loan or municipal bond scenario for financing.

## **6.6 IMPLEMENTATION - PHASED VERSUS IMMEDIATE**

### **6.6.1 Activities Necessary to Abate Critical Public Health Hazards**

No critical public health hazards were identified. Only a few, scattered wells tested positive for fecal coliform, and residents were immediately notified (and given information of disinfecting the well). The identified septic system malfunctions were primarily lush green grass, spongy soil, and odors. Although unpleasant, they did not, in the estimation of the SEO's observing the problems, constitute immediate health hazards.

### **6.6.2 Phasing**

The "Limekiln Interceptor" option does not require phasing; it simply extends sewer service to Bel Air Estates.

Option 2, the "Monocacy Creek Interceptor" option serving both Bel Air Estates and Valley Road, could be phased. Phase I would provide sewer to Bel Air Estates; Phase II would connect Valley Road to the sewer.

Option 3, constructing a package plant in Bel Air Estates, would not require phasing.

Option 4 would construct a package plant serving both Bel Air and Valley Road. It could be done in phases; a second package unit could be added at a later date, and the Valley Road collector could be built separately. However, the location of the plant at a point that would allow connection of both areas would only make sense if the intent is to serve Valley Road. If Valley Road sewer is only a remote possibility, it would not be cost-effective to locate the plant that far downstream. The only benefit to phasing would be in limiting the scope of the project in a given year to better manage the project or to spread the financial burden over a greater period.

Options 5, a community on-lot disposal system, would not require phasing.

## **6.7 ADMINISTRATIVE ORGANIZATIONS AND LEGAL AUTHORITY**

This is more fully covered in Section 7. No administrative or legal issues that would prevent full implementation of this plan were identified.