

WASTEWATER TREATMENT FACILITY

FEASIBILITY STUDY

RECOMMENDATIONS FOR UPGRADES

FOR:

POSSUM VALLEY MUNICIPAL AUTHORITY
609 CLEARVIEW ROAD
ASPERS, PA 17304

November, 2023

BY:



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Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

TABLE OF CONTENTS

| | |
|---|-----------|
| EXECUTIVE SUMMARY | 1 |
| OBJECTIVE | 2 |
| BACKGROUND | 3 |
| WASTEWATER TREATMENT FACILITY | 3 |
| <i>Treatment Process</i> | 3 |
| <i>Treatment Site</i> | 5 |
| <i>Hydraulic and Organic Capacity Discussion</i> | 6 |
| WASTEWATER TREATMENT OPTIONS / PRELIMINARY RECOMMENDATIONS | 6 |
| WWTF REPLACEMENT WITH IDENTICAL CAPACITY | 7 |
| WWTF REPLACEMENT WITH DOUBLE CAPACITY | 10 |
| PA DEP APPROVAL | 12 |
| SEWAGE PLANNING..... | 12 |
| PA DEP PERMITTING..... | 13 |
| PROJECT FUNDING | 14 |
| ALTERNATIVE FINANCIAL SCENARIOS | 15 |
| CONCLUSIONS / RECOMMENDATIONS | 18 |
| APPENDIX | 20 |

EXECUTIVE SUMMARY

Possum Valley Municipal Authority (PVMA) owns and operates a 120,000 gallon per day wastewater treatment facility (WWTF) constructed in 1986 that currently is running at 66% of capacity and would be limited hydraulically as opposed to organically. There has been relatively little growth experienced but there have been several large subdivisions proposed in the service area that could necessitate expansion but growth is not a primary driving force for new wastewater treatment facilities.

Despite the fact that the existing WWTF is meeting all of current NPDES discharge requirements, it is approaching the end of its useful life and would not be capable of meeting more restrictive nutrient removal requirements if imposed. Due to the time frames associated with planning, permitting, and financing a large capital wastewater facilities project, it is recommended that PVMA consider taking immediate actions to begin the process of replacement of the existing WWTF.

Given the existing site and potential expansion areas are in low lying areas near streams and in the floodplain, it is recommended that the areas being considered for new construction are delineated for wetlands and screened for bog turtle habitat. This information may be useful to determine where future facilities will be located.

PVMA is faced with a difficult decision on whether to move forward with a new WWTF with greater capacity and / or nutrient removal capabilities. The decision is difficult because it is impossible to predict at this point whether there will be future growth in the area or whether PA DEP will impose stricter effluent limitations when the NPDES permit is renewed. The decision will likely be based on what the current users can afford.

Financing and grant funding will need to be aggressively pursued to reduce the impact on users and their rates for sewer service. Based on current economic conditions, it appears that funding for the project may be best suited through Pennvest.

The initial recommendation is to pursue the single basin SBR option due to its flexibility to meet nutrient removal requirements at any flow rate. Since this is the highest cost option, if this alternative is determined to be unaffordable, our recommendation would be for replacement of the existing WWTF with a new one of identical capacity without nutrient removal capabilities.

OBJECTIVE

The objective of this feasibility report is to present the results of an evaluation of the current Possum Valley Municipal Authority (PVMA) wastewater treatment facility (WWTF) and make recommendations moving forward for upgrading the facilities. This evaluation will consider two options: The first will be for replacement of the existing WWTF with a new WWTF of identical capacity. The second option will be with an eye towards future growth with a WWTF of double the current capacity. Based upon this evaluation, recommendations will be provided for consideration by the PVMA Board to address the replacement of the current WWTF. These recommendations will ensure compliance with the current and consider future National Pollutant Discharge Elimination System (NPDES) permits granted by the Pennsylvania Department of Environmental Protection (PADEP) that may contain stricter nutrient removal requirements.

Suppliers of wastewater treatment equipment and treatment systems were contacted and requested to provide pricing and recommendations for the above scenarios.

Note that the opinion of costs provided in this report for upgrading the WWTF are based upon estimate of costs used on similar projects and from budgetary pricing provided by equipment suppliers. The actual cost may vary and will be dependent upon, among other factors, actual market conditions at time of bidding. Also note that operation and maintenance costs have not been included at this time.

Based upon the findings and recommendations in this feasibility study, the PVMA Board, after careful consideration and deliberation will chose the appropriate course of action to be taken to address the current situation. If this course of action involves increasing the hydraulic or organic capacity of the treatment system, authorization will be needed to prepare planning documents for PADEP. The next step would then be an application for a Water Quality Management Permit from PADEP will be required for any modifications or changes to the WWTF. Other permits may also be required and may include: (1) General Permit for wetland encroachment; (2) Erosion & Sedimentation or NPDES permitting for earth disturbance; (3) floodplain permitting; and (4) any other local permits. Funding sources will need to be sought out and applied for, including grants. Finally bid documents will need prepared for the authorized work to be undertaken and completed.

