TOWN OF GLASGOW
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# TOWN OF GLASGOW
# PRELIMINARY ENGINEERING REPORT
# WASTEWATER SYSTEM IMPROVEMENTS PROJECT
# KANAWHA COUNTY, WEST VIRGINIA



January 2024

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**TOWN OF GLASGOW**
**WASTEWATER SYSTEM IMPROVEMENTS PROJECT**

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TOWN OF GLASGOW
WASTEWATER SYSTEM IMPROVEMENTS PROJECT

## 1) PROJECT PLANNING

The Town of Glasgow is located on the bank of the Kanawha River in Kanawha County, West Virginia. The Town was incorporated on June 20, 1920. The Town has a population of 771 according to the 2021 Census. The Town provides wastewater collection and treatment services to approximately 295 customers according to the WV Public Service Commission Annual Report for 2023. Flows received by the wastewater treatment plant have increased over time. The flow during dry weather is as low as 22,000 gallons per day with peak daily flows exceeding 515,000 gallons per day. Additionally, a low-lying area of town has started experiencing sewer backups and overflows. As a result, the Town is begun a phased project approach to infiltration and inflow reduction. A Sanitary Sewer Evaluation Study (SSES) was conducted on the most problematic portions of the system. The proposed project is the first phase.

The proposed project will consist of replacement of 6" gravity sewer, replacement of 8" gravity sewer, lining of 6" and 8" gravity sewer as well as a point repair on a section of 8" gravity sewer on King Street. Seven (7) manholes are to be replaced, seven (7) manhole frames and covers are to be replaced, ten (10) manholes will be spin-coated, and the installation of five (5) storm manholes will be done as well. Also, lining the existing 12" storm sewer will occur.

### a) Location

The Town of Glasgow is located on the bank of the Kanawha River in the eastern portion of Kanawha County, West Virginia. The planning area is drained by the Kanawha River and Kelly's Creek (See Appendix A for project location map).

### b) Environmental Resources Present

The USDA-NRCS has been provided with the proposed project information and location map to determine potential impacts.

The U.S. Corps of Engineers has been provided with the proposed project information and location map to determine potential impacts.

The WV Division of Culture and History has been provided with the proposed project information and location map to determine potential impacts.

The WV Division of Natural Resources & U.S. Fish and Wildlife Service has been provided with the proposed project information and location map to determine potential impacts.

The environmental resources letters and agency responses are included in Appendix B.

c) Population Trends

The Town of Glasgow has a population of 703 according to the 2020 census. The population trend in the area is generally in decline. However, the population increased by approximately 15% between 2000 and 2010 followed by a steep population decline of approximately 22% between 2010 and 2020 census. The most likely reason for the sharp decrease is the downsizing of the coal industry in the area coupled with the idling of the adjacent power plant. See Appendix C for Census Data.

| Year | Population | Increase/(Decrease) |
|---|---|---|
| 1990 | 888 | (-) |
| 2000 | 781 | (12.0) |
| 2010 | 905 | 15.9 |
| 2020 | 703 | (22.3) |

d) Flow Projections

The proposed project will not add any additional customers and therefore there will be no additional sanitary sewer flow in the system. The project will improve the water tightness of the collection system and thereby reduce the infiltration and inflow into the sanitary sewer system. See Appendix D for historic flows.

e) Wasteload Allocation

A new wasteload allocation is not required for this project since there will be no change in the sanitary sewer flows.

f) Community Engagement

A public meeting was held on _____ to provide an explanation of the need for the project, to discuss the proposed project costs and expected

sewer rate, and to receive public input. See Appendix E for the public meeting minutes and attendance sheet.

2) EXISTING FACILITIES

The existing system serves 295 customers in the Town of Glasgow. The Town of Glasgow's existing wastewater collection system consists of the following:

~3 miles of 6" to 10" gravity sewers
44 manholes
Two (2) lift stations
Five (5) cleanouts
~0.45 miles of 2" force mains

The 150,000 gpd activated sludge wastewater treatment facility consists of the following major units:

2 – 13,000-gallon clarifiers
2 – 2,300-gallon chlorination chambers
1 – 150,000-gallon oxidation ditch
1 – 30,000-gallon aerated digester

See Appendix F for Collection System Schematic.

The WV/NPDES limits for the treatment facilities discharge into the Kanawha River are:

| Parameter | AVG. | MAX |
|---|---|---|
| $BOD_5$ | 20 mg/l | 40 mg/l |
| TSS | 30 mg/l | 60 mg/l |
| Fecal Coliforms | 200 colonies/100 ml | 400 colonies/100 ml |
| Ph | | 6 to 9 standard units |
| Chlorine | 0.028 mg/l | 0.057 mg/l |
| Total Nitrogen | 18 mg/l | 36 mg/l |

The Town's NPDES Permit Number is WV 0020265. The current permit expires on August 11, 2025. See Appendix G for NPDES Permit.

