

Options for Clean Water Solutions in Greene County, Alabama



June 2024
EPA-830-R-24-012

Contents

- Closing America’s Wastewater Access Gap Community Initiative Pilot: EPA/USDA-RD Partnership3
- Greene County, Alabama 5
- Wastewater Treatment Options for Greene County7
- Funding Opportunities..... 14
- Benefits of Investing in Adequate Wastewater Infrastructure..... 16
- Sustaining the Investment Through Operations and Maintenance 17
- Partners and Roles.....21
- Road Map for Implementation23
- Concluding Thoughts.....26
- Definitions26

Options for Clean Water Solutions in Greene County, Alabama

Greene County is located in an area known as the Black Belt, south of Tuscaloosa and west of Montgomery and Selma, Alabama. Approximately 4,050 people live in the unincorporated areas of Greene County. The area’s natural beauty, vibrant history, and potential for economic development are defining features of this community.

Residents of Greene County currently have inadequate wastewater treatment services. With the passage of the Bipartisan Infrastructure Law and new Water Technical Assistance services, there is momentum to bring wastewater treatment solutions to homes in Greene County. This document describes technical options and financial resources for water treatment. It is the product of the combined efforts of many organizations and individuals and provides options for clean water solutions for the community.

Back cover: Greene County Water tower. Photo by Vincent Atkins, General Manager, Greene County Water & Sewer Authority.

Closing America's Wastewater Access Gap Community Initiative Pilot: EPA/USDA-RD Partnership

Introduction

The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Agriculture Rural Development (USDA-RD) partnered with six states and three Tribes (two federally recognized and one state-recognized) on the Closing America's Wastewater Access Gap Community Initiative. As a pilot program, this initiative was the first of its kind for EPA and USDA-RD. This initiative provides technical assistance to support capacity to improve wastewater management for the 11 participating communities. EPA and USDA have grant and loan programs to help pay for wastewater system improvements. Recent increases in federal funding offer an opportunity for communities to invest in septic upgrades, connect to nearby treatment systems, or build new sewer and wastewater treatment systems that meet their needs.

EPA offers a range of Water Technical Assistance (WaterTA) for communities to identify water challenges and solutions, build capacity, and develop application materials to access water infrastructure funding. EPA collaborates with states, Tribes, territories, community partners, and other stakeholders to implement WaterTA efforts. The result: more communities apply for federal funding to support quality water infrastructure and reliable water services. Communities can learn more about EPA WaterTA and how to indicate interest in receiving assistance by visiting EPA's WaterTA website.¹

USDA offers a wide range of water and wastewater assistance for rural communities to obtain the technical assistance and financing necessary to develop drinking water and waste disposal systems. USDA's Water and Waste Disposal Technical Assistance and Training Grants program helps qualified, private nonprofits provide technical assistance and training to identify and evaluate solutions to water and waste problems. It also helps applicants prepare applications for water and waste disposal loans and grants, and it helps associations improve the operation and maintenance (O&M) of water and waste facilities in eligible rural areas with populations of 10,000 or fewer. Communities can learn more about USDA Water and Waste Disposal Technical Assistance and Training Grants and how to indicate interest in receiving assistance by visiting USDA's website.²



Greene County has so much to offer. With multiple transportation corridors (highways and rivers), history, and amenities, we have everything in place to get this area thriving. Improved wastewater systems are critical to our success.

— Vincent Atkins, Greene County Water & Sewer Authority

¹ <https://www.epa.gov/waterta>

² <https://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-technical-assistance-training-grants>

Purpose

EPA and USDA-RD pilot program staff members worked with the pilot program team—Greene County Commissioners; Greene County Utilities; the Greene County Water and Sewer Authority Board; the Greene County Industrial Development Authority; the local engineering consultant, Sentell Engineering; the local technical assistance provider, the Alabama Rural Water Association; the Alabama Department of Environmental Management (ADEM); and the Alabama Department of Public Health (ADPH)—to develop solutions for Greene County’s wastewater issues. This document, *Options for Clean Water Solutions in Greene County, Alabama*, outlines potential solutions for improved wastewater treatment approaches in Greene County. Residents and county leadership can use this information to estimate costs and select a wastewater solution that meet today’s challenges and help the community thrive.

Over the past 6 to 9 months, the pilot program team has:

1. **Conducted a community wastewater assessment.** A team of EPA, USDA-RD, and technical assistance providers worked with state, regional, Tribal, and community partners to review existing wastewater systems in the community and find areas that need improvement.
2. **Identified wastewater solutions.** The team identified wastewater solutions and estimated their costs. They considered the community’s long-term needs and outlined a path to apply for funding. State and local officials and community members played a key role in developing these options.
3. **Helped the community find and apply for funding opportunities.** This document outlines federal funding sources and how to apply for funding. It also shows how to pay for construction and long-term costs.
4. **Developed a plan to pay for ongoing costs.** To install and operate a wastewater treatment system, Greene County needs to develop a plan to pay for construction and ongoing costs. These ongoing costs could include management, O&M, and any potential construction loan repayments. This document offers funding strategies and suggestions to consider, such as low-income rate assistance programs and non-rate revenue programs that other utilities have used.

Greene County, Alabama

Greene County is a small, rural community in western central Alabama. Eutaw, the county seat, is known as the “Gateway to the Black Belt.” Other municipalities in the county include the Towns of Boligee, Forkland, and Union. Interstate 20 and U.S. Highways 43 and 80 are important transportation corridors for the county and offer economic development opportunities. Three large rivers border the county: the Black Warrior River, the Tombigbee River, and the Sipsy River. In addition to serving as recreational areas, the rivers are major avenues for barge transport within the region.

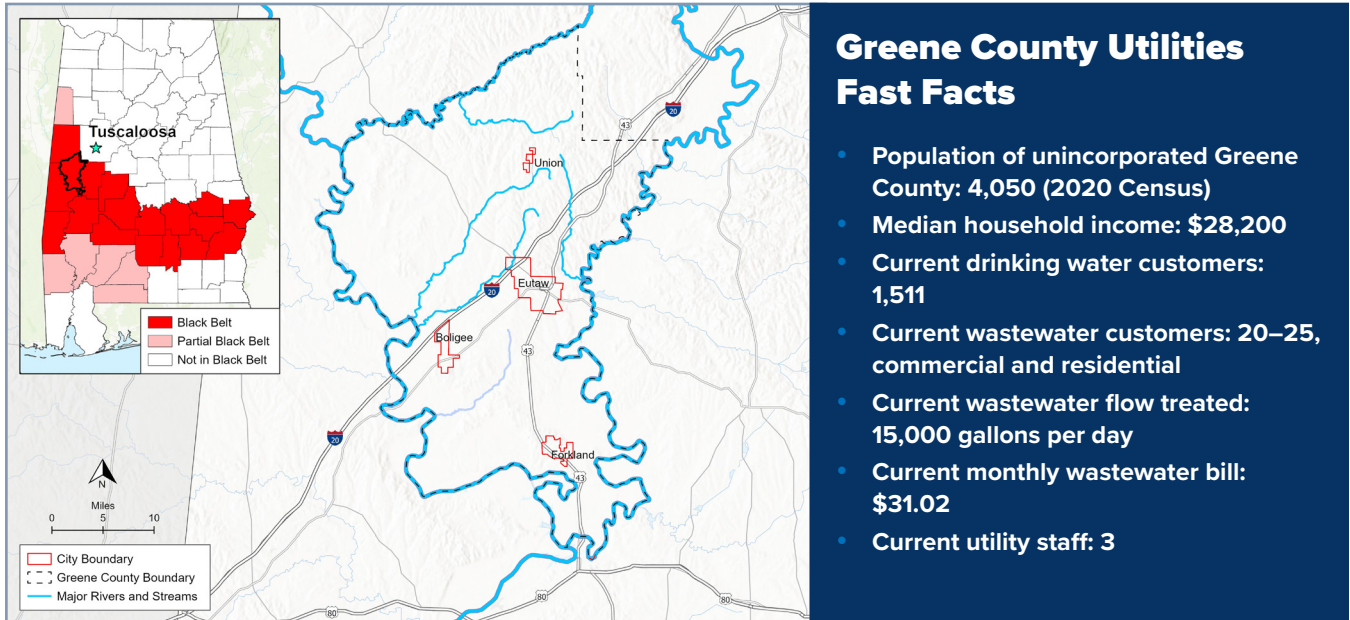


Figure 1. Map of Greene County, Alabama.