BACKGROUND

PVMA owns and operates an extended aeration, steel package WWTF system that utilizes flow equalization and is currently permitted for 120,000 gallons per day (0.120 MGD). The WWTF was constructed in 1986 and specifically designed to treat the septic tank effluent from portions of Menallen Township and the Borough of Bendersville. Newer developments that have been connected to the sewer system have eliminated the septic tank requirement and treat the raw wastewater generated without the benefit of solids and BOD₅ removal from the septic tank. The service area has seen some growth over the years and there are many areas that could be developed, particularly in Menallen Township.

A similar feasibility study was undertaken by William F. Hill & Associates in October of 2005 when development plans were plentiful in the service area. However, the Great Recession of 2006 drastically reduced the potential for residential development. Thus, the primary recommendation for the construction of new sequencing batch reactor (SBR) WWTF system designed to treat a flow of 0.30 MGD contained in this prior study was never implemented.

WASTEWATER TREATMENT FACILITY

Treatment Process

The existing wastewater treatment facility contains influent and effluent composite samplers, influent headworks and an above ground steel package wastewater treatment system that has been in operation since the mid-1980s. The package plant consists of a single surge tank followed by a dual train of extended aeration tanks with separate interior sludge holding tanks and clarifiers and then two trains of chlorine contact tanks. The above ground tanks are sitting on concrete slabs in an area that appeared to be filled in with imported ground to elevate the structure above the floodplain level. The discharge is directly to the Opossum Creek and apparently crosses the adjoining parcel owned by Matthew and Sonya Showers.

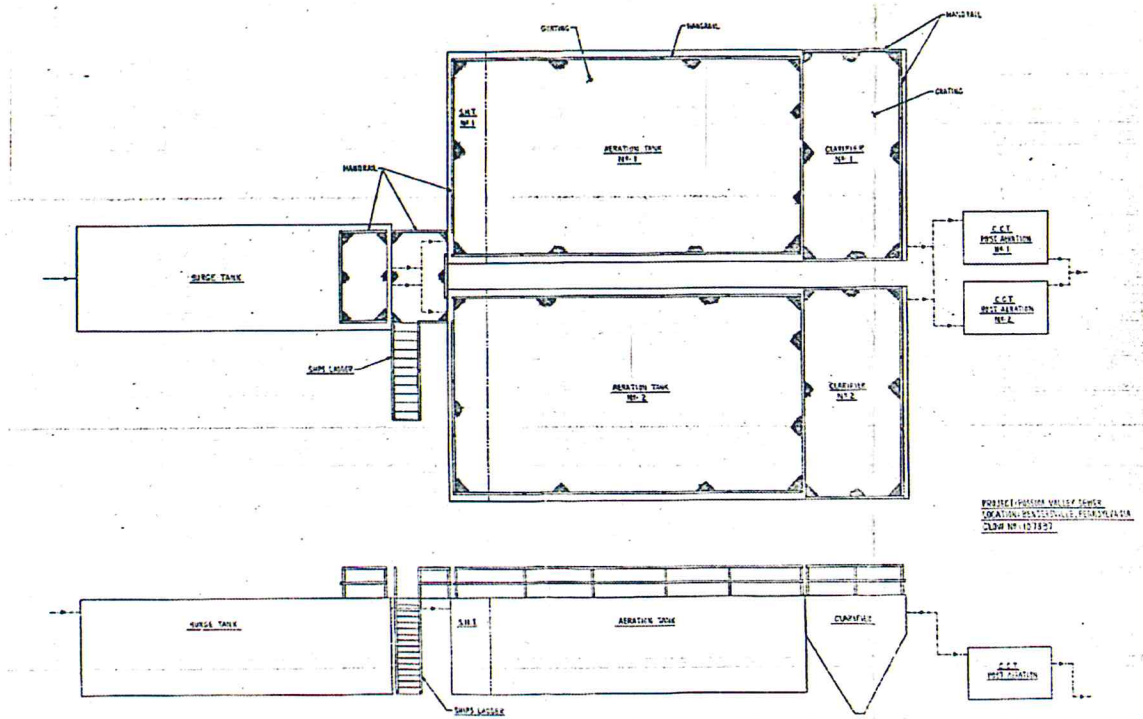
The system is designed to meet secondary treatment (BOD₅ / TSS / NH₃) standards as required in the latest NPDES permit for the discharge to the Opossum Creek. The system is well operated and currently produces effluent that is higher in quality than what is required. However, it would not be capable of meeting more stringent tertiary standards associated with nutrient removal as currently configured, particularly Total Nitrogen (Total N), although sodium aluminate is added for phosphorus removal and pH control.