The wastewater treatment plant effluent is discharged to the Kanawha River at mile point 77.8 just upstream of the confluence with Kelly's Creek.

a) Location Map

A Project Location Map is included in Appendix A and a Collection System Schematic is included in Appendix F.

b) History

The original wastewater collection system construction history is not available. It is believed to have been built between the 1930's and 1950's. The majority of the Town's collection system is comprised of vitrified clay sewer pipe with brick manholes. The only exceptions to this are areas where the sewer line had to be repaired or replaced due to development.

c) Condition of Existing Facilities

The Town's wastewater treatment plant experiences high flows during wet weather events. The wet weather flows are six to seven times the average daily flows. The experienced levels of infiltration and inflow are common in sanitary sewer systems of this age. The non-gasket joints on the pipe and the deterioration of the pipe due to its age are major contributors to infiltration of non-domestic wastewater into the system. Additionally, the storm water system in the area was constructed around the same period as the sanitary sewer and with similar materials. Deteriorated stormwater pipes allow stormwater to flow out of the stormwater system and into the sanitary sewer system. The higher flows experienced at the wastewater treatment facility exceed the capacity of not only the clarifiers but also the disinfection system. The increased flow also results in a decreased level of service to the customers. The Town has decided to take a proactive approach to addressing the excessive amount of infiltration and inflow into the sanitary sewer system. The Town has chosen to utilize $189,000 of its American Rescue Plan Act funds to begin the first phase of the rehabilitation of the Town's sanitary sewer rehabilitation. The first phase began with a Sewer System Evaluation Study for a portion of the collection system that was completed in August 2023. Manhole inspections, smoke testing, and closed caption video inspection were all utilized to develop the SSES that covers approximately 15% of the existing collection system. The areas of the Town that the SSES was prepared for are the entire length of 5th Avenue, a portion of 3rd Avenue, a portion of 2nd Street and a section of King Street.

The existing sanitary sewer utilities in close proximity to the Town of Glasgow are as follows: Town of Pratt, which is located approximately 1.5 miles to the southeast, Town of East Bank which is located approximately 1.0 mile to the north west, and The Town of Cedar Grove which is immediately to the northwest. Pratt and East Bank are both located on the opposite side of the Kanawha River from Glasgow, and both have their own issues with infiltration and inflow. Cedar Grove is located on the other side of Kelly's Creek and is a combined sewer overflow community. East Bank and Cedar Grove rely on Kanawha Public Service District to provide wastewater treatment. Pratt has a wastewater treatment plant but is currently under orders to address sanitary sewer overflows at the facility. Additionally, Pratt is also relying on Kanawha PSD to provide operational

services for the wastewater treatment facility. All three of the other utilities are also having issues with excessive amounts of infiltration and inflow. Therefore, sending additional flows to these utilities is not practical at this time. The most effective way for Glasgow to address the high flows at its wastewater treatment facility is to reduce the infiltration and inflow into the collection system.

d) Financial Status of any Existing Facilities

The Town of Glasgow has no outstanding long-term debt. The Town is current on all outstanding invoices. See current annual report submitted to WVPSC for more details. The annual report is on West Virginia Public Service Commission' Website. See Appendix H for the Annual WV PSC Report.

The current rate schedule (effective July 1, 2022) charged to its customers is as follows:

| | |
|---|---|
| Every 1,000 gallons | $12.92 per 1,000 gallons |
| 3,400 gallons | $43.93 per month |
| 4000 gallons | $51.68 per month |
| 4,500 gallons | $58.14 per month |
| Minimum bill | $32.92 per month |

See Appendix I for Current Tariff

The annual O & M cost was $209,907 and total revenues were $242,193. The town has a surplus of $32,286.

e) Water/Energy/Waste Audits

Not Applicable. There was no recorded water, energy, and/or waste audits conducted.

f) Customer Base

Glasgow currently has 295 customers on its sanitary sewer collection system. The customer base is comprised of 277 residential customers, 13 commercial customers (87 customer equivalents), and 5 public authority customers (4 customer equivalents). Resulting in a total of 368 customer equivalents.

3) NEED FOR PROJECT

a) Environment, Health, Sanitation, and Security

As stated above the Town of Glasgow is addressing excessive amounts of infiltration and inflow into its sanitary sewer system. The higher flows increase pump run times and wear on the treatment plant equipment. The excessive amount of extraneous water entering the system has during period of extremely wet weather exceeded the capacity of the system to transport the water, which results in system overflows. Furthermore, the infiltration and inflow will dilute the mixed liquor in the treatment basin and reduce the treatment efficiency of the clarifiers and the disinfection system. The ultimate result of which is the degradation of the quality of the effluent that is being discharged to the receiving stream resulting in additional risk to the environment and to public health. In fact, the Town has been issued several notices of violation by the WVDEP and the USEPA for failure to comply with permitted discharge contaminant levels. See Appendix J for the Notices of Violation.

b) Aging Infrastructure

The original wastewater collection system is believed to have been built between the 1930's and 1950's and consists of 4" to 10" Vitrified Clay Pipe (VCP) and brick manholes. Approximately 15% of the sanitary sewer collection system was smoke tested and closed caption video inspected as part of this initial phase. A sanitary sewer system evaluation study was prepared for this portion of the collection system. The Town is planning on conducting a similar analysis on the remainder of its collection system as finances permit.

c) Reasonable Growth

There has been no major development around the Town for several decades. Development in the area around Glasgow is not expected to increase in the foreseeable future and the population is expected to remain relatively unchanged.

