

Options for Clean Water Solutions on Calico Bay Road, North Carolina



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Calico Bay Road’s Options for Clean Water Solutions

Calico Bay Road is an unincorporated area in Duplin County, North Carolina, with approximately 80 homes. The area is located between the towns of Teachey and Wallace. Many residents of Calico Bay Road currently have inadequate wastewater treatment services. For many years, community members have advocated to change this situation. The community remains hopeful, despite unfulfilled previous efforts to provide wastewater solutions.

With the passage of the Bipartisan Infrastructure Law and new Water Technical Assistance services, there is momentum to bring wastewater treatment solutions to homes on Calico Bay Road. This plan describes technical options and financial resources for wastewater treatment. It is the product of the combined efforts of many organizations and individuals and provides options for clean water solutions for the community.

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 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

Purpose

EPA and USDA-RD pilot program staff members worked with the pilot program team—the Town of Wallace; Duplin County; EPA and USDA-RD state leadership; a local technical assistance provider, the North Carolina Rural Water Association (NCRWA); and the North Carolina Department of Environmental Quality (NCDEQ)—to develop solutions for Calico Bay Road’s wastewater issues. This document, *Options for Clean Water Solutions on Calico Bay Road, North Carolina*, outlines potential solutions to address the needs for improved wastewater treatment approaches on Calico Bay Road. Residents and town leadership can use this information to estimate costs and select a wastewater solution that meets today’s challenges and helps the community thrive.

Over the past year, the pilot program team has:

1. **Conducted a community wastewater assessment.** The pilot program team reviewed existing information on wastewater systems on Calico Bay Road and found areas that need improvement. This review did not include collecting site information on soils or existing septic systems.

1 www.epa.gov/waterta

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

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 communities find and apply for funding opportunities.** This plan outlines federal funding sources and how to apply for funding. It also shows how to pay for construction and long-term costs. Duplin County applied for a Special Evaluation Assistance for Rural Communities and Households (SEARCH) grant from USDA-RD to develop a Preliminary Engineering Report (PER) and Environmental Information Document.
4. **Developed a plan to pay for ongoing costs.** To install and operate the selected system, the appropriate management entity will have to develop a plan to pay for construction and ongoing costs. These costs could include management, operations, maintenance, and any potential construction loan repayments. This plan offers ideas to get started, such as programs with low-income rate assistance and non-rate revenue programs that other utilities have used.



Calico Bay Road, Duplin County, North Carolina

The Calico Bay Road community is an unincorporated area located just outside the towns of Wallace and Teachey in Duplin County, North Carolina (Figure 1). Calico Bay Road is a few miles west of Interstate 40 and connects with North Carolina Highway 41 at its southern end. There are approximately 80 residences in the Calico Bay Road area, which are the focus of this pilot.

According to the 2020 Decennial Census, the towns of Wallace and Teachey have estimated populations of 3,413 and 448, respectively. Both towns are served by wastewater treatment facilities located in the Town of Wallace, which is being considered as a viable wastewater solution. Wallace also serves as the main commercial hub for the area and owns property along Calico Bay Road.

The Calico Bay Road community is currently served by individual onsite septic systems, and is experiencing challenging conditions for onsite wastewater management, including a high frequency of system failures. A 2014 analysis found that 16 of the 19 septic systems inspected in the Calico Bay Road community were failing. Residents have noted frequent surface overflow of sewage from their septic systems. Some septic system dispersal fields are in direct contact with groundwater due to system failure and a high water table. This leads to groundwater infiltrating dispersal field lines, causing sewage to back up into septic tanks and home plumbing. Many septic tanks in the Calico Bay Road area are exposed to the surface, and some have open holes at the top, which leads to sewage exposures on properties. One resident reported that they dug a trench from their septic tank to a local road ditch to mitigate the surfacing of sewage on their property.

The Calico Bay Road area, located in the Coastal Plain region of North Carolina, is known for its flat terrain and strong forestry and agricultural history. The predominant soil types within the Calico Bay Road area are Goldsboro loamy sand (35.6 percent) and Rains fine sandy loam (34.9 percent). The high water tables beneath these soils, as well as the moisture content of the soils, limit their suitability for onsite and cluster wastewater treatment systems. In addition, the flat terrain of the Calico Bay Road area limits the subsurface flow and treatment of wastewater, further reducing the feasibility of onsite and cluster systems and likely requiring mounded dispersal beds. The community is situated in a high-rainfall area that is susceptible to flooding, storms, and sewage drainage issues. The project team identified onsite upgrades and small community systems as options, but these would require additional treatment or fill material.

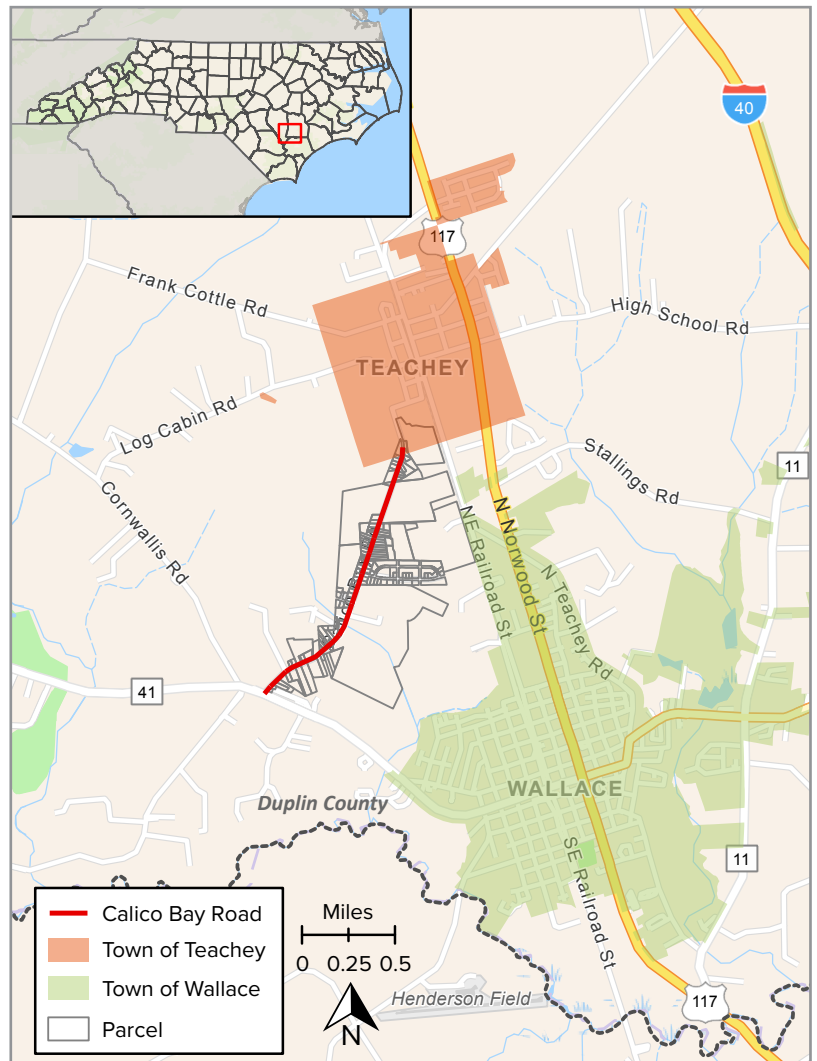


Figure 1. Calico Bay Road, located between the towns of Teachey and Wallace in Duplin County, North Carolina.