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

The WWTF is constructed of carbon plate steel and has shown some signs of corrosion and has been patched and repaired as needed. There are concerns regarding the structural integrity of the wall separating the sludge holding and aerations basins. It is fairly evident that the WWTF is rapidly approaching the end of its useful life and PVMA has decided to look into options for the upgrades and replacement before a catastrophic failure were to occur. Despite the physical problems with the tank and aging equipment associated with the WWTF, effluent quality has consistently met the requirements outlined in the latest NPDES permit.

See Figure 1 for an overall schematic of the wastewater treatment facility.

Figure 1 PVMA WASTEWATER TREATMENT FACILITY SCHEMATIC



Based on the age and condition of the WWTF it is recommended that Possum Valley Municipal Authority take immediate actions to begin the process of replacement of the existing WWTF.

Treatment Site

The current parcel contains the influent pump station, the controls and administration building, garage, storage buildings and wastewater treatment facility. It is approximately 2.66 acres with a significant portion currently wooded and is bounded by Clearview Road on the west, an unnamed tributary stream to Opossum Creek to the south and a single adjoining parcel to the north and east owned by Matthew and Sonya Showers. This relatively low-lying parcel lies between the Opossum Creek and an unnamed tributary branch and is entirely located in the 100-year floodplain according to FEMA mapping. See Floodway and Wetland Map included in the Appendix.

Due to the fact that the existing WWTF will need to be operated while construction on any new facilities begins, the existing parcel is further constrained. It may be possible however that the existing site could contain a new WWTF of identical capacity.

The floodway in this area is undefined and would need to be assumed to be 50 feet from the top of the bank of both the Opossum Creek and tributary stream which further constrains the site. Based on this assumption, the buildings and WWTF are presently located in the floodway. In addition, there is a strong possibility that some of the wooded areas, particularly, those near the tributary stream may contain wetlands that are not currently included in the National Wetland Inventory (NWI) and potentially be bog turtle habitat. It is likely the currently farmed fields, although lower in elevation, would not contain wetlands or bog turtle habitat.

Any new facilities would need to be constructed above the 100-year floodplain and may be subject to any other floodplain management ordinances, if enacted by Menallen Township. If wetlands are delineated and were to be disturbed, general permits would be required for PA DEP. Federal permits may also be required if any work were to be proposed in the floodway or if multiple general permits were being pursued.

It is recommended that delineation of the wetlands and a Pennsylvania Natural Diversity Inventory (PNDI) be run on the both the currently occupied existing parcel as well as the adjoining parcel owned by Showers. This information would be crucial to help determine, and may dictate, where any future expansion could take place. In addition, geotechnical analysis of the soils would also be advised to ensure any future activities have a stable base.

Hydraulic and Organic Capacity Discussion

The WWTF is currently rated for an average flow of 0.120 MGD with an organic loading of 325 pounds per day of BOD₅. Review of the annual Chapter 94 Reports show an approximate annual average flow of 80,000 gallons per day with an organic load of 110 pounds of BOD₅ per day. The flows are approximately two thirds of the permitted hydraulic capacity of 0.12 MGD while the organic loading is approximately one third of the permitted organic capacity of 325 pounds of BOD₅ per day.

The hydraulic loading is not considerably affected by inflow and infiltration (I/I) as the maximum three-month average to annual average flow ratio is typically lower than 1.3 on an annual basis. Based on current dry weather flows and organic loading to the wastewater treatment facility, the facility will be more limited hydraulically than it will be organically and currently has the capacity to take on some additional hydraulic and organic loading.

Growth in the area has been relatively limited for some time and is always subject to the current economic climate. At this time, future growth does not appear to be a primary driver for new wastewater treatment facilities.

WASTEWATER TREATMENT OPTIONS / PRELIMINARY RECOMMENDATIONS

Replacement and expansion of the current WWTF may require the purchase of additional land adjoining the current parcel as the existing site is somewhat physically constrained and may be constrained further if wetlands and bog turtle habitat are encountered. Additional land would be particularly important to allow for construction of the new facilities while the existing facilities continue to provide treatment. Exploratory discussions should immediately be undertaken with the adjoining property owners in the context of trying to negotiate obtaining the additional land. The assistance of the solicitor to develop the legal agreements required for obtaining the required land would be strongly recommended.

In conjunction with the pursuit of the additional land and as mentioned previously, the existing and surrounding areas should be delineated for wetlands and soil stability testing performed to ensure any future construction can be successfully completed and in compliance with environmental regulations.

Given the issues experienced with the corrosion of the carbon steel plant, quotes for new WWTF tanks and systems were requested from concrete plant manufacturers and suppliers. Historically steel package plants have been less

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

Budgetary opinion of construction cost for the supply and installation of this system is \$2,700,000 and is summarized below. Note that this cost does not include a new building or demolition of the old WWTF, including any salvage value of it.