4) ALTERNATIVES CONSIDERED

A "no action plan" would allow the present conditions in the sanitary sewer system to persist and subsequently allow the wastewater treatment facility to receive flows more than its rated capacity. The collection system would continue to degrade do to its age and infiltration and inflow will increase in volume resulting in further reduction of the level of treatment and/or discharges of raw sewage out of the system. Under this alternative, the environment would continue to deteriorate,

both economically and socially. Therefore, this alternative is not considered for further evaluation.

A "conventional dig option" would replace all the aging pipelines with new gasket sewer pipes, reinforced concrete manholes equipped with cast in flexible boots and new service laterals to the customers point of service. In addition to the sanitary sewer modifications, the storm sewer in the area would also be replaced. This option will improve the level of service and extend the longevity of the sanitary sewer system. However, this option will also result in the most inconvenience to the customer, the most disturbed area during construction and is the most expensive of the alternatives considered. For the above reasons this option has not been chosen as the desired option. See Appendix K for a cost estimate for this alternative.

A "Lining project with replacement" would line portions of the existing system where the pipe is structurally sound but is susceptible to infiltration and inflow. Pipe sections that have deteriorated to the point that they are no longer structurally sound will be replaced by conventional dig methods. Similarly, the brick manholes will be coated or replaced based on condition. The laterals will have to be exposed and reconnected to the newly lined pipe. The storm sewer in the area will be lined and manholes replaced similarly to the sanitary sewer system. This alternative will reduce the infiltration and inflow into the system and result in the least inconvenience to the customer. This alternative is the most efficient use of the Town's funds to address the high flow issue. Therefore, this alternative is the preferred alternative for the Town. See Appendix K for a cost estimate for this alternative.

5) SELECTION OF AN ALTERNATE

This project will consist of replacement of approximately 400 LF of 6" gravity sewer, 650 LF of 8" gravity sewer, lining 1,250 LF of 8" gravity sewer, lining 500 LF of gravity sewer as well as a point repair on a section of 8" gravity sewer on King Street. Seven (7) manholes are to be replaced, seven (7) manhole frames and covers are to be replaced, ten (10) manholes will be spin-coated, and the installation of five (5) storm manholes will be done as well. Also, lining the existing 12" storm sewer will occur.

a) Life Cycle Cost Analysis

The following provides the life cycle cost analysis for the two construction alternatives. The operation and maintenance cost for the Lining and Conventional alternatives will be the same.

1. Conventional Dig

   Present Worth Factor = [((1+i)^n)-1]/[i*(1+i)^n]
   Real Rate: r = 1.2%, Planning Period: n = 20 years
   Present Worth Factor = 17.69
   Total Project Cost (Capitol & Others) = $ 2,991,370
   O & M Cost = $ 2,500
   Therefore, $2,500 x 17.69 = $ 44,225
   Total Present Worth = $ 2,991,370 + $44,225
   = $ 3,035,595

2. Lining with Replacement

   Present Worth Factor = [((1+i)^n)-1]/[i*(1+i)^n]
   Real Rate: r = 1.2%, Planning Period: n = 20 years
   Present Worth Factor = 17.69
   Total Project Cost (Capitol & Others) = $ 2,163,345
   O & M Cost = $ 2,500
   Therefore, $2,500 x 17.69 = $ 44,225
   Total Present Worth = $ 2,163,345 + $44,225
   = $ 2,207,570

b) Non-Monetary Factors

The lining alternative will be faster to construct, require less hauling of excavated material, require less fuel to construct and reduce the amount of time customers will be out of service. For this reason, we recommend that the lining with replacement alternative be chosen. A detailed comparison of the non-monetary factors can be found in the table below. Each factor has been ranked on a scale of 1-5 for each alternative. Five being the most favorable and five being the least favorable.

| Alternative | Conventional Dig | Lining with Replacement |
|---|---|---|
| Impact to Customers | 2 | 4 |
| Fuel Required | 3 | 5 |
| Traffic Disturbance | 2 | 4 |
| Public Acceptance | 3 | 4 |
| Total | 10 | 17 |

The lining with replacement option had the lowest estimated present worth and the highest score for the non-monetary considerations, making it the recommended alternative.

6. PROPOSED PROJECT

a. Preliminary Project Description

The proposed project generally consists of:

Collection System Improvements:
Rehabilitation of 10 manholes
Replacement of 7 manholes
Replacement of 7 manhole frames and covers
Replacement of 400 LF of 6" gravity sewer
Replacement of 650 LF of 8" gravity sewer
Lining of 1,250 LF of 8" gravity sewer
Lining of 500 LF of 6" gravity sewer
Installation of 1950 LF of sewer service lateral
Point repair on gravity sewer line
Installation of 5 storm manholes
Replacement / Installation of 8 catch basins
Lining of 700 LF of 12" storm sewer line
3,000 LF of asphalt for street replacement

More extensive and specific design aspects will be determined in the design phase of the Project.

b. Project Schedule

A Project Schedule is included in Appendix L.

c. Permit Requirements

The following permits may be required:

i. WV/NPDES storm water
ii. WV DOH
iii. WV Bureau of Public Health

d. Sustainability Considerations

i. Green Infrastructure

Green infrastructure implementation for operation and maintenance of the facilities after completion of construction is not feasible when revitalizing an existing sanitary sewer gravity collection system.