The Potential of Infrastructure Investment

Calico Bay Road residents have expressed support for capital investment in sanitation infrastructure, and they understand that monthly bills are necessary for maintenance of infrastructure. They want a community where their children can safely play in their backyards without risking exposure to untreated wastewater. The ability to do laundry and take a shower at the same time, even during rain, is a basic need. An affordable wastewater system is key to maintaining a vibrant, productive community.

Local Partners and Community Engagement Efforts

Community members advocated for the inclusion of the Calico Bay Road area as part of this pilot program. Because of existing awareness in the community, engagement with residents during this phase of the project was limited. However, local technical assistance provider NCRWA and Duplin County Commissioner Wayne Branch engaged with residents to provide updates on progress and next steps and to solicit feedback on preliminary options and educational materials.

County, community, and federal and state funding representatives held biweekly meetings. NCRWA led the interactions with Duplin County staff, Town of Wallace representatives, and Calico Bay Road area residents. NCRWA has experience working with local authorities and has led outreach since the first kickoff meeting. They intend to conduct public outreach meetings once more detailed options are available and financing is completed. Summaries of the meetings to date are below.

In October 2022, a kickoff meeting was held with federal, state, and local partners to establish a vision for success, field questions and feedback, and create a plan for achieving the project's goals. Unique community challenges included:

- Concern from residents about higher fees from annexation or out-of-town sewer rates if connecting to nearby sewer systems.
- Reluctance of homeowners to disclose existing failed septic systems due to concerns about enforcement actions.
- Hesitancy from Duplin County about becoming a wastewater system provider.

The Duplin County Health Department discussed repair options, such as a fill system to address high groundwater levels. A leader for the Calico Bay Road community expressed a community interest in connecting to a local centralized sewer system instead of giving up partial use of property for potential septic system repairs. Many residents pump existing septic tanks multiple times per year due to improperly performing systems, which costs up to \$250 each time. These costs could instead help pay for new sewer bills. However, many residents are elderly and on fixed incomes, so any increased costs would be difficult to manage.

The pilot project team held numerous meetings with the Wallace Public Works Director and Town Manager to discuss wastewater options for the Calico Bay Road area, including a cluster system and connection to the town sewer system. These options were also presented at a Wallace Town Council meeting, where the town expressed interest in continuing to support the project.

Members of the project team met with community leaders in December 2023 to provide progress updates and propose next steps. Representatives from the engineering firm selected to carry out an updated PER provided a demonstration of a septic tank with effluent pump (STEP) system that could be installed at homes (Figure 2). The pilot project team recommends additional community outreach and meetings to further discuss the options outlined below and inform the community that more detailed costs will be included as part of the PER.



Figure 2. STEP system demonstration during a meeting with community leaders.

Wastewater Treatment Options for the Calico Bay Road Area

In 2016, McDavid Engineering conducted a PER on a potential sewer service extension to the Calico Bay Road area in support of a Community Development Block Grant (CDBG) funding application, which was ultimately awarded but returned by Duplin County due to concerns about residents' potential inability to afford new sewer bills. Based on the previous PER by McDavid Engineering, Duplin County evaluated three alternatives to address project needs for the Calico Bay Road area. Alternatives included the "no action" option, pumping collected sewer to the Town of Wallace via North Carolina Highway 41, and pumping collected sewer to the Town of Wallace via James Andrews Lane. Both pump collection options include a conventional gravity sewer collection system to one or two pumping stations and a force main that discharges into the existing Wallace collection system. Both actionable options had challenges, including the need to obtain land easements due to a private parcel and railroad crossing, as well as a Highway 41 connection that would cross a 100-year floodplain.

As part of the current pilot project, the project team identified and evaluated three options for improved wastewater management in the Calico Bay Road community, which are summarized below and in the upcoming section. Preliminary design and cost estimates are based on an estimated service capacity of 80 individual residences or equivalent dwelling units with an average daily design flow of 117 gallons per day (gpd) based on historic water records, and a total peak design flow of 10,000 gpd. These design flows are subject to change during final design but serve as a baseline for this evaluation.

Since the Town of Wallace's sewer collection system is near the Calico Bay Road community, the primary alternative being considered is centralized sewer with added capacity in the sewer design to accommodate additional dwelling units in the future. The estimated service capacity may change during final design based on actual occupied dwellings, the number of future developed lots (including lots that currently cannot be developed due to septic limitations), and willingness of existing residents to connect to the community sewer. This option would involve installing a grinder pump system at each residence that would connect to a pressure community sewer. The Town of Wallace has expressed interest in providing sewer services to the Calico Bay Road area and has the wastewater treatment plant capacity to serve this extension. Wallace officials have also expressed willingness to provide sewer services without annexing this unincorporated area. However, those connecting to wastewater services must also connect to the Duplin County water system, which currently serves only 33 connected properties on Calico Bay Road.

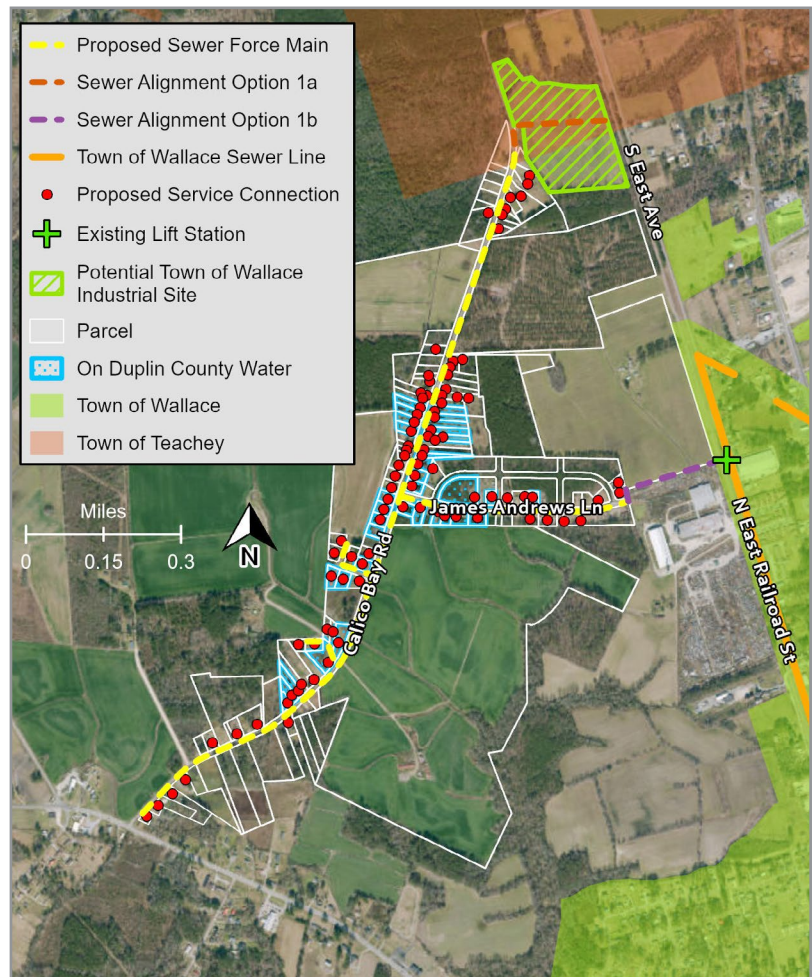


Figure 3. Proposed sewer options for Calico Bay Road.