This pilot project focused on the unincorporated area of Greene County and the Town of Union. About 4,050 people live in these areas, including 700 families within the designated project area.

Greene County is proactively addressing their wastewater infrastructure needs. The City of Eutaw and Town of Boligee have consolidated their utility systems under the City of Eutaw through a formal agreement. A planned force main will pump wastewater flow from Boligee to Eutaw for treatment at Eutaw’s wastewater treatment plant. The Town of Forkland also has a water utility. As shown in Figure 2, the Fosters-Ralph Water Authority provides water to the northeastern part of the county. Greene County Utilities manages the Greene Track wastewater treatment facility, which is a three-cell lagoon system serving the surrounding area. Currently, there are no cluster wastewater treatment systems in the area. There is no official record to date of failed onsite wastewater treatment systems or associated public health concerns, but residents in Greene County have noted concerns with their septic systems or know of others who have failing septic systems.

The Potential of Infrastructure Investment

A major challenge to investing in wastewater infrastructure is the monthly bill required for periodic system maintenance. Despite this affordability challenge, Greene County residents agree that investing in wastewater infrastructure is important for improving the community's future. The ability to do laundry and take a shower at the same time, even during rain, is a basic need. Furthermore, wastewater infrastructure supports economic development. Community leaders recognize that with proper infrastructure they could attract industry and services for residents and visitors who want to explore the natural beauty and history of Greene County.

Greene County residents have expressed a need for further economic growth in the area. Identifying and capitalizing on economic opportunities now could provide better employment opportunities for future generations. Currently, the Greene County Industrial Development Authority maintains two industrial parks and has developed a hotel siting plan. However, the 2019 Greene County Profile from the Alabama Department of Labor indicates that over 72 percent of the labor force in Greene County commutes out of the county for work, with 29 percent of commuters traveling to Tuscaloosa County. The Greene County community wants to reverse this commuting pattern and halt the county's population decline. Creating a healthy environment for residents and encouraging economic development that brings jobs, businesses, and housing options to Greene County is an important step in fulfilling this vision. An affordable wastewater system is key to success.

Community Engagement Feedback

The Greene County community held a listening session in February 2023 to gather feedback from community members on alternatives for a wastewater system. Major themes included the following:

- The community would like to move as quickly as possible with wastewater infrastructure improvements.
- The community is interested in coupling this initiative with an effort to address related issues, such as stormwater, erosion, and road infrastructure, if there is an opportunity to do so.
- The community would like to avoid upfront costs.
- The community acknowledges that residents and Greene County Utilities share responsibility for addressing the infrastructure needs of the community.
- These solutions are long overdue.

Wastewater Treatment Options for Greene County

Potable water service is available to residents of Greene County, but many homes still lack functioning wastewater systems. A future detailed survey to determine how many homes need upgraded wastewater systems has been planned and funded. However, no single approach will be able to address all of Greene County's wastewater needs. The project team anticipates a mix of solutions, including onsite systems, small cluster systems, and central sewer and treatment. The county will need to prioritize which areas and locations to address first. Taking no action is not a viable option due to the significant pollution concerns associated with inadequate wastewater infrastructure.

The options presented in this document were developed at a high level. To refine alternatives and associated costs, further analyses with data specific to Greene County are needed, including results from a door-to-door survey on how many residents have trouble with their septic systems and soils data to determine whether drainfields can be used in the area.

Greene County is a rural community with homes spread out over wide areas and clusters of homes that are far from other clusters. This rural landscape is challenging for central wastewater systems such as gravity sewers. Soils in the area are predominantly clay, which makes it difficult to use septic systems with drainfields. The USDA Natural Resource Conservation Service's Web Soil Survey tool indicates that over 90 percent of the soils in Greene County are very limited in their ability to support septic tank absorption fields.

Two sewer alternatives for serving the widely distributed homes in Greene County are a gravity sewer system and a septic tank effluent pump (STEP) sewer system. A gravity sewer system provides the highest level of service to residents; however, it is more expensive to construct and requires lift stations to periodically manage the depth of the system (Figure 3). Gravity sewers only require a sewer lateral (pipeline) from the home to the sewer system. A STEP sewer system is less expensive to construct, as its low-pressure sewer line does not need to be built on a downhill gradient. A STEP system (Figure 4) requires a sewer lateral to a septic tank at the front of each property for maintenance and a pump that receives electricity from the house. Therefore, this option requires

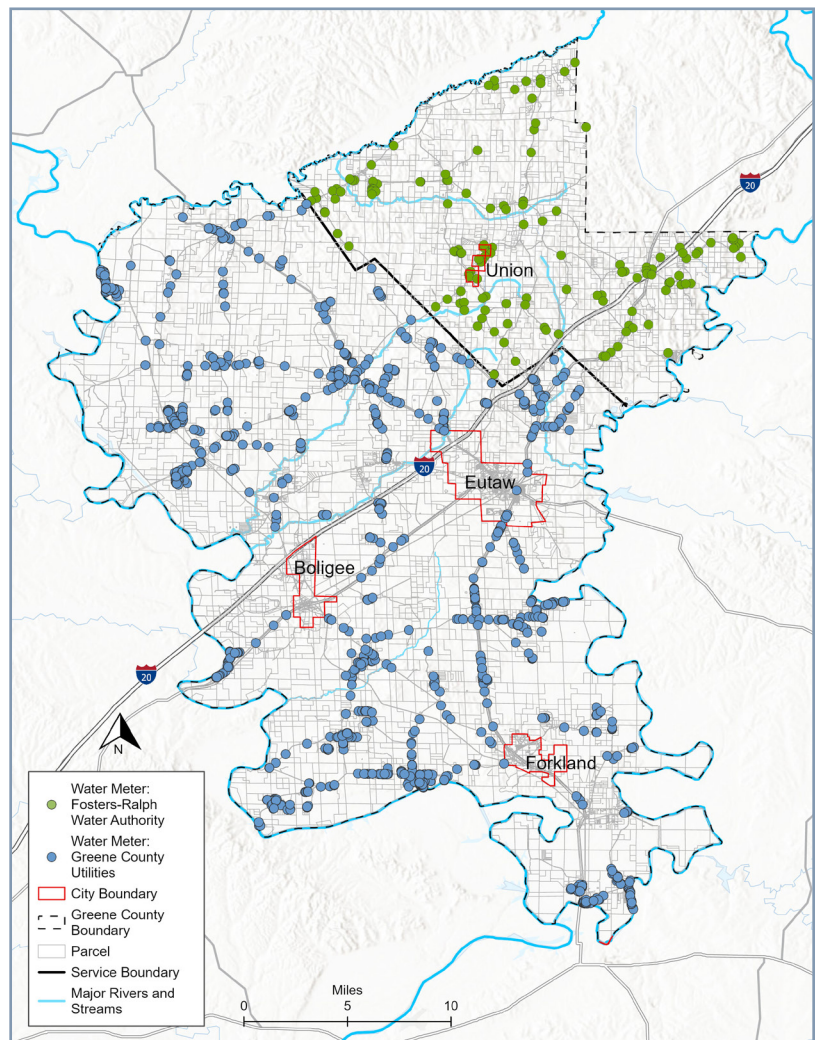


Figure 2. Map of Greene County showing water meters and service boundaries between Greene County Utilities and Fosters-Ralph Water Authority.

greater involvement from the property owner. Construction costs for a gravity sewer system with lift stations and treatment in Greene County would exceed \$100 million, while STEP sewer costs would be around \$20 million. Because of the high cost of a gravity sewer, this document focuses on STEP sewer options.