However, the utilization of lining technology in lieu of conventional dig replacement will serve to reduce the consumption of natural resources. The main natural resource that will be reduced is diesel fuel. The amount of diesel fuel required to complete the project will be reduced due to fewer trucks being required to transport the materials to the construction site, reduced excavation requiring fewer hours of excavator operation and reducing the need to temporarily haul off excavated material.

e. Environmental Information

i. General

The following information is a summarization of environmental issues as they relate to this project. The revitalization of an aging sanitary sewer gravity collection system will reduce the amount of extraneous water entering the system, reducing the likeliness of system overflows and reducing peak flows experienced that the wastewater treatment facility. The impact of the construction of the proposed project on the environment will be minimal.

ii. Flood Plain

The proposed project will be constructed in areas where there have been previous construction activities. The proposed modifications will not alter the elevations of the existing sanitary sewer lines. The base flood elevation in the Town is approximately 610.00 ft above mean sea level. Only a section of 3rd Street is located below this elevation. The ground surface elevation in the area is lower than the flood elevation. Therefore, the sanitary sewer line cannot be raised above the flood elevation. However, no mechanical or electrical equipment will be installed below the flood elevation as part of the proposed project.

iii. Wetlands

The U. S. Army Corps of Engineers was not contacted regarding the potential for the project to impact wetlands. The project is proposed to take place in existing City streets and will replace/revitalize existing sanitary and storm sewer systems and appurtenances. Additionally, it is expected that no new historical materials will be encountered during construction due to the areas having been previously disturbed.

iv. Groundwater and Public Water Supply

The current condition of the groundwater in the project area is not known. There are no water wells that supply municipal water systems within the project area. Any change to the current condition of the groundwater in the area because of this project would be an improvement.

v. Unavoidable and Adverse Impact

There will be some short-term impacts to the area as a result of construction. The impacts would be noise, dust, erosion, odor and air pollution. Erosion control measures will be implemented as part of the construction project. The impacts will be minimized to the greatest extent practicable. The impacts are temporary in nature and should have no long-term effect.

vi. Open Space Opportunities

The project will have no adverse impact on the establishment or creation of any public open space. The project area primarily consists of residential lots with a few churches and government buildings.

vii. Land Use

The proposed project will not have any major effect on the land use in the project area. The residential and commercial character of the customers is expected to remain the same.

viii. Land Availability

The project will not require any acquisition of land by the Town. All construction will take place within existing streets and rights of way. Additionally, the construction of this project will not subject any land to development that would have otherwise not been developed.

ix. Local Short Term Uses and Long-Term Productivity

The construction of the proposed project will have no lasting deleterious effect on the project area. Any effects will be temporary in nature and will cease shortly after the completion of construction. The project will provide the long-term benefit of extending the useful life of the sanitary and storm sewer systems in the project area.

x. Irreversible and Irretrievable Commitment of Resources

The primary irretrievable resources which must be committed to construction project are fuel, piping, concrete, steel, stone, and construction machinery used to construct the project. The use of said materials will have a minimal impact on the nation's vital resources.

xi. Efficient Use of Energy and Resources

The project is designed to utilize energy efficient resources to the greatest extent practicable. The contract documents will encourage the contractor to utilize energy efficient construction methods. The materials selected for the proposed project will ensure long-term service of the finished project.

xii. Noise, Odor, Dust and Air Pollution

Noise, odor, dust, mud and air pollution resulting from construction will create a temporary adverse impact on the environment. The impact will be localized in nature and will cease with the completion of construction. The West Virginia Division of Air Quality has determined that no pre-construction permits, authorizations, or air quality analysis should be required.

xiii. Mitigative Measures

The primary adverse impact of noise, dust, mud, erosion, air pollution and sedimentation during construction can be mitigated utilizing sound construction methods. Proper scheduling, installation and maintenance of erosion and sedimentation controls, keeping the work site tidy, properly managing refueling and fuel storage areas, and establishing cover promptly will all aid in reducing negative effects of construction. The enforcement of the above-mentioned measures will serve to help ensure that no lasting effects are realized.

xiv. Archeological and Historical

The West Virginia Division of Culture and History was contacted for a review of cultural resources and historic structures in the proposed project area. The Division found that due to the project being conducted in previously disturbed areas there is little likelihood that significant archaeological deposits will be encountered. Furthermore, the Division found that since there are no above ground

structures related to the project, there are no visual effects expected from the project.

xv. Endangered Species

The Natural Heritage Program in the Wildlife Section of the West Virginia Division of Natural Resources and the United States Fish and Wildlife Service were contacted regarding rare, threatened, or endangered species in the project area. The WV DNR determined that there are no trout streams or RTE species within the project area. We have not yet received the response from U.S. Fish and Wildlife Service.

xvi. Total Maximum Daily Load

The West Virginia Department of Environmental Protection's website was reviewed to determine if the Kanawha River is an impaired stream. The Upper Kanawha River at Glasgow is listed on the 303d list as impaired due to dissolved aluminum. The Upper Kanawha River is in hydrologic group A. See Appendix M for 303d list. The Upper Kanawha River is listed as fully supporting for Agriculture and Wildlife, Public Water Supply, Water Contact Recreation: Recreation, and Water Supply Industrial, Cooling, and Power: as not assessed for Water Contact Recreation; Consumption: and as insufficient information for Warm Water Fishery.