OPTION #1: WWTF REPLACEMENT OF IDENTICAL CAPACITY
Extended Aeration / Secondary Treatment Standards
Estimated

| Item # | Description | Unit | Quantity | Unit Price | Total |
|--|------------------------------------|------|----------|-------------|--------------------|
| 1 | Land Acquisition** | Acre | 2 | \$30,000 | \$60,000 |
| 2 | Site Preparation | L.S. | 1 | \$150,000 | \$150,000 |
| 3 | Treatment Equipment & Installation | L.S. | 1 | \$1,429,000 | \$1,429,000 |
| 4 | Yard Piping | L.S. | 1 | \$150,000 | \$150,000 |
| 5 | Security Fencing | L.F. | 200 | \$100 | \$20,000 |
| 6 | Generator | L.S. | 1 | \$100,000 | \$100,000 |
| 7 | Site Restoration | L.S. | 1 | \$100,000 | \$100,000 |
| 8 | Electric Work | L.S. | 1 | \$150,000 | \$150,000 |
| 9 | Engineering, Legal, Financing | L.S. | 1 | \$539,750 | \$539,750 |
| ** Includes Appraisal, Survey and Legal Fees | | | | | |
| Total | | | | | \$2,698,750 |

Tertiary Treatment Standards:

Another option for consideration is to upgrade the extended aeration package WWTF at the same capacity but to include provisions for nutrient removal.

The size of the tertiary treatment system depicted in Figure 2 below will be approximately 100 feet long, 45 feet wide and 12 feet deep. The layout for it will be similar to the secondary treatment system but with additional basins for biological nutrient removal. It will consist of a single equalization basin, two anoxic basins, two aeration basins, two clarifier basins, two sludge holding basins and a basin dedicated to chlorine disinfection. Note that this could be upgraded to an ultraviolet disinfection system similar to the secondary system.

WWTF REPLACEMENT WITH DOUBLE CAPACITY

Sequencing Batch Reactor (SBR) Treatment System

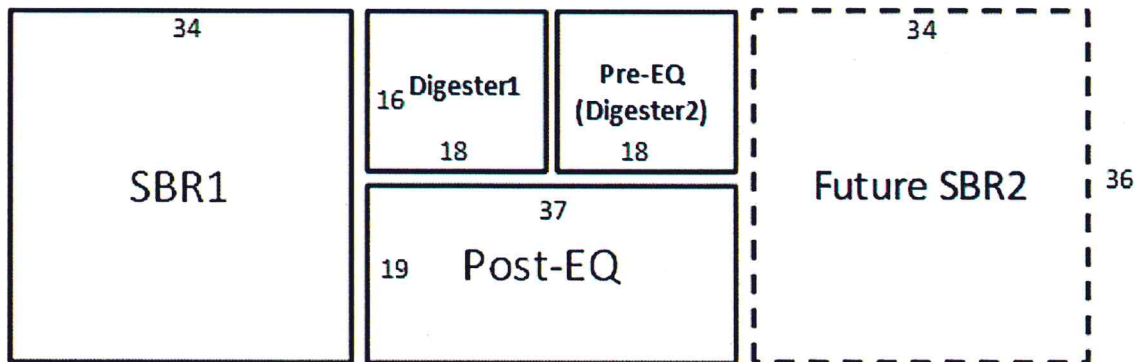
A dual basin, sequencing batch reactor (SBR) treatment system would be recommended for the WWTF with double the treatment capacity of 0.240 MGD. The SBR system has the inherent ability to achieve nutrient removal without additional basins. Therefore, the SBR treatment system is capable of meeting the secondary and tertiary standards by simply manipulating the cycle structure and adding chemicals for phosphorus removal.

After confirming with PA DEP, there is also the possibility that the SBR system could be set up in a single basin configuration at the current capacity (0.120 MGD) with a pre-equalization basin to hold flow when the SBR is in a non-fill cycle. The pre-equalization basin would be converted to a sludge holding basin if the system were ever to double in size by adding a second, identically sized, SBR basin.

The following schematic shows what the ultimate buildout for doubling the capacity would look like for an SBR treatment system.

The size of the SBR treatment system depicted in Figure 4 below will be approximately 110 feet long, 40 feet wide and 23 feet deep. The layout for it will be similar to the tertiary treatment system but without additional basins for biological nutrient removal. It will consist of a single pre-equalization basin, a post-equalization basin, a digester basin and a single SBR basin.

Figure 4: Dual Basin SBR Schematic Layout



| | LWL | HWL | TOW | SRT |
|----------|-------|-------|-----|-----------|
| SBR | 12.8' | 21' | 23' | |
| Pre-EQ | 0' | 17.4' | 23' | |
| Digester | 11.9' | 17' | 23' | 50.5 days |
| Post-EQ | 0' | 11.3' | 23' | |

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

Budgetary opinion of construction costs for the supply and installation of single basin SBR system to be upgraded in the future would be \$5,000,000 and is summarized below,