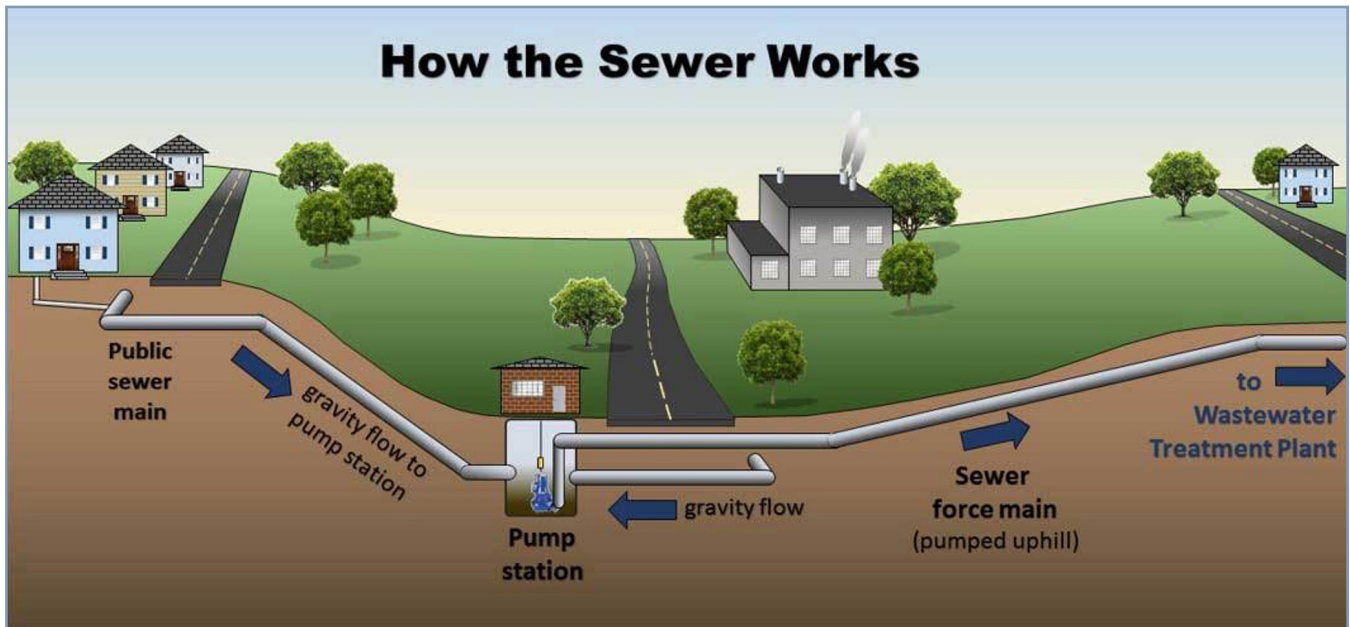


Figure 3. Example of a gravity sewer system. Image provided by Des Moines Metropolitan Wastewater Reclamation Authority.

Greene County community members, government officials, and utilities evaluated several wastewater treatment options, including their capital and operations costs. These options include:

- Upgrading septic systems with systems tailored to the challenging soils in Greene County.
- Constructing cluster treatment systems in neighborhoods that have 20 to 50 closely grouped homes. This option would use a STEP sewer system with a recirculating treatment filter and an approximately 20-acre drainfield. It may be easier to use one large drainfield rather than several smaller drainfields for individual septic systems.
- Constructing a STEP sewer system to central treatment facilities with surface water discharge in South County and Central County.

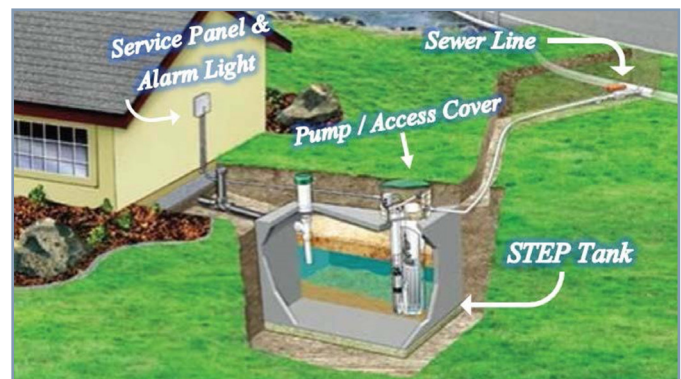


Figure 4. Example of a STEP sewer system. Image provided by Tom Faye, City of Lacey, Washington.

The following section provides information on wastewater system options, estimated capital and operating costs, and pros and cons for each option. There are two options that were evaluated by the project team but not presented in this table due to a lack of information. One of these options was providing sewer service to residents between Boligee and Eutaw by pumping flow into the planned force main between the two cities. There are approximately 20 households near the force main that could be connected to sewer service and a lift station. The second of these options involved collaborating with the Town of Forkland on a wastewater treatment system in South County or a connection to the City of Demopolis’ wastewater treatment system.

The wastewater treatment plant options that were evaluated included using a lagoon with end treatment and using an oxidation ditch. The lagoon with end treatment would be preferable due to much lower operating costs. The end treatment would use a wetland system to provide additional treatment for nutrients. However, this treatment system may not be needed if there is a discharge into the Tombigbee River. End treatment options can be further evaluated in the next phase of the analysis.

Options for Wastewater Infrastructure Improvements

Option 1a: Traditional and engineered onsite/septic systems—Homeowners responsible for upgrades, maintenance, and replacement

This option examines the use of traditional and engineered onsite/septic systems, with homeowners responsible for maintenance. Use of these systems would depend on site-specific soil conditions. Under this option, each homeowner would be responsible for updating, maintaining, and replacing parts of their system. Replacing septic tanks would be the responsibility of the homeowner but could be funded through grants.

O&M and replacement costs would include pumping out the septic system every 5 years, replacing pumps and motors every 10 years, and replacing drainfields every 20 years.

Expected capital cost range: \$21,000 to \$31,000 in construction costs per residence, depending on soil types. Eligible homeowners could apply for grant funding. Total capital costs for design and construction would be \$23 million to \$33 million, assuming 700 systems need upgrades.

Expected annual operating costs: \$200 to \$500 per household. Homeowners would be responsible for periodically pumping out septic tanks, as well as replacing motors, pumps, and drainfields, but they would receive no monthly bill.

Pros:

- Effective for large lots.
- Should not require the utility to purchase land.
- Can be implemented quickly to address immediate needs.
- Septic systems are effective if installed and maintained correctly.

Cons:

- Might not encourage economic growth, as most businesses want a sewer system.
- Maintenance costs do not include replacing septic tanks, which is the homeowner's responsibility.
- If homeowners do not keep up with maintenance, the system could fail in 10 years.
- Soils in Greene County are not conducive for drainfields.

Option 1b: Traditional and engineered onsite/septic systems—County forms Responsible Management Entity (RME) for maintenance

This option examines the use of traditional and engineered onsite/septic systems, with a county RME responsible for maintenance. Use of onsite systems would depend on site-specific soil conditions. This option assumes that Greene County Utilities would develop an RME to maintain and periodically replace septic system pumps, motors, and drainfields. Replacing septic tanks would be the responsibility of the homeowner but could be funded through grants.

O&M and replacement costs would include pumping out the septic system every 5 years, replacing pumps and motors every 10 years, and replacing drainfields every 20 years. As the RME, Greene County Utilities would be responsible for planning, implementing, and tracking maintenance activities and equipment needs. This option assumes that 50 percent of septic tanks (700 septic tanks total) would be upgraded.

Expected capital cost range: \$23 million to \$33 million. As the RME, Greene County Utilities would apply for and facilitate grant and loan funding.

Expected annual operating costs: \$400,000. Homeowners would pay an electric cost of \$4 to \$8 per month per household, depending on the type of septic system. The rest of the costs would be incurred by the county. (Table 1 provides estimated monthly costs.)

Pros:

- Effective for large lots.
- Should not require the utility to purchase land.
- Can be implemented quickly to address immediate needs.
- Septic systems are effective if installed and maintained correctly.
- RME would cover costs for periodic system maintenance and replacement of motors and pumps.