f. Total Project Cost Estimate

**Town of Glasgow**
**Wastewater System Improvements Project - Phase 1**
**Preliminary Cost Estimate**
**Lining with Replacement Option**
**November 2023**

| Item | Quanity | | Unit Cost | | | Total Cost |
|---|---|---|---|---|---|---|
| Mobilization | 1 LS | $ | 60,000.00 | / LS = | $ | 60,000 |
| 8" PVC Gravity Sewer Replacement | 650 LF | $ | 150.00 | / LF = | $ | 97,500 |
| 6" PVC Gravity Sewer Replacement | 400 LF | $ | 140.00 | / LF = | $ | 56,000 |
| 8" Gravity Sewer Lining | 1,250 LF | $ | 160.00 | / LF = | $ | 200,000 |
| 6" Gravity Sewer Lining | 500 LF | $ | 140.00 | / LF = | $ | 70,000 |
| 4" PVC Laterals | 1,950 LF | $ | 100.00 | / LF = | $ | 195,000 |
| Reconnect Service Lateral | 83 EA | $ | 300.00 | / EA = | $ | 24,900 |
| Inserta Tee Lateral Connection | 83 EA | $ | 350.00 | / EA = | $ | 29,050 |
| Point Repair on Line | 1 LS | $ | 9,500.00 | / LS = | $ | 9,500 |
| Replace Manhole Steps, Per Manhole | 5 EA | $ | 750.00 | / EA = | $ | 3,750 |
| Replace Manhole | 7 EA | $ | 10,000.00 | / EA = | $ | 70,000 |
| Manhole Extra Depth | 20 VF | $ | 250.00 | / VF = | $ | 5,000 |
| Replace Manhole Frame and Cover | 7 EA | $ | 2,000.00 | / EA = | $ | 14,000 |
| Spincoat Manhole | 10 EA | $ | 7,500.00 | / EA = | $ | 75,000 |
| Line Existing 12" Storm Sewer | 700 LF | $ | 170.00 | / LF = | $ | 119,000 |
| Install Storm Manhole | 5 EA | $ | 10,000.00 | / EA = | $ | 50,000 |
| Catch Basin - Type "G" W/ Type I Grate 10 Ft. Deptl | 8 EA | $ | 12,000.00 | / EA = | $ | 96,000 |
| Special Fill | 50 TN | $ | 125.00 | / TN = | $ | 6,250 |
| Type B Trench Replacement | 3,000 LF | $ | 95.00 | / LF = | $ | 285,000 |
| Site sign | 1 EA | $ | 5,000.00 | / EA = | $ | 5,000 |
| Pre-Con Video | 1 LS | $ | 5,000.00 | / LS = | $ | 5,000 |
| Office Trailer | 1 LS | $ | 10,000.00 | / LS = | $ | 10,000 |
| | | | | Sub-total = | $ | 1,485,950 |
| | | | | Construction Contigency @ 10% = | $ | 148,595 |
| | | | | **Total Construction Cost =** | **$** | **1,634,545** |

**ADDITIONAL COSTS**

| | | |
|---|---|---|
| Engineering | | |
| PER | = $ | 35,000 |
| SSES | = $ | 100,000 |
| Preliminary Design | = $ | 60,000 |
| Final Design | = $ | 40,000 |
| Bidding & Negotiation | = $ | 10,000 |
| Construction Mgmt | = $ | 65,000 |
| Post Construction | = $ | 10,000 |
| RPR Services | = $ | 60,000 |
| Special Services | = $ | 10,000 |
| Administration | = $ | 30,000 |
| Legal - Local | = $ | 25,000 |
| Legal - PSC | = $ | 25,000 |
| Accounting | = $ | 15,000 |
| Project Contingencies | = $ | 43,800 |
| **Total Additional Cost** | **= $** | **528,800** |
| **Total Project Cost** | **= $** | **2,163,345** |

g. Annual Operating Budget

The annual operating budget, O & M and debt services are discussed in Item 2 - Existing Facilities. More details can be found in the 2023 annual WVPSC report posted on WVPSC web site.

The annual budget for O & M is as follows:

i. Annual O & M Costs

| | |
|---|---|
| Personnel Cost | = $ 58,218 |
| Power | = $ 10,766 |
| Chemicals | = $ 4,027 |
| Materials & Supplies | = $ 12,125 |
| Contractual Services | = $108,766 |
| Travel, Insurance, Misc. | = $ 16,005 |
| TOTAL | = $209,907 per year |

ii. Debt Repayments

It is anticipated that upon completion of the Project, O & M expenses will remain at the current level. The reduction in infiltration and inflow as a result of the system work will theoretically reduce pumping times and equipment wear and tear. However, the degree to which these reductions are realized is heavily dependent on the weather and is difficult to quantify.

The Town of Glasgow does not have any outstanding long-term debt associated with either its sanitary sewer collection system or its wastewater treatment plant.