OPTION #3: WWTF REPLACEMENT OF IDENTICAL CAPACITY
Single Basin SBR / Tertiary Treatment Standards

| Item # | Description | Unit | Quantity | Unit Price | Total |
|--|----------------------------------|------|----------|-------------|--------------------|
| 1 | Land Acquisition** | Acre | 2 | \$30,000 | \$60,000 |
| 2 | Site Preparation | L.S. | 1 | \$175,000 | \$175,000 |
| 3 | Treatment Equipment | L.S. | 1 | \$513,000 | \$513,000 |
| 4 | Concrete Structure for SBR | L.S. | 1 | \$675,000 | \$675,000 |
| 5 | WWTF Construction / Installation | L.S. | 1 | \$1,500,000 | \$1,500,000 |
| 6 | Blower Building | L.S. | 1 | \$180,000 | \$180,000 |
| 7 | Ultraviolet Disinfection | L.S. | 1 | \$260,000 | \$260,000 |
| 8 | Influent Screen | L.S. | 1 | \$150,000 | \$150,000 |
| 9 | Yard Piping | L.S. | 1 | \$150,000 | \$150,000 |
| 10 | Security Fencing | L.F. | 200 | \$100 | \$20,000 |
| 11 | Generator | L.S. | 1 | \$120,000 | \$120,000 |
| 12 | Site Restoration | L.S. | 1 | \$100,000 | \$100,000 |
| 13 | Electric Work | L.S. | 1 | \$125,000 | \$125,000 |
| 14 | Engineering, Legal, Financing | L.S. | 1 | \$1,007,000 | \$1,007,000 |
| ** Includes Appraisal, Survey and Legal Fees | | | | | |
| Total | | | | | \$5,035,000 |

The estimated costs to upgrade the single basin to a dual basin SBR in the future by adding another SBR basin and appurtenances would be approximately \$1,500,000.

The last option would be to install a system with double the capacity right of way thereby skipping the phased approach. Budgetary opinion of construction costs for the supply and installation of a dual basin SBR system immediately would be \$6,900,000 and is summarized below,

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

OPTION #4: WWTF REPLACEMENT OF DOUBLE CAPACITY
Tertiary Treatment Standards

| Item # | Description | Unit | Estimated Quantity | Unit Price | Total |
|--|----------------------------------|------|-----------------------|-------------|--------------------|
| 1 | Land Acquisition** | Acre | 2 | \$30,000 | \$60,000 |
| 2 | Site Preparation | L.S. | 1 | \$200,000 | \$200,000 |
| 3 | Treatment Equipment | L.S. | 1 | \$680,000 | \$680,000 |
| 4 | Concrete Structure for SBR | L.S. | 1 | \$911,250 | \$911,250 |
| 5 | WWTF Construction / Installation | L.S. | 1 | \$2,025,000 | \$2,025,000 |
| 6 | Blower Building | L.S. | 1 | \$200,000 | \$200,000 |
| 7 | Ultraviolet Disinfection | L.S. | 1 | \$275,000 | \$275,000 |
| 8 | Influent Screen | L.S. | 1 | \$160,000 | \$160,000 |
| 9 | Yard Piping | L.S. | 1 | \$175,000 | \$175,000 |
| 10 | Security Fencing | L.F. | 200 | \$100 | \$20,000 |
| 11 | Generator | L.S. | 1 | \$120,000 | \$120,000 |
| 12 | Site Restoration | L.S. | 1 | \$100,000 | \$100,000 |
| 13 | Electric Work | L.S. | 1 | \$150,000 | \$150,000 |
| 14 | Engineering, Legal, Financing | L.S. | 1 | \$1,776,688 | \$1,776,688 |
| ** Includes Appraisal, Survey and Legal Fees | | | | | |
| Total | | | | | \$6,852,938 |

PA DEP APPROVAL

The following discussion is provided to outline the necessary steps required for PA DEP approval of the proposed improvements to the wastewater treatment facility. If it is decided to move forward with any upgrades, it would be advisable to review the requirements from PA DEP to ensure the permitting process would go as smoothly as possible.

SEWAGE PLANNING

If the hydraulic or organic capacity of the wastewater treatment facility is ultimately decided to be increased, PA DEP would likely require an update to the existing Act 537 Sewage Facilities Plan for Menallen Township and Bendersville. A meeting with PA DEP to review in detail what would be required would be highly recommended if the decision is made to increase capacity. Input from Menallen Township or Bendersville on their willingness to undertake such an update or revision would be necessary and if they are willing, they should be part of any meeting with PA DEP.

If the hydraulic or organic capacity is decided not be increased, the requirement for sewage planning will likely not be required. This however would need to be confirmed prior to moving forward with an upgrade project.

PA DEP PERMITTING

Part I: NPDES Permit

If the decision is made to increase the capacity of the wastewater treatment facility and after the sewage planning issues are resolved, PA DEP will need to be contacted to determine the effluent requirements for the higher flow rate. Included with the effluent requirements would also be the Chesapeake Bay Tributary Strategy (CBTS) nutrient Total Mass Discharge Limitations (TMDLs) that may be required. It would be critical that these CBTS TMDLs be known to ensure the treatment facility can attain them or alternatively if the purchase of nutrient credits will be required.