For the sewer extension alternative, two options for force main alignment were considered (Figure 3). The first option (Option 1a) would run the force main to the proposed industrial site parcel owned by the Town of Wallace at the north end of Calico Bay Road. This alternative assumes that the town will cover the cost for the additional force main or gravity sewer to connect to the town’s existing sewer along South East Avenue/North East Railroad Street, since this would be required for the property’s development. Including the Calico Bay Road wastewater demand as part of this overall system would reduce the payback period for this infrastructure investment through additional sewer service revenue, which could be investigated further as part of the PER. The Town of Wallace is in the early stages of developing this property, and building a sewer line to the property would be contingent upon Wallace obtaining outside funding. As such, the town should consider the timing of a sewer line for Calico Bay Road at this property. The second force main alignment option (Option 1b) involves extending the force main east from James Andrews Lane and connecting directly to the lift station along North East Railroad Street. However, this option involves crossing a private parcel (requiring a land acquisition or easement) and crossing under the railroad, which would also require an easement. The lift station may also need improvements for increased capacity. While this is the most direct route to connect to the town’s existing sewer system, it also involves the most uncertainties and challenges.

Alternatives to sewer extension include onsite wastewater treatment through a community cluster system (Option 2) or onsite upgrades (Option 3). A community cluster system would require a similar pressure sewer as the sewer extension option but would use STEP tanks at each lot instead of grinder pump systems. The community sewer would then pump the effluent to one or more larger parcels for additional treatment and dispersal. Given the general soil moisture conditions and shallow water table in the Calico Bay Road area, preliminary cost estimates assume advanced treatment and a drip dispersal system to minimize the vertical separation requirements between the dispersal field lines and the water table. Pending preliminary soil investigations, Option 2 could require a surface dispersal/land application system treated to reclaimed water standards. This option is contingent upon the ability to acquire a larger parcel close to Calico Bay Road with moderately suitable soil conditions for onsite wastewater dispersal.

Onsite upgrades to fill systems with low-pressure pipe dispersal (Option 3) was also considered for the Calico Bay Road community. Although this option could work for some parcels, others would have insufficient area to install a new system as a repair to an existing septic system. Detailed investigations of each parcel will need to be conducted to determine final feasibility of this alternative. However, developing costs for this option is useful for preliminary assessment and evaluation as part of the initial pilot project.

Although this study provides a range of cost estimates, a full understanding of the alternatives and their costs will require in-depth analysis. In January 2024, Duplin County applied to receive grant funding from USDA-RD to conduct a PER.



We are still hopeful in finding a solution to the wastewater issues we have on Calico Bay Road.

—Calico Bay Road community resident



Members of the Calico Bay Road community deserve a wastewater system that allows them to live safely and comfortably.

—Duplin County Commissioner Wayne Branch

Option 1a: Sewer Extension via Wallace Industrial Site

This option examines the installation of approximately 12,650 feet of public sewer serving approximately 80 residences. Grinder pump systems would be installed at each service connection. The force main would be extended through the town's proposed industrial site parcel, and the town would cover the cost of the sewer connection onward from this location. Ownership and maintenance responsibilities of the grinder pump stations would be determined during subsequent PER and design efforts.

Expected capital cost: \$2.14 million.

Expected annual operating costs: \$22,500 for grinder maintenance and \$59,330 in sewer fees to Wallace. Does not include additional water service fees (around \$30 per month) for residents not currently connected to public water.

Pros:

- Eliminates health and environmental hazards from overflowing and failing septic tanks.
- Provides consistent service throughout the community.
- Reduces burden on residents for maintenance and replacement of onsite septic systems.
- Encourages economic growth and development of existing parcels limited by septic feasibility.
- Supports Wallace plan to develop parcel at end of Calico Bay Road that would need wastewater system.

Cons:

- Requires residents to connect to the sewer system and public water if not currently connected.
- Requires ongoing maintenance and replacement for grinder pumps, which varies based on residents' use.

Option 1b: Sewer Extension via James Andrews Lane

This option examines the installation of approximately 12,680 feet of public sewer serving approximately 80 residences. Grinder pump systems would be installed at each service connection. The force main would be extended east along James Andrews Lane and cross a privately owned parcel and a commercial railroad. Ownership and maintenance responsibilities of the grinder pump stations would need to be determined during subsequent PER and design efforts.

Expected capital cost: \$2.09 million.

Expected annual operating costs: \$22,500 in grinder maintenance and \$59,330 in sewer fees to Wallace. Does not include additional water service fees (around \$30 per month) for residents not currently connected to public water.

Pros:

- Eliminates health and environmental hazards from overflowing and failing septic tanks.
- Provides consistent service throughout the community.
- Reduces burden on residents for maintenance and replacement of onsite septic systems.
- Encourages economic growth and development of existing parcels limited by septic feasibility.

Cons:

- Requires residents to connect to the sewer system and public water if not currently connected.
- Requires ongoing maintenance and replacement for grinder pumps, which varies based on residents' use.
- Requires land acquisition and easements to install force main.

Option 2: Community Cluster System

This option examines the installation of a pressure community sewer to serve the Calico Bay Road community, with a STEP system for primary treatment at each household. Wastewater would be pumped to a community dispersal field for advanced treatment and dispersal based on in situ soil conditions (i.e., soil texture and depth to restrictive layer). This option is contingent upon acquisition of open land adjacent to Calico Bay Road suitable for a large onsite wastewater system. Although this option would require less homeowner maintenance than existing onsite septic systems, it would still require intermittent septic tank pump-out and pump replacement.

Expected capital cost: \$3.18 million.

Expected annual operating costs: \$47,230.

Pros:

- Eliminates health and environmental hazards from overflowing and failing septic tanks.
- Provides consistent wastewater service throughout the community.
- Allows for growth within the community.
- Gives the community greater control over the wastewater system and fee structure.
- Reduces maintenance, as STEP systems require less maintenance than grinder pumps.

Cons:

- Requires most (if not all) current residents to connect to the sewer system.
- Requires residents to maintain both septic tanks and effluent pumps, including pump replacement as needed (assumed once every 7 years).
- Requires land acquisition for treatment parcel as part of capital costs.
- Requires a licensed operator for operations and maintenance (O&M) of the community treatment and dispersal system.
- Requires establishment of a Responsible Management Entity (RME) for the community.
- Requires the system be owned by a public entity (county, town, sanitary or sewer district) so the project is eligible for funding through the Clean Water State Revolving Fund (CWSRF) program.