Cons:

- Might not encourage economic growth, as most businesses want a sewer system.
- Maintenance costs for the RME do not include replacing septic tanks, which is the homeowner's responsibility.
- Replacing pumps and motors in engineered septic systems adds significant costs for residents.
- Soils in Greene County are not conducive for drainfields.

Option 2: Cluster or community treatment systems with drainfields

This option examines the use of a cluster or community treatment system for closely grouped homes. Six neighborhoods in Greene County were evaluated for a cluster treatment system of less than 15,000 gallons per day (gpd). A cluster system would include a STEP sewer system, recirculating filter for treatment, and an approximately 20-acre drainfield. Capital costs would include decommissioning existing septic tanks, constructing lateral lines from homes to septic tanks with pumps at the front of properties for maintenance, constructing a low-pressure sewer system, implementing recirculating filter treatment with electric service, using monitoring and telemetry, and constructing a drainfield. The number of customers would be between 21 and 34 connections.

O&M and replacement costs would include flow monitoring and reporting, annual maintenance, renewing pumps and motors every 7 years, and renewing the drainfield every 10 years. O&M would also involve maintaining the STEP sewer system, which involves pumping out septic tanks every 5 years and replacing pumps and motors every 7 years. Homeowners would pay electric costs each month.

Expected capital cost range: \$2.5 million to \$5 million for each system.

Expected annual operating costs: \$8,000 to \$12,000 for each system, paid for by homeowners through monthly rates.

Pros:

- Effective for neighborhoods with challenging soils and floodplain conditions.
- May be easier to implement in smaller project areas where neighborhoods support the project.

Cons:

- Requires the utility to acquire land for a drainfield.
- Requires frequent replacement of parts for treatment systems and STEP systems.
- Depends on finding a suitable drainfield site.

Option 3a: STEP sewer and treatment in South County

This option examines constructing a STEP sewer and central treatment system in South County. The STEP sewer would be constructed for 182 existing connections. A central treatment system would be constructed using a lagoon with an end treatment system for nutrient reduction with a potential discharge to the Tombigbee River. Capital costs would include decommissioning existing septic systems, constructing lateral lines from each house to a STEP tank and sewer at the front of each property for maintenance, acquiring a pumper truck for maintaining septic tanks, constructing a low-pressure sewer system, constructing a lagoon treatment system with an end treatment filter to address nutrient reduction, and using instrumentation to remotely monitor and control the treatment system (including telemetry).

O&M and replacement costs would include periodically pumping out septic tanks every 5 years; supplying electricity for STEP pumps; replacing STEP pumps every 7 years; maintaining the treatment system; and replacing monitors, sensors, and pumps every 5 to 10 years.

Expected capital cost range: \$12 million to \$17.3 million.

Expected annual operating cost: \$125,000.

Pros:

- Provides the highest level of service to residents.
- Supports economic growth in South County.
- Greater economy of scale can be gained by working with the Town of Forkland.
- May have an option to send flow to Demopolis for treatment if land for a treatment plant is not available in South County.

Cons:

- Requires the longest timeframe to construct and provide service to the community.
- Requires certified wastewater operators to operate and maintain the system.
- Requires the highest level of permitting.
- Requires the utility to acquire land.

Option 3b: STEP sewer and treatment in Central County

This option examines constructing a STEP sewer and central treatment system in Central County. The STEP sewer would be constructed for 245 existing connections. A central treatment system would be constructed using a lagoon with an end treatment system for nutrient reduction with a potential discharge to the Tombigbee River. Capital costs would include decommissioning existing septic systems, constructing lateral lines from each house to a STEP tank and sewer in the front of each property for maintenance, acquiring a pumper truck for maintaining septic systems, constructing a low-pressure sewer system, constructing a lagoon treatment system with an end treatment filter to address nutrient reduction, and using instrumentation to remotely monitor and control the treatment system (including telemetry).

O&M and replacement costs would include pumping out septic tanks every 5 years; supplying electricity for STEP pumps; replacing STEP pumps every 7 years; maintaining the treatment system; and replacing monitors, sensors, and pumps every 5 to 10 years.

Expected capital cost range: \$19 million to \$26.7 million.

Expected annual operating cost: \$170,000.

Pros:

- Provides the highest level of service to residents.
- Supports economic growth in Central County.
- Large rivers nearby could support a surface water discharge.
- Does not require drainfields, which would be challenging to site.

Cons:

- Requires the longest timeframe to construct and provide service to the community.
- Requires certified wastewater operators to operate and maintain the system.
- Requires the highest level of permitting.
- Requires the utility to acquire land.

Table 1. Comparison of Wastewater Treatment Options

Evaluation Criteria	Option 1a	Option 1b	Option 2	Option 3a	Option 3b
Expected capital cost range	\$23 million–\$33 million	\$23 million–\$33 million	\$2.5 million–\$5 million	\$12 million–\$17.3 million	\$19 million–\$26.7 million
O&M cost per home per month ^a	Annual cost of \$200–\$500, no monthly bill	\$26–\$45	\$25–\$35	\$45–\$55	\$45–\$55
Eliminates the current public health concern	Yes	Yes	Yes	Yes	Yes
Provides a long-term solution	Potentially	Yes	Yes	Yes	Yes
Includes existing local sewer management authority	No	Potentially	Potentially	Yes	Yes

^a Approximate costs; dependent on rate study results and potential loan repayments (see Table 2).

Financing Options

The financing options evaluated include:

- **CWSRF principal forgiveness loan.** Up to 100 percent principal forgiveness loans through the Clean Water State Revolving Fund (CWSRF) from ADEM.
- **USDA-RD loan/grant.** Rural Development loan/grant that includes a 25 percent loan for a 40-year term at an assumed interest rate of 2.5 percent with a varying number of customers based on the service area. The interest rate is adjusted quarterly.
- **30-year bond.** Bond from Greene County Utilities to construct the system on its own, with a 5 percent interest rate. The number of customers would vary by service area.

Table 2 shows estimated monthly rates for O&M for each option, and the monthly rate impact of each financing alternative.

Table 2. Capital and Financing Costs for Wastewater Treatment Options

Option	Name	Estimated Capital Cost Range	Estimated O&M Monthly Bill per Customer ^a	Monthly Bill Addition for Financing Options of Capital Costs <i>(CWSRF Principal Forgiveness Loan)^{a,b}</i>	Monthly Bill Addition for Financing Options of Capital Costs <i>(USDA-RD 25% Loan 75% Grant)^a</i>	Monthly Bill Addition for Financing Options of Capital Costs <i>(30-Year Bond)^a</i>
1a	Onsite/septic systems, maintenance by homeowners	\$23 million–\$33 million	Annual cost \$200–\$500 ^c	Financing dependent on individual situations.	Financing dependent on individual situations.	Financing dependent on individual situations.
1b	Onsite/septic systems, maintenance by RME ^b	\$23 million–\$33 million	\$26–\$45	\$0	\$39	\$175
2	Cluster treatment systems ^d	\$2.5 million–\$5 million	\$25–\$35	\$0	\$90–\$135	\$400–\$600
3a	STEP sewer and treatment system in South County	\$12 million–\$17.3 million	\$45–\$55	\$0	\$80	\$360
3b	STEP sewer and treatment system in Central County	\$19 million–\$26.7 million	\$45–\$55	\$0	\$90	\$420

a Monthly costs are based on the number of customers that would be served by each system, which varies across options.

b Full principal forgiveness is possible but not guaranteed. Funding availability depends on several factors. The county will need to engage with ADEM and USDA along the way to determine principal forgiveness funding availability.

c Homeowners would pay for periodically pumping out their septic tanks and replacing pumps, motors, and drainfields as needed but would not pay a monthly bill.

d Capital and operating costs for cluster treatment systems are estimated for one system serving 20 to 40 homes.

Funding Opportunities

The Bipartisan Infrastructure Law provides additional funding to the CWSRF for loans and grants to small, rural, and disadvantaged communities that can be leveraged with USDA-RD funds to address inadequate water and wastewater systems. There are multiple potential funding sources for Greene County, including USDA-RD and the CWSRF administered by ADEM.