If the decision is made to not increase the capacity of the wastewater treatment system, this step will not be necessary as the existing NPDES permit would apply.

Note that is impossible to know for sure or speculate whether PA DEP may or may not impose stricter effluent requirements on the Opossum Creek.

Part II: Water Quality Management Approval

Regardless of the decision to increase or not to increase the capacity of the wastewater treatment facility, an application will need to be submitted to PA DEP for approval of the Part II Water Quality Management permit. This permit will detail all the revisions proposed for the upgrades.

Floodway / Wetlands / Water Encroachment / Other

Permitting from PA DEP may be required if wetlands will be encountered and disturbed on the current or proposed land to be obtained as part any upgrades. In addition, permitting would be required if the existing outfall is proposed to be revised or if a new outfall will be required. If more than one acre of ground disturbance is anticipated a separate NPDES permit would be required for this. Otherwise, an Erosion and Sedimentation (E&S) plan would need to be approved by the Adams County Conservation District. There may also be local permitting needed for any work done in the floodplain, for zoning or for the structures themselves.

PROJECT FUNDING

It should be noted that the budgetary opinion of cost summarized above would need to be updated once the design work begin and finer details of exactly what will be needed and installed are finalized. This will ensure that PVMA has the most accurate budgetary costs available prior to finalizing amounts to be borrowed.

Due to significant costs associated with any of options presented earlier, investigation of sources of funding will need to be undertaken by the PVMA. Applications for grant funding could be undertaken through various programs associated with the Department of Community and Economic Development (DCED) which typically require only a minimum amount of matching funds to be committed to the project. The problem with the pursuit of these funds is that some programs are not always available and grant funding is not guaranteed. These programs also tend to favor “shovel ready” projects which require a significant investment to get them to this point without financing to do so.

Other options include application for funding through the Adams County Office of Planning and Development for Community Development Block Grant funding. PVMA has had success with this funding in the past but it does require documentation through surveying that the local residents meet income requirements. This type of funding can be applied for and grants provided for up to three years. The drawback is that the grants are limited to the amount the County is allotted on an annual basis and how they chose to distribute the funds they do receive to any number of qualified applicants. Typically, the County will

try to fund as many projects as possible which decreases the grant amounts individually.

Funding through local banks is also an option and during the period where interest rates were low, was a very good option. However given the high current interest rates, PennVest is a much better option given their lower rates and longer terms offered as opposed to bank loans which are typically limited to 10 years and require refinancing after that initial period. Another potential advantage with Pennvest funding is the possibility of grant funding depending on the projected future rates and local median household incomes. Pennvest does require permits to be in hand prior to awards.

ALTERNATIVE FINANCIAL SCENARIOS

The following financial analysis is provided for each of the priced alternatives outlined earlier using Pennvest as the funding source to give PVMA an idea of the impact to user rates. The estimated monthly costs per EDU are strictly for paying off the debt at standard Pennvest rates for Adams County. These rates from Pennvest were found on their website as of October 2023 and are 1.743% for first 5 years and 2.179% for the remaining 15 years.

The estimated monthly costs per EDU would need to include the costs to cover operation and maintenance as well as any other debt that PVMA currently is in the process of paying off.

Note that it may be possible for grants or special financing terms to be provided by Pennvest if the total monthly bills for each EDU were to exceed Pennvest's target rates for the area. This may include extended the term to 30 years, reducing the interest rate, providing a grant or a combination of all of the above.

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

Possum Valley Municipal Authority
WWTF Feasibility Study

Financing Option 1 - PennVest Financing

Alternative #1 - WWTF Replacement Identical Capacity Ext. Aeration Secondary Treatment
743 EDU's

PennVest @ 1.743% for First 5 Years and 2.179% for Remaining 15 Years

| | |
|-----------------------------|--------------------|
| Rehabilitate Existing WWTF | \$2,159,000 |
| Legal / Admin / Engineering | \$539,750 |
| Total Project Cost | <u>\$2,698,750</u> |

| | <u>First Year</u> | <u>Sixth Year</u> | <u>Tenth Year</u> |
|---|-------------------|-------------------|-------------------|
| Annual Debt Service | \$160,982 | \$166,326 | \$166,326 |
| Annual O & M Costs | \$0 | \$0 | \$0 |
| Total Annual Costs | \$160,982 | \$166,326 | \$166,326 |
| EDU's | 743.0 | 748.0 | 753.0 |
| Annual Cost/EDU (Assume 5% Delinquency) | \$228 | \$234 | \$233 |
| Estimated Monthly Fee | \$19 | \$20 | \$19 |

Possum Valley Municipal Authority
WWTF Feasibility Study

Financing Option 2 - PennVest Financing

Alternative #2 - WWTF Replacement of Identical Capacity Ext Aeration Tertiary Treatment
743 EDU's