Option 3: Onsite System Upgrades

This option explores the approach of replacing existing systems with a fill septic system where lot space is available. Most systems would require a pump-to-gravity distribution, although some sites may be able to use gravity dosing. Where site conditions limit feasibility of a fill system, alternative onsite options would need to be considered (e.g., treatment standard-1 [TS-1] or TS-II pretreatment, drip dispersal) during final permitting and design.

Expected capital cost: \$2.64 million (\$33,000 per connection).

Expected annual operating costs: \$26,245.

Pros:

- Eliminates health and environmental hazards from overflowing and failing septic tanks.
- Requires residents to perform periodic system maintenance instead of paying monthly fees.
- Is effective for large lots.
- Does not require a certified operator for maintenance of gravity distribution systems requiring just one pump (certified operators required for advanced pretreatment, low-pressure pipe, or drip dispersal).
- Allows for quickest implementation to address immediate needs.

Cons:

- May not be feasible for all lots.
- Requires homeowners to maintain and replace systems, unless an RME is established for the community.
- May limit future lot development along Calico Bay Road, as more advanced systems can be cost-prohibitive even with grant funding.
- May require premature system replacement if homeowners fail to maintain the septic system.

Financing Options

The financing options evaluated include:

- **North Carolina CWSRF:** Up to \$500,000 grant or principal loan forgiveness. Low-interest loans through NCDEQ.
- **CDBG:** Up to \$3 million over 3 years for wastewater or water infrastructure projects. Eligibility includes residential areas that meet the U.S. Department of Housing and Urban Development's (HUD's) low- and moderate-income thresholds. This grant could help cover the costs of new water or wastewater service lines or extensions.
- **USDA-RD Water and Environmental Programs (WEP), Water and Waste Disposal Loan and Grants:** Low-interest, long-term loans up to 40 years. Grant funds may be combined with a loan to keep user cost reasonable.
- **USDA Single Family Housing Repair Loans and Grants:** For low- and very-low-income homeowners, up to \$10,000 grant (age 62 or older), up to \$40,000 loan, 1 percent interest rate, 20-year term. Grants should be used to remove health and safety hazards. Loans may be used to repair, improve, or modernize homes or remove health and safety hazards.
- **Southeast Rural Community Assistance Project, Inc. (SERCAP) Individual Septic Loan Program:** Up to \$15,000 loan with 1 percent interest rate for low-income residents of rural communities to pay for the installation of a new standard/alternative septic system or to repair an existing malfunctioning system.
- **Water Well Trust Loan Program:** Funding for well and/or septic system repairs for low-income families nationwide.

O&M Estimated Costs and Fees

Table 1 shows the three options for new construction of wastewater infrastructure and the estimated capital costs for each option. The table also shows information on potential additional costs if the construction is partially or fully grant funded.

Table 1. Capital and Financing Costs for Wastewater Treatment Options

Option	Name	Estimated Total Capital Cost	Estimated Capital Cost Per Connection	Monthly Bill Addition for Financing Options of Capital Costs <i>(CWSRF Principal Forgiveness Loan^a)</i>	Monthly Bill Addition for Financing Options of Capital Costs <i>(USDA-RD 25% Loan 75% Grant)</i>
1a	Sewer extension via Wallace industrial site	\$2.14 million	\$26,100	\$0	\$22
1b	Sewer extension via James Andrews Lane	\$2.09 million	\$26,800	\$0	\$21
2	Community cluster system	\$3.18 million	\$39,800	\$0	\$32
3	Onsite system upgrades	\$2.64 million	\$33,000	Financing dependent on individual situations	Financing dependent on individual situations

^a Full principal forgiveness is possible but not guaranteed. Funding availability is dependent on several factors. The town will need to engage with NCDEQ to determine principal forgiveness funding availability.

^b Assumes 75% of the total project cost is funded with a grant or forgivable loan, and the remainder is funded with a loan. Also assumes 80 existing developed lots repay the loan at a 2.325% annual interest rate and 40-year loan term.

Table 2 shows the estimated monthly costs for operating the various wastewater management options. Note that these costs should not be considered monthly bills, as some of them represent amortized costs to replace major system components (e.g., dispersal fields), pump septic tanks, or hire operators. The only mandatory monthly bills would be utility fees for Option 1 and monthly power bills that cover STEP or grinder pump energy consumption. Other notes on Table 2 include:

- Grinder pump O&M costs for Options 1a and 1b (sewer extension) are estimated raw costs. It is not known at this time what the Town of Wallace will charge for the additional grinder system maintenance.
- If an RME is established for Option 2 (community cluster), a monthly fee will need to be established to cover the amortized costs included in Table 2 and necessary overhead costs to operate the RME and handle permitting, monitoring, and reporting requirements.
- Future grants may be used to cover system replacement costs for Options 2 and 3, which would lower (or fully negate) the estimated dispersal field replacement costs.

Table 2. Potential Monthly Costs for Calico Bay Road Customers

Option	Name	Utility Fee ^a	STEP or Grinder Pump O&M ^b	STEP or Grinder Pump Energy Cost ^c	Amortized Septic Tank Pump-Out ^c	Dispersal Field O&M Costs ^d	Amortized Dispersal Field Replacement ^e
1a	Sewer extension via Wallace industrial site	\$61.80	\$20	\$3	\$0	\$0	\$0
1b	Sewer extension via James Andrews Lane	\$61.80	\$20	\$3	\$0	\$0	\$0
2	Community cluster system	\$0	\$30	\$2	\$2.30	\$21.90	\$13.60
3	Onsite system upgrades	\$0	\$6 ^c	\$1	\$2.30	\$19 ^c	\$36 ^d

^a Sewer fee estimate based on Wallace out-of-town rates for 3/4-inch meter size, \$34 monthly base charge, and average monthly water usages of 4,000 gallons per residence (\$27.80).

^b Estimated raw O&M costs to maintain grinder or STEP pump systems. Final costs are to be determined by the town or RME based on overhead requirements.

^c Responsibility of homeowner. Assumes the pump runs 20 hours per day at \$0.13 per kilowatt-hour. Could be managed by a Homeowner’s Association (HOA) or RME if established for community.

^d Capital and O&M costs for onsite/septic systems and community cluster systems could be reduced based on results of soil testing. Costs are based on unsuitable soils as noted in USDA Web Soil Survey.

^e Assumed 30-year life span for onsite fill systems and 60-year life span for cluster drip system with pretreatment.

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 Duplin County, including USDA-RD and the CWSRF administered by NCDEQ.

Overview of the CWSRF Program Administered by NCDEQ

- The CWSRF program provides low-interest loans (up to half the market interest rate) to finance public infrastructure improvements.
- The program can provide up to \$500,000 in grants or principal loan forgiveness and up to \$35 million in loans.
- Applications are evaluated based on the Priority Rating System, which awards points for project purpose, project benefits, system management, and affordability.
- Eligibility for grant or principal loan forgiveness is based on NCDEQ's affordability criteria, which include population trends, poverty rate, median household income (MHI), unemployment rate, and sewer bill.
- Loans are administered by NCDEQ and should be approved by the North Carolina Local Government Commission.
- Three years of financial audits are required for the application process.
- Construction should begin within 24 months of receiving the letter of intent to fund.
- Application forms³ and application training⁴ can be found on NCDEQ's website.