Overview of the CWSRF Program Administered by ADEM

- The Alabama CWSRF is a low-interest loan program intended to finance public infrastructure improvements.
- Eligibility is based on ADEM's affordability criteria, which include population trends, unemployment rate, poverty rate, and location of the project on the environmental justice Justice40 Map. Based on current data, ADEM staff have indicated that Greene County would qualify for subsidy through principal forgiveness loans. This will need to be confirmed at the time of application(s).
- Communities that qualify for subsidy generally receive additional subsidy in the form of principal forgiveness in their assistance agreements.
- Three years of financial audits are required for the application process.
- Alabama establishes its Intended Use Plan (IUP) and current year priorities for this program at the end of March each year. The state accepts applications year-round, but to receive funding for State Revolving Fund (SRF)-eligible projects and be placed on the IUP for the current year, communities should submit applications before February 28 of that year.
- The loan term is generally 20 years, and the interest rate is below market. The interest rate is adjusted annually.
- As a result of an SRF application, ADEM allotted Greene County \$706,933 from the American Rescue Plan Act (ARPA) for planning wastewater improvements in unincorporated Greene County.

Overview of USDA's Rural Development Water and Environmental Programs: Water and Waste Disposal Loans and Grants

- Through Rural Utilities Service Water and Environmental Programs, rural communities obtain the technical assistance and financing necessary to develop drinking water and waste disposal systems.
- USDA-RD has long-term, low-interest loan financing programs to assist communities with infrastructure costs. There are opportunities for grants combined with loans for communities that qualify.
- Eligibility for funding is based on median household income (MHI) and population of the community.
- Greene County would be considered for other USDA-RD programs, such as Persistent Poverty assistance, which can provide a higher percentage of grant funds.
- USDA-RD loans and grants require financial audits, as well as a commitment to revenue collection during the life of the loan.
- For communities receiving loans, the loan term can be up to 40 years based on the expected life of the system.
- The interest rate is adjusted quarterly.
- Water and Waste Disposal Predevelopment Planning Grants (PPG) can assist with funding. Greene County was awarded a PPG for \$70,000 on August 31, 2023.
 - The PPG program helps eligible low-income communities plan and develop applications for proposed USDA-RD water or waste disposal projects.
 - State and local government entities, nonprofits, and federally recognized Tribes may apply.
 - The area to be served must be rural, with a population of 10,000 or fewer, and have an MHI that is below the poverty line or less than 80 percent of the statewide MHI.

- USDA-RD accepts applications year-round on a rolling basis through RD Apply.³
- More information is available on USDA's website.⁴

Current Funding Programs for Septic System Upgrades

- ADEM is developing a program to make loans to an organization such as the county (but not individuals) for septic system upgrades. It expects to have that program established in 1 year.
- USDA-RD's Single Family Housing Repair Loans and Grants program (also known as the Section 504 Home Repair Program) provides loans to low- and very-low-income homeowners to repair, improve, or modernize their homes. It also provides grants to elderly, very-low-income homeowners to remove health and safety hazards.
- The USDA Rural Decentralized Water Systems Grant program helps qualified nonprofits create a revolving loan fund for eligible individuals who own and occupy a home in an eligible rural area (one with population of 50,000 or fewer). These revolving loan funds come in the form of low-interest loans. The maximum loan amount is \$15,000 at a 1 percent fixed interest rate, repaid over a 20-year period. The fund may be used to construct, refurbish, or service individually owned septic systems.

³ <https://www.rd.usda.gov/programs-services/rd-apply>

⁴ <https://www.rd.usda.gov/programs-services/water-environmental-programs>

Benefits of Investing in Adequate Wastewater Infrastructure

Public and Community Health Improvement

Exposure to sewage can have negative health impacts and spread diseases such as salmonellosis, shigellosis, cholera, giardiasis, amoebiasis, hepatitis A, viral enteritis, and other diarrheal diseases.⁵ There are many different types of microbes in wastewater, which makes it challenging to determine specific causes of illness. Detecting and identifying microbes in wastewater takes time and resources.⁶ However, it is well known that exposure to untreated waste negatively affects residents' health and well-being.

Investing in adequate wastewater infrastructure creates a healthier environment for residents of Greene County. Children can play in backyards, residents do not have to worry about their families and pets encountering raw sewage, household plumbing is more functional, and odors of sewage are not persistently present. Well-maintained and properly built wastewater treatment systems protect residents from viruses and bacteria. They also reduce environmental pollution, function during rain and storms, and provide a foundation for economic development.

Economic Impact of Wastewater Infrastructure Investment

Although the primary purpose of wastewater system improvements is to address the existing sanitation conditions in Greene County, developing wastewater systems can bring economic benefits and jobs for communities.

The *Economic Benefits of Investing in Water Infrastructure* study, commissioned by the Value of Water Campaign and completed by the U.S. Water Alliance in 2017, found that for every \$1 million spent on infrastructure construction, over 15 jobs are generated. Community leaders in Greene County may want to consider school apprenticeship programs and other local workforce development programs to create local employment opportunities for residents once construction-related activities begin.

Infrastructure can provide a strong foundation for the community through improved wastewater treatment. Greene County, located just south of Tuscaloosa, could be an attractive location for commercial and industrial businesses and could attract jobs so that residents do not have to drive out of the county for work. Coordinating wastewater system plans with economic growth plans, such as the hotel siting plan, would help the community prioritize infrastructure improvements.

5 World Health Organization. (2006). *WHO guidelines for the safe use of wastewater, excreta and greywater* (Vol. 2). <https://www.who.int/publications/i/item/9241546832>

6 Kaushal, S., & Singh, J. S. (2017). Wastewater impact on human health and microorganism-mediated remediation and treatment through technologies. In J. Singh & G. Seneviratne (Eds.), *Agro-environmental sustainability*. Springer. https://link.springer.com/chapter/10.1007/978-3-319-49727-3_12

Sustaining the Investment Through Operations and Maintenance

Greene County Utilities will most likely maintain the wastewater infrastructure selected for the community, as they already maintain the water system and the existing community wastewater treatment system at Greene Track.

Potential Approaches for O&M

Greene County Utilities has options for providing O&M services to the community. These include:

- Using technology, such as remote monitoring, instrumentation, and reporting, in community systems or a wastewater treatment plant to support O&M.
- Financing the purchase of equipment, such as pumper trucks and sewer jetters, through the USDA-RD and CWSRF programs.

Paying for O&M and the Affordability Challenge

Across the United States, utilities use sewer bills to pay for management, O&M, and loan repayments for wastewater systems. Greene County Utilities will need to keep rates affordable for low-income customers but high enough to collect funds to operate and maintain the system. Traditionally, wastewater-only projects are considered “affordable” if the sewer bill is 2 percent of MHI or less. However, using MHI as an indicator can make it challenging to understand the community’s affordability needs, as low-income residents struggle more with paying utility bills than high-income residents do. This analysis incorporates both household income quintile upper limits from the U.S. Census Bureau and MHI into the affordability analysis to better reflect the impact for low-income residents.

Economies of scale can improve affordability. Figure 5 assumes the cost to support one full-time wastewater employee is \$80,000 in total, including salary, benefits, vehicle, equipment, training, uniforms, and office supplies. However, as the number of system connections increases, the monthly cost per connection to support this employee decreases, making the cost more affordable for each resident. Greene County can optimize its wastewater service area and use an economy of scale to manage costs of extending the sewer to distributed housing areas to keep the system affordable.



We want Greene County to be a place where our children can find jobs that support their families and build a successful life while staying in Greene County. We need to focus our tools and resources to create this future.