PennVest @ 1.743% for First 5 Years and 2.179% for Remaining 15 Years

| | |
|-----------------------------|--------------------|
| Rehabilitate Existing WWTF | \$3,115,600 |
| Legal / Admin / Engineering | \$778,900 |
| Total Project Cost | <u>\$3,894,500</u> |

| | <u>First Year</u> | <u>Sixth Year</u> | <u>Tenth Year</u> |
|---|-------------------|-------------------|-------------------|
| Annual Debt Service | \$232,309 | \$240,022 | \$240,022 |
| Annual O & M Costs | \$0 | \$0 | \$0 |
| Total Annual Costs | \$232,309 | \$240,022 | \$240,022 |
| EDU's | 743.0 | 748.0 | 753.0 |
| Annual Cost/EDU (Assume 5% Delinquency) | \$329 | \$338 | \$336 |
| Estimated Monthly Fee | \$27 | \$28 | \$28 |

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

Possum Valley Municipal Authority
WWTF Feasibility Study

Financing Option 3 - PennVest Financing

Alternative #3 - WWTF Replacement of Identical Capacity SBR Tertiary Treatment
743 EDU's

PennVest @ 1.743% for First 5 Years and 2.179% for Remaining 15 Years

| | |
|-----------------------------|--------------------|
| Rehabilitate Existing WWTF | \$4,028,000 |
| Legal / Admin / Engineering | \$1,007,000 |
| Total Project Cost | \$5,035,000 |

| | <u>First Year</u> | <u>Sixth Year</u> | <u>Tenth Year</u> |
|---|-------------------|-------------------|-------------------|
| Annual Debt Service | \$300,340 | \$310,312 | \$310,312 |
| Annual O & M Costs | \$0 | \$0 | \$0 |
| Total Annual Costs | \$300,340 | \$310,312 | \$310,312 |
| EDU's | 743.0 | 748.0 | 753.0 |
| Annual Cost/EDU (Assume 5% Delinquency) | \$426 | \$437 | \$434 |
| Estimated Monthly Fee | \$35 | \$36 | \$36 |

Possum Valley Municipal Authority
WWTF Feasibility Study

Financing Option 4 - PennVest Financing

Alternative #4 - WWTF Replacement of Double Capacity SBR Tertiary Treatment
743 EDU's

PennVest @ 1.743% for First 5 Years and 2.179% for Remaining 15 Years

| | |
|-----------------------------|--------------------|
| Rehabilitate Existing WWTF | \$5,076,250 |
| Legal / Admin / Engineering | \$1,776,688 |
| Total Project Cost | \$6,852,938 |

| | <u>First Year</u> | <u>Sixth Year</u> | <u>Tenth Year</u> |
|---|-------------------|-------------------|-------------------|
| Annual Debt Service | \$408,781 | \$422,353 | \$422,353 |
| Annual O & M Costs | \$0 | \$0 | \$0 |
| Total Annual Costs | \$408,781 | \$422,353 | \$422,353 |
| EDU's | 743.0 | 748.0 | 753.0 |
| Annual Cost/EDU (Assume 5% Delinquency) | \$579 | \$594 | \$590 |
| Estimated Monthly Fee | \$48 | \$50 | \$49 |

It is recommended that once a decision is made that an introductory meeting be set up with Pennvest to go over all the details needed to apply for financing.

CONCLUSIONS / RECOMMENDATIONS

It is evident that a no action alternative is not in the best interests of PVMA and that plans for replacement of the WWTF should be undertaken right away. PVMA must carefully consider whether they want to install a new WWTF based on the same or increased capacity, nutrient removal capabilities or a combination of both. This consideration must also be done in the context of what will be affordable for the current users.

The least expensive option is to just replace the current WWTF with a new one of the same exact size and treatment process that does not consider nutrient removal (Option #1). The most expensive option would be to replace the WWTF with a new SBR system of double the current capacity and is capable of nutrient removal (Option #4). Given that growth does not appear to be a primary driving factor it would be recommended that PVMA pursue replacement of the current WWTF with a new one of the same size and capacity. Under this particular scenario, the option with the most flexibility would be to construct a single basin SBR now and add the second basin in the future if capacity is needed for growth. The primary advantage of this option is the nutrient removal capabilities of the SBR system regardless of design flow. The option chosen may be limited to what the current users can reasonably afford.

Based on the flexibility it would be our recommendation to move forward with the single basin SBR option, provided that it is affordable. Otherwise, the recommendation would be for replacement with a new WWTF with identical capacity capable of meeting secondary standards only.