Overview of HUD's CDBG

- The CDBG program provides grants for states, cities, and counties to develop housing and certain public utilities, including water and sewer facilities.
- Funding from the North Carolina CDBG program is administered by the NCDEQ Division of Water Infrastructure. Maximum grant funding is \$3 million over a 3-year period.
- Project area should have at least 51 percent of low- to moderate-income persons, according to HUD's low and moderate income threshold.
- The CDBG infrastructure program has one funding cycle per year, typically in September.
- Application forms³ and application training⁴ can be found on NCDEQ's website.

Overview of NCDEQ's Merger/Regionalization Feasibility Grants

- The Merger/Regionalization Feasibility grants provide up to \$50,000 from the Wastewater Reserve fund for studying the feasibility of regionalizing or extending wastewater sewer services.

Overview of USDA-RD's Water Programs for Septic System Upgrades

Single Family Housing Repair Loans and Grants

- The Single Family Housing Repair Loans and Grants program, also known as the Section 504 Home Repair program, provides loans to very-low-income homeowners to repair, improve, or modernize their homes, as well as grants to elderly, very-low-income homeowners to address health and safety hazards, including septic systems.
- To qualify, applicants should be the homeowner and occupy the house, be unable to obtain affordable credit elsewhere, and have a household income that does not exceed the very low limit by county. In Duplin County, the limit is \$34,600 for households of up to four and \$45,700 for households of five or more.

³ www.deq.nc.gov/about/divisions/water-infrastructure/i-need-funding/application-forms-and-additional-resources

⁴ www.deq.nc.gov/about/divisions/water-infrastructure/application-training

- Grants go up to \$10,000, specifically for those aged 62 and older. Grants can be combined with full loans.
- Loans go up to \$40,000 and are termed for 20 years with a 1 percent fixed interest rate.
- Applications are accepted through the North Carolina RD office.⁵

Rural Decentralized Water Systems Grant

- The 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 (i.e., areas with a population of 50,000 or fewer). The fund may be used to construct, refurbish, or service individually owned septic systems.
- The nonprofit should contribute at least a 10 percent match.
- The maximum loan amount is \$15,000 at a 1 percent fixed interest rate, repaid over a 20-year period.
- Applications for nonprofits to apply are accepted through Grants.gov (see USDA website for current posting).⁶ Nonprofits currently administering loans include SERCAP and the Water Well Trust Loan Program, listed below.

SERCAP's Individual Septic Loan Program

- SERCAP's Individual Septic Loan program offers loans of up to \$15,000 to residents of rural communities to pay for the installation of a new standard/alternative septic system or to repair an existing malfunctioning system. The interest rate is locked in at 1 percent, and these loans are not readily available from other lending institutions.
- Applications are accepted on SERCAP's website.⁷

Water Well Trust Loan Program

- The Water Well Trust Loan program provides funding for wells and/or septic system repairs for low-income families nationwide that need safe drinking water or wastewater systems. This program primarily serves residents living in rural and unincorporated areas, as well as minority communities.
- To qualify, applicants should have a deed or mortgage in their name, occupy the property, and have a gross annual household income based on North Carolina's MHI.
- Applicants can fill out the information form⁸ on the Water Well Trust website⁹ to begin the application process.

Overview of USDA-RD's Other Water Programs

SEARCH Grant

- The SEARCH grant program helps very small, financially distressed rural communities with predevelopment feasibility studies, design, and technical assistance on proposed water and waste disposal projects.
- State and local government entities, nonprofits, and federally recognized Tribes may apply.
- The area to be served should be rural, with a population of 2,500 or fewer, and have an MHI below the poverty line or less than 80 percent of the statewide MHI.
- Applications are accepted year-round through RD Apply.¹⁰ Duplin County applied in January 2024.

WEP Water and Waste Disposal Loan and Grants

- Through the Rural Utilities Service WEP, this program provides funding to rural communities with populations of fewer than 10,000 to obtain the technical assistance and financing necessary to develop drinking water and waste disposal systems.

⁵ www.rd.usda.gov/nc

⁶ www.rd.usda.gov/programs-services/water-environmental-programs/rural-decentralized-water-systems-grant-program

⁷ sercap.org/about/who-we-serve/programs-and-services-homeowners

⁸ www.waterwelltrust.org/online-app-info/

⁹ www.waterwelltrust.org/

¹⁰ www.rd.usda.gov/programs-services/rd-apply

- USDA-RD has long-term, low-interest loan financing programs to assist communities with infrastructure costs. Qualifying communities have opportunities for grants combined with loans.
- 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.
- Borrowers should have the legal authority to construct, operate, and maintain the proposed services or facilities.
- USDA-RD loans and grants require financial audits, as well as a commitment to revenue collection during the life of the loan.
- USDA-RD accepts applications year-round on a rolling basis through RD Apply.⁵

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.¹¹ 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.¹² 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 the residents of Calico Bay Road. Children can play outdoors, 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

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. Rural wastewater infrastructure also increases property values and development potential, which enhances the overall wealth of a community while reducing out-migration of residents. This creates a positive feedback loop that further benefits the community, as the increased tax base reinvests in public services and other supporting infrastructure.

Although Calico Bay Road is not within the Town of Wallace's municipal boundary, Calico Bay Road residents contribute to the town's economy as patrons of local businesses and service providers. Expanding the growth and prosperity of Calico Bay Road residents via sustainable wastewater infrastructure will have economic benefits for both the town and county. Extended sewer service from the town would likely be a revenue-positive venture upon implementation (assuming that most of the construction costs were covered by grants), yielding additional investment capital for the town. If Option 1a of the proposed alternatives is selected, development and occupation of an industrial site would not only add jobs and tax revenue to the community but would also provide a quicker return on investment for the sewer extension to this location. If Option 2 is chosen, additional jobs could be created to maintain and operate the decentralized wastewater infrastructure.

¹¹ World Health Organization. (2006). *WHO guidelines for the safe use of wastewater, excreta and greywater* (Vol. 2). www.who.int/publications/item/9241546832

¹² 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. link.springer.com/chapter/10.1007/978-3-319-49727-3_12

Sustaining the Investment Through Operations and Maintenance

Options 1a and 1b: Sewer Extension

For this option, the Town of Wallace would maintain the adjacent public wastewater collection and treatment system and Duplin County would own and maintain the public water system that currently serves residents along Calico Bay Road. If a sewer extension is implemented, then the sewer collection system will be owned and maintained by the Town of Wallace. Given that the town does not currently own individual grinder or STEP pump systems in their sewer network, further discussion is needed regarding pump system ownership and maintenance, and analysis is needed to determine additional fees. Options 1a and 1b leverage the existing resources of the town's Public Services Department without requiring new operator certifications or specialty equipment and training.

Potential options for O&M:

- The Town of Wallace maintains ownership of the sewer collection system.
- Duplin County and the Town of Wallace implement an interlocal agreement that allows for the Duplin County Water Department to bill and collect sewer fees in conjunction with the county's water billing process.
- Additional fees (beyond the town's out-of-town sewer rates) are charged to the Calico Bay Road customers to cover the additional grinder pump system maintenance. However, a fee structure is developed to incentivize preventative maintenance of the grinder system, with a potential "three-strike" clause that would cause customers with repeat pump damage to take over full O&M of the grinder system.
- Residents could receive reduced fees or rebates for completing training on grinder system preventative maintenance.
- The town could contract O&M to a private entity to manage all the grinder pumps and pressure sewer maintenance within the Calico Bay Road community.