— Danny Cooper, Chairman, Greene County Industrial Development

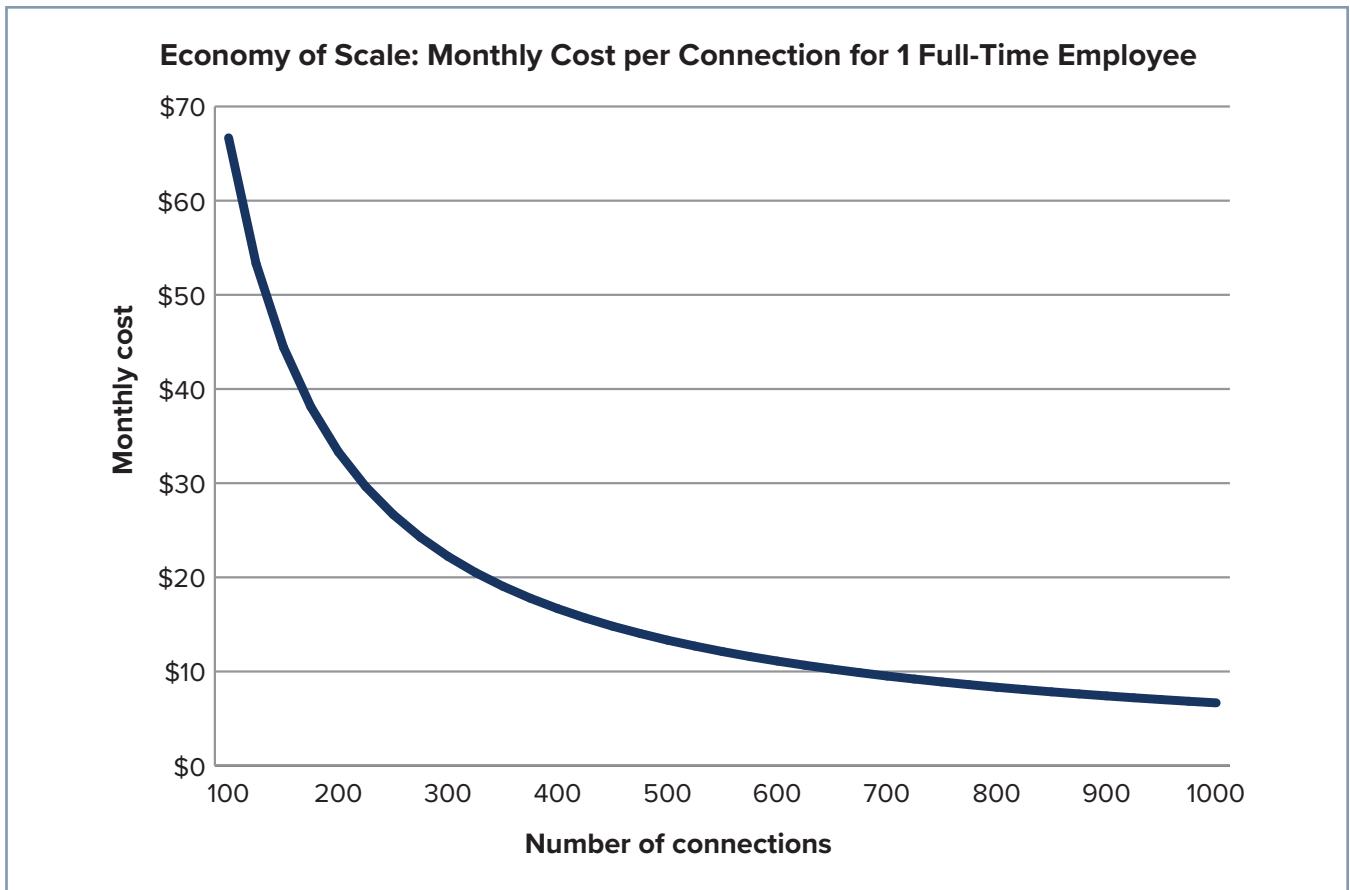


Figure 5. Economy of scale benefits: monthly cost per wastewater customer to support one full-time employee.

As mentioned above, the annual cost for wastewater service is usually calculated as a percentage of MHI to determine whether a system is affordable for a community. However, this approach has a disproportionate impact on low-income households. EPA’s 2023 *Clean Water Act Financial Capability Assessment Guidance* suggests including households in the lowest 20 percent income range in calculations, but this guidance was meant for systems with more than 3,000 connections. There is no current formula for small communities like Greene County, where the MHI is below the national poverty level.

Tables 3 and 4 show the financial impact of O&M costs at various household income levels and the percentage of income that would be spent on each of the wastewater infrastructure options. Table 3 evaluates the percent of income that would be spent on only O&M costs for wastewater infrastructure options, assuming 100 percent principal forgiveness for capital costs. Table 4 evaluates the percent of income that would be spent on the wastewater infrastructure options if a loan component is included.


Table 3. Percent of Household Income Spent on Sewer Rates in Greene County (Considering O&M Costs and Assuming 100 Percent Principal Forgiveness for Capital Costs)

Income Range	Estimated Monthly Bill	First Income Upper Limits	Second Income Upper Limits	Third Income Upper Limits	Fourth Income Upper Limits	MHI	Poverty Level
Percent of Households in Income Range	–	0%–20%	20%–40%	40%–60%	60%–80%	–	40%
Annual Household Income	–	\$11,647	\$20,929	\$32,968	\$67,609	\$32,000	\$30,000
Onsite/septic systems	\$35	3.6%	2.0%	1.3%	0.6%	1.3%	1.4%
Cluster treatment systems	\$30	3.1%	1.7%	1.1%	0.5%	1.1%	1.2%
STEP sewer and treatment in South County	\$50	5.2%	2.9%	1.8%	0.9%	1.9%	2.0%
STEP sewer and treatment in Central County	\$50	5.2%	2.9%	1.8%	0.9%	1.9%	2.0%

 Households spending 2% or more of household income on sewer bills are considered “high financial impact.”

Table 4. Percent of Household Income Spent on Sewer Rates in Greene County (Considering O&M and Potential USDA-RD Loan Repayment Costs)

Income Range	Estimated Monthly Bill	First Income Upper Limits	Second Income Upper Limits	Third Income Upper Limits	Fourth Income Upper Limits	MHI	Poverty Level
Percent of Households in Income Range	–	0%–20%	20%–40%	40%–60%	60%–80%	–	40%
Annual Household Income	–	\$11,647	\$20,929	\$32,968	\$67,609	\$32,000	\$30,000
Onsite/septic systems	\$80	8.2%	4.6%	2.9%	1.4%	3.0%	3.2%
Cluster treatment systems	\$142	14.6%	8.1%	5.2%	2.5%	5.3%	5.7%
STEP sewer and treatment in South County	\$130	13.4%	7.5%	4.7%	2.3%	4.9%	5.2%
STEP sewer and treatment in Central County	\$140	14.4%	8.0%	5.1%	2.5%	5.3%	5.6%

 Households spending 2% or more of household income on sewer bills are considered “high financial impact.”

Addressing the Affordability Challenge

It is possible to lower the financial burden of these investments, especially for low-income households. Some local communities and states are developing affordability programs to provide rate assistance to low-income customers. The Low Income Household Water Assistance Program, created in response to the COVID-19 pandemic, was the first program of its kind in the United States, but is only authorized by Congress through 2024. It is unclear whether Congress or the State of Alabama will continue this program.

Greene County Utilities, like other local governments and utilities, can build local affordability programs by charging different rates on commercial accounts, new customers, or other customer bases that incorporate funding for a local affordability program. This creates a pot of money to help other customers during times of need. Customers who have a temporary medical issue or qualify for assistance based on income guidelines can take advantage of this rate structure to pay for water and wastewater service. However, this solution might not work if Greene County does not have many commercial or industrial accounts to pay extra to fund it.

Greene County Utilities will need multiple approaches to address the financial burden of water utilities for low-income residents, beyond just the programs discussed above. For example, Greene County Utilities can consider non-rate revenue opportunities, such as leasing space on water towers.

Key Takeaways on Affordability

All the wastewater treatment options have a high financial impact on the lowest-income residents of Greene County. **Rate assistance programs will be necessary for some households in Greene County.**

Loan repayments will cause any option to have a high financial impact on residents of Greene County. Greene County will need to work with the funding agencies to **maximize the amount of grants** for construction of their system.