The Town of Glasgow's revenue for the period ending 6/30/2023 was approximately $242,193. The Median Household Income (MHI) for the Town of Glasgow was $49,412 in the 2020 Census. The current sewer system rate for 3,400 gallons is $43.93 per month which is 1.07% of the 2020 MHI. The Town's current rates, respective to the MHI are too low to qualify the Town for some of the available low interest funding. However, this project is the first phase of a multiple phase project that will increase the Town's sewer rates substantially. The rate will have to increase to $61.77 to achieve 1.5% MHI which would qualify the Town for lower interest loan rates and the rate will have to increase to $82.35 to achieve 2% MHI which would qualify the Town for the lowest interest rate loans and most of the available grants.

iii. Proposed Project Funding

The most favorable funding package for this project is likely to be acquired by utilizing several funding sources. Low interest loans from the WVDEP State Revolving Fund (SRF), WV Infrastructure and Jobs Development Council (IJDC), and the US Department of Agriculture-Rural Utilities Service (RUS) and grant funds form Congressional Directed Spending (CDS), Economic Enhancement Grant (EEG), UDSA-RUS, WV IJDC, WV DEP Debt Forgiveness, and other sources are all candidates for providing funding for the project.

The WVDEP funding for sanitary sewer systems with rates less than 1.5% of MHI is a 20-year loan with a 2.75% interest and 0.25% administrative fee. If the town utilized this funding source only the principal and interest payment would be $145,377 annually, which equates to a rise in the average customer bill of $41.00 per month. Borrowing $1 million of the funds at the above rate and the remaining $1.2 million at 2% for 30 years will result in a rate increase of approximately $32.53 per month for the average customer. Although this scenario is an improvement it still requires a rate increase of approximately 74%. The recommendation of this report is that the Town pursue grant funding to help alleviate the rate impact on the customers.

## 7. CONCLUSIONS

The Conclusions of this report are as follows:

a. The Town of Glasgow owns and operates a sanitary sewer collection system that serves approximately 295 customers in eastern Kanawha County.

b. The Town owns and operates a 150,000 gallon a day wastewater treatment facility.

c. The sanitary sewer collection system is aging and is predominantly comprised of vitrified clay pipe and brick manholes.

d. The wastewater treatment facility has experienced issues complying with its NPDES discharge permit.

e. The sanitary sewer system is experiencing excessive amounts of infiltration and inflow resulting in system overflows and degradation of treatment at the wastewater treatment plant.

f. The town has adopted a phased approach to addressing the infiltration and inflow issue.

g. The first phase involves remediation of sanitary and storm sewers on 5th and 3rd Avenues in addition to localized repairs on King and 2nd Streets.

## 8. RECOMMENDATIONS

The Recommendations of this report are as follows:

a) The Town of Glasgow should accept the findings of this report.

b) A project application should be filed with the WV Infrastructure and Jobs Development Council in early 2024.

# APPENDIX A

# PROJECT LOCATION MAP

# APPENDIX B

# ENVIRONMENTAL RESOURCE LETTERS

# APPENDIX C

# 2020 CENSUS DATA

# APPENDIX D

# HISTORIC FLOWS

**Town of Glasgow**
**Wastewater System Improvements Project - Phase 1**
**WWTP Flow Data**
**January 2021 - July 2023**
**November 2023**

| Month | Min. Flow MGD | Max. Flow MGD | Avg. Flow. MGD |
|---|---|---|---|
| Jan-21 | 0.051 | 0.241 | 0.119 |
| Feb-21 | 0.089 | 0.338 | 0.165 |
| Mar-21 | 0.056 | 0.384 | 0.150 |
| Apr-21 | 0.050 | 0.207 | 0.105 |
| May-21 | 0.047 | 0.127 | 0.075 |
| Jun-21 | 0.042 | 0.483 | 0.141 |
| Jul-21 | 0.056 | 0.134 | 0.081 |
| Aug-21 | 0.037 | 0.311 | 0.129 |
| Sep-21 | 0.052 | 0.383 | 0.094 |
| Oct-21 | 0.042 | 0.102 | 0.066 |
| Nov-21 | 0.050 | 0.093 | 0.064 |
| Dec-21 | 0.045 | 0.138 | 0.076 |
| Jan-22 | 0.088 | 0.506 | 0.177 |
| Feb-22 | 0.062 | 0.356 | 0.149 |
| Mar-22 | 0.084 | 0.244 | 0.135 |
| Apr-22 | 0.081 | 0.222 | 0.127 |
| May-22 | 0.075 | 0.440 | 0.152 |
| Jun-22 | 0.052 | 0.135 | 0.102 |
| Jul-22 | 0.057 | 0.385 | 0.160 |
| Aug-22 | 0.093 | 0.515 | 0.190 |
| Sep-22 | 0.054 | 0.178 | 0.105 |
| Oct-22 | 0.039 | 0.407 | 0.088 |
| Nov-22 | 0.038 | 0.240 | 0.089 |
| Dec-22 | 0.032 | 0.174 | 0.109 |
| Jan-23 | 0.033 | 0.219 | 0.138 |
| Feb-23 | 0.022 | 0.499 | 0.154 |
| Mar-23 | 0.057 | 0.294 | 0.130 |
| Apr-23 | 0.057 | 0.191 | 0.067 |
| May-23 | 1.000 | 0.173 | 0.067 |
| Jun-23 | 0.032 | 0.129 | 0.069 |
| Jul-23 | 0.050 | 0.400 | 0.155 |
| Average | 0.085 | 0.279 | 0.117 |

# APPENDIX E

# PUBLIC MEETING MINUTES AND ATTENDANCE SHEET

## APPENDIX E

## PUBLIC MEETING MINUTES & ATTENDANCE SHEET

## TOWN OF GLASGOW

## WASTEWATER SYSTEM IMPROVEMENTS PROJECT

A public meeting was held at the Glasgow Town Hall at 6:00 PM on September 19, 2017 to receive public input regarding the Wastewater System Improvements Project.