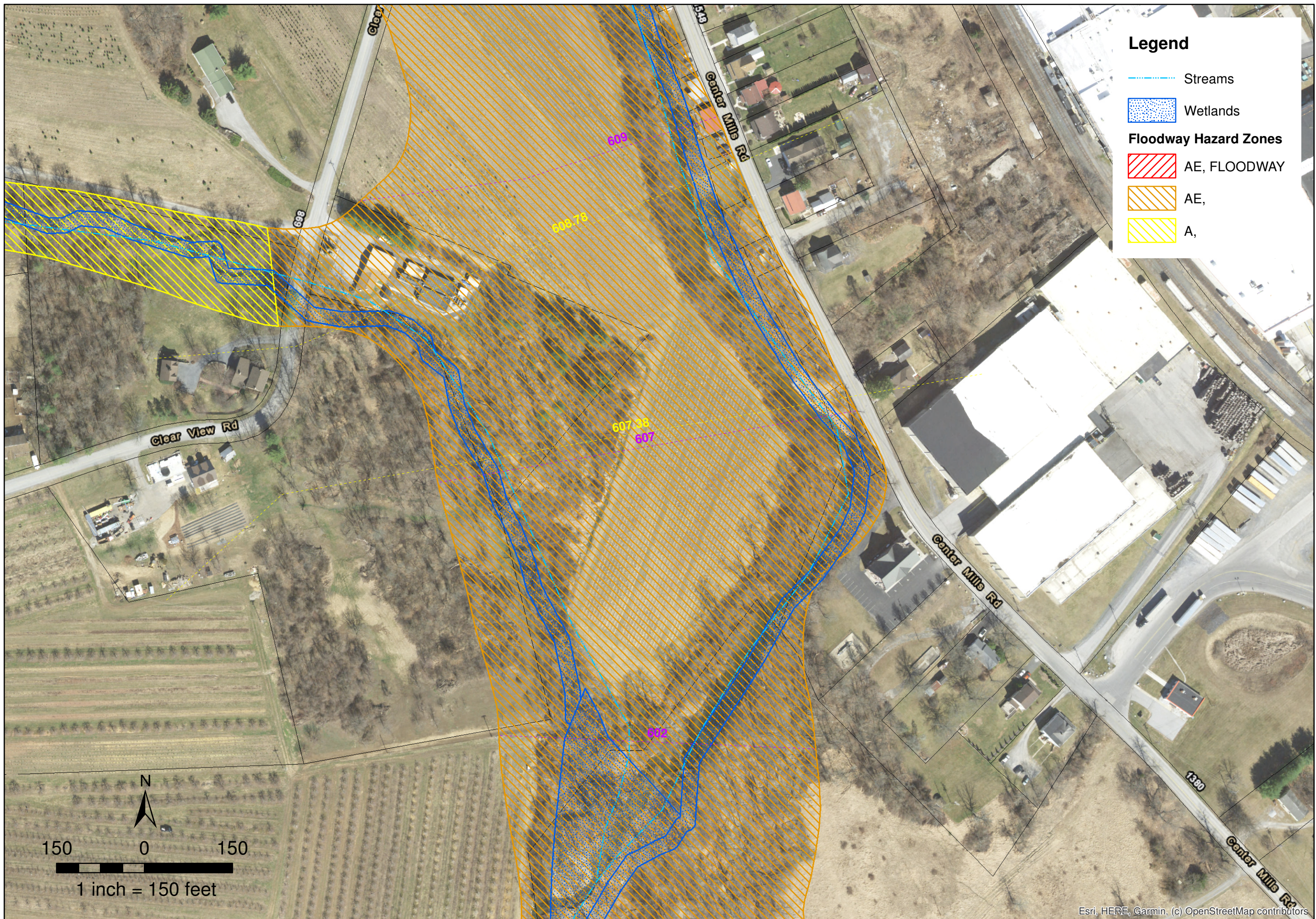
The following summarizes our recommendations based on the study presented:

- Based on our evaluation of the current WWTF, it is recommended that PVMA move forward with plans to replace it with a new WWTF.
- Geotechnical investigations, wetland delineation and screening for bog turtle habitat should be done on the existing and adjoining property to determine the most optimum location for the new facilities.
- PVMA should begin discussing the purchase of more land for any expansion with the adjoining property owner based on the results of the geotechnical investigations, wetland delineation and screening for bog turtle habitat.

Possum Valley Municipal Authority Feasibility Study
Wastewater Treatment Facility

- A meeting should be set up with Pennvest after a decision is made on moving forward so that financing can be obtained. Grant funding should also be aggressively sought from local, state and federal sources.
- PA DEP should be consulted to facilitate the permitting process

APPENDIX



Legend

-  Streams
-  Wetlands
- Floodway Hazard Zones**
-  AE, FLOODWAY
-  AE,
-  A,



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|--|--|-----|------|-------------|
| PROJECT NO. | | NO. | DATE | DESCRIPTION |
| DRAWN BY: MK | | | | |
| DESIGNED BY: CZ | | | | |
| CHECKED BY: CZ | | | | |
| DATE: 10/24/23 | | | | |
| SHEET: | | | | |
| POSSUM VALLEY MUNICIPAL AUTHORITY FLOODWAY AND WETLAND MAP WWTP FEASIBILITY STUDY | | | | |