Optimizing economy of scale in the service area can make infrastructure more affordable for residents of Greene County.



Partners and Roles

The path to clean water is not an easy one. Greene County has options to choose from when it comes to new wastewater systems. Many partners in this pilot program will continue to support Greene County Utilities along this journey (Figure 6), including:

- **U.S. Department of Agriculture Rural Development (USDA-RD).** Lead agency (with EPA) providing jointly leveraged technical assistance resources in this pilot program. Funding partner.
- **U.S. Environmental Protection Agency (EPA) Headquarters and Region 4.** Lead agency (with USDA) providing jointly leveraged technical assistance resources in this pilot program.
- **Alabama Department of Environmental Management (ADEM).** Agency providing funds through the CWSRF, including Bipartisan Infrastructure Law funds. Environmental permitting authority.
- **Alabama Department of Public Health (ADPH).** Permitting authority for onsite and community systems.
- **Alabama Rural Water Association (ARWA).** Technical assistance provider.
- **Sentell Engineering.** Local engineering consultant that will conduct master planning and potentially design infrastructure projects.

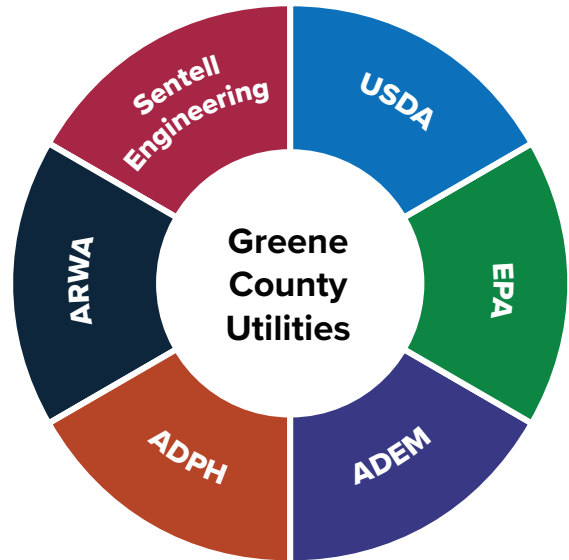


Figure 6. Partners to Greene County Utilities.

Technical Assistance and Support for Greene County Moving Forward

Both EPA and USDA-RD fund technical assistance programs that support small, rural, and disadvantaged communities and help them navigate the CWSRF, Drinking Water State Revolving Fund (DWSRF), and USDA-RD funding programs. The ultimate goals of the technical assistance (e.g., WaterTA) programs are to help communities identify water challenges and solutions, build capacity to address those needs, and develop application materials to access water infrastructure funding. Technical assistance providers can help Greene County Utilities understand the funding available through the SRF and USDA-RD programs, as well as deadlines and application requirements.

EPA WaterTA and USDA-RD technical assistance providers can also help prepare and submit funding applications. The Alabama Rural Water Association, or other EPA and USDA-RD technical assistance providers, can offer advice as the community considers infrastructure options, financing, and rate structures. These providers' connections with EPA and USDA-RD can help the community successfully complete projects and programs. Other technical assistance support for Greene County Utilities can include:

- **Developing a wastewater rate program to build a local “affordability assistance” and asset management program.** Greene County Utilities could establish a rate program where new, commercial, or industrial customers contribute to an affordability assistance program for low-income residents. EPA’s network of Environmental Finance Centers partners with technical assistance providers that specialize in these types of rate programs.
- **Supporting workforce development and staff training.** Greene County will need operations staff for new and existing systems. The technical assistance providers have staff training programs available.
- **Engaging residents in the needs and benefits of a wastewater treatment system.** Customers play a large part in the success of a wastewater treatment system. Technical assistance providers can help engage and educate residents on topics such as “What Not to Flush,” “Management of Fats, Oils, and Grease,” why having a wastewater system is important, and how to maintain a septic system. Educational materials are available for residents.

More information can be found at EPA’s WaterTA website.⁷

⁷ <https://www.epa.gov/waterta>

Road Map for Implementation

Greene County Utilities is considering solutions for its wastewater treatment needs, but this step is just the beginning of the process. Developing wastewater infrastructure takes time. Creating a holistic program to address septic system needs could take 2 or more years, and constructing a sewer system and treatment plant could take 5 to 8 years. Now is the best time in decades to act, as Bipartisan Infrastructure Law funds boost water infrastructure across the United States. Over the next year, Greene County will need to consider its options and determine the best path for the community's future.

The Greene County community will need to consider a policy in the Alabama State Constitution that gives municipalities express permission to implement wastewater ordinances requiring property owners to connect to a sanitary sewer system if they lack a working septic system. The Greene County Water and Sewer Authority Board requested an opinion from the Alabama Attorney General on whether the county could require property owners to connect a building with sanitation fixtures to a sewer system if the building has no working septic system and the sewer is in proximity.

On May 15, 2024, the Alabama Attorney General responded that the Water and Sewer Authority can require property owners to connect to the sewer system but cannot shut off a customer's water if they do not connect or pay their bill. This presents a financial risk for Greene County Utilities, as property owners may not pay their bills for service. Greene County Utilities will need to consider other means for collecting monthly bills from customers who do not connect or pay. Other communities have used special assessment districts or public improvement districts, where the cost owed for constructing the sewer system is included as a fee on the property tax bill over a given timeframe (e.g., 20 years). Greene County should work with their legal counsel to adequately mitigate this risk.

Without local regulation to enforce connection, Greene County Utilities will have to depend on ADPH to use their enforcement capacity. Enforcement requires ADPH to issue a warrant for criminal court to homeowners that do not have a working septic system and do not connect to a sewer system in close proximity to their property.

Immediate Next Steps Ongoing Through 2024

Using materials from this pilot project, Greene County Utilities applied for funding from ADEM and USDA-RD to complete a master plan for wastewater needs. ADEM allotted Greene County \$706,933 in grant funds, and USDA-RD allotted the county a \$70,000 PPG to develop the master plan, Preliminary Engineering Report, and Environmental Information Document over the next 12 months. Sentell Engineering will complete the master planning process and help the community select an option. Plan activities include:

- Performing a door-to-door survey of residents to determine the status of their septic system and their perception of wastewater needs in the community.
- Collecting site-specific soil data to determine the feasibility of onsite/septic and community systems.
- Evaluating site criteria and real estate needs for the treatment system and sewers if those options are selected.
- Engaging with the Town of Forkland and City of Eutaw regarding potential connections to their proposed projects.
- Addressing permit requirements and submitting a waste load allocation to ADEM, if appropriate, for a National Pollutant Discharge Elimination System permit for a treatment facility.
- Developing cost estimates and modifying options based on site-specific data and wastewater flow projections.
- Engaging with the community, County Commission, and Water and Sewer Authority Board to select the best option and prioritize which systems are implemented first.

Activities After Options Selection

After Greene County prioritizes community wastewater needs and selects the first system to be constructed through the master planning process, the county will have to determine how to design the system, acquire property, and get the necessary permits. Both USDA-RD and ADEM offer funding for design and construction through a competitive application process. The amount of funding from grants versus loans will need to be determined at the time of application(s).

Figure 7 shows the multiple wastewater options for Greene County. Due to the county's size and widely distributed residents, multiple paths will be needed to address all sanitation needs, including onsite systems, central treatment systems, and (potentially) cluster treatment systems. Developing and implementing a program to help residents install and maintain upgraded onsite systems may take a few years, depending on whether Greene County wants to take on the RME role. Greene County could engage with the Black Belt Unincorporated Wastewater Program (BBUWP) to potentially provide service.

Once Greene County Utilities is comfortable with implementing a wastewater ordinance, the county can consider extending sewer and treatment to areas where septic systems are not feasible or cost effective. Design, permitting, and construction of a system can take 5 to 8 years, depending on the size of the system. Greene County will need to prioritize where to start this service and recognize that it may take several years to extend sewer service to all residents.