Option 2: Community Cluster System

This alternative will require establishing a new ownership entity such as a HOA, sanitary/sewer district, or equivalent legal structure with maintenance agreements for the offsite wastewater system. As with the sewer extension option, residents would pay monthly or annual fees to cover O&M, which could be contracted to certified contractors or a new private or public RME. The Wallace Public Services Department could potentially manage the cluster system option; however, this would require additional administrative procedures and staff training and certification, as the town currently does not operate onsite wastewater treatment and dispersal systems. Alternatively, the Town of Wallace could own, operate, and maintain such a system if they chose.

Potential options for O&M:

- The county could establish a cost-effective, private ownership and management entity (e.g., RME, HOA) consistent with North Carolina law and local ordinances. This entity could be set up for both system ownership and O&M or just for O&M.
- The county could also take over ownership and O&M by establishing a publicly owned RME or sanitary/sewer district, which could benefit other properties in the county that depend on onsite systems.
- Advanced technology, such as remote monitoring and reporting, could be used in community systems or a wastewater treatment plant to reduce O&M.
- Residents could receive reduced fees for completing training on STEP system preventative maintenance.
- The town could be contracted to manage both the STEP and cluster treatment system. However, Town Public Services staff currently do not have the appropriate certifications to operate onsite wastewater systems.
- The county Environmental Health Department could provide additional education and outreach regarding preventative maintenance and O&M of onsite systems.

Option 3: Onsite System Upgrades

Onsite upgrades to fill systems or advanced pretreatment and drip dispersal would have the most O&M requirements for the residents of Calico Bay Road. Under this option, each property owner would ultimately maintain system ownership and perform O&M. Depending on the system's complexity, residents may be required to contract an authorized service provider for maintenance.

Potential options for O&M:

- Residents work collaboratively with an independent contractor to perform regular inspections and as-needed O&M to provide economy-of-scale cost benefits to individual owners.
- The county Environmental Health Department could provide additional education and outreach regarding preventative maintenance and O&M of onsite systems.

All three wastewater management options require the homeowners to accept responsibility for properly operating and maintaining their wastewater systems or connections. As such, it will be critical to educate homeowners on how to maintain their systems. For sewer connections, the utility fulfills the role of O&M and charges monthly rates for this service. This solution could be the most sustainable since the sewer system would be operated by a functioning utility with an active asset management program. For onsite replacements where the homeowner is solely responsible for the O&M, homeowners have an opportunity to remove any current health or environmental hazards, improve their use of their property, and have a reliable property asset, which will help maintain property values. The Duplin County Environmental Health Department and specific permitting and design requirements will enforce any future health or environmental violations which may occur from lack of maintenance or misuse.

Paying for O&M and the Affordability Challenge

Across the United States, utilities use sewer bills to pay for management, operations, maintenance, and loan repayments for wastewater systems. The Town of Wallace or other management entity will need to keep rates affordable for low-income customers but high enough to collect funds to operate and maintain the system. This challenge is a key obstacle for utilities across the United States. Traditionally, wastewater-only projects are considered "affordable" if the sewer bill is 2 percent of MHI or less. Given the weighted MHI¹³ of \$43,493¹⁴ for Calico Bay Road, a monthly wastewater fee of \$72 per month would represent approximately 2 percent of MHI. Although this rate might be affordable for some households, a portion of the population has an income less than the MHI. The monthly rates would also increase if there were loan repayment costs. Using MHI as an indicator can make it challenging to understand the community's affordability needs, since low-income residents struggle more with paying utility bills than high-income residents do.


Table 3 shows 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 proposed wastewater infrastructure options. All options will have a high financial impact on the lowest-income residents of Calico Bay Road. Additionally, many homes that are not currently connected to the public water system would have to connect, which would add another monthly fee for some households that cannot meet the affordability index. This water connection requirement would exist for sewer extension options and could be required for the cluster system option if it is owned and operated by a public utility (but not necessarily if it is owned by a community HOA).

¹³ Weighted MHI is calculated by averaging the total MHI for each census block group on Calico Bay Road (block groups 1 and 2 in tract 907.06). The formula used was $(\text{MHI block group 1} * \text{households in block group 1}) + (\text{MHI block group 2} * \text{households in block group 2}) / (\text{total households})$.

¹⁴ U.S. Census Bureau. (2021). *Median household income in the past 12 months (in 2021 inflation-adjusted dollars)*. American Community Survey Five-Year Estimates. data.census.gov/table/ACSDT5Y2021.B19013

Table 3. Percent of Household Income Spent on Wastewater Services for Calico Bay Road Options (Considering O&M Costs, 100 Percent Principal Forgiveness for Capital Costs)

Income Bracket	\$0–\$14,999	\$15,000–\$29,999	\$30,000–\$44,999	\$45,000–\$75,000	\$0–\$43,493 (MHI)
Percent of Households in Income Bracket^a	13.4%	20.5%	21.2%	24.4%	50%
1a. Sewer extension via Wallace industrial site	6.8%	3.4%	2.3%	1.4%	2.3%
1b. Sewer extension via James Andrews Lane	6.8%	3.4%	2.3%	1.4%	2.3%
2. Community cluster system	5.6%	2.8%	1.9%	1.1%	1.9%
3. Onsite system upgrades	5.14%	2.6%	1.7%	1%	1.8%


 Greater than 2% of MHI considered “high impact” to households based on the 2023 EPA *Clean Water Act Financial Capability Assessment Guidance* focused on Clean Water Act compliance cases.

^a Based on 2021 American Community Survey Five-Year Estimates.

If a partial loan is part of funding, an additional monthly cost would further challenge the affordability of all options for low-income residents, as shown in Table 4.

Table 4. Percent of Household Income Spent on Wastewater Services for Calico Bay Road Options (Considering O&M and Potential USDA-RD Loan Repayment Costs)

Income Bracket	\$0–\$14,999	\$15,000–\$29,999	\$30,000–\$44,999	\$45,000–\$75,000	\$0–\$43,493 (MHI)
Percent of Households in Income Bracket	13.4%	20.5%	21.2%	24.4%	50%
1a. Sewer extension via Wallace industrial site	8.5%	4.3%	2.8%	1.7%	2.9%
1b. Sewer extension via James Andrews Lane	8.4%	4.2%	2.8%	1.7%	2.9%
2. Community cluster system	8.1%	4.1%	2.7%	1.6%	2.8%
3. Onsite system upgrades ^a	17.2%	8.6%	5.7%	3.4%	5.9%

 Greater than 2% of MHI considered “high impact” to households based on the 2023 EPA *Clean Water Act Financial Capability Assessment Guidance* focused on Clean Water Act compliance cases.

^a Based on USDA Single Family Housing Repair Loan.

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 it is only authorized by Congress through 2024. It is unclear whether Congress or the state of North Carolina will continue this program.