The meeting was attended by Mayor Donald Fannin and the Town Council, and Mr. Eric Hartwell, P.E. with New River Engineers (see attached attendance sheet).

The meeting was opened by Mayor Fannin outlining the reason for the meeting. Mr. Hartwell followed with comments regarding the need for the project, Mr. Hartwell also discussed the proposed project costs, and that financing recommendations would be made by WVIJDC.

There being no other comments, the meeting was adjourned at 6:05 PM.

# APPENDIX F

## COLLECTION SYSTEM SCHEMATIC

# APPENDIX G

# NPDES WATER POLLUTION CONTROL PERMIT

# APPENDIX H

# ANNUAL PSC REPORT

# APPENDIX I

# TARIFF

# APPENDIX J

# NOTICE OF VIOLATION

# APPENDIX K

# COST ESTIMATES

**Town of Glasgow**
**Wastewater System Improvements Project - Phase 1**
**Preliminary Cost Estimate**
**Conventional Dig Option**
**November 2023**

| Item | Quanity | Unit Cost | | Total Cost |
|---|---|---|---|---|
| Mobilization | 1 LS | $ 60,000.00 / LS | = $ | 60,000 |
| 8" PVC Gravity Sewer Replacement | 1,900 LF | $ 150.00 / LF | = $ | 285,000 |
| 6" PVC Gravity Sewer Replacement | 900 LF | $ 140.00 / LF | = $ | 126,000 |
| 4" PVC Laterals | 1,950 LF | $ 100.00 / LF | = $ | 195,000 |
| Reconnect Service Lateral | 83 EA | $ 300.00 / EA | = $ | 24,900 |
| 8x8x4 PVC Wye | 55 EA | $ 320.00 / EA | = $ | 17,600 |
| 6x6x4 PVC Wye | 28 EA | $ 150.00 / EA | = $ | 4,200 |
| Point Repair on Line | 1 LS | $ 9,500.00 / LS | = $ | 9,500 |
| Replace Manhole | 17 EA | $ 12,000.00 / EA | = $ | 204,000 |
| Manhole Extra Depth | 45 VF | $ 250.00 / VF | = $ | 11,250 |
| Replace Manhole Frame and Cover | 7 EA | $ 2,000.00 / EA | = $ | 14,000 |
| Replace Existing 12" Storm Sewer | 700 LF | $ 250.00 / LF | = $ | 175,000 |
| Install Storm Manhole | 5 EA | $ 10,000.00 / EA | = $ | 50,000 |
| Catch Basin - Type "G" W/ Type I Grate 10 Ft. Depth | 8 EA | $ 12,000.00 / EA | = $ | 96,000 |
| Specialo Fill | 50 TN | $ 125.00 / TN | = $ | 6,250 |
| Asphalt Pavement Restoration, Type B Trench Replacement | 5,000 LF | $ 95.00 / LF | = $ | 475,000 |
| Site sign | 1 EA | $ 5,000.00 / EA | = $ | 5,000 |
| Pre-Con Video | 1 LS | $ 5,000.00 / LS | = $ | 5,000 |
| Office Trailer | 1 LS | $ 10,000.00 / LS | = $ | 475,000 |
| | | Sub-total | = $ | 2,238,700 |
| | | Construction Contigency @ 10% | = $ | 223,870 |
| | | **Total Construction Cost** | = **$** | **2,462,570** |

| | | | |
|---|---|---|---|
| **ADDITIONAL COSTS** | | | |
| Engineering | | | |
| PER | = $ | 35,000 | |
| SSES | = $ | 100,000 | |
| Preliminary Design | = $ | 60,000 | |
| Final Design | = $ | 40,000 | |
| Bidding & Negotiation | = $ | 10,000 | |
| Construction Mgmt | = $ | 65,000 | |
| Post Construction | = $ | 10,000 | |
| RPR Services | = $ | 60,000 | |
| Special Services | = $ | 10,000 | |
| Administration | = $ | 30,000 | |
| Legal - Local | = $ | 25,000 | |
| Legal - PSC | = $ | 25,000 | |
| Accounting | = $ | 15,000 | |
| Project Contingencies | = $ | 43,800 | |
| **Total Additional Cost** | = **$** | **528,800** | |
| **Total Project Cost** | = **$** | **2,991,370** | |