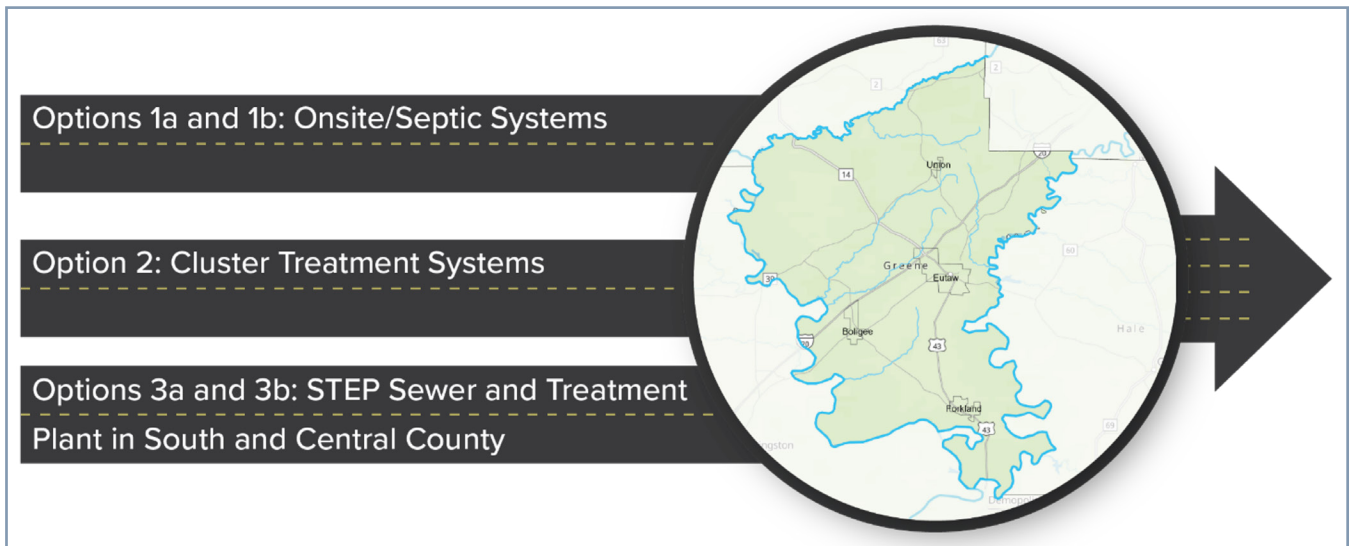


Figure 7. Multiple systems will be necessary to address wastewater needs in Greene County.

Potential Timeline for Onsite/Septic Systems (Options 1a and 1b)

If the community selects an onsite/septic system option (Option 1a or 1b), there are several funding alternatives that can assist residents with implementation. These alternatives include:

- Engaging with the BBUWP (if applicable) to support homeowners who need new systems.
- Seeking support from ADEM for funding through the CWSRF program.
- Evaluating USDA-RD's Decentralized Water Systems Program (low-interest loans are available).
- Evaluating USDA-RD's Section 504 Home Repair Program loans and grants to address health and safety hazards for homeowners that qualify based on income requirements.

The ADPH and USDA-RD programs are set up to assist individual homeowners. ADEM is working on a program that could include funding for an RME that would provide O&M, like the BBUWP. However, ADEM has not established these guidelines yet. EPA has guidance and outreach material available on their SepticSmart website.⁸

Next steps for Greene County include:

- Evaluating whether the BBUWP can meet resident needs, and (if the BBUWP can assist) connecting residents with the program so they can receive new septic systems in a timely manner.
- Deciding whether residents need additional support. If so:
 - Developing an RME to actively manage septic systems for residents, including developing ordinances and financing programs for the systems.
 - Establishing ordinances and rate structures in 2024.
 - Submitting funding applications and arranging funding options for residents in 2024 or 2025.
 - Determining staffing needs and hiring staff in mid-2025.
 - Completing system implementation so that customers can sign up for service in 2025.

Potential Timeline for Sewers and Treatment Systems (Options 2, 3a, and 3b)

If Greene County selects a cluster treatment system or central sewer option (Options 2, 3a, or 3b), the project could take 5 to 8 years, depending on the size of the system. A plan of action would include:

- Developing ordinances and rate structures and determining financial needs in early 2025.
- Applying to ADEM and USDA-RD for design and construction funding in early 2025.
- Designing and permitting the system. This will usually take 1.5 to 2 years, depending on system size:
 - Subsurface systems (i.e., systems with drainfields) less than 15,000 gpd are permitted through ADPH.
 - Subsurface systems greater than 15,000 gpd and all systems with a surface water discharge are permitted through ADEM. A waste load allocation is required for a surface water discharge.
 - Other permitting agencies for construction activities may include the U.S. Army Corps of Engineers, ADEM for stormwater and dewatering activities, and the Alabama Department of Transportation if construction occurs on state highways. The design engineer usually obtains these permits.
- Acquiring land for treatment systems and sewer easements. This is usually done at the same time as design and permitting. It is important to note that funding agencies will only fund acquisition from willing sellers.
- Applying for construction funding through ADEM and USDA-RD, once design is 90 percent complete and the system is permitted.

Residents could expect to connect to the system for service in late 2028 or early 2030, depending on the system selected.

⁸ <https://www.epa.gov/septic/septicmart>

Concluding Thoughts

As Greene County moves forward with an in-depth analysis of its options for wastewater service, EPA and USDA-RD staff and technical assistance providers are ready to support the community with funding opportunities through the Bipartisan Infrastructure Law and other funding sources. This is a historic time for water and wastewater infrastructure funding for small, rural communities such as Greene County. New funding can help Greene County address current and persistent wastewater challenges, encourage economic development, and build a prosperous future.

Definitions

Central wastewater treatment facility. A wastewater treatment system that is larger than 15,000 gallons per day and permitted through the Alabama Department of Environmental Management. It usually has a surface water discharge permit to discharge treated water into a surface water. Certified operating staff and monitoring are required for these systems.

Community or cluster treatment system. A small wastewater treatment system of less than 15,000 gallons per day with a drainfield for subsurface discharge. These systems are permitted through the Alabama Department of Public Health.

Gravity sewer system. A system that includes a sewer lateral connected to the house and sewer lines that flow by gravity to one or more pump stations that pump the flow to a treatment plant.

Onsite/septic system. A traditional system includes a settling (i.e., septic) tank and drainfield. Advanced or engineered systems can include aeration systems, chemical dosing, and a sand filtration system for the drainfield.

Responsible Management Entity (RME). A legal entity responsible for providing various management services, with the requisite managerial, financial, and technical capacity to ensure the long-term, cost-effective management of decentralized onsite and/or cluster wastewater treatment facilities in accordance with applicable regulations and performance requirements.

Septic tank effluent pump (STEP) sewer system. A sewer system with a septic tank and pump at the customer's building. Effluent from the septic tank is pumped through a low-pressure sewer system to a treatment facility. Septic tanks need to be pumped out periodically. This system is the responsibility of the homeowner, utility, or common Responsible Management Entity, depending on ownership and the operations and maintenance model.



It is encouraging to see various federal and state agencies coming together to address the need for adequate sanitation for residents of Greene County. The real test will be successful implementation of these projects.

— Phillis Belcher, Executive Director, Greene County Industrial Development Authority



**Mantua-Lewston
Volunteer Fire Department**
9372 Co Rd 60
Eutaw, AL 35462
372-0102



Limitations

Any systems and associated cost estimates discussed in this draft analysis are preliminary and not intended to serve in lieu of a Preliminary Engineering Report prepared by a professional engineer licensed in the relevant jurisdiction.

Alternatives have been developed at a high level with desktop tools and have not been informed with survey data or field reconnaissance work. Further field evaluation is needed to verify these alternatives in subsequent work following this assessment and solutions plan.

Treatment and dispersal systems designed by licensed design professionals are based on soil evaluations, flood elevation evaluations and variances, permitted discharge limit determinations, and unforeseen factors that cannot be determined without onsite field surveys and evaluations beyond the scope of this draft assessment.