The Town of Wallace and Duplin County, 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 the area does not have many commercial or industrial accounts to pay extra to fund it.

The Calico Bay Road community will need multiple approaches to address the financial burden of water utilities for low-income residents, beyond just the programs discussed above. For example, the Town of Wallace or Duplin County could consider non-rate revenue opportunities such as leasing space on water towers or offering non-traditional services. These could include providing construction services to new projects related to the utilities connections and charging for the time, although this would require contract documents with the private sector.

Key Takeaways on Affordability

All wastewater treatment options have a high financial impact on the lowest-income residents of Calico Bay Road. **Rate assistance programs may be necessary for some households on Calico Bay Road.**

Loan repayments will cause any option to have a high financial impact on residents of Calico Bay Road. The Town of Wallace or Duplin County will need to work with the funding agencies to **maximize the amount of grants** for construction of their system.

Economic growth can lower monthly costs of central treatment systems; therefore, **the community should carefully weigh multiple factors in deciding on a system.**

Partners and Roles

The path to clean water is not an easy one. The Calico Bay Road community has options to choose from when it comes to new wastewater systems. Many partners in this pilot program will continue to support Calico Bay Road along this journey (Figure 4), 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.
- **North Carolina Department of Environmental Quality (NCDEQ), Division of Water Infrastructure:** State agency overseeing funding programs such as CWSRF, CDBG, and Merger/Regionalization Feasibility grants.
- **North Carolina Rural Water Association (NCRWA):** Nonprofit organization providing technical assistance for drinking water and wastewater service. Lead for community outreach support.
- **Duplin County:** Applicant for USDA SEARCH grant funding and entity providing community outreach support. With Town of Wallace, providing support for wastewater service options.
- **Town of Wallace:** Entity potentially providing wastewater service options and applying for funding.
- **Southeast Rural Community Assistance Project, Inc. (SERCAP):** Program providing support with USDA SEARCH grant funding applications.



Figure 4. Partners to Calico Bay Road.

Technical Assistance and Support for Calico Bay Road 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 (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 Duplin County and the Town of Wallace understand the funding available through the SRF and USDA-RD programs, as well as deadlines and application requirements. **EPA WaterTA and USDA-RD TA can also assist with preparing and submitting funding applications.** NCRWA, SERCAP, and North Carolina Environmental Finance Center can assist with community outreach, education and training of professionals, and utility rate assistance. These providers can offer advice as communities consider infrastructure options, financing, and rate structures. Their connections with EPA, USDA-RD, and NCDEQ can help communities successfully complete projects and programs. Other technical assistance support for the Calico Bay Road community can include:

- **Developing a wastewater rate program to build a local “affordability assistance” and asset management program.** Duplin County or the Town of Wallace 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.** Utilities 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 or sewer connection. Technical assistance providers can help with engagement and education for residents on topics such as “What Not to Flush,” “Management of Fats, Oils, and Greases (FOG),” 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.¹⁵

Road Map for Implementation

Both the Town of Wallace and Duplin County have committed to continuing with planning and preliminary design of a wastewater solution for the Calico Bay Road community. This detailed planning, in addition to community engagement, is required for a successful outcome. Advancing a large wastewater infrastructure project to full implementation (as well as sustained O&M) takes time and commitment from all parties and is typically best achieved by evaluating all feasible options using a triple-bottom-line framework (i.e., considering social, environmental, and economic outcomes). Formal community engagement (e.g., public listening sessions) should be conducted following finalization of this document to solicit input from Calico Bay Road residents on the wastewater management alternatives evaluated. Further details on proposed next steps for project implementation are described below.

Immediate Next Steps Ongoing Through 2024

Duplin County applied for a SEARCH grant with USDA-RD to fund a formal PER and the supporting environmental documentation. This step is necessary for soliciting funding for design, permitting, and construction from CWSRF and USDA’s other programs. Extending beyond the scope of this document, the PER may include the following tasks as part of the scope of work:

- Individual parcel evaluations to determine the condition of existing septic systems, as well as verification of occupied status.
- Refinement of design flow for preliminary solutions design and cost estimates.

¹⁵ www.epa.gov/waterta

- Parcel screening and identification for potential cluster treatment areas, followed by preliminary soils investigation to assess suitability for onsite wastewater disposal.
- Refinement of cost estimates for identified solution alternatives.
- Further engagement (i.e., community meetings, site visits and demonstrations, presentations at town council meetings) with the Calico Bay Road community and Town of Wallace to select a preferred system option. Topics to consider include:
 - The future: how can this investment shape the next 20 years for the community?
 - Monthly bills:
 - » Do the potential grants and low-interest loans make monthly bills affordable enough for the community?
 - » If not, are there programs like the Low Income Household Water Assistance Program that could make them affordable?
 - If the town does not act now with the current funding, will it ever be able to act? How can the community encourage action?

Ideally, the PER will yield a proposed solution that has been vetted and supported by the Calico Bay Road community and the involved stakeholders, and that is affordable to Calico Bay Road residents with or without 100 percent grant funding. Once this solution is selected, the next step will be choosing one or more funding sources to move the project to detailed engineered design, permitting, and construction. These funding sources and their eligibility and application requirements are detailed above in the “Financing Options” section.

Activities After Alternative Selection

Figure 5 provides a general flow of major project milestones for each of the alternatives evaluated. Note that the sequential order is typical and subject to change based on the funding source used.