**Town of Glasgow**
**Wastewater System Improvements Project - Phase 1**
**Preliminary Cost Estimate**
**Lining with Replacement Option**
**November 2023**

| Item | Quanity | | Unit Cost | | | Total Cost |
|---|---|---|---|---|---|---|
| Mobilization | 1 LS | $ | 60,000.00 | / LS | = $ | 60,000 |
| 8" PVC Gravity Sewer Replacement | 650 LF | $ | 150.00 | / LF | = $ | 97,500 |
| 6" PVC Gravity Sewer Replacement | 400 LF | $ | 140.00 | / LF | = $ | 56,000 |
| 8" Gravity Sewer Lining | 1,250 LF | $ | 160.00 | / LF | = $ | 200,000 |
| 6" Gravity Sewer Lining | 500 LF | $ | 140.00 | / LF | = $ | 70,000 |
| 4" PVC Laterals | 1,950 LF | $ | 100.00 | / LF | = $ | 195,000 |
| Reconnect Service Lateral | 83 EA | $ | 300.00 | / EA | = $ | 24,900 |
| Inserta Tee Lateral Connection | 83 EA | $ | 350.00 | / EA | = $ | 29,050 |
| Point Repair on Line | 1 LS | $ | 9,500.00 | / LS | = $ | 9,500 |
| Replace Manhole Steps, Per Manhole | 5 EA | $ | 750.00 | / EA | = $ | 3,750 |
| Replace Manhole | 7 EA | $ | 10,000.00 | / EA | = $ | 70,000 |
| Manhole Extra Depth | 20 VF | $ | 250.00 | / VF | = $ | 5,000 |
| Replace Manhole Frame and Cover | 7 EA | $ | 2,000.00 | / EA | = $ | 14,000 |
| Spincoat Manhole | 10 EA | $ | 7,500.00 | / EA | = $ | 75,000 |
| Line Existing 12" Storm Sewer | 700 LF | $ | 170.00 | / LF | = $ | 119,000 |
| Install Storm Manhole | 5 EA | $ | 10,000.00 | / EA | = $ | 50,000 |
| Catch Basin - Type "G" W/ Type I Grate 10 Ft. Depth | 8 EA | $ | 12,000.00 | / EA | = $ | 96,000 |
| Special Fill | 50 TN | $ | 125.00 | / TN | = $ | 6,250 |
| Type B Trench Replacement | 3,000 LF | $ | 95.00 | / LF | = $ | 285,000 |
| Site sign | 1 EA | $ | 5,000.00 | / EA | = $ | 5,000 |
| Pre-Con Video | 1 LS | $ | 5,000.00 | / LS | = $ | 5,000 |
| Office Trailer | 1 LS | $ | 10,000.00 | / LS | = $ | 10,000 |
| | | | | Sub-total | = $ | 1,485,950 |
| | | | | Construction Contigency @ 10% | = $ | 148,595 |
| | | | | **Total Construction Cost** | = $ | **1,634,545** |

**ADDITIONAL COSTS**

| | | |
|---|---|---|
| Engineering | | |
| PER | = $ | 35,000 |
| SSES | = $ | 100,000 |
| Preliminary Design | = $ | 60,000 |
| Final Design | = $ | 40,000 |
| Bidding & Negotiation | = $ | 10,000 |
| Construction Mgmt | = $ | 65,000 |
| Post Construction | = $ | 10,000 |
| RPR Services | = $ | 60,000 |
| Special Services | = $ | 10,000 |
| Administration | = $ | 30,000 |
| Legal - Local | = $ | 25,000 |
| Legal - PSC | = $ | 25,000 |
| Accounting | = $ | 15,000 |
| Project Contingencies | = $ | 43,800 |
| **Total Additional Cost** | = $ | **528,800** |
| **Total Project Cost** | = $ | **2,163,345** |

# APPENDIX L

# PROJECT SCHEDULE

## APPENDIX L

## PROJECT SCHEDULE

| ACTIVITY | DATE |
|---|---|
| Public Meeting | March 2024 |
| Submit Preliminary Application to IJDC | February 2024 |
| Preliminary Application Approved by IJDC | March 2024 |
| Project Design Initiated | April 2024 |
| Plans and Specifications Submitted | November 2024 |
| Plans and Specification Approved by BPH/DEP | January 2025 |
| Project Advertises for Bids | February 2025 |
| Bids Received | April 2025 |
| PSC Approval | August 2025 |
| Contracts Awarded | September 2025 |
| Project Construction Begins | October 2025 |
| Project Improvements Completed | May 2026 |

IJDC - Infrastructure & Jobs Development Council
DEP - Department of Environmental Protection
BPH - Bureau of Public Health, Environmental Engineering Division

# APPENDIX M

## TMDL 303D LIST

# APPENDIX N

# RESOLUTION OF ACCEPTANCE

## APPENDIX N

## RESOLUTION OF ACCEPTANCE

## TOWN OF GLASGOW

Be it resolved that the Town of Glasgow, Glasgow, West Virginia has reviewed the Preliminary Engineering Report, dated February 2024, prepared by New River Engineers, Inc. The Town of Glasgow is in full agreement with the finding of the report and will proceed with project as set forth in the report.

Resolved this _____ day of _____, 2024

Town of Glasgow, Kanawha County, West Virginia.

Motion made to accept the Resolution by _____

and recorded by _____.

Motion carried _____ in favor; _____ against.

_____
Mayor