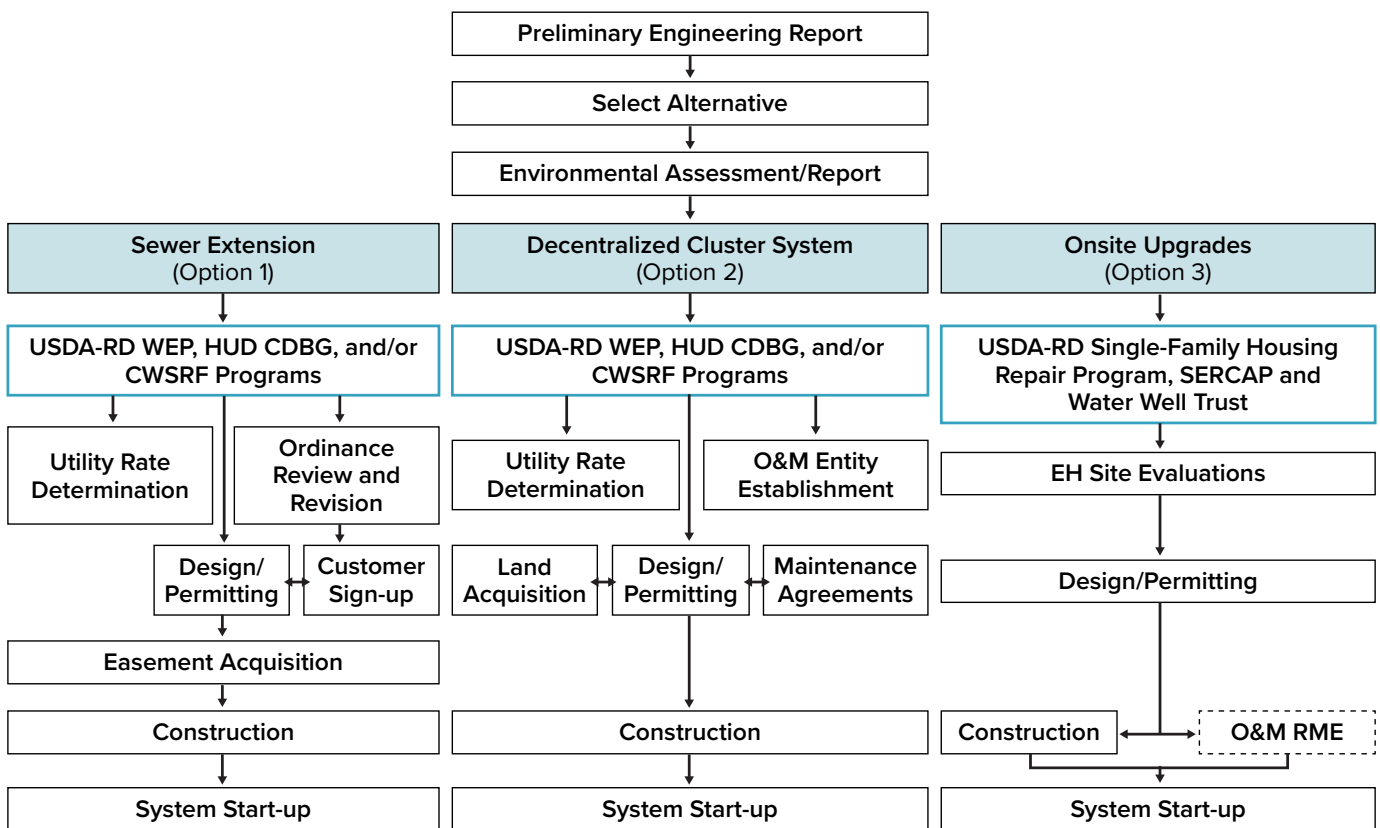


Figure 5. Major project milestones for each option.

Potential Project Timeline

The schedule in Figure 6 is estimated and subject to change once a specific alternative is selected and the overall project progresses.

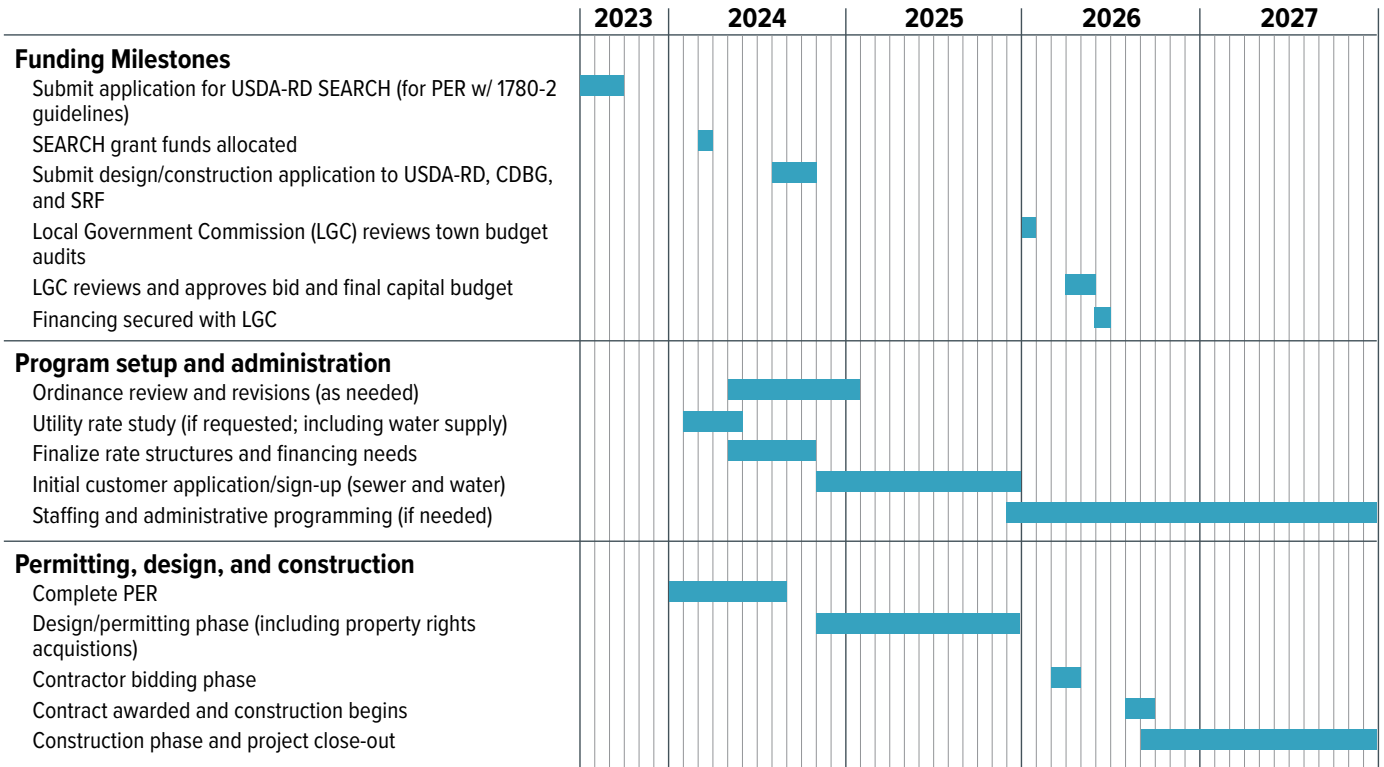


Figure 6. Potential timeline for project completion.

Concluding Thoughts

As Duplin County and the Town of Wallace move forward with an in-depth engineering analysis of their options for wastewater service, EPA, USDA-RD, and NCDEQ staff and technical assistance providers are ready to support the community with funding opportunities from 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 Duplin County, North Carolina. New funding can help Duplin County and the Calico Bay Road community address their current and persistent health challenges and build a prosperous future.

Definitions

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

Fill (“mound”) system. A system in which all or part of the dispersal field media are installed in fill material. The system includes both the basal area of dispersal field and the toe slope in all directions.

Community or cluster treatment system. A small wastewater treatment system of less than 15,000 gallons per day with a dispersal field for subsurface or surface discharge. These systems are permitted either through Halifax County Health Department (subsurface) or the North Carolina Department of Environmental Quality (surface).

Pressure sewer system. A system that uses effluent or grinder/sewage lift pumps to convey wastewater to a treatment system and/or disposal system. Effluent pumps typically follow septic tank treatment, while grinder pumps can handle raw wastewater before discharging to pressurized, small-diameter pipes.

Grinder pump. A type of sewage pump designed to handle solids without pretreating the raw wastewater. Grinder pumps contain cutter blades that pulverize wastewater solids into a slurry that can easily be pumped through smaller diameter discharge pipes (e.g., 2 inches or less). Grinder pumps typically cost more to purchase and operate than effluent pumps but do not require a septic tank.

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 into a 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 RME depending on ownership and the O&M model.

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

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.



Limitations

Any systems and associated cost estimates discussed in this draft analysis are preliminary and not intended to serve in lieu of a PER